

**Understanding the Masculinity Dilemma: A Mixed Methods
Investigation of the Psychosocial Mechanisms Contributing to
Men's Meat Consumption and Reduction**

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Thesis submitted in fulfilment of the requirements for the degree of

Doctor of Philosophy

Victoria University

Institute for Health and Sport

May 2025

Abstract

Men are the biggest meat consumers worldwide, placing themselves at greater risk of chronic diseases and contributing substantially to animal suffering, climate change, and environmental destruction. Despite these consequences, men consistently show greater unwillingness to reduce their meat intake than women. Researchers argue that meat's connection to masculinity partly explains men's resistance to meat reduction, presenting a "masculinity dilemma". This dissertation aimed to develop a comprehensive understanding of the masculinity dilemma by investigating how masculine norms, hegemonic masculinity, and other psychological factors influence men's resistance to meat reduction. This aim was achieved using a hybrid sequential convergent mixed methods research design.

In a preliminary study, a Meat Consumption Scale was developed and psychometrically validated to improve the methodological rigour of the quantitative phase. Five hundred and seventy-five Australian (n=322) and English (n=253) participants who identified as male participated in the initial quantitative phase, which included two empirical studies. In the first quantitative study, a partial least squares structural equation model investigated which traditional and non-traditional masculine norms predicted men's meat consumption and willingness to reduce their meat consumption. When controlling for age, education, geographic location, personal income, sexual orientation, and social dominance orientation, the traditional masculine norms violence and importance of sex positively predicted men's meat consumption, and the non-traditional masculine norm sensitivity to male privilege positively predicted men's willingness to reduce. In the second quantitative study, a latent profile analysis identified the psychological profiles of latent subgroups of male meat consumers, based on twenty psychological variables related to meat consumption. Three distinct consumer segments (Resistant, Ambivalent, and Meat-Averse) displayed unique psychological characteristics, with profiles differing significantly on all indicator variables,

self-reported meat consumption, and willingness to reduce their meat intake. The qualitative phase involved 19 semi-structured interviews with Resistant, Ambivalent, and Meat-Averse participants sampled from the quantitative participant pool. Through an ecofeminist and critical animal theoretical lens, a reflexive thematic analysis identified three themes elucidating how hegemonic masculinity contributes to men's meat consumption through (1) rewarded meat-eating gender performances reinforced by (2) mechanisms of domination (feminisation, ridicule, and social exclusion) and (3) consent (self-policing, free choice discourse, and strategic ignorance). This hegemonic system rewards, reinforces, and polices men's meat consumption, producing a sociocultural environment in which plant-based diets are unappealing and difficult for men to initiate or sustain.

The results elucidated the gendered social mechanisms underlying the masculinity dilemma. In a unified hegemonic gender order, mechanisms of dominance and consent reinforce a culturally idealised construction of heterosexual carnist masculinity that not only sustains meat consumption, but also normalises violence against human and animal groups, subordinates nonhegemonic masculinities (veg*n and homosexual men), and indirectly contributes to the oppression of women and animals. Thus, this dissertation presents a non-anthropocentric theory of the meat-masculinity link, contributes to the ecofeminist “linked oppression” thesis, and highlights the connection between human- and animal-directed violence, which has practical implications for the development of meat-reduction interventions and strategies. Additionally, this dissertation contributes The Meat Consumption Scale, a psychometrically valid assessment tool for measuring an individual's self-reported meat consumption.

Doctor of Philosophy Declaration

I, Lauren Camilleri, declare that the PhD thesis entitled *Understanding the Masculinity Dilemma: A Mixed Methods Investigation of the Psychosocial Mechanisms Contributing to Men's Meat Consumption and Reduction* is no more than 80,000 words in length including quotes and exclusive of tables, figures, appendices, bibliography, references and footnotes. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work. I have conducted by research in alignment with the Australian Code for the Responsible Conduct of Research and Victoria University's Higher Degree by Research Policy and Procedures.

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Date: 21/08/2025

Ethics Declaration

All research procedures reported in this thesis were approved by the Victoria University Human Research Ethics Committee (approval number HRE21-162).

Signature:

Date: 21/08/2025

Acknowledgements

Completing this thesis would not have been possible without the support I've received throughout my life, which has given me the skills and opportunities to pursue a PhD. My greatest support has been my family. Dad, thank you for always valuing and supporting my education and for your financial assistance, which allowed me to focus on my studies. Mum, thank you for nurturing my love of reading and writing from an early age, which has been essential to my academic success. Mariella and Marius, your unconditional love and support enabled me to overcome personal barriers that once held me back. I would not be who I am today, nor capable of completing a PhD, without you. I also would like to thank Nanna, my brother Nic, and the entire Camilleri family who have been a continuous source of love, belonging, inspiration, and happiness in my life.

This research would also not have been possible without my academic supervisors. I am deeply grateful to Dr. Peter Gill, my primary supervisor, for his unwavering guidance, mentorship, and support throughout my honours and PhD. During my honours I had no intention of pursuing a PhD; without such a positive experience, I wouldn't have taken this path. Thank you for the countless hours spent mentoring and training me, the professional opportunities you've provided, and for encouraging pragmatism over perfectionism. Dr. Andrew Jago, thank you for your invaluable statistical advice and moral support. During moments of self-doubt, your encouragement helped me believe in myself. Dr. Lutfiye Ali, thank you for your generosity with your time and patience in helping me navigate the qualitative study and teaching me how to conduct a qualitative analysis. I appreciate your willingness to help me well before you joined as an official supervisor and author. To Dr. Jessica Scarfo and Dr. Melissa Kirkovski, I sincerely appreciate your time and insights. Thank you Jess for your statistics advice, and thank you Mel for your career and publishing guidance.

I would also like to thank my fellow PhD student Daniel Zarate who provided tips for performing latent profile analysis in R, and the research participants for their time. Finally, this research was supported by a stipend scholarship from Victoria University. I would most likely not have undertaken this PhD without this financial support so am very grateful for this.

I would also like to acknowledge that parts of this thesis have been edited for clarity of expression, punctuation and grammar using Chat GPT 4o AI software. This use complies with VU Academic Integrity Guidelines, section 86c.



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Chapter No.	Publication Title	Publication Status <ul style="list-style-type: none"> Published Accepted for publication In revised and resubmit stage Under review Manuscript ready for submission 	Publication Details <ul style="list-style-type: none"> Citation, if published Title, Journal, Date of acceptance letter and Corresponding editor's email address Title, Journal, Date of submission
6	Development and Preliminary Validation of the Meat Consumption Scale	Accepted for publication	Development and preliminary validation of the Meat Consumption Scale accepted by BMC Psychology on 6/08/2025. doi:10.1186/s40359-025-03270-2
7	Understanding the Meat-Masculinity Link: Traditional and Non-Traditional Masculine Norms Predicting Men's Meat Consumption	Published	Camilleri, L., Kirkovski, M., Scarfo, J., Jago, A., & Gill, P. R. (2024). Understanding the meat-masculinity link: Traditional and non-traditional masculine norms predicting men's meat consumption. <i>Ecology of Food and Nutrition</i> , 62(4), 1-22.
8	Resolving the Masculinity Dilemma: Identifying Subtypes of Male Meat Consumers with Latent Profile Analysis	Published	Camilleri, L., Gill, P. R., Scarfo, J., & Jago, A. (2023). Resolving the masculinity dilemma: Identifying subtypes of male meat consumers with latent profile analysis. <i>Food Quality and Preference</i> , 108, 104800. https://doi.org/10.1016/j.foodqual.2023.104800
9	Hegemonic Carnist Masculinity: Mechanisms of Domination and Consent Sustaining the Oppression of Women and Animals	Manuscript ready for submission	

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23/08/2025

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Chapter 1: Introduction to the problem

“Our patterns of overconsumption are unsustainable and will ultimately cause the collapse of our civilisation” (Horton et al., 2014, p. 847)

This chapter introduces the problem of meat overconsumption in developed and developing countries, emphasising the urgent need for widespread meat reduction to address critical environmental, health, and ethical challenges. It then explores the masculinity dilemma, a pervasive phenomenon that hinders men's willingness to reduce meat consumption. Given that men consume more meat, they hold the potential to make substantial contributions to improving public health, as well as benefiting the environment and animal welfare. Despite this, men consistently exhibit resistance to reducing their meat intake. The chapter underscores the importance of understanding the masculinity dilemma in order to develop more effective interventions targeted at male meat consumers. This dissertation holds global relevance for public health, environmental sustainability, and the alleviation of immense animal suffering.

1.1. Context of the current study: The problem with excessive meat consumption

Meat has played a key role in the evolution of the human species, serving as an important source of nutrition and energy (Mann, 2018). Historically, meat was consumed sporadically (e.g., in hunter gather societies), reserved for special occasions, or consumed mostly by the wealthy and privileged (Leroy & Degreeef, 2015). Today, however, thanks to technological advancements in agriculture, animal husbandry, and transportation, meat is a dietary staple in developed and developing countries. In some third world countries meat consumption remains infrequent (Whitton et al., 2021). However, since the 1970's, global meat consumption has quadrupled (Ferreira et al., 2021). People in developed countries, particularly in Australia and the US, have become “excessive” meat consumers by surpassing dietary needs for protein and saturated fats (Onwezen, 2022; Whitton et al., 2021). For

example, the average Australian consumes 100kg of meat per capita per year, compared to the world average of 34kg, exceeding recommended protein intakes (Whitton et al., 2021). Developing countries are following these trends, rapidly increasing their meat consumption in line with economic growth (Whitton et al., 2021). Although some country's meat consumption has decreased in recent years (e.g., New Zealand and Paraguay), overall, global meat consumption levels continue to rise (Whitton et al., 2021).

As a nutrient- and energy-rich food source, meat is an important dietary component for members of low-income countries where malnutrition is rife (Adesogan et al., 2020). However, as will be outlined below, in developed and developing countries, the negative impacts of meat overconsumption on planetary health, human health, and animal welfare are far-reaching and devastating. In response to these concerns, in 2019, the EAT-Lancet Commission—comprised of scientists from the fields of human health, agriculture, political sciences, and environmental sustainability across 16 countries—proposed a healthy and sustainable plant-based diet as a solution to achieving the United Nation's Sustainable Development Goals and Paris Agreement climate change targets, which “largely consists of vegetables, fruits, whole grains, legumes, nuts, and unsaturated oils, includes a low to moderate amount of seafood and poultry, and includes no or a low quantity of red meat [or] processed meat” (Willett et al., 2019, p. 447). The authors emphasised that a major transformation in global food systems is needed to ensure food security, sustainability, planetary health, and human health, requiring “unprecedented global collaboration and commitment” (Willett et al., 2019, p. 448).

1.1.1. Meat consumption and the environment

In Western countries, the public have little awareness of the contribution of meat consumption to global warming (Hartmann & Siegrist, 2017). Fossil fuel emissions have often been the focus of climate debates. Only relatively recently have people drawn attention

to the global food system, a major source of greenhouse gas (GHG) emissions (approximately 30-35% of total emissions; Clark et al., 2020; Xu et al., 2021). Within the food system, meat production is responsible for 54% of total agricultural emissions (Food and Agricultural Organization of the United Nations, 2023). Assessment of the current global food system estimates that, even if all fossil-fuel emissions were immediately reduced to zero, GHGs emitted by the food system alone would likely exceed the 1.5°C target by 2063 (Clark et al., 2020). This highlights the need for major shifts in the global food system to reach emission targets.

Plant-based diets offer a solution for reducing emissions. A systematic review by Chai et al. (2019) found strong evidence that meat and animal products have higher GHG emissions and greater land and water use than plant-based diets, with vegan diets having the smallest ecological footprint. Meat consumption is positively associated with GHG emissions (Raihan, 2023; Scarborough et al., 2023), with animal-based diets producing twice the emissions of plant-based diets (Xu et al., 2021). A vegan diet produces 30.3% of the carbon dioxide and 6.5% of the methane emissions of a heavy meat diet (Scarborough et al., 2023). Hence, there is strong scientific consensus that substantial reductions in meat consumption are required to meet Paris Agreement targets (Aleksandrowicz et al., 2016; Chai et al., 2019; Hedenus et al., 2014; Scarborough et al., 2023; Xu et al., 2021).

Meat production systems are also unsustainable, resource inefficient, and environmentally destructive (Pimentel & Pimentel, 2003; Poore & Nemecek, 2018; Sabaté & Soret, 2015). Compared to plant-based diets, meat-based diets require additional land, water, and fossil energy (Sabaté & Soret, 2015). For example, animal protein requires 11 times more fossil energy and 100 times more water to produce than plant protein (Pimentel & Pimentel, 2003), while animal agriculture utilises 83% of farmland, yet provides only 37% protein and 18% of human's dietary calories (Poore & Nemecek, 2018). This plant-to-animal-to-human

energy conversion is inefficient. Moreover, plant-based diets could improve food security by enabling direct consumption of grains currently fed to livestock (Pimentel & Pimentel, 2003). Over a third of human-edible grain is fed to livestock, which if directly consumed by humans would feed an additional four billion people (Rust et al., 2020). Moreover, meat production contributes to deforestation and biodiversity loss, with cattle ranching and soybean production being the primary drivers of deforestation in the Amazon rainforest (da Silva Bueno et al., 2021), with 90% Amazon-grown soybeans used as livestock feed (Rust et al., 2020).

Large-scale industrial fishing is also unsustainable and environmentally destructive. Overfishing—harvesting fish faster than they can reproduce—is a major threat to marine ecosystems (Sumaila & Tai, 2020). Overfishing larger fish leads to overpopulation of smaller species, disrupting marine ecosystem balance (Daskalov, 2002; Daskalov et al., 2017). Additionally, removing large fish releases blue carbon into the atmosphere, which would otherwise be sequestered in their bodies at the ocean's bottom (Mariani et al., 2020). Many marine species are threatened with extinction due to the destruction of marine habitats from fishing equipment (e.g., bottom trawls) and “bycatch”, whereby fishing nets indiscriminately catch all types of marine life, including birds, sea mammals, sharks, and turtles (Dulvy et al., 2021; Telesetsky, 2017). Overfishing is further driven by the meat industry’s use of fishmeal as livestock feed (Kraham, 2017).

1.1.2. Meat consumption and human health

In addition to damaging planetary health, excessive meat consumption directly harms human health. Once considered essential for nutrition, recent large-scale cohort studies have linked red and processed meat intake to numerous health issues, including colorectal and prostate cancer, cardiovascular disease, stroke, type 2 diabetes, obesity, and overall mortality (Grosso et al., 2022; Libera et al., 2021; Zheng et al., 2019), even when controlling for age,

race, BMI, smoking status, blood pressure, physical activity, and lipids (Battaglia Ritchie et al., 2015). In response to increasing evidence supporting the link between red and processed meat and cancer, in 2015, the International Agency for Research on Cancer (IARC) classified processed meat as carcinogenic, and red meat as probably carcinogenic (De Smet & Vossen, 2016). Consequently, the IARC and other research bodies, such as the American Institute for Cancer Research (2024) and the World Cancer Research Fund International (2025), recommend that people limit their red and processed meat consumption. Thus, while meat is a rich source of protein, iron, and essential nutrients (Baltic & Boskovic, 2015), its health risks appear to outweigh the benefits. Conversely, plant-based diets provide protection against cardiovascular disease (Satija & Hu, 2018), cancer (DeClercq et al., 2022), type 2 diabetes (Qian et al., 2019), kidney disease (Joshi et al., 2020), obesity (Medawar et al., 2019; Turner-McGrievy et al., 2017), and overall chronic disease mortality (Jafari et al., 2022).

Meat overconsumption is particularly harmful to men's health. In Western countries, men consume significantly more red and processed meat than women (Rozin et al., 2012; Pfeiler & Egloff, 2018), increasing their risk of disease and early death (Battaglia Richi et al., 2015; Rohrmann et al., 2013). One prospective cohort study found that higher red and processed meat intake was associated with greater incidence of colorectal cancer and rectal cancer in Swedish men but not women (Vulcan et al., 2017). Another found that total, unprocessed, and processed red meat consumption was associated with coronary heart disease among US men, even when adjusting for consumption of other foods (Al-Shaar et al., 2020). In Japan, total and red meat intake was associated with increased risk of Type 2 diabetes in men but not women (Kurotani et al., 2013). In US men, red and processed meat consumption is associated with increased risk of Type 2 diabetes (van Dam et al., 2002), prostate cancer (Sinha et al., 2009), and diverticulitis (Cao et al., 2018). Additionally, meat consumption has been linked to men's reproductive health, with higher red and processed meat intake

associated with lower sperm count (Afeiche et al., 2014) and erectile dysfunction (Defeudis et al., 2022).

Meat consumption raises significant public health concerns. The COVID-19 pandemic highlighted the catastrophic potential of infectious diseases, with animal-based food products being a primary source of transmission (Abebe et al., 2020; Espinosa et al., 2020). Agricultural systems account for over 25% of all infectious diseases and more than 50% of zoonotic diseases (Rohr et al., 2019). Live animal transport and high-density factory farming environments facilitate the spread of disease due to the close proximity of often unhealthy livestock (Espinosa et al., 2020; Priyadarsini et al., 2020). Moreover, ubiquitous use of antibiotics in livestock production is responsible for the spread of antimicrobial-resistant bacteria from animals to humans (Hammerum & Heuer, 2009; Marshall & Levy, 2011). This resistance reduces the effectiveness of infection treatments, heightens the risks associated with medical procedures (World Health Organization, 2025a), and increases the risk of pandemics (Abebe et al., 2020; Priyadarsini et al., 2020).

1.1.3. Meat consumption and animal welfare

Animals are the most severely impacted by meat consumption. Over 80 billion land animals and trillions of aquatic animals are killed annually for human consumption (Mood et al., 2023; Mood & Brooke, 2024). To meet demand, intensive “factory farming” practices confine animals to cramped, artificial environments that restrict natural behaviours, causing psychological distress, physical harm, disease, and premature death (Bollard, 2017). Other standard animal agricultural practices, such as dehorning, debeaking, teeth clipping, tail docking, castration, and slaughter, are undertaken without anaesthesia or pain relief (Bonnet et al., 2020; Fiber-Ostrow & Lovell, 2016). Live transport of livestock also raises ethical concerns, as animals are exposed to extreme temperatures, dehydration, and in many cases, death before reaching their destination (Caulfield et al., 2014; Hing et al., 2021). Hence, the

animal agricultural industry faces criticism for its inhumane treatment of animals (Cassuto & Eckhardt, 2016; Fiber-Ostrow & Lovell, 2016; Gullone, 2017).

1.1.4. Summary of the problem of excessive meat consumption

Meat overconsumption is a major issue worldwide, contributing to environmental destruction, global warming, food insecurity, animal suffering, and increased risk of chronic diseases and antibiotic resistance. This issue is particularly urgent considering that current efforts to meet Paris Agreement targets are currently not on track (Clark et al., 2020). To protect the environment, improve food security and sustainability, reduce risks to human health, and alleviate farm animal suffering, humans' overconsumption of meat must be curtailed.

1.2. The Problem with Meat Reduction: The Masculinity Dilemma

Worldwide, men consume more meat than women, particularly red and processed meats, which are most harmful to the environment and human health. Data from the National Diet and Nutrition Survey (2012-2017) found that UK males ate 35.5% more red and processed meat than females, with males aged 19-30 eating more than double the amount as women (James et al., 2022). Both men and women exceeded the World Cancer Research Forum's recommendations for red and processed meat consumption, but males consistently surpassed the guidelines to a greater extent (James et al., 2022). Similar disparities exist in Australia and the US (Ritzel & Mann, 2021). For example, in 2011-2012, Australian men ate almost 50% more processed meat and over 50% more red meat than women (Australian Government Cancer Australia, 2017). Conversely, women are twice as likely as men to avoid meat (Modlinska et al., 2020). Thus, efforts to reduce global levels of meat consumption should target male populations, who have the greatest potential for reducing meat demand.

However, men consistently exhibit a stronger resistance to meat reduction, a phenomenon referred to as "the masculinity dilemma" (Bogueva et al., 2020). Studies

consistently demonstrate that men possess a stronger psychological attachment to meat (Graça et al., 2015a; Günelan et al., 2024; Lentz et al., 2018) and are more unwilling than women to reduce their meat consumption or adopt plant-based diets (Graça et al., 2019; Graça et al., 2015b; Nakagawa & Hart, 2019; Schösler et al., 2015). Additionally, interventions aimed at reducing meat consumption tend to be less effective among male participants (Campbell Arvai et al., 2014; Jalil et al., 2020). In some instances, men (but not women) have reacted defensively to meat reduction attempts, with interventions unintentionally *increasing* men's commitment to eating meat (Dowsett et al., 2018; Pohlmann, 2022). It has been suggested that the connection between meat and masculinity is responsible for men's resistance to meat reduction (Bogueva et al., 2020). This “masculinity dilemma” places men in a unique predicament: on the one hand, there are increasingly urgent environmental, ethical, and health-related needs for meat reduction, but on the other, meat's connection with masculinity presents a major barrier to men's dietary change (Bogueva et al., 2020).

Clearly, more effective interventions are necessary to overcome the masculinity dilemma and facilitate meat reductions among male consumers. A variety of strategies, such as social marketing, government policy changes, and financial incentives/taxes, will likely be needed to promote a shift from meat-heavy to plant-based diets. Consumer interventions are key in this process (Kwasny et al., 2022; Onwezen, 2022). Interventions influence behaviour and help shift attitudes, making individuals more accepting of changes in policy and regulation (Tummers, 2019; Wright et al., 2020). Dietary behaviour change interventions should be evidence-based, requiring a clear understanding of the factors driving the behaviour (Atkins & Michie, 2015). “[D]esigners need to undertake a behavioural analysis to understand why behaviours are as they are and what needs to change in order to bring about the desired behaviour” (Atkins & Michie, 2013, p. 32). Therefore, to design effective meat-

reduction interventions for male meat consumers, it is imperative to have a comprehensive understanding of the masculinity dilemma and the psychosocial factors influencing men's meat consumption and reduction. Since a variety of psychosocial factors influence individual meat consumption patterns (Stoll-Kleeman & Schmidt, 2017), it is crucial to consider these, in addition to the influence of masculinity, to form a comprehensive understanding of men's meat consumption.

1.3. The Research Problem

Considering the severity of problems related to meat consumption and the need for meat reduction in men, theoretical knowledge of men's meat consumption is lacking. Gender is one of the strongest and most consistent predictors of meat consumption and avoidance (Graça et al., 2019; Modlinska et al., 2020). Hence, researchers have called for gender-focused meat consumer research (Cordts et al., 2014; De Backer et al., 2020; Modlinska et al., 2020) and for gender to be considered when designing meat-reduction interventions (Bogueva & Marinova, 2018; Graça et al., 2019). Despite these recommendations, studies tend to exclude gender from their designs and/or analyses. While there is an extensive body of literature on the psychosocial factors influencing meat consumption, particularly through cross-sectional, longitudinal studies, and systematic reviews (see literature review by Kwasny et al., 2022), many experiments use mixed-gender samples, limiting understanding of the factors specific to men's consumption. Researchers who account for gender often stratify results by sex, but this approach of comparing men to women treats men as a homogeneous group, overlooking differences *between men* in psychosocial factors that influence meat consumption, which could yield more nuanced insights (De Backer et al., 2020; Rosenfeld & Tomiyama, 2021).

Notably, although men's relationship with meat appears to be uniquely shaped by social and cultural factors, there has been limited research focusing specifically on men's

meat consumption (Bogueva et al., 2020; De Backer et al., 2020; Leary et al., 2023; Mesler et al., 2022). These studies have mainly focused on the meat-masculinity link, excluding other psychosocial variables that predict meat consumption. While they offer valuable insights into the role of meat in masculinity maintenance, they do not provide a comprehensive understanding of men's meat consumption. Additionally, current understanding of the meat-masculinity link hinders knowledge of how to change men's meat consumption patterns. While the literature shows a clear connection between meat and masculinity, methodological limitations prevent identification of the specific aspects of masculinity that contribute to this link. Specifically, studies often treat masculinity as a unidimensional construct, which fails to reflect contemporary understandings of masculinity as multifaceted (Levant & Wong, 2017). It is important to understand which particular dimensions of masculinity present the biggest barriers to men's meat reduction.

One final methodological limitation in the literature contributes to the paucity of knowledge on men's meat consumption. In a systematic review of the psychosocial factors influencing meat reduction, Graça et al. (2019) found that, of the 110 articles reviewed, 81% utilised a quantitative design, 15.5% utilised a qualitative design, and only 3.6% utilised a mixed methods design. Mixed methods approaches are optimal for understanding complex social phenomena, providing greater breadth (i.e., quantitative) and depth (qualitative) than is possible with a single method design (Creswell, 2018; Patton, 2015). Notably, a recent scoping review of the literature on meat consumption, veg*nism, and masculinity revealed that, of 39 studies, only four utilised mixed methods (Velzeboer et al., 2024). Thus, while a mixed methods approach can provide a more holistic and comprehensive understanding of men's meat consumption, very few researchers have utilised this type of research design.

Collectively, due to the methodological approaches taken by meat consumer researchers, and the paucity of studies on male meat consumers, there is insufficient

knowledge about men's meat consumption to design effective meat-reduction interventions or to influence their consumption choices. A more comprehensive understanding of men's meat consumption can be achieved by (1) focusing on differences between male consumers; (2) including a broad range of psychosocial factors influencing meat consumption in addition to masculinity; (3) treating masculinity as a multidimensional construct; and (4) using a mixed methods approach.

1.3.1. Summary of the research problem

To summarise, there are many health, environmental, and animal welfare problems associated with excessive meat consumption that can be mitigated if men, the heaviest meat consumers, reduce their meat consumption. However, there is a “masculinity dilemma”—broadly speaking, men are unwilling to reduce their meat intake. Hence, an understanding of the factors impeding men's meat reduction is needed to develop more effective meat-reduction interventions. Unfortunately, there is a paucity of knowledge of men's meat consumption, due to several methodological trends in the literature. Firstly, many studies of the psychosocial influences on meat consumption do not consider gender. Secondly, researchers focus on male versus female differences, treating men as a homogenous population, which overlooks potential differences between male meat consumers in their relationship with meat. Thirdly, studies that investigate men's meat consumption focus on the meat-masculinity link and exclude other important psychosocial factors. Fourthly, studies of the meat-masculinity link treat masculinity as a unidimensional construct, failing to identify which aspects of masculinity influence men's meat consumption. Finally, there are very few mixed methods studies in the literature that have investigated men's meat consumption. The current study aimed to extend theoretical knowledge of men's meat consumption by addressing these research gaps.

1.4. Problem Statement

Despite the ineffectiveness of meat-reduction interventions in reducing men's meat consumption, there is a lack of research on male meat consumers. This is due to an overemphasis on male versus female differences rather than within-gender differences amongst male consumers. Moreover, it is understood that masculine norms play a role in men's meat consumption, however, it is unknown which masculine norms are responsible for this relationship. Deeper theoretical insights into male meat consumers are needed to clarify the ways in which masculinity and other psychosocial factors may relate to men's resistance to meat reduction (i.e., the masculinity dilemma).

1.5. Purpose Statement

The purpose of this mixed methods study was to understand and explain how masculinity and other psychological factors contribute to men's resistance to meat reduction. A hybrid sequential and convergent mixed methods design was utilised, in which cross-sectional quantitative and qualitative data were collected, analysed, and integrated to add greater depth and insight into men's meat consumption than would be possible through one method. In the quantitative phase, structural equation modeling determined which masculine norms predicted men's meat consumption and willingness to reduce their meat consumption; and a latent profile analysis identified whether homogenous subgroups of male meat consumers could be differentiated on the basis of psychological variables related to meat consumption. In the qualitative phase, a reflexive thematic analysis was conducted on data from one-on-one semi-structured interviews with 19 male participants with varying diets to understand how hegemonic masculinity contributes to men's meat consumption.

1.6. Research significance

By responding to deficiencies in the literature on men's meat consumption, this dissertation will elucidate the psychosocial factors contributing to men's resistance to meat

reduction. By providing more nuanced insights into male meat consumers, the results will help inform consumer demand-side strategies for meat reduction, as understanding individual behaviour is a crucial step in developing behavioural change interventions (Atkins & Michie, 2015). This will enable more effective meat-reduction policies, interventions, and campaigns to be developed. Consumer insights can also inform marketing strategies for food industry stakeholders targeting male consumers, such as food tech companies (e.g., producers of lab-grown meat), plant-based and sustainability-focused food brands, food retailers, or traditional meat-based companies.

As outlined in Chapter 1, meat overconsumption poses serious threats to public and planetary health. Given men's higher meat consumption rates globally, meat reduction amongst male populations can mitigate public and planetary health issues. Plant-based and/or meat-reduced diets offer a viable and sustainable dietary solution to mitigate climate change through the reduction of GHG emissions (Willett et al., 2019) and addressing various other environmental issues such as deforestation, ocean acidification, and the destruction of marine ecosystems (Sabaté & Soret, 2014; Sumaila & Tai, 2020). This is critically important because the wellbeing of all life on Earth depends on the planet's health. Thus, findings will be useful for policy makers, governmental, and non-governmental organisations focused on the environment, climate action, and sustainability. For example, understanding the psychological antecedents of men's dietary behaviours can inform strategies for the development of tailored messaging frameworks for public-awareness campaigns that appeal to male consumers.

Understanding men's resistance to meat reduction also has significance for public health, considering the extensive list of chronic diseases associated with red and processed meat consumption (e.g., Al-Shaar et al., 2020; Battaglia Ritchie et al., 2015; Cao et al., 2018; Kurotani et al., 2013; Sinha et al., 2009; van Dam et al., 2002). Over 70% of deaths globally

are caused by chronic diseases (Schmidt, 2016) and the prevalence of chronic disease is increasing (Arredondo & Aviles, 2015; Holman, 2020). Diet is one of the four modifiable risk factors associated with chronic disease, alongside exercise, alcohol and tobacco consumption (Schmidt, 2016). Thus, changing unhealthy dietary patterns is an important chronic disease mitigation strategy. Results of this dissertation will contribute to public health policies, interventions, and campaigns aiming to modify unhealthy red and processed meat consumption dietary patterns in male populations. As chronic disease treatment is costly to society, diverting resources away from other essential needs (World Health Organisation, 2009), this can potentially ease the strain on public health systems, particularly in middle-income countries that struggle to meet the demand for chronic disease care (Arredondo & Aviles, 2015).

Moreover, reducing demand for meat can potentially mitigate the spread of infectious diseases (Espinosa et al., 2020) and antimicrobial-resistant bacteria (Abebe et al., 2020; Hammerum & Heuer, 2009; Marshall & Levy, 2011). Infectious disease outbreaks, which often originate in industrial animal farming operations (Priyadarsini et al., 2020), disproportionately harm poor and disadvantaged populations, reinforcing social inequalities (Espinosa et al., 2020). In addition to their direct impact on human health, infectious disease outbreaks impact mental health (Yue et al., 2020) and disrupt international trade and global economic systems (World Health Organisation, 2009). Furthermore, medical treatment for humans infected with antimicrobial-resistant agents is severely limited (Hammerum & Heuer, 2009). Therefore, this research has the potential to enhance health outcomes for male populations while also contributing significant health benefits on a global scale. The results will be of significance for institutional bodies responsible for public health. This may be particularly significant in tropical and developing countries, where infectious diseases account for approximately 75% of all deaths (Espinosa et al., 2020, p. 1033). Findings will

also be useful for nutrition and healthcare professionals work one-on-one with clients, or broader community health campaigns, to assist men to change their dietary patterns.

As there are important human rights issues associated with meat production, transitioning to plant-based food systems has significant implications for human mental health. Slaughterhouse workers—often immigrants and individuals from disadvantaged backgrounds—experience amongst the highest rates of occupation injuries than any other profession (Leibler & Perry, 2017), with a 33% probability of injury by six months of employment (Culp et al., 2008). Compared to other professions, and the general public, slaughterhouse workers show higher rates of mental health issues, particularly anxiety and depression (Slade & Alleyne, 2023), poorer physical and psychological wellbeing (Baran et al., 2016), and higher incidences of substance abuse, emotional detachment, social isolation, and domestic violence (Baran et al., 2016; Slade & Alleyne, 2023; Victor & Barnard, 2016). This is due to the dehumanising and traumatising effects of the repetitive and violent tasks they are forced to perform. Thus, this research can contribute to shaping food systems that offer better working conditions and quality of life for employees.

Finally, this dissertation has significance for the nonhuman animals raised in inhumane conditions, systematically abused, and killed against their will for their meat. With trillions of animals killed annually for human consumption (Mood et al., 2023; Mood & Brooke, 2024), the scale of suffering extends far beyond human comprehension. Meat reduction has the potential to save trillions of animal lives and reduce this immense scale of animal suffering. The results of this dissertation may be useful for animal rights organisations aiming to promote veganism and plant-based diets amongst men.

Chapter 2: Understanding the Masculinity Dilemma

The first part of this chapter establishes the existence of the meat-masculinity link—namely, that in Western cultures, there is a pervasive cultural schema that associates meat with men and masculine traits. The meat-masculinity link influences people's perceptions such that meat-eaters are viewed as more masculine than vegetarians and vegans (veg*ns), people who intentionally refrain from eating meat. This has methodological implications for investigating men's meat consumption. The chapter then outlines three primary theories of the meat-masculinity link—doing gender, conformity to masculinity ideology, and hegemonic masculinity theory—which offer explanations for why men are resistant to meat reduction (i.e., “the masculinity dilemma”). Gaps in the literature on understandings of both the meat-masculinity link, and explanations for the masculinity dilemma, will be highlighted, presenting a rationale for this dissertation's research questions.

2.1. The Meat-Masculinity Link

Throughout human history, the acquisition and consumption of meat has been associated with men and masculinity. Before the establishment of agricultural-based societies, men in hunter gather societies were largely responsible for hunting and providing the family and broader social group with meat (Washburn & Lancaster, 2017). In these societies, meat played a role in shaping hierarchical social structures, bestowing skilled hunters with greater social power, such as increased sexual access to females, better reproductive success, and favourable treatment from group members (Hawkes, 1991; Kaplan & Hill, 1985). Historically, meat was believed to confer masculine qualities upon consumers. For example, hunting hard-to-kill prey allowed men to demonstrate courage and power (Leroy & Praet, 2015). Roman and Persian military ate meat for strength (Leroy & Praet, 2015). Similarly, during World War I in the US, meat rations were diverted from women,

children, and the elderly, and reserved for male soldiers to provide them with vitality and strength (Willard, 2002).

Today, the connection between meat and masculinity persists. Attributing certain foods with “masculine” or “feminine” connotations is common (Vartanian, 2015). In Western cultures, meat is associated with masculinity, whereas plant-based food is associated with femininity. For instance, in a study investigating German consumers’ perceptions of meat versus plant-based meat alternatives, meat products (steak, wiener sausages, and chicken nuggets) were rated as masculine, whereas plant-based meat alternative products (vegetarian sausages, vegetarian nuggets, and tofu) were rated as feminine (Michel et al., 2021). In a free-association task of the word “meat”, 58% of participants in an Australian sample mentioned masculinity and related concepts such as strength and meat being “real” food (Bogueva & Marinova, 2018). Another Australian study found that 37.3% of men and 15.4% of women associated red meat with masculinity, believing it to be a symbol of traditional masculine ideals such as strength, status, prosperity, and prestige (Bogueva et al., 2017). In the US, participants rated the extent to which they perceived various foods to be “male” and “female”. The foods rated highest in terms of being “male” were all red meat products (i.e., medium-rare steak, hamburger, and well-done steak), whereas food items rated as “female” were mostly non-meat (Rozin et al., 2012).

The meat-masculinity link can be observed in stereotypes and expectations regarding who should (and shouldn’t) eat meat. When viewing pictures of food on fictitious Instagram profiles, participants believed that the profile belonged to a man when images displayed dishes such as steak, hamburgers, salami, and pork knuckle, and believed the profile belonged to a woman when images displayed more “feminine” dishes, such as salad and desserts (Cavazza et al., 2020). In a Canadian study, when asked “who is a typical meat eater?”, participants of all demographics described meat-eaters as men with masculine

attributes, such as a stereotypical “muscle man” or men with a “scruffy beard” (Johnston et al., 2021). Conversely, the prototypical vegetarian was described as a skinny white woman, with feminine attributes such as being interested in fashion, weight loss, and appearance conscious.

Masculinity is not always *explicitly* associated with meat, but can be associated with meat on an implicit (i.e., unconscious) level. In the US, Lax and Mertig (2020) created a Masculinity of Meat scale, measuring the extent to which participants agreed that eating meat is masculine. Most participants disagreed with the scale items, especially that meat is “men’s food” (90% disagreement) and that giving up meat is “wimpy” (85% disagreement) and “girly” (91% disagreement). This demonstrates that meat is not always explicitly associated with masculinity. However, participants may have been hesitant to agree with blatantly sexist and condescending language (i.e., “wimpy”, “girly”). Importantly, however, the meat-masculinity association can occur implicitly. Using an Implicit Association Test (IAT) to measure unconscious associations, one experiment found that Australian men and women implicitly associated meat with masculine attributes, represented by the words “virile”, “strong”, and “powerful”, compared to non-masculine words such as “weak”, “feeble”, and “sick” (Love & Sulikowski, 2018). In another IAT study, participants paired meat words with the word “male” faster than with “female”, and paired vegetable words faster with the word “female” than with “male”, again indicating an implicit meat-masculinity association (Rozin et al., 2012). Experiments have shown that the implicit, but not explicit, association between meat and masculinity occurs in children as young as four years old (Graziani et al., 2021). Thus, the meat-masculinity link can exist unconsciously rather than consciously.

Due to meat’s association with masculinity, male meat-eaters tend to be perceived as more masculine than male veg*ns. One US experiment compared the perceived masculinity ratings of various hypothetical male and female character profiles (Rozin et al., 2012).

Participants read descriptions of the characters' hobbies, interests, and favourite foods. Beef-eating character profiles were rated by participants as significantly more masculine, and significantly less feminine, than characters who ate fish or vegetables (Rozin et al., 2012). In a similar Canadian experiment, fictional characters who ate a plant-based diet were perceived as significantly less masculine than characters who ate meat (Ruby & Heine, 2011). It was theorised that, because meat is associated with and symbolic of masculinity, men who eat meat are perceived as more masculine than vegetarian men (Ruby & Heine, 2011).

Moreover, this perception effect is stronger when applied to men than women. In a second character profile experiment, characters explicitly labelled as “omnivorous” versus “vegetarian” were rated on masculinity (Ruby & Heine, 2011). Omnivorous characters were rated as marginally (but not significantly) more masculine than vegetarian characters. However, there was a significant interaction between the character's diet and gender on masculinity ratings. Specifically, omnivorous male characters were perceived to be more masculine than vegetarian male characters, whereas there were no differences in perceived masculinity between female omnivorous and vegetarian characters. While a replication of Ruby and Heine's study by Thomas (2016) did not find differences in masculinity ratings between omnivorous versus vegetarian characters, the character descriptions were different. Importantly, however, Thomas (2016) found that omnivorous male characters were perceived as significantly more masculine than vegan male characters. Overall, these studies highlight the influence of the meat-masculinity link on people's perceptions of others, where there is a tendency for people to perceive veg*n men as less masculine than meat-eating men.

2.1.2. Summary of the meat-masculinity link

Overall, a substantial body of evidence demonstrates that the widespread prevalence of the meat-masculinity link persists in modern Western cultures. That is, there is a pervasive cultural schema that associates meat consumption with men and masculinity. This association

exists at both an explicit and implicit level, influencing people's perceptions of others, such that male meat-eaters are viewed as more masculine than male veg*ns. As will be discussed below, this connection between meat and masculinity contributes to the masculinity dilemma. Having established the existence of the link between meat and masculinity, the following section considers several theoretical explanations for this link.

2.2. Social Constructionist Theories of the Meat-Masculinity Link

The following section outlines the three most common theoretical frameworks used to explain the meat-masculinity link—namely, doing gender theory, conformity to masculinity ideology theory, and hegemonic masculinity theory. Unlike essentialist theories, which regard gender as inherent, biologically fixed quality rooted within the individual, these are social constructionist gender theories, which conceptualise gender as fluid and socially constructed, shaped dynamically by social interactions, as well as broader sociocultural and historical conditions (Butler, 1990; Connell, 1995; West & Zimmerman, 1987). By outlining current theoretical explanations of the meat-masculinity link, this section will first demonstrate the methodological implications for investigating men's meat consumption, and secondly, will identify deficiencies in current theoretical explanations of the masculinity dilemma.

2.2.1. Masculinity management: Meat consumption as a gender performance

The theory of “doing gender” asserts that gender is not a fixed, stable, and enduring internal attribute, but rather, is performative—that is, a social practice performed through everyday social interactions (Butler, 1990; West & Zimmerman, 1987). These daily gender performances create the illusion of a fixed, enduring gendered self—both subjectively to the actor (i.e., gender *identity*), and outwardly to others (i.e., gendered *impression/image*). In other words, gender identity is socially constructed rather than biologically determined. As such, an individual's gender identity is fluid, unstable, and precarious, and therefore,

independent of their biological sex. Thus, gender is something that is “done”, rather than who one “is”. In this way, maintaining one’s gender identity requires persistent, ongoing maintenance through continued gendered performance in day-to-day life.

Gender performances are especially crucial for men because, unlike femininity, masculinity is “precarious” (Vandello & Bosson, 2013). Womanhood is viewed as an inevitable, automatic biological process (e.g., attained upon beginning menstruation), whereas the status of “manhood” is difficult to attain, and must be earned through social achievements, such as losing one’s virginity, or buying one’s first house or car. Moreover, the status of manhood can easily be lost through men’s actions. For example, men can fail to embody masculinity if they lose a job or fail to provide for their family. On the other hand, womanhood is more stable, diminishing gradually and biologically through aging (Vandello & Bosson, 2013). As manhood is approved and endorsed by others, it must be proven through one’s actions in public (Vandello & Bosson, 2013). Men must engage in gender performance to prove their masculinity outwardly to others and reinforce their own masculine identity. Hence, while gender is salient, or “omnirelevant”, in all social interactions, regardless of one’s gender (West & Zimmerman, 1987), men’s day-to-day actions have greater significance for maintaining their masculinity.

Engaging in gender-congruent behaviour (actions that align with and display one’s gender identity) assists in gender performance and identity maintenance. Individuals, and men in particular, tend to engage in behaviours and consume products that are gender-congruent, and avoid those that are gender-incongruent (Fugate & Phillips, 2010). For example, in a series of experiments, Brough et al. (2016) demonstrated that, because of the association between environmentally friendly behaviour and femininity, men were less likely than women to engage in eco-friendly behaviours or choose eco-friendly products. When asked to recall a time that they engaged in eco-friendly behaviour, men reported feeling more

feminine that men who were asked to recall a time when they engaged in behaviour that was bad for the environment. Moreover, consuming gender-incongruent products can diminish men's sense of masculinity. Another experiment by Brough et al. (2016) showed that men reported that they would feel more masculine, and less feminine, wearing an environmental organisation's t-shirt that was branded with masculine attributes, compared to wearing an eco-friendly t-shirt branded as more feminine. These experiments not only show that men prefer gender-congruent products, but also suggest that men some believe that the consumption of "feminine" products can diminish their sense of masculinity. Therefore, men tend to prefer to engage in more stereotypically masculine behaviours and consume more masculine products.

Importantly, the likelihood of men choosing masculine products is increased when their sense of masculinity is threatened. In a hypothetical scenario experiment, men whose gender identity was threatened were less likely to spend money on a more "feminine" eco-friendly (versus conventional) product compared to men whose age was threatened (Brough et al., 2016). However, when men's masculinity was affirmed, they were more willing to buy eco-friendly (i.e., feminine) products. This suggests that when a man's masculinity is diminished, he is more likely to avoid feminine products and seek masculine products to reestablish his masculinity. When men's sense of masculinity is affirmed, there is less need to "prove" his manhood and the effect disappears. Collectively, Brough et al.'s (2016) studies demonstrated that men's consumption behaviour can help manage their masculine identity. Men preferred products that they perceived to be more masculine, as these aligned with their masculine identity, helping them feel more masculine; and avoided products that were associated with femininity, as these made them feel more feminine.

Likewise, numerous studies show that men make meat-related consumption choices to enhance their masculine identity when it is threatened, highlighting meat consumption's role

in men's gender performance and masculinity management. In a series of studies, Mesler et al. (2022) examined the relationship between meat consumption and "masculinity stress"—a chronic state of distress whereby men feel they fail to adequately meet traditional masculine norms. Considering the "precariousness" of manhood (Vandello & Bosson, 2013), men high in masculinity stress feel greater pressure to prove their manhood, and can do so through dietary choices. Men high on masculinity stress were more likely than men low on masculinity stress to believe that eating meat makes them feel manly, and as a result, were more likely to prefer eating red meat, compared to more feminine plant-based alternatives (Mesler et al., 2022). In an additional study, Mesler et al. (2022) found that when men scored lower on traditional masculinity conformity, those high on masculinity stress were more likely to purchase meat as a result of believing that eating meat enhances manhood. However, for men high on traditional masculinity conformity, who believed they appeared masculine to others, these conditional effects disappeared. These studies suggest that men who feel a sense of inadequacy regarding their manliness are more likely to eat meat, due to the belief that it will augment their manhood.

Masculinity-threat experiments also find that men eat meat to enhance their masculinity. Mesler et al. (2022) found that men high on masculinity stress whose masculinity was threatened were more likely to choose red meat compared to more feminine options (chicken or salad with tofu). However, when masculinity was affirmed, the men high on masculinity stress no longer showed a preference for red meat. Nakagawa and Hart (2019) found that when their masculinity was threatened, men were more unwilling to consider reducing their meat consumption. Similarly, Pohlmann (2022) found that compassionate men were more likely to choose a soy rather than meat-based jerky product; but when their masculinity was threatened, were more likely to choose the meat option. The findings

demonstrate that, under certain circumstances, men consume meat to bolster their masculinity.

In summary, “doing gender” theory suggest that masculinity is established and maintained through daily gender performances that enable men to reinforce their masculine identity within themselves and project a masculine image to others. Because meat is heavily associated with masculinity in Western cultures, meat consumption offers a simple and effective option for men to manage their masculinity in day-to-day life. Men often choose to consume masculine (i.e. gender-congruent) products, and avoid feminine products, as a means of affirming and demonstrating their masculinity. As a stereotypically masculine product this naturally offers meat as a default preference for men, compared to other food items (such as vegetarian meals), which are associated with femininity. Moreover, men are more likely to eat meat when their masculinity is threatened. In a state of masculinity threat, a man is motivated to prove and reaffirm his masculinity. Experiments consistently show that men choose meat options when motivated to affirm their masculinity identity, suggesting that meat is used as a masculinity maintenance tool. Collectively, the literature supports the theory that men are resistant to meat reduction because meat-eating gender performances enable men to bolster and manage their masculine identity and image.

The role of meat consumption in men’s masculinity management has important implications for studying and understanding male meat consumers. Gender identity is intimately entwined with an individual’s sense of self, and connected to self-esteem, psychological adjustment, and quality of life (Alsaker & Kroger, 2007). For example, greater masculine identity is indirectly related to greater life satisfaction, via higher levels of self-esteem, in male but not female Chinese university students (Li et al., 2022). Moreover, masculine identity predicts higher subjective wellbeing (Basu et al., 2018; Matud et al., 2019). Hence, there is a greater personal cost to men when faced with the prospect of giving

up meat; men are not simply giving up taste or nutrition; there is a threat to their personal identity as a man, and the associated benefits their masculine identity affords—particularly psychological wellbeing. This has two implications for investigating men’s meat consumption. Firstly, studies of men’s meat consumption must take masculinity into account. Numerous researchers agree that gender needs to be considered when investigating meat consumers and designing meat-reduction interventions (Bogueva & Marinova, 2018; Cordts et al., 2014; De Backer et al., 2020; Graça et al., 2019; Modlinska et al., 2020; Rosenfeld & Tomiyama, 2021). Secondly, this highlights that men have a unique relationship with meat, indicating that male-identifying meat consumers need to be investigated and understood separately from people of other genders. Thus, efforts to reduce men’s meat consumption must understand the unique barriers to meat reduction experienced by men. Taking these insights into consideration, the current study focused solely on male consumers to understand men’s meat consumption (and reduction) as a unique phenomenon, and aimed to understand the role of masculinity in men’s resistance to meat reduction.

2.2.2. Masculinity Ideologies

The following section outlines the masculinity ideology theoretical framework, which asserts that men’s conformity to masculine norms contributes to their meat consumption. Until the 1980’s, gender was conceptualised on a unidimensional, bipolar masculinity–femininity spectrum, with masculinity and femininity conceived as opposing traits (Pleck, 2017; Smiler, 2004). From this perspective, masculinity was “a single, coherent construct” (Smiler, 2004, p. 17). Hence, men were believed to possess “masculinity” to varying degrees on a masculinity–femininity spectrum. Moreover, essentialist gender theories dominated, which conceptualise gender as biologically determined and fixed (i.e., permanent), inherently residing within individuals (DeCecco & Elia, 1993). The essentialist view promotes binary understandings of sex and gender (DeCecco & Elia, 1993). However, the socially constructed

and multidimensional nature of gender is now widely recognised amongst gender theorists (Levant & Wong, 2017; Smiler, 2004), despite the persistence of essentialist views in Western society (Schudson & Gelman, 2022). Social constructionist gender theories recognise gender as fluid and separate from biological sex, accommodating gender diversity (e.g., non-binary, transgender and genderqueer identities; Richards et al., 2016).

Thus, from a social constructionist perspective, the concept of “masculinity” is a cultural gender *ideology*—a “body of prescriptive and proscriptive social norms that sanction men and masculinity performances” (Thompson & Bennett, 2015, p. 115)—rather than biologically determined. As such, gender is socially *learned* through the behaviours, attitudes, and expectations of others (Levant & Powell, 2017). In this way, masculinities are inextricably linked with social norms (i.e., normative theories of behaviour). Multiple masculinity ideologies can coexist, which “vary with time, place, culture, and circumstance” (Levant & Wong, 2017, p. 5). Each masculinity ideology within a given context (e.g., sports, religion, military, subcultures, ethnic groups etc.) can have multiple sub-facets or “norms”, each of which individuals internalise and conform to, to varying degrees (Mahalik et al., 2003). It’s possible, therefore, for men to internalise and subscribe to multiple versions of masculinity. Importantly, individuals vary in the extent to which they conform to or reject specific masculine norms and the relative importance they place on each (Mahalik et al., 2003).

While multiple, sometimes competing masculinity ideologies coexist in a particular context, there is nevertheless often a dominant masculinity ideology that holds the most influential position in a culture or society (Levant & Powell, 2017). Over decades of research, a set of masculine norms, collectively referred to as “traditional masculinity ideology”, holds this dominant place in Western societies today (Levant & Powell, 2017), despite the emergence of alternative masculinities (e.g., Anderson & McCormack, 2016; Kaplan et al.,

2017). Traditional masculinity ideology has numerous sub-facets (i.e., it is multidimensional). The primary dimensions of traditional masculine ideology include social norms regarding relational power (e.g., the pursuit of social status; maintaining power over women); the importance of work and breadwinning; being respected; avoiding femininity; maintaining emotional control; self-reliance; physical toughness and violence; risk-taking; (hetero)sexuality (e.g., virility; casual sexual relations); and heterosexism (Thompson & Bennett, 2017). Due to the cultural context in which most of this masculinity research was conducted, these ideals more accurately reflect “traditional White Western heterosexual” masculinity ideology (Levant & Powell, 2017, p. 29). Nevertheless, cisgender, trans, and queer men and non-binary peoples of different nationalities, races, and sexual orientations conform to these traditional ideological standards of masculinity (Cooper et al., 2023; Isacco & Wade, 2017; Rochelle, 2019; Vogel et al., 2011).

According to Mahalik et al. (2003), key researchers in traditional masculinity ideology, masculine norms operate in the same way as social norms, serving as “implicit codes of conduct that provide a guide to appropriate action” (Higgs, 2015, p. 38). In other words, masculine norms provide guidance on what behaviour is expected of and acceptable for men. A key aspect of social (and masculine) norms is that they most often function implicitly. Therefore, individuals are usually unaware that their behaviour is guided by social norms (Nolan et al., 2008). By behaving in accordance with these codes of conduct (i.e., *conforming* to traditional masculine norms), men can feel greater security in their social group by obtaining approval from others, and/or avoiding social disapproval and ostracism (Shulman, et al., 2017). Levant and Powell (2017) succinctly described how traditional masculinity ideology influences men’s behaviour:

Traditional masculinity ideology is posited to exert social influence through interactions resulting in reinforcement, punishment, and observational learning.

Traditional masculinity ideology thus informs, encourages, and constrains boys and men to conform to, comply with, or obey the prevailing male role norms... by adopting certain socially sanctioned (prescribed) masculine behaviours and avoiding certain forbidden (proscribed) behaviours. (p. 19)

In other words, men experience implicit social pressure to engage in traditional masculine behaviours. Thus, according to masculinity ideology theory, male resistance to meat reduction could be explained by socially prescribed gender role norms. That is, because meat is associated with masculinity, there may be societal expectations pressuring men to eat meat, rewarding men for conforming to meat-eating norms, and deterring men from deviating from meat consumption for fear of negative social repercussions.

Masculinity ideology theory is compatible with doing gender theory, as both conceptualise masculinity as a) socially learned and constructed rather than biologically determined; b) residing in culture and social relations (e.g., gender performances) rather than inside the individual; c) impermanent and unstable rather than fixed; and d) multidimensional rather than unidimensional. Moreover, gender conformity and performances are connected, such that masculinity ideologies guide the choice of behaviours to enact in day-to-day gender performances for masculinity management. By performing gender in accordance with traditional masculine ideology (i.e., *conforming* to traditional masculine norms), men can internally affirm their subjective sense of masculine identity and/or outwardly portray a masculine image. When men conform to masculine norms by engaging in meat-eating gender performances, they reinforce the connection between meat and masculinity.

2.2.2.1. Masculinity Ideology and Meat Consumption

Decades of research has found that conformity to traditional masculine norms predicts a range of psychosocial outcomes (Addis et al., 2016). Masculinity ideology has also been applied to understanding men's meat consumption. As demonstrated by the meat-masculinity

link, eating meat is a widely prescribed, stereotypical masculine behaviour, and avoiding meat is stereotypically viewed as unmanly and feminine. Thus, according to masculinity ideology theory, for men, avoiding meat (a socially prescribed “masculine” behaviour) may increase the risk of exposure to social judgements regarding the legitimacy of their masculinity. From this perspective, men who conform to masculine gender role norms (e.g., eating meat) can avoid social disapproval for violating expectations about how men should behave (Rosenfeld & Tomiyama, 2021), and simultaneously affirm their masculinity through gender performance. Thus, conformity to masculine norms presents a barrier to men’s meat reduction (Bogueva et al., 2020).

Because men who conform to traditional masculinity ideology place greater importance on adhering to stereotypical and socially prescribed masculine gender roles, this theory suggests that they should be more likely to eat meat, a stereotypically masculine food. Research on the relationship between conformity to traditional masculinity ideology and meat consumption shows that this is indeed the case. Rothgerber (2013) was the first to empirically and quantitatively investigate the relationship between traditional masculinity and meat consumption using a psychometrically validated masculinity scale—Thompson and Pleck’s (1986) Male Role Norms Scale, comprised of three subscales measuring three traditional masculine norms (status-seeking, toughness, and antifemininity) that together form a global measure of masculinity. Rothgerber found that among the US male participants, those who scored higher on total masculinity were more likely to eat beef and less likely to eat vegetarian meals, but did not examine the relationships between meat consumption and the three dimensions of masculinity. Nevertheless, this study was the first to suggest that men who conform to traditional masculine norms eat more meat.

Subsequently, Rosenfeld and Tomiyama (2021) investigated the relationship between meat consumption and conformity to traditional gender role conformity among men and

women using Kachel et al.'s (2016) Traditional Masculinity-Femininity scale. This scale measures the extent to which an individual feels that they conform to what *they* believe it means to be masculine/feminine (rather than pre-specified gender role norms) on a bipolar unidimensional scale ranging from strongly masculine to strongly feminine. They found that men who conformed more to traditional masculine norms consumed more beef and chicken (but not pork or fish) and were less willing to adopt a vegetarian diet. In contrast, there was no relationship between meat consumption and conformity to traditional feminine roles in women. Thus, consistent with Rothgerber (2013), conformity to traditional masculinity ideology was related to higher meat consumption and less willingness to reduce in men.

Other studies investigating the relationship between meat consumption and conformity to traditional masculinity measured by Kachel et al.'s (2016) Traditional Masculinity-Femininity scale have shown similar findings. Peeters et al. (2022) found that among US and UK participants, men with greater conformity to traditional masculinity tended to eat more red and white meat, were more psychologically attached to eating meat, and were less willing to reduce their meat consumption. Stanley et al. (2023) found that stronger conformity to traditional masculinity was negatively associated with meat reduction and willingness to become vegetarian or vegan; and specifically, that conformity to traditional masculinity was negatively associated with meat reduction in men, but conformity to traditional femininity was not associated with meat reduction in women. Thus, studies consistently demonstrate a positive relationship between traditional masculinity ideology and meat consumption. It appears that, for men who conform to traditional masculinity ideology, it is important to meet socially expected ideals of manliness. Therefore, they are more likely to engage in stereotypically masculine behaviours (i.e., eating meat), and to avoid stereotypically feminine behaviours (i.e., avoiding eating meat).

2.2.2.2. Critique of the traditional masculinity literature

As has been demonstrated, there is a consistent positive relationship between conformity to traditional masculinity and meat consumption in the literature. Men who have a greater tendency to conform to societal standards of masculinity are more likely to eat meat, because it is a stereotypically masculine behaviour. This allows them to avoid negative social repercussion, fit in as a man, and boost their masculine identity and image. However, it is not clear which *dimensions* of masculinity ideology account for this meat-masculinity relationship. This is due to researchers measuring masculinity as a global unidimensional construct. This methodological approach is problematic. Firstly, it does not align with current multidimensional conceptualisations of masculinity. Secondly, this approach misses information that would be useful for expanding knowledge of men's meat consumption and for developing gender-specific meat-reduction interventions. Thus far, studies have established a broad connection between traditional masculinity ideology and meat consumption, but have not highlighted the specific masculine norms explaining this relationship.

In a meta-analysis of 78 samples, Wong et al. (2017) found that conformity to different traditional masculine norms were associated with various unfavourable health outcomes such as depression, body image problems, and substance use. Wong et al. (2017) argued that because different masculine norms predict different health outcomes, there is a “need for researchers to disaggregate the generic construct of conformity to masculine norms and to focus instead on specific dimensions of masculine norms and their differential associations with other outcomes” (p. 80). Indeed, conformity to specific traditional masculine norms predict different behaviours. For example, men who conform to the traditional masculine norm regarding self-reliance tend not to seek help for suicidal ideation (Pirkis et al., 2017); men who conform to the norms of winning, risk-taking, and being a

playboy are more likely to engage in barroom violence (Miller et al., 2017); and winning, risk-taking, being a playboy, and self-reliance are associated with problematic alcohol consumption (Iwamoto et al., 2011).

However, the common theme among previous studies of meat consumption and conformity to masculine ideology is their conceptualisation and measurement of masculinity as a unidimensional construct. Rosenfeld and Tomiyama (2021), Peeters et al. (2022), and Stanley et al. (2023) used Kachel et al.'s (2016) Traditional Masculinity-Femininity scale, which conceptualises gender identity on a single bipolar masculinity-femininity dimension. Rothgerber (2013) used a global masculinity index to represent a person's overall tendency to conform to traditional masculinity ideology. Neither of these approaches are compatible with contemporary masculinity theories that conceptualise masculinity as multidimensional and dynamic (Levant & Wong, 2017). Scholars have argued that researchers need to abandon the unidimensional construct of conformity to masculine norms "and focus instead on specific dimensions of masculine norms and their differential associations with other outcomes" (Wong et al., 2017, p. 80). While researchers have established the relationship between overall conformity to masculinity ideology and meat consumption, it remains unclear which dimensions of masculinity ideology explain this relationship. As men vary in the extent to which they conform to various masculine norms (Mahalik et al., 2003), conformity to certain masculine norms may better predict and explain variations in men's meat consumption.

To date, only one study has examined the relationship between specific dimensions of traditional masculinity and men's meat consumption. Using a Portuguese version of Mahalik et al.'s (2003) Conformity to Masculine Norms Inventory, Campos et al. (2020) found no correlation between norms related to violence, being a "playboy," disdain for homosexuals, or risk-taking with meat consumption. However, mediation analysis revealed that conformity to violence explained men's higher meat consumption compared to women, suggesting that

violence norms contributes to the meat-masculinity link. However, these findings should be treated with caution due to several methodological limitations. Firstly, the meat consumption measure used a single item, which may have limited predictive validity (Diamantopoulos et al., 2012). Secondly, the meat consumption item captured only red and processed meat consumption. Thus, results may have differed if the scale had included all meat types. Thirdly, several masculine norms were excluded due to high cross-loadings in a preliminary analysis, and other relevant norms (e.g., importance of sex, power over women, toughness) were not included. Hence, it's possible that other masculine norms may relate to men's meat consumption. To provide a more nuanced understanding of the relationship between meat consumption and conformity to masculinity ideology, this dissertation aimed to test this relationship using a multi-item measure of meat consumption and a multidimensional measure of masculinity that includes a broader range of norms.

2.2.2.3. Dimensions of Traditional Masculinity Predicting Men's Meat Consumption

Conformity to specific masculine norms may predict and explain variations in men's meat consumption. While the relationship between meat consumption and masculine norms using psychometrically validated instruments has not fully been explored, research outlined in the following section suggests that traditional masculine norms regarding violence, toughness, social status, sexuality, emotional control, and heterosexual self-presentation may be dimensions of masculinity ideology contributing to the meat-masculinity link.

Men who conform to masculine norms regarding violence and toughness may be less willing to reduce their meat consumption. Campos et al. (2020) found that conformity to the violence norm mediated the relationship between sex and meat consumption, such that men's endorsement of physical violence explained their higher meat intake compared to women. This may reflect a generalised acceptance of violence among heavier meat-eaters, as

qualitative research has found that meat-eaters were more accepting than vegetarians of various forms of violence, such as the use of nuclear weapons, capital punishment, and blood sports (Hamilton, 2015). Alternatively, several sociologists have suggested that some men eat meat because they believe it confers the consumer with strength, aggression, and vitality (Beardsworth & Keil, 1996; Twigg, 1983; Willard, 2002). “If meat is perceived as a source of strength and aggression, then it would make sense that it would be a desirable food selection for men wishing to acquire these masculine traits” (Willard, 2002, p. 113). Hence, men who conform to violence and toughness may eat meat because they believe it cultivates these masculine traits. Indeed, several studies have shown that men eat meat because it supports their physical strength and toughness. When asked to consider adopting a plant-based diet, men are more likely than women to be concerned about muscle loss (Wyker & Davison, 2010). Heavier meat-eating men are also more likely than low-frequency meat-eating men to eat meat for reasons associated with strength, muscles and being tough (Bogueva et al., 2017). Qualitative research has found that male soldiers in the Norwegian armed forces believed they needed to eat meat for strength, energy and muscles, showing a strong preference for meat in military environments which value physical and mental “toughness”. (Kildal & Syse, 2017).

The restriction of emotional expression may contribute to men’s unwillingness to reduce their meat consumption. Empathy for animal suffering negatively predicts meat consumption (Camilleri et al., 2020; Niemyjska et al., 2018), and men consistently show less empathy for animals killed for meat than women (Beardsworth et al., 2002; Estévez-Moreno et al., 2021; Malek et al., 2018). It has been suggested that men may fail to express concern for animal suffering, and therefore eat more meat, because it conflicts with the masculine norm of restrictive emotionality (Rothgerber, 2013). Indeed, research finds that men’s choice to be vegetarian for religious or health reasons is viewed by Australian meat-eating men as a

legitimate reason for meat reduction, but their choice to be vegetarian on compassionate grounds for animals is perceived as “unmanly” (Bogueva et al., 2020). Experiments also suggest that men suppress empathetic feelings to preserve their masculinity through meat consumption. When their masculinity was threatened, men who were primed to feel compassion, or were higher in trait compassion, were more likely to choose a meat-based snack over a vegetarian snack (Pohlmann, 2022). Thus, men may be unwilling to reduce their meat consumption for animal welfare reasons due to masculine norms pressuring men to refrain from expressing emotions like empathy and compassion, which are traditionally associated with femininity (Plumwood, 2002).

The pursuit of social status is potentially another dimension of traditional masculinity ideology related to men’s meat consumption. Three experiments conducted by Chan and Zlatevska (2019a) demonstrated that (1) participants low in subjective socioeconomic status (SSES) were driven to eat more meat than those high in SSES; (2) participants low in SSES who had a greater desire for status had a greater preference for meat than those high in SSES; and (3) participants low in SSES had a greater preference for meat than those high in SSES, but no difference in preference for plant-based food. The experimental effects were not explained by hunger or feelings of powerless among the low-SSES participants. As lower status participants consistently showed a preference for meat compared to high-status participants, the results suggested that people may consume meat as a strategy to enhance their perceived social status, since meat is historically and symbolically a high-status food (Adams, 2015). Thus, men who seek higher status may be more likely to eat meat.

Another aspect of traditional masculinity ideology related to men’s meat consumption pertains to men’s sexuality. A series of experiments demonstrated that, when sexually primed, men were more likely to prefer meat-based (versus vegetarian) food compared to controls (Chan & Zlatevska, 2019b). A similar experiment asked men to imagine having

dinner with a romantic partner (versus alone) and to indicate what menu items they would order (Timeo & Suitner, 2018). While there were no significant differences in meat preference between the partner versus alone condition, there was a tendency for men in the romantic (i.e., sexually motivated) condition to prefer meat. This suggests that men may eat meat to enhance their sexual desirability. Supporting this, one experiment found that women rated meat-eating men as more sexually desirable than vegetarian men (Timeo & Suitner, 2018). Alternatively, some men claim to eat meat because it enhances their sexual virility (Bogueva et al., 2017). Thus, conformity to sexual traditional masculinity norms (i.e., being a “playboy” and placing high importance on sex) may be positively related to men’s meat consumption.

Finally, in cultural analyses of meat advertisements and restaurants, some scholars have argued that men’s meat consumption enables performances of heterosexual masculinity (Buerkle, 2009; Lapina & Leer, 2016; Rogers, 2008). Heterosexual self-presentation involves fear or disdain of being perceived as homosexual (Levant et al., 2020; Mahalik et al., 2003). As homosexual men are stereotypically viewed as more feminine than heterosexual men (Hunt et al., 2016), to distance themselves from homosexuality and present a heterosexual image, some men avoid associating themselves with femininity (Hunt et al., 2016; Wilkinson, 2004). Because meat is associated with masculinity, and vegetables/vegetarianism is associated with femininity, men concerned with presenting a heterosexual image may be resistant to plant-based diets because they fear associating themselves with femininity. Other experimental research has demonstrated a marginal tendency for heterosexual men to prefer meat in a romantic dinner setting with a woman, where the need for heterosexual self-presentation is salient, compared to men dining alone (Timeo & Suitner, 2018). Thus, men who conform to the heterosexual self-presentation dimension of masculinity ideology may be more likely to eat meat.

2.2.2.4. Non-traditional “New” Masculinity Ideology

Men’s meat consumption has mostly been investigated in relation to traditional masculinity ideology. However, researchers have begun to examine the connection between men’s meat consumption and non-traditional masculinities. “New masculinity” is an alternative yet widespread masculinity ideology that captures a set of emerging masculine norms that have arisen in response to societal progression in women’s rights as well as the increase of therapeutic discourse in popular Western culture. Since the late 1990’s, through mainstream media and popular psychology, therapeutic discourse has filtered into everyday understandings and perceptions of who people are, how they operate, and what they need emotionally and psychologically to achieve personal growth and mastery (Ferudi, 2004; Illouz, 2008). These changes have marked “a shift toward greater self-awareness, sensitivity, and intimate expressivity in both male-to-female and male-to-male interactions” (Kaplan et al., 2017, p. 397). Moreover, aligning with societal progression regarding gender equality, new masculinity questions the traditional masculine/feminine gender role binary, embracing gender roles that traditionally have been considered “feminine”. Thus, men who conform to new masculinity are more likely to identify as feminist and less likely to hold modern and old-fashioned sexist views (Kaplan et al., 2017).

New masculinity ideology was first defined and measured by Kaplan et al. (2017) who identified its five core sub-facets. Non-traditional masculinity ideology encourages men to live with greater self-awareness, authenticity, self-expression, and meaningful relationships (Kaplan et al., 2017). Men with “holistic attentiveness” acknowledge the importance of their body and health, and recognise the connection between the mind and body for their well-being. “Authenticity” recognises the importance of emotional expression and expressing one’s true self in all areas of life. “Sensitivity to male privilege” endorses gender equality and rejects traditional gender roles that harm men and disadvantage women. “Domesticity and

nurturing” reflects active involvement in and prioritisation of childrearing. Finally, “questioning definitions of masculinity” challenges the validity of traditional, restrictive masculine norms that prevent men from being their authentic selves. Collectively, new (a.k.a. non-traditional) masculinity ideology challenges traditional, restrictive, and oppressive gender roles, promoting greater equality and personal freedom.

Researchers have found an inverse relationship between new masculinity ideology and men’s meat consumption. In a sample of male meat-eaters, De Backer et al. (2020) found that men who conformed to new masculinity ideology were less psychologically attached to meat, had a greater willingness to reduce their meat consumption, and held more positive attitudes towards vegetarians. While there were no differences in participants’ meat consumption at lunch or dinner, higher conformity to new masculinity ideology predicted lower meat consumption for breakfast and snacks. Amongst UK men and women, Peeters et al. (2022) found that conformity to new masculinity ideology negatively predicted both red and white meat consumption, over and above demographic variables (including sex) and traditional masculinity ideology. Moreover, new masculinity ideology negatively predicted psychological meat attachment and positively predicted willingness to reduce meat consumption. Experimental research has also demonstrated that men who conform to new masculinity ideology are less likely to eat meat. When presented with a hypothetical menu serving either a meat or plant-based burger, Leary et al. (2023) found that men who conformed to new masculinity ideology were more likely than men low in conformity to choose the plant-based burger. Hence, men who conform to new masculinity ideology tend to eat less meat and more open to meat reduction. However, like the traditional masculinity literature, these studies measured new masculinity ideology as a unidimensional construct, and therefore, did not capture which dimensions of new masculinity ideology explain the meat-masculinity relationship.

Although no studies have examined which dimensions of non-traditional masculinity are related to men's meat consumption, the norms "questioning definitions of masculinity" and "authenticity" may explain the negative relationship between men's meat consumption and overall conformity to non-traditional masculinity. Because plant-based diets tend to be viewed as "feminine" or "unmanly" (Bogueva et al., 2020), it's likely that they are more appealing to men who challenge traditional masculine roles and embrace behaviours traditionally construed as "feminine". The "questioning definitions of masculinity" norm captures this ideal, endorsing the view that men should be free from restrictive gender roles and freely engage in behaviour, regardless of whether society views it as "unmanly". Therefore, men who conform to questioning definitions of masculinity may eat less meat or be more willing to reduce their meat consumption. Furthermore, men who eschew meat out of compassion for animals are viewed as "unmanly" (Bogueva et al., 2020) because emotional expression has traditionally been associated with femininity (Plumwood, 2002). As the new masculine norm "authenticity" promotes open and authentic emotional expression, men who conform to authenticity may feel more comfortable expressing empathy for farm animals, a common motivator of meat reduction (Kunst & Hohle, 2016). Therefore, the authenticity norm may be associated with meat reduction.

2.2.2.5. Summary of Masculinity Ideologies

Masculinities are multidimensional, socially constructed "ideologies" that prescribe and proscribe certain behaviours for men. Individuals prioritise and conform to different dimensions of masculinity ideologies to varying degrees. Men who place greater importance on behaving in accordance with traditional gender roles (i.e., high conformity to traditional masculinity ideology) are more likely to eat meat, a stereotypically masculine behaviour. Conversely, men who challenge traditional gender roles (i.e., high conformity to new masculinity ideology) are less likely to eat meat and more willing to reduce their meat

consumption. However, as the literature has only examined masculinity ideologies as unidimensional constructs in relation to men's meat consumption, it remains unclear which dimensions of traditional and non-traditional masculinities explain the meat-masculinity relationship. This dissertation sought to fill this gap by identifying which masculine norms predict men's meat consumption and willingness to reduce their meat consumption. The literature suggests that traditional masculine norms regarding the *pursuit of social status*, *sexuality*, *toughness*, *violence*, *emotional control*, and *heterosexual self-presentation*, and the non-traditional masculine norms *questioning definitions of masculinity* and *authenticity*, may explain the meat-masculinity link.

2.2.3. Hegemonic Masculinity Theory

Thus far this chapter has shown that the masculinity dilemma may be explained by doing gender and conformity to masculinity ideology theories; the former suggests that men resist meat reduction because it serves as a means of maintaining and preserving their masculine identity; the latter suggests that men resist meat reduction due to conformity to societal pressures of how men should behave. While these theories acknowledge the influence of sociocultural conditions, they emphasise the role of the individual (i.e. personal motivations) in men's resistance to meat reduction.

As an alternative approach, various scholars have explored the meat-masculinity link with Connell's (1987) hegemonic masculinity theory, based on Gramsci's (1971) theory of hegemony, which asserted that the ruling class maintained social power by securing mass consent through cultural and ideological dominance. Connell (1987) adapted Gramsci's theory with a feminist lens, emphasising the role of power dynamics between groups of men and women in producing a hierarchical "gender order," which legitimates and maintains oppressive social structures. Aligning with doing gender and masculinity ideology theories,

hegemonic masculinity theory assumes a multiplicity of masculinities and that gender is social constructed.

A “hegemonic” masculinity is constructed as a culturally idealised form of masculinity at the apex of a social hierarchy in relation to subordinate masculinities and femininity. Power dynamics between masculinities and femininities within the gender order are instrumental in constructing and sustaining this social hierarchy. For instance, historically, heterosexuality has been a key marker of hegemonic masculinity, culturally and institutionally privileged over a subordinated and oppressed homosexual masculinity (Connell, 1995). These gender hierarchies are further complicated by intersections with race, class, and other identity markers (Wesley, 2015). While most men do not personally embody hegemonic masculinity, all position and evaluate themselves in relation to it.

The current construction of hegemonic masculinity in Western cultures is often linked to character traits associated with traditional masculinity ideology, particularly aggressiveness, competitiveness, toughness, emotional control, and heterosexuality (Wedgwood et al., 2023). However, hegemonic masculinity is not a “fixed character type”, but rather, is historically and culturally contingent, changing in response to shifting social conditions and relations within the gender order (Connell, 1995; Yang, 2020). Importantly, the character traits associated with a hegemonic masculinity are not what constitutes its hegemonic status. Rather, what makes a masculinity *hegemonic* is whether it legitimises and reinforces power inequalities within the gender order. Thus, the focus of hegemonic masculinity theory is not on masculine characteristics but instead on the power relations between hegemonic masculinity, nonhegemonic masculinities, and femininity, as well as the processes by which the gender order is legitimated.

2.2.3.1. Hegemonic masculinity and meat consumption

Numerous scholars have linked Western men's dietary choices to hegemonic masculinity. Most have explored the meat-masculinity link from veg*n men's perspectives, investigating how veg*n men construct their masculinity in relation to hegemonic masculinity. Greenebaum and Dexter (2018) found that vegan men constructed a hybrid version of masculinity, incorporating feminine traits, such as compassion, whilst reinforcing and aligning themselves with hegemonic masculine traits such as independence, courage, non-conformity, toughness, and heroism. Mycek (2018) found that vegan men masculinised themselves by constructing their diet choice as rational (masculine) rather than emotional (feminine). Oliver (2023) found that gender performances amongst male vegan activist influencers conformed rigidly to hegemonic masculinity, portraying veganism "through hegemonic masculine ideals of physical strength and enhanced virility whilst claiming to disrupt these same norms" (p. 75). Moreover, marketing veganism in a way that aligns with white, heteronormative hegemonic masculinity is often used in Western culture to enhance its appeal (Dubisar, 2023, p. 137). However, there are a lack of empirical studies exploring men's dietary practices with hegemonic masculinity theory that include both meat-eating and veg*n participants. Moreover, these studies focus on veg*n men as individuals, and how they align themselves with traditional masculine norms, rather than understanding hegemonic power relations between masculinities and femininity. Hence, these studies have not thoroughly established whether the relationship between meat and masculinity is in fact *hegemonic*.

Specifically, previous studies often misapply hegemonic masculinity theory. For example, several scholars have explained men's dietary choice as a *gender performance* of hegemonic masculinity (Dubisar, 2023; Greenebaum & Dexter, 2018; Mycek, 2018; Oliver, 2023). As Greenebaum and Dexter (2018) explain, "By equating meat eating with 'masculine

traits' of emotional stoicism, strength and virility, food consumption becomes a performance by which men are able to assert their dominance as hegemonic men in patriarchal culture" (p. 637). From this perspective, men's meat-eating gender performances are "hegemonic" because eating meat symbolically aligns with traditional "masculine traits" (i.e., traditional masculinity ideology). Others have understood the meat-masculinity link as *conformity to* hegemonic masculine norms (De Backer et al., 2020; Nath, 2011; Oliver, 2023), where men's meat consumption is viewed as the "social embodiment of patriarchal norms" (Oliver, 2023, p. 63) or as conformity to "socially constructed norms of hegemonic masculinity" (De Backer et al., 2020, p. 1). These explanations, which emphasise performances of or conformity to masculine norms or "traits", are based primarily on doing gender and conformity to masculine ideology theories. This misses Connell's (1987) focus on hierarchical power relations between masculinities and femininity, and how these inequalities are legitimated. Equating hegemonic masculinity with traditional masculinity ideology is a common misapplication of Connell's theory (Everitt-Penhale & Ratele, 2015; Wedgwood et al., 2023). It is important to go beyond focusing on how men's meat consumption is a performance of, or conformity to, traditional masculinity, to explore *how* gendered power relations within the hegemonic order contribute to men's meat consumption.

Due to these limitations, scholars have assumed that men's meat consumption is an expression of hegemonic masculinity (Gelfer, 2013; Greenebaum & Dexter, 2018) without thoroughly establishing its hegemonic nature. Hegemonic gender orders are produced and sustained by *domination* and *consent*. According to Connell (1987), hegemony is "a social ascendancy achieved in a play of social forces that extends beyond contests of brute power into the organisations of private life and cultural processes" (p. 23). A masculinity achieves hegemonic status over subordinate masculinities and femininity through subtle mechanisms of domination in everyday cultural processes, social interactions and discursive tactics, rather

that brute force (Connell, 1995). Furthermore, a hierarchical system is hegemonic if it is sustained by consent from all groups within the gender order (Connell & Messerschmidt, 2005; King et al., 2021; Yang, 2020). Connell (1987, 1995) argued that nonhegemonic masculinities consent to the hegemonic gender order because they benefit from their privileged position over women, whereas women consent by accepting and conforming to definitions of femininity constructed as submissive and compliant. Thus, a masculinity is only *hegemonic* when it achieves cultural ascendancy through mechanisms of domination and consent (Yang, 2020). Currently, to the author's knowledge, there is very limited research establishing *if*, and more importantly, *how* the hegemony of meat-eating masculinity is achieved and sustained, through mechanisms of domination and consent.

Although hegemonic masculinity theory examines gendered power dynamics between masculinities and femininity, to the author's knowledge, only two studies have explored relations between meat-eating and plant-based masculinities using hegemonic masculinity theory. In Nath's (2011) interviews with Australian vegetarian men, the participants described how meat-eating men attempted to dominate them as a means of "hegemonic masculine norm enforcement" through social pressure such as disapproval, criticism, and intrusive questioning (p. 14). However, only Bogueva et al. (2020) explored gender relations from both meat-eating and veg*n men's perspectives, suggesting that vegetarian men may be subordinated to hegemonic masculinity in the same manner as other marginalised groups (i.e., women, gay men, and transgender people). In their exploration of men's attitudes to vegetarian men, Bogueva et al. (2020) found that meat-eating men were positioned as embodying "real" masculinity in comparison to inferior vegetarian men. Although Bogueva et al. (2020) did not explicitly identify mechanisms of domination or consent, they found that meat-eating men expressed discrimination towards, and avoided associating with, vegetarian men and that vegetarian men adopted "apologetic" (i.e., submissive) behaviour towards meat-

eating men. While mechanisms of domination and consent were not explicitly identified in either of these studies, findings suggest that the meat-masculinity link is hegemonic because, at least in Australian society, veg*n masculinity is subordinated in relation to a hegemonic meat-eating masculinity. These studies provide initial insights into how hegemonic domination mechanisms contribute to men's meat consumption, but a holistic understanding of the hegemonic processes (including both domination and consent) remains unclear.

Scholars have also argued that femininity is subordinated in relation to meat-eating masculinity. In a critical feminist-vegetarian analysis, Adams (2015) argued that men's meat consumption both symbolically and materially contributes to women's oppression through the unequal distribution of meat and the legitimization of violence, domination, objectification, and consumption. Using the same feminist-vegetarian approach inspired by Adams, Gelfer (2013) explored the role of hunting and meat consumption in men's ministries in Australia and the US. He argued that meat consumption in men's ministries is hegemonic because it symbolises and reinforces men's power over women. Both Adams and Gelfer argue that meat is a symbol of, and reinforces, women's subordination to men. Thus, these studies suggest that meat-eating masculinity is hegemonic because it subordinates femininity.

Overall, the connection between hegemonic masculinity and meat consumption is a relatively underdeveloped area of research. Hegemonic masculinity theory is often misapplied, or not fully utilised, with scholars tending to draw on doing gender and conformity to traditional masculinity ideology theories, rather than examining how meat consumption may relate to power dynamics and inequalities between masculinities and femininities in the gender order. Without identifying or understanding how meat consumption is related to power dynamics and consent mechanisms reinforcing gender inequalities, this merely *assumes* that men's meat consumption is an expression of hegemonic masculinity, given that domination and consent are fundamental components of hegemony. Moreover, it is

unclear *how* (i.e., the processes) hegemonic masculinity contributes to men's meat consumption. While some studies have identified possible mechanisms of domination contributing to men's meat consumption, none have identified mechanisms of consent. Hence, there is an incomplete understanding of how hegemonic masculinity may contribute to men's meat consumption. Understanding these processes can provide insights into the psychological, interpersonal, and sociocultural barriers impeding men's meat reduction. This dissertation sought to address this gap by applying Connell's (1987) theory of hegemonic masculinity theory to identify how hegemonic masculinity, through mechanisms of domination and consent, contributes to the masculinity dilemma.

2.3. Chapter 2 Summary

As outlined in Chapter 1, the aim of this dissertation was to gain a comprehensive understanding of men's meat consumption to understand "the masculinity dilemma"—*why are men resistant to meat reduction?* This chapter demonstrated that the well-established answer to this question is that meat consumption is inextricably linked with masculinity. This highlights the need for researchers to focus on men's meat consumption as a distinct phenomenon and to consider the influence of masculinity. However, there are components of the meat-masculinity link that remain unclear. Firstly, masculinity ideology theory has established the unidimensional relationship between conformity to masculinity ideology and meat consumption, but it is unknown which dimensions of traditional and non-traditional masculinity ideology account for this relationship. Secondly, previous explanations of how hegemonic masculinity contributes to men's meat consumption resemble the doing gender and masculinity ideology theoretical frameworks, framing men's meat consumption as a *performance* of or *conformity* to hegemonic masculinity, rather than focusing on the power dynamics between masculinities and femininity in the gender order. This dissertation sought to address these gaps by (1) identifying which dimensions of traditional and non-traditional

masculinity ideology contribute to men's meat consumption; and (2) exploring *how* hegemonic masculinity contributes to men's meat consumption through mechanisms of domination and consent.

Chapter 3: Psychological Influences on Meat Consumption

The first chapter outlined the importance of understanding and addressing the masculinity dilemma—there are major problems associated with excessive meat consumption, and men in particular eat more meat and exhibit greater resistance to meat reduction. The second chapter demonstrated that men are placed in this “dilemma” due to the connection between meat and masculinity. Men’s unique relationship with meat emphasises the need to understand men’s meat consumption as a distinct phenomenon. Recognising the role of gender in meat consumption, researchers have called for gender-specific meat consumer research and meat-reduction interventions (Bogueva & Marinova, 2018; Graça et al., 2019; Rosenfeld, 2023). It is especially important to understand male meat consumers given that meat-reduction interventions are less effective amongst men (e.g., Campbell-Arvai et al., 2014; Pohlmann, 2022).

Unfortunately, understandings of male meat consumers are limited due to methodological trends in the meat consumer literature, in which researchers tend to compare men with women, rather than exploring within-gender differences. Rather than focusing on understanding the diversity within male meat consumers to grasp nuances of the meat-masculinity link, studies considering the role of gender in meat consumption tend to examine male versus female differences in meat consumption and related variables. As a result, understandings of male versus female gender differences in meat consumption are well known, but within-gender differences remain, for the most part, unexplored and fragmented in the literature. Modlinska et al. (2020) systematically reviewed 29 articles comparing men and women on the psychosocial factors related to meat-avoidance behaviour. The review yielded clear and consistent differences between men and women in meat-related behaviours and attitudes, but concluded that a focus on within-gender differences, and subgroups within single-sex populations, was lacking. Other researchers concur, arguing that treating men as a

homogenous consumer group overlooks potentially important differences between men that would be useful for understanding male consumers and developing more effective male-targeted meat-reduction interventions (De Backer et al., 2020; Leary et al., 2023; Rosenfeld & Tomiyama, 2021).

Consumer segmentation studies—a person-centred analytic approach—are one of the most effective and commonly used approaches to understanding differences in consumer behaviours and attitudes. Compared to variable-centred analyses (e.g., structural equation modelling), which assume samples derive from one homogenous population, person-centred analyses (e.g., cluster analysis, latent class analysis) assume that multiple subpopulations may be present and are useful for identifying differences between individuals (Marsh et al., 2009). By identifying multiple subpopulations that hold unique “profiles” (i.e., different sets of parameters), person-centred approaches can provide more complex, specific information about consumers (Howard & Hoffman, 2018). Samples can be broken down into distinct consumer segments, where members of each segment share a common profile based on the set of indicator variables related to the phenomenon of interest. Understanding the unique characteristics of each consumer segment can be used for targeted product development, interventions, campaigns, marketing strategies, and policy development (Gunter, 2016; Onwezen, 2018). Previous meat consumer segmentation research has demonstrated that successful meat-reduction interventions can be developed by firstly identifying distinct meat consumer profiles (Lacroix & Gifford, 2019) and then tailoring interventions to the unique psychological profile of each consumer segment (Lacroix & Gifford, 2020).

Previous meat consumer segmentation studies have distinguished between various segments or “types” of meat consumers, based on their willingness to eat meat, lab-grown meat, and plant-based meat alternatives (Cornelissen & Piqueras-Fiszman, 2023); attitudes towards the health and animal welfare issues associated with meat production (Onwezen &

van der Weele, 2016); reasons for changes in meat consumption (Latvala et al., 2012); perceived impacts of meat consumption on health, animals, and the environment (Graça et al., 2015b; Malek et al., 2018); preferences for meat and meat substitute attributes (Apostolidis & McLeay, 2016); and meat-eating habits when “eating out” (Ritzel & Mann, 2023). However, no consumer segmentation studies have specifically focused on *male* meat consumers, nor have they included masculinity-related profiling variables. This dissertation addressed this gap by examining men exclusively and incorporating measures of masculinity, alongside other psychological variables.

Meat consumption is a complex social phenomenon impacted by a broad range of psychological, sociocultural, and external factors (Stoll-Klemann & Schmidt, 2017). Hence, to form a comprehensive understanding of male meat consumers, a broad range of factors should be considered in addition to masculinity. This chapter reviews the key psychological factors influencing individual meat consumption and reduction that were selected as profiling variables for the male meat consumer segmentation analysis. Psychological factors encompass individual-level psychological differences pertaining to internal cognitive or emotional processes.

This chapter begins with an overview of Ajzen’s (1991) Theory of Planned Behaviour (TPB), the most commonly applied theoretical framework in the study of individual meat consumption. It goes on to demonstrate that the TPB is an insufficient theoretical framework for understanding the complexities of meat consumer behaviour. The TPB emphasises the primary role of conscious intention in determining human behaviour. However, as will be outlined in this chapter, eating behaviour, and specifically meat consumption, is influenced heavily by unconscious factors (i.e., habits) as well as emotions, meat-related cognitive dissonance, food choice motives, social dominance orientation, and identity.

Therefore, this dissertation did not aim to apply or “extend” the TPB, but rather, included the TPB’s three key behavioural antecedents (attitude, subjective norm, and perceived behavioural control) alongside equally important psychological factors (habits, emotions, cognitive dissonance, dietary motives, social dominance orientation, and identity). To the author’s knowledge, there are no existing theoretical models that include such a diverse range of factors. Hence, no specific behavioural model guided the selection of psychological factors to include in the male meat consumer segmentation study. Instead, the selection of factors was guided by Stoll-Kleemann and Schmidt’s (2017) systematic review and meta-analysis of the meat consumption literature in conjunction with the author’s own literature review. While external factors, such as economic, political, or food environment (i.e., infrastructure) impact broad meat consumption patterns, these were beyond the scope of this dissertation and hence were excluded.

3.1. The Theory of Planned Behaviour

The TPB is one of the most widely used models of human behaviour in the social sciences (Bosnjak et al., 2020). Consequently, it is the most commonly applied behavioural model in the field of meat consumer research. The TPB proposes that volitional human behaviour is determined by an individual’s *intention* to perform the behaviour. “The stronger the intention to engage in a behaviour, the more likely should be its performance” (Ajzen, 1991, p. 181). So long as a person has behavioural control—the *actual* capability to perform the behaviour (i.e., access to the requisite resources and possesses the ability or skills needed to perform the behaviour), then intention should be the primary factor determining whether a behaviour is performed (Ajzen, 1991). In turn, behavioural intention is driven by three antecedent factors: *attitude* (i.e., “the degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour in question”), *subjective norm* (i.e., “the perceived social pressure to perform or not perform the behaviour”), and *perceived*

behavioural control (PBC; i.e., “the perceived ease or difficulty of performing the behaviour”; Ajzen, 1991, p. 188). Thus, when an individual has a positive attitude towards eating meat, believes others expect them to eat meat, and perceives eating meat as easier than eating plant-based food, they will have greater intentions to eat meat, and consequently, eat more meat. Conversely, when an individual has a positive attitude towards meat reduction, believe others expect them to limit their meat consumption, and views meat reduction as relatively simple and easy, they should have greater intentions to reduce, and consequently, should eat less meat. Findings from many meat consumer studies have supported these hypotheses (Bakr et al., 2023; Carfora et al., 2022; Chen, 2022; Çoker & van der Linden, 2022; de Gavelle et al., 2019; Seffen & Dohle, 2023; Wyker & Davison, 2010).

In some samples, subjective norm (Carfora et al., 2017; Lentz et al., 2018; Rees et al., 2018; Wang & Scrimgeour, 2021) and PBC (Borusiak et al., 2022; Carfora et al., 2020; Lentz et al., 2018; Wolstenholme et al., 2021) have not predicted meat-eating intentions and behaviours. However, in most samples, all three constructs are significant predictors (Bakr et al., 2023; Carfora et al., 2022; Chen, 2022; Çoker & van der Linden, 2022; de Gavelle et al., 2019; Fantechi et al., 2024; Seffen & Dohle, 2023; Wang & Scrimgeour, 2021; Wolstenholme et al., 2021; Wyker & Davison, 2010). Moreover, the TPB factors tend to have high explanatory power, explaining 75% variance in intentions to reduce meat consumption in a Taiwanese sample (Chen, 2022), 61% in a US sample (Wyker & Davison, 2010), 57% variance in a UK sample (Çoker & van der Linden, 2022), 55% variance in a German sample (Seffen & Dohle, 2023), and 51% variance in a French sample (de Gavelle et al., 2019). Only one study found lower predictive ability of the TPB, explaining only 19% variance in intentions to reduce meat consumption and 24% variance in willingness to reduce meat consumption (Lentz et al., 2018).

Although the TPB proposes that attitude, subjective norm, and PBC influence meat consumption behaviour indirectly via intentions, these factors also directly predict meat consumption. Having a positive attitude towards meat is a strong predictor of whether an individual is a meat-eater or a vegetarian, with meat-eaters having more positive attitudes (De Houwer & De Bruycker, 2007). Attitude to meat reduction has strong negative relationships with red, white, and fish/seafood meat consumption (Hayley et al., 2015) and predicts whether participants had already reduced their meat intake (Weibel et al., 2019). Perceived behavioural control has been found to directly predict meat consumption, rather than meat-eating intention (D'Souza, 2022), and to be a stronger predictor of meat consumption than the intention to reduce meat consumption (de Gavelle et al., 2009; Rees et al., 2018). Subjective norms from friends (though not family members; Sharps et al., 2020), and health professionals (McCarthy et al., 2004), expressing social approval about eating meat, have also positively predicted meat consumption. Attitude, subjective norm, and PBC also predict willingness to reduce meat consumption (Seffen & Dohle, 2023) and willingness to adopt a plant-based diet (Wang & Scrimgeour, 2021). Thus, the TPB variables are important factors contributing to meat consumption.

3.1.1. Criticisms of the TPB

As a “reasoned action” model of behaviour, the TPB assumes that behaviour is determined by conscious, deliberate, and rational reasoning (Ajzen & Dasgupta, 2015). However, critics argue that the emphasis on conscious intention fails to consider unconscious behavioural influences, such as habit, culture, and identity (Sheeran et al., 2013). Dual-process theories suggest that non-conscious mechanisms influence eating behaviour at least as strongly as conscious determinants like intention or attitude (Horgan et al., 2019; Köster, 2009). Intentions are best at predicting goal-directed, deliberate behaviours that occur infrequently (e.g., buying a home), but have less predictive validity for habitual behaviours

(Ajzen & Dasgupta, 2015). As eating is highly habitual (Neal et al., 2012), habits can have greater influence on eating behaviour than conscious factors like intention (Ouellette & Wood, 1998). Furthermore, the TPB's emphasis on rational reasoning ignores the centrality of emotions and identity in people's lives (Schwartz et al., 2011). Finally, despite the strong explanatory power of the TPB constructs, researchers have argued that a theory of human behaviour containing only four factors is oversimplified and lacking in ecological validity (Snichotta et al., 2014; Maio & Haddock, 2010). To address these concerns, most researchers applying the TPB utilise extended models by incorporating additional psychological factors. Extended TPB models regularly explain additional unique variance in meat consumer behaviour, demonstrate better goodness-of-fit, and higher explanatory power than the original TPB model (Carfora et al., 2020; Carfora et al., 2022; Chen, 2022; Wolstenholme et al., 2021). This indicates that additional factors provide a more comprehensive explanation of meat consumer behaviour.

3.2. Habit

A habit refers to unconscious, automatic, and routine behaviour (Wood & Rünger, 2016). Habits are formed through positive and negative reinforcement of frequent, repetitive actions (Brewer et al., 2018; Orbell & Verplanken, 2020), saving time and energy by providing an automatic response to situational cues without the need for conscious deliberation (Orbell & Verplanken, 2020). Reinforcement of habits can occur physically (e.g., satiation, pain relief), socially (e.g., approval from others), emotionally (e.g., inducing positive emotions or removing unpleasant emotions), or with practical benefits (e.g., time or money saving; Brewer et al., 2018; Verplanken, 2010). Habits are conceptualised as dimensional, ranging from weak to strong, with stronger habits usually occurring more frequently and automatically (Neal et al., 2012). The stronger a habit, the harder it is to change.

According to dual-process models of cognition, behaviour will mostly likely be habitual, arising from the effortless/automatic cognitive system, unless the effortful/deliberative system is activated, disrupting the automatic system. In other words, the habitual cognitive system is the brain's default. Thus, habits strongly influence people's everyday actions (Wood & Rünger, 2016), with habits driving an individual to repeat past behaviour (Neal et al., 2012). As eating behaviours occur with such frequency and stability (i.e., in the same contexts), and are reinforced with the neural reward system, eating and food choice is especially subject to habituation (Brewer et al., 2018; Verplanken, 2010).

Studies suggest that meat consumption is highly habitual. A German study found that meat-eating habit strength was the strongest predictor of participants' meat consumption, compared to all TPB variables (Rees et al., 2018). Other research found that habit was the second-most frequently cited reason for eating meat among omnivores and flexitarians (second only to liking the taste of meat), compared to other reasons such as health, environment, price, religion, availability, or social influences (Mullee et al., 2017; Schösler et al., 2014). The literature suggests that frequent meat consumption may become highly automatic (i.e., habitualised), leading to higher meat consumption. Strong meat-eating habits can also impede meat reduction because changing dietary habits requires conscious deliberation and effort.

3.2.1. The power of habit on eating behaviour

Notably, meat-eating habit strength does not influence meat-reduction *intentions*, but nonetheless, is a major barrier to meat reduction. This is because habits operate independently of intentional, goal-directed behaviour and have a *stronger* influence on behaviour than conscious intentions and attitudes (Neal et al., 2012). A meta-analysis of 64 studies investigating the effect of intentions and habits on various behaviours (including eating behaviour) found that intentions predicted behaviour when habit strength was

relatively weak, whereas habit was a substantially stronger predictor of behaviour than intention when habit strength was high (Ouellette & Wood, 1998). Another meta-analysis of 47 intervention studies found that participants' intentions to change a behaviour were only successful when the behaviour in question was not habitual (Webb & Sheeran, 2006). Due to the automaticity of habit—characterised by a lack of conscious awareness and difficulty to control—people may consciously *intend* to perform a behaviour, but are more likely to act in accordance with their habits, particularly when their habits are strong (Verplanken, 2010). The power of habit over intention on eating is demonstrated in weight loss studies, where up to 60% of participants in weight trials, who intend to lose weight through dietary restriction, fail to successfully sustain dietary changes, due to the power of habitual eating loops (Brewer et al., 2018).

Likewise, habit has more influence on actual meat consumption than on *intentions* to eat meat. In a longitudinal study applying an extended TPB model, Rees et al. (2018) found that habit was the strongest model predictor, with participants' meat-eating habits explaining an additional 40% unique variance in their meat consumption over and above the TPB constructs. In contrast, two studies found that habit strength did not explain additional variance in participants' *intentions* to reduce their meat consumption over and above the TPB constructs (Çoker & van der Linden, 2022; Seffen & Dohle, 2023). Similarly, research has found that habit correlated more strongly with meat consumption than meat-eating intention (Saba & Natale, 1998). Thus, habit appears to strongly predict actual meat consumption behaviour but not meat-reduction intentions. This is because individuals can form the intention to reduce their meat consumption regardless of their meat-eating habit strength, but their meat-eating habits will impede meat reduction, particularly among those with deeply ingrained habits. Hence, while intention is a key factor in the TPB model, it was not included

as a factor in the current study because meat-eating habit strength is a more important predictor of meat consumption than the intention to eat meat.

Habit may be especially important for understanding male meat consumers since men tend to be higher frequency meat-eaters, and therefore, more likely to have stronger meat-eating habits. The habitual nature of meat consumption has been found to be significantly higher among meat-eating groups with more male participants (Schösler et al., 2014). Moreover, men can potentially develop stronger meat-eating habits via reinforcements from sensory pleasure (men score higher than women on meat “hedonism”, enjoying meat’s sensory pleasure; Graça et al., 2015a) and from boosting masculinity (Mesler et al., 2022). Evidently, men’s meat-eating habits are a major barrier to men’s meat reduction. One study found that one of the strongest barriers to adopting a plant-based diet among men was being unwilling to change their eating habits and routines (Lea et al., 2006). Another found that men were more likely than women to perceive their habitual meat consumption behaviour as a barrier to reducing their meat consumption (Cordts et al., 2014). Importantly, strongly ingrained habits can only be changed if a person is sufficiently motivated to behave differently (Wood & Rünger, 2016). However, men are less persuaded and concerned than women by the most common motivators of meat reduction (i.e., animal welfare, the environment, and personal health; Hopwood et al., 2020). Thus, habit strength is likely to differentiate male consumers and is an important factor affecting men’s dietary change.

3.3. Emotions: Disgust and Moral Emotions

Emotions influence human behaviour by producing instantaneous physiological and motivational responses in the body, alongside changes in subjective feeling and motor expression, which trigger and motivate action (Brosch et al., 2013). Each emotion elicits a different type of behavioural response. For example, fear compels people to flee or avoid, whereas anger elicits defensive or aggressive behaviours. In a systematic meta-analysis of the

psychosocial factors influencing meat reduction, emotions were identified as having the most powerful influence on meat consumption and reduction behaviour (Stoll-Kleemann & Schmidt, 2017). Emotions are inextricably linked with eating and food choice, particularly because they can positively or negatively reinforce eating behaviour (Brewer et al., 2018, Figure 1, p. 3). Disgust has a direct influence on eating behaviours, having evolved to protect humans from ingesting life-threatening or disease-ridden substances (Chapman & Anderson, 2012). Additionally, as the production of meat involves killing an animal, which raises moral questions, meat consumption has also been linked to moral emotions; namely, empathy and moral disgust.

3.3.1. Sensory Disgust

Disgust is an emotion characterised by the sense of revulsion at the prospect of ingesting or being contaminated by an offensive substance (Martins & Pliner, 2006; Rozin & Fallon, 1987). This reaction compels an individual to actively avoid the offensive substance. Hence, disgust has a strong influence on food choice (Egolf et al., 2018), especially animal derived foods (Rozin & Fallon, 1987; Tybur et al., 2016). Meat most commonly elicits disgust in response to its “bloody”, “fatty” or “slimy” sensory qualities (Fessler et al., 2003; Santos & Booth, 1996), or when reminders of its living animal origins are present, such as bones, veins, and other animal body parts (Kunst & Hohle, 2016). Stronger disgust in response to meat is associated with lower meat consumption (Becker & Lawrence, 2021; Rothgerber, 2015), less willingness to eat meat (Kunst & Hohle, 2016; Kunst & Palacios Haugestad, 2018; Ruby & Heine, 2012), and total meat avoidance (Santos & Booth, 1996). This negative relationship between disgust and meat consumption appears in both Western and Eastern cultures (Ruby & Heine, 2012).

The relationship between disgust and men’s meat consumption is somewhat inconsistent. Many studies have found that men tend to display lower levels of disgust

towards meat than women. Across Canadian, US, Indian, and Hong Kong Chinese samples, men have reported lower levels of disgust towards meat than women (Ruby & Heine, 2012). Another study investigated attitudes towards beef across four different cultures (Argentina, Brazil, France, and the US), asking participants to write down the first three words that came to mind when they thought of the word “beef” (Ruby et al., 2016). Words such as “disgusting”, “gross”, and “yuck” were mentioned by women in Argentina, Brazil, and the US, but not mentioned at all by men from any culture. This suggests that men may eat more meat than women because they are less disgusted by it. However, two experiments did not find significant gender differences in the strength or direction of the relationship between disgust and willingness to eat meat; for both men and women, greater feelings of disgust led to equally less willingness to eat meat (Kunst & Hohle, 2016). More recent research has found that, among meat-eaters, men had significantly lower levels of implicit and explicit disgust towards meat than women, but that this gender difference was not observed among the meat-reducers and vegetarians (Becker & Lawrence, 2021). Hence, the literature suggests that, generally, men eat more meat because they are less likely to find it disgusting, and that only men who feel disgusted by meat are compelled to reduce or avoid meat.

3.3.2. Moral Emotions: Empathy and Moral Disgust

Moral emotions are a key mechanism involved in meat avoidance behaviour. Moralisation refers to “the degree to which moral relevance is attached to issues, actions, or entities” (Rhee et al., 2019, p. 2). Moral emotions—such as guilt, shame, disgust, anger, and empathy—are affective responses to behaviours that one evaluates to be immoral, unjust, or socially unacceptable (Turner & Stets, 2006), and are fundamental underlying mechanisms involved in the moralisation of meat. For some people, meat consumption becomes “moralised” when the poor treatment and/or killing of animals in the meat industry is perceived as unjust (Feinberg et al., 2019). Indeed, moral concern regarding the treatment of

farm animals is the most common reason for initiating meat avoidance among veg*ns (Janssen et al., 2016; Malek & Umberger, 2021; Ploll et al., 2020). When meat consumption becomes viewed as a moral issue through the experience of moral emotions, people are compelled to stop eating meat. For example, in three longitudinal experiments, Feinberg et al. (2019) investigated the impact of moralising meat consumption on meat-reduction intentions. Moral emotions were measured before, during and after an intervention highlighting farm animal suffering and sentience. Experiencing moral emotions (e.g., empathy, guilt, disgust) lead to the moralisation of meat, which in turn was associated with stronger intentions to reduce meat intake and adopt a vegetarian diet. Two moral emotions instrumental in the moralisation process driving meat avoidance are moral disgust and empathy.

Moral disgust—related to but distinct from sensory disgust— refers to the feeling of revulsion arising from perceived moral transgressions (Chapman et al., 2009; Rozin et al., 2009). For example, moral disgust often arises in response to incest, paedophilia, child abuse, or violations of moral norms such as cheating, lying, or theft (Chapman & Anderson, 2013). Like sensory disgust, moral disgust elicits rejection and avoidance behaviour and therefore is associated with lower meat consumption (Graça et al., 2015b) and meat avoidance (Anderson et al., 2019; Rozin et al., 1997). This is because some people feel morally disgusted by the cruel treatment of animals in the meat industry, while others find the thought of killing an animal for its meat disgusting (Buttlar & Walther, 2022; Graça et al., 2015b; Khara et al., 2021; Kubberød et al., 2002). One experiment highlighted the importance of moral disgust in meat avoidance behaviour by comparing meat-eaters' and vegetarians' emotional responses to images of various food types and farm animal suffering (Anderson et al., 2019). There were no group differences in emotional responses to vegetables, rotten foods, and sweet foods, however, vegetarians felt more morally disgusted by the images of meat and farm animals. Importantly, this difference was not explained by general disgust sensitivity or other

emotions such as guilt, anger, or sadness, highlighting moral disgust as the key emotional factor distinguishing vegetarians.

Empathy, also related to meat avoidance, serves as a guide to moral behaviour (Zaki, 2018). Empathy motivates altruistic behaviour; an emotional response arises when a person perceives that another is suffering, or that their welfare is compromised, which compels the individual to alleviate that suffering (Batson et al., 2015). People are capable of experiencing empathy for animals as well as humans (Angantyr et al., 2015). Studies consistently show a negative relationship between empathy for animal suffering and meat consumption (Camilleri et al., 2020; Earle et al., 2019; Niemyjska et al., 2018), and a positive relationship between animal empathy and intentions to reduce meat consumption (Herrewijn et al., 2021; Kunst & Hohle, 2016). Experimental research has found that eliciting empathy for farm animal suffering increases people's willingness to reduce their meat consumption (Earle et al., 2019; Herrewijn et al., 2021; Kunst & Hohle, 2016; Kunst & Palacios Haugestad, 2018). Thus, the literature suggests that feeling empathy for farm animal suffering may motivate meat reduction.

3.3.2.1. Men, Meat, and Moral Emotions.

One of the reasons that men eat more meat may be because they are less inclined to feel empathy for farm animal suffering. Generally speaking, men tend to score lower than women on self-report measures of empathy directed towards both humans and animals (Angantyr et al., 2015; Camilleri et al., 2020; Pang et al., 2023) and express less concern than women about animal welfare, animal rights, and the suffering of livestock animals used in the production and consumption of meat (Angantyr et al., 2015; Beardsworth et al., 2002; Cordts et al., 2014; Estévez-Moreno et al., 2021; Malek et al., 2018).

Moreover, men are less likely to be morally disgusted by meat than women. A Portuguese study identified a cluster of participants, most of whom never ate meat, who

expressed disgust towards meat related to moral concerns about animal suffering (Graça et al., 2015b). Only 25.9% of this cluster were men, whereas the two other clusters were balanced in gender, indicating that women were more likely to be morally disgusted by meat than men. A longitudinal experiment also showed that men were less likely than women to experience moral disgust in response to meat-industry videos depicting animal suffering (Feinberg et al., 2019). Participants who felt moral emotions such as disgust, empathy, and guilt were more likely to view meat consumption as a moral issue and intended to reduce their meat intake, with women showing this tendency more than men. Thus, empathy and moral disgust are key psychological factors to consider for investigating differences between male meat consumers.

3.4. Meat-related Cognitive Dissonance

Meat-related cognitive dissonance (MRCD) is the psychological discomfort that arises when people realise their meat consumption conflicts with their values (e.g., concern for their health, the environment, or animal suffering; Rothgerber & Rosenfeld, 2021). Although eating meat is a longstanding social custom, many people find meat consumption conflicting due to increasing awareness of its negative impacts on animals, the environment, and their health (Rothgerber & Rosenfeld, 2021). Cognitive dissonance compels people to alleviate their psychological discomfort, through either one of two methods: (1) change your behaviour to align with your values (e.g., stop eating meat), or (2) change your *perception* of your behaviour—through various cognitive dissonance reduction strategies—so that it *appears* to align with your values (McGrath, 2017). Literature on MRCD reduction strategies demonstrates that, regarding meat consumption, most people opt for the second option (Rothgerber & Rosenfeld, 2021). Greater use of MRCD strategies is associated with higher levels of meat consumption (Ang et al., 2019; Camilleri et al., 2020) and lower willingness to reduce meat consumption (Graça et al., 2016).

Meat-related cognitive dissonance strategies play an important role in men's meat consumption because men have greater personal motivation to use them. The MRCD theory is based on Festinger's (1957) cognitive-dissonance theory and Bandura's (1999) moral disengagement theory, which assert that implementing cognitive mechanisms to alleviate internal dissonance is a *motivated* process. That is, a person will be more motivated to employ cognitive strategies if they value or desire the harmful behaviour in question. As a motivated process, men are more likely than women to engage MRCD strategies to defend their consumption of meat (Camilleri et al., 2020; Graça et al., 2016), due to its role in men's masculinity maintenance.

Studies have identified a range of cognitive mechanisms that prevent or alleviate MRCD and enable people to continue eating meat without psychological discomfort (Bastian & Loughnan, 2017; Rothgerber & Rosenfeld, 2021). These strategies often take the form of rationalisations, justifications, and denial (Graça, et al., 2016; Piazza et al., 2015; Rothgerber, 2013). The most comprehensive set of MRCD strategies was identified in a series of studies that identified nine primary meat-eating justifications (MEJs) that correlated strongly with meat consumption. The MEJs form two dimensions: *direct* and *indirect* strategies. Direct strategies unapologetically defend meat consumption through the following justifications: meat tastes delicious; meat is necessary for human health; God created animals for human to consume; humans are biologically evolved to eat meat; animals are lower than humans in "the food chain"; animals used for meat do not experience pain or suffering; and food animals are different from other types of animals, such as pets. Collectively, this constellation of rationalisations resembles "carnist" ideology—a cohesive set of beliefs defending the justness of killing and eating animals (Joy, 2009). On the other hand, indirect MEJs defend meat consumption in a more "apologetic" or passive way, representing a "look-the-other-way" approach (Rothgerber, 2013, p. 366). The indirect strategies include dissociation (i.e.,

dissociating meat from the living, sentient animal from which it came) and avoidance (avoiding thinking about where meat comes from or how it is processed). Studies find that men are more likely to employ direct strategies (Piazza et al., 2015; Hartmann & Siegrist, 2020; Mertens et al., 2020; Mertens et al., 2021), whereas women are more likely to employ indirect strategies (Hartmann & Siegrist, 2020). It is important to consider the role of both direct and indirect mechanisms to understand whether male meat consumers differ in the cognitive strategies they employ to facilitate their meat consumption.

3.5. Dietary Motives

Food preferences are shaped by self-interested “egoistic” concerns, including preferences for convenience, health, and nutritional value, within the constraints of price (Birch et al., 2018; Drewnowski & Monsivais, 2020). Additionally, many consumers consider the broader impacts of their consumption choices on animals and the environment, which are considered “altruistic” food choice motives (Birch et al., 2018). The following section outlines the key egoistic and altruistic dietary motives influencing meat consumption and reduction.

3.5.1. Egoistic Motives: Price, Convenience, and Health

The perceived affordability of certain food products, relative to alternative products, is a highly influential factor driving food choice decisions (Drewnowski & Monsivais, 2020). While for some meat consumers taste is of paramount importance, for many, price is the most pressing concern. The perceived affordability of meat is one of the most commonly reported factors motivating meat consumption and reduction. In a representative Canadian sample of meat-reducers, 62.1% reported that their reduction of beef consumption over the previous 12 months was motivated by financial reasons, compared to health, ethical, food safety, environmental, or religious reasons. Similarly, among a representative sample of US consumers, the high cost of meat was the most commonly reported reason for meat reduction,

compared to health, environmental, animal welfare, or “other” reasons (Neff et al., 2018). A representative sample of New Zealand participants also reported that the high price of meat would be the most important motivating factor for meat reduction, compared to health or environmental benefits, animal welfare concerns, taste preferences, and weight control (Lentz et al., 2018). Although two studies have found that the perceived price of meat was not associated with meat consumption or intentions to reduce (de Gavelle et al., 2019; Schenk et al., 2018), particularly within the context of the 2022-2023 “cost-of-living crisis” (Lokshin et al., 2025), the literature suggests that price is likely to be an important factor motivating meat reduction currently amongst consumers. Essentially, when meat is perceived to be too expensive, people are less likely to purchase it and are more motivated to reduce their meat consumption (Charlebois et al., 2016).

Although many consumers are motivated to reduce their meat consumption for financial benefits, some meat-eaters perceive plant-based food and meat alternatives as too expensive, and therefore, an unfeasible and impractical dietary option (Flint et al., 2023). In a representative sample of German consumers, meat-eaters were more likely than flexitarians and meat-avoiders to believe that meat was more affordable than meat-alternatives, such as tofu or mock-meats (Michel et al., 2021). The higher cost of meat alternatives can even be viewed as a barrier to meat reduction among individuals who are actively trying to reduce their meat consumption (Kemper, 2020). For meat-eaters, meat-free meals must be cheaper than meat-based meals in order to enhance willingness to opt for plant-based food. In a hypothetical restaurant experiment, Swedish meat-eaters chose between a meat burger or a meat-alternative burger (veggie, mock-meat, or lab-grown; Carlsson et al., 2022). When prices were equal, between 87-92% of participants preferred the meat burger. However, when the meat-alternative burger was priced at two-thirds the cost of the meat burger, a third of the sample became willing to eat it. This demonstrates that price plays a significant role in meat

reduction, with meat-eaters more likely to choose alternatives when they are perceived as cheaper.

Convenience is another important food choice motive related to meat consumption. Convenience is a fundamental principle guiding modern-day consumer society (Hansen & Wethal, 2023), particularly due to increasing (perceived) time scarcity (Leroy & Degreef, 2015). Consumers want food that is quick and easy to obtain, prepare, consume, and dispose of, with minimal physical energy, mental effort, labour, and skill (Leroy & Degreef, 2015). People are more likely to list convenience as a reason to eat meat, or increase their meat consumption, rather than as a reason to reduce (Malek et al., 2019a), suggesting that meat is most often viewed as a convenient food to eat, and that meat-free meals tend to be perceived as inconvenient. Although certain meat-based dishes take considerable time, effort, and skill to prepare, there are many day-to-day meat products that offer fast, easy, and relatively unskilled options for consumers (e.g., sausages, bacon, steak). For example, processed meats are often viewed as convenient, valued for their easy accessibility and simple cooking method (Hansen & Wethal, 2023). Conversely, plant-based food is often viewed as requiring more time and effort to prepare (Carroll et al., 2019; Kemper, 2020; Tucker, 2014). Although today there are more “convenience” plant-based meat-alternative products available (e.g., vegetarian sausages or burger patties), many consumers have negative attitudes towards meat alternative products, perceiving them to be unnatural, unhealthy, expensive, and a compromise on taste (Hansen & Wethal, 2023). Generally, meat-avoiders tend to view meat alternative products as convenient, whereas meat-eaters tend to view meat as convenient (Kerslake et al., 2022).

Convenience is an important factor motivating men’s food choices. Generally, young, single men, and those with longer working hours, are more likely than women to consume “ready-to-eat” and “easy-to-prepare” convenience foods (Contini et al., 2016). For example,

one study identified four major dietary patterns among UK university students: “vegetarian”, “snacking”, “health-conscious” and “convenience, red meat, and alcohol” (Sprake et al., 2018). Men were more likely to consume the convenience dietary pattern, which consisted of foods requiring little or no preparation (e.g., fried food, processed meat, red meat) and was associated with more frequent consumption of take-away and ready-to-eat meals. Similarly, among US student athletes, males were more likely to consume fast food and restaurant meals, indicating a greater preference for convenience, a key factor driving fast food consumption (Hull et al., 2016). A similar trend is observed in older samples. For example, in a cluster analysis of attitudes towards convenience food in UK adults, most men fell into the “casual consumer” group, which had the most positive attitudes towards convenience foods (e.g., ready-made meals), spent little time preparing food or shopping, and were less likely to plan meals in advance (Mallinson et al., 2016).

As convenience is an important food choice motivate for men, the perceived inconvenience of plant-based food may be an important barrier to men’s meat reduction. A study of Swiss university students found that, compared to price and taste, convenience was the strongest barrier to intended meat reduction, particularly amongst male students, who were less motivated than females to reduce because they were more likely to view vegetarian diets as inconvenient (Schenk et al., 2018). The perceived inconvenience of plant-based food is also a barrier to men’s meat reduction in older populations. A representative Australian segmentation study found that “committed” meat-eaters—comprised of a higher proportion of males than other consumer segments—were more likely than “undecided” meat-eaters, meat-reducers, or prospective veg*ns to believe that meat-free meals are inconvenient (Malek et al., 2019b).

Health is another important food choice motive. The nature of the relationship between health and meat consumption depends on an individual’s beliefs about the health

benefits and risks of eating eat. Many people believe that meat is necessary for optimal health (Piazza et al., 2015). For example, it is commonly believed that meat is necessary to obtain sufficient protein, vitamins, and minerals (Kemper, 2020; Wyker & Davison, 2010). The more someone believes that meat is healthy, or necessary for health, the greater quantities of meat that they tend to eat (Hopwood & Bleidorn, 2019; Piazza et al., 2015) and the less vegetarian food they consume (Hartmann & Siegrist, 2020; Rothgerber, 2013). Consequently, the perceived necessity of meat often motivates meat consumption, and can serve as a barrier to meat reduction.

Conversely, perceived health benefits of plant-based food can motivate meat reduction. People who believe that meat-reduced or meat-free diets offer health benefits are more likely to reduce or eliminate meat from their diet (Malek & Umberger, 2021; Shenck et al., 2018) and are more willing to reduce their meat consumption in the future (Cheah et al., 2020). In fact, health is one of the most common motives for meat reduction and avoidance (Graça et al., 2019; Hopwood et al., 2020), with people believing that plant-based diets offer health benefits such as decreased saturated fat intake; increase intake of fibre, vitamins, and minerals; weight management; reduced risk of disease; and increased energy levels (Kemper & White, 2021). Most people, however, are more likely to associate meat with healthy rather than unhealthy concepts (Love & Sulikowski, 2018) and agree that meat is necessary or beneficial for nutrition and health (De Boer et al., 2017; Piazza et al., 2015).

The belief that meat is necessary for health is particularly prevalent amongst men. Men are more likely to believe that meat is good for their health, or has nothing to do with their health, than believe that meat is related to poor health outcomes (Bogueva & Marinova, 2018). Various studies have found that men score higher than women on Rothgerber's (2013) Meat-Eating Justification Health subscale, indicating that men are more likely to believe that meat is essential for strong muscles, protein, and good health (Hartmann & Siegrist, 2020;

Piazza et al., 2015; Mertens et al., 2021). Other research has found that men believe meat is necessary for protein, nutrition, strength, energy, and physical fitness (Kildal & Syse, 2017), and that plant-based diets lack iron and protein (Lea et al., 2006b).

Although many men believe that eating meat is healthy, the potential health benefits of a plant-based diet appear to be the most compelling reason for men's meat reduction. When asked what factors would potentially motivate meat reduction, the most common answer among Australian male participants was "personal health problems", compared to other factors such as animal welfare, the environment, marketing campaigns, social pressure, and government regulations (Bogueva & Marinova, 2018). A study of US meat-eaters again found health to be the most popular prospective motive to adopt a vegetarian diet, particularly among male participants, compared to factors such as animal welfare, the environment, taste preferences, finances, religion, disgust towards meat, or social pressure (Rosenfeld & Tomiyama, 2021). Hence, the perceived health benefits of a meat-reduced diet is likely to be an important meat reduction motive amongst male meat consumers.

3.5.2. Altruistic motives: Animal welfare and the environment

In addition to health, animal welfare and environmental concerns are the most common motives for meat reduction and the adoption of plant-based diets (Hopwood et al., 2020). Due to increasing awareness of the harmful impacts of meat consumption on animals and the environment, many consumers view plant-based diets as a more ethical and socially responsibly dietary option (Rosenfeld, 2018). Generally, the more concerned a person is about animal welfare (De Backer & Hudders, 2014; De Boer et al., 2017), farm animal welfare (Malek et al., 2019; Malek & Umberger, 2021), animal rights (Hopwood & Bleidorn, 2020), or the environment (Izmirli & Phillips, 2011; Neff et al., 2018), the less likely they are to eat meat. Moreover, people are more likely to restrict their meat intake if they are aware of the detrimental impacts of meat production on the environment (Tobler et al., 2011) or

believe that reducing their meat consumption will benefit the environment (de Boer et al., 2016; Tobler et al., 2011).

Generally, men tend to be less driven than women by animal welfare and environmental meat-reduction motives. For example, a cluster analysis of meat-eaters found that consumer segments dominated by women were more likely to intend to reduce their meat consumption for environmental and animal welfare reasons than other consumer segments (Latvala et al., 2012). Among vegetarians, vegans, and pescatarians, men are less likely than women to reduce their meat consumption for environmental or animal welfare reasons (Haverstock & Forgays, 2012; Rosenfeld, 2020) and instead are more likely to be motivated by personal health reasons (Rosenfeld & Tomiyama, 2021; Wyker & Davison, 2010). Moreover, experimental research found that an environmental argument increased women's intentions to reduce their meat consumption but had little impact on men (Cordts et al., 2014). This may be due to men being less concerned than women about the harmful impacts of meat production on animals and the environment (Malek et al., 2018) or because men are less likely than women to perceive meat reduction as a solution to environmental problems (Pohjolainen et al., 2016; Truelove & Parks, 2012).

Nevertheless, while men tend to be less motivated by animal welfare and environmental concerns than women, these still may be important motivators amongst some men. In a longitudinal study tracking the efficacy of an intervention educating university students on the negative impacts of meat production on climate change, compared to women and a control group, only men reduced their consumption of beef (Jalil et al., 2023). Although the men initially consumed greater quantities of beef and therefore had more to reduce, the study showed that 65% of men in the sample were motivated to reduce their meat consumption for environmental reasons. Another study found that environmental messages had no persuasive impact on male participants' meat reduction, but found that messages

detailing farm animal suffering was effective in increasing men's meat-reduction intentions (Cordts et al., 2014). Animal welfare and environmental motives may be more important among younger men, as a study of university students across 11 countries in Europe and Asia found that male students were more likely to report the environment and animal welfare as their primary reasons for avoiding meat, whereas female students were more likely to be motivated by health (Izmirli & Phillips, 2011).

3.6. Social dominance orientation

Social dominance theory explains the psychological, cultural, and institutional processes responsible for the universal presence of hierarchical (i.e., unequal) social structures across human societies (Pratto & Stewart, 2011). According to social dominance theory, hierarchical social structures are shaped by a combination of individual-level dispositions, group-level attitudes, and systematic/institutional factors. Social Dominance Orientation (SDO) is an individual-level disposition instrumental in the maintenance of social hierarchies, referring to “the fundamental desire to achieve and maintain group-based dominance and inequality among social groups” (Dhont et al., 2014, p. 105). Individuals high on SDO view the superiority of their own social group as a reflection of a “natural” social order and outgroup members as inferior and deserving of low social status. On the other hand, people low in SDO seek and promote egalitarian social structures. As such, SDO reflects a general propensity for holding prejudicial attitudes (Pratto & Stewart, 2011), for example, sexism, racism, and heterosexism (Hyers, 2006).

Social dominance orientation not only applies to human-human intergroup prejudices but also extends to animals (Dhont & Hodson, 2014; Dhont et al., 2016). Numerous studies have found a positive association between SDO and meat consumption (Allen et al., 2000; Dhont & Hodson, 2014; Veser et al., 2015). For example, a systematic review of the differences between meat-eaters and vegetarians regarding personality, emotions, and values

found that across five studies, meat-eaters consistently exhibited significantly higher levels of SDO than vegetarians (Holler et al., 2021). This difference is also observed between men, with studies finding that meat-eating men are higher in SDO and human supremacy beliefs than veg*n men (Veser et al., 2015; Weber & Kollmayer, 2022). Individuals high on SDO are more likely to eat meat because they believe it is acceptable and inevitable to exploit animals for human benefit, due to their inferior status below humans (Dhont & Hodson, 2014).

Moreover, individuals high on SDO are more unwilling to reduce their meat consumption and more likely to reject policies promoting meat reduction (Choma et al., 2024). Specifically, individuals high on SDO supported increasing penalties for animal rights activists caught trespassing on animal agricultural farms and slaughterhouses, and supported relaxing animal welfare laws to allow animal agricultural industries to increase their profits (Stanley, 2021). Those high on SDO also show resistance to plant-based diets, opposing policies directing government subsidies away from animal agriculture to plant-based food production, and rejecting the idea of environmentally motivated meat taxes (Stanley, 2021). These findings reflect the underlying desire among individuals high on SDO to maintain human dominance over animals.

Furthermore, individuals high on SDO tend to hold prejudicial attitudes towards veg*ns (MacInnis & Hodson, 2017). Because veg*ns seek to raise animals' legal status (i.e., promoting more egalitarian social structures) they are viewed as a threat to the meat-eating status quo, and consequently, meat-eaters' dominant social position (Dhont & Hodson, 2014). Opposition to meat reduction among individuals high on SDO is partially explained by the perceived threat of veg*n ideology on cultural food norms and traditions, as well as their perceived threat to animal agricultural systems that support the nation's economy (Stanley, 2021). Thus, meat-eating individuals high on SDO seek to maintain dominance over veg*ns because they threaten to destabilise existing hierarchical social structures. Overall, the

literature shows that individual differences in SDO are highly relevant to the study of meat consumers.

3.7. National Identity

The self-concept is constructed through personal and social identities (Turner, 1982). Personal identity refers to specific characteristics an individual identifies with, such as being funny or intelligent, whereas social identities are collectively shared, constructed through a process of self-categorisation, whereby a person defines and perceives themselves in terms of the characteristics of certain social groups to which they belong (Hogg & Abrams, 1990). Common self-categorisations include sex, race, religion, and nationality. Social identities provide a sense of meaning and continuity throughout one's life, a sense of belonging and social acceptance, and enhance self-esteem (Vignoles, 2011). Tajfel's (1982) social identity theory posits that, in many contexts, people's thoughts and behaviours are governed by their social identities. Individuals tend to behave in ways that are stereotypical of the groups with which they most identify (Hogg & Abrams, 1990).

3.7.1. National identity and meat consumption

Cuisine, eating behaviours and food practices are inextricably entwined with national identity (DeSoucey, 2010; Ranta & Ichijo, 2022), which refers to the collectively shared social identity among individuals who perceive themselves as part of a particular nation. National identity is strongly tied to food culture, being constructed, defined, and reinforced by the production, preparation, and consumption of certain food and drinks (Ranta & Ichijo, 2022). "Food function symbolically as markers of identity", such that "certain foods and industries are representative of national cultural traditions" (DeSoucey, 2010, pp. 433-434). For example, sushi is unmistakably Japanese, pasta is iconic of Italian culture, whereas Mexicans are renowned for tacos. The consumption of foods doesn't have to be widespread to be considered a part of a nation's identity—it simply needs to *symbolise* it (Edwards,

2019). For example, roast beef is a longstanding symbol of England's national identity, yet historically was only consumed by wealthier members of society (Durbach, 2013; Edwards, 2019). Similarly, the annual Australia Day "We Love Our Lamb" campaign advertises lamb as integral to Australia's national identity (Talbot, 2024), yet lamb is the least popular Australian meat in terms of quantities consumed (IBISWorld, 2024).

Gastronationalism goes beyond merely highlighting the connection between food and national identity, by emphasising the role of food culture in national identity construction and preservation. Specifically, gastronationalism is a "protective mechanism", referring to a nation's impetus to defend, protect, and maintain its food cultural practices, with certain foods being "morally and politically justified as traditional, authentic, and worthy of protected status" (DeSoucey, 2010, p. 433). By maintaining a nation's food culture, the country's national identity is preserved (DeSoucey, 2010). Thus, an individual has a personal imperative to defend their nation's cultural practices to protect their national identity.

DeSoucey (2010) coined and illustrated the concept of gastronationalism with the case of foie gras in France. Foie gras, a luxury food product made from the liver of geese or ducks that are fattened through force-feeding, has become a focal point of controversy due to the ethical concerns surrounding these practices. Many European countries have banned the production of foie gras on the grounds of animal welfare. Despite international protest, France has defended foie gras based on its cultural significance, arguing that to eschew foie gras would detrimentally impact France's culture and national identity (DeSoucey, 2010).

Meat consumption has also been defended on the basis of gastronationalism in countries where consumption of certain meats are part of the nation's identity. For example, in response to (Western) opposition to South Korea's consumption of dog meat, and Japan's consumption of whale meat, both countries have defended these food practices on the basis of cultural tradition and their significance to national identity (Ranta & Ichijo, 2022). Meat

consumption is especially important to national identity in countries like Australia and New Zealand where the meat industry supports the nation's economy (Bogueva et al., 2020; Kemper, 2020; Potts & White, 2008). This suggests that individuals with a stronger national identity, particularly those living in countries where meat is part of the economy and/or culture, may be more likely to resist meat reduction, due to it being seen as a threat to their self-concept.

Indeed, the literature consistently demonstrates that stronger national identity is associated with higher meat consumption and resistance to meat reduction. In a sample of US, English, and Australian participants, those with stronger national identities had more positive attitudes towards eating meat, greater intentions to eat meat in the future, and were less likely to intend to eat a vegetarian meal in the upcoming week (Nguyen & Platow, 2021). In a Danish study, national identity positively predicted intentions to eat red meat, when controlling for other social identities (e.g., gender identity, religious identity), and was negatively correlated with vegetarian and flexitarian identities (Randers & Thøgersen, 2023). Similarly, a US study found that participants who viewed vegetarianism as a threat to cultural traditions tended to eat more meat and were less willing to reduce their meat consumption (Stanley, 2021). In a Brazilian sample, national identity was negatively related to acceptance of meat alternatives such as lab-grown meat (Fernandes et al., 2022). In line with social identity theory, an individual with a stronger national identity is more likely to eat meat because it is stereotypic of the nation's food practices. Hence, national identity is an important psychological variable to consider amongst meat consumers, particularly in cultures such as Australia and England, where meat production supports the economy and meat-eating is part of the nation's identity (Ankeny, 2008; Durbach, 2013; Edwards, 2019).

3.8. Chapter 3 Summary

To better understand male meat consumers it is important to understand within-gender differences in male populations rather than focusing on differences between men and women. Consumer segmentation can provide nuanced insights into consumer diversity by identifying differences between consumer segments with distinct psychological profiles. As no previous studies have investigated whether there are distinct male meat consumer segments, this dissertation aimed to conduct a consumer segmentation analysis to explore within-gender differences among male meat consumers. This chapter outlined the key psychological factors that influence meat consumer behaviour, to guide the selection of indicator variables to explore the psychological profiles of male meat consumers.

According to the TPB, attitude, subjective norm, and perceived behavioural control are three key antecedents of human behaviour. While intention is the primary predictor of behaviour in the TPB model, habit has a stronger influence on meat consumption than meat-eating intentions, due to the high frequency of eating behaviours. Therefore, habit rather than intention was selected as an indicator variable. Emotions elicit and motivate behavioural responses; sensory disgust directly impacts the avoidance of certain foods; and moral emotions (empathy and moral disgust) influence meat consumption due to the moral implications associated with animal suffering and killing animals for meat. Direct and indirect MRCD strategies are commonly deployed by meat-eaters to alleviate psychological discomfort associated with eating meat. Price, convenience, health, animal welfare, and the environment are the most important dietary motives influencing meat consumption and reduction. Social dominance orientation is an important individual difference related to meat consumption, with individuals high on SDO resisting meat reduction to maintain dominance over minority groups (i.e., veg*ns) and animals. Finally, national identity predicts higher meat consumption, particularly in countries where meat consumption is part of the nation's

economy and culture. Collectively, these factors can provide a comprehensive psychological profile of different types of male meat consumers.

Chapter 4: Aims, Research Questions, and Hypotheses

4.1. Study rationale, aims, research questions and hypotheses

The overarching aim of this dissertation was to develop a comprehensive understanding of the masculinity dilemma by exploring how masculinity and other psychological factors contribute to men's resistance to meat reduction. To achieve this aim, the overarching research question guiding the research was: *How are masculinity and other psychosocial factors associated with men's meat consumption and their resistance to meat reduction?* Using a mixed methods research design, this aim was achieved across three empirical studies.

4.1.1. Study 1 Rationale and Aims

The relationships between traditional and non-traditional (i.e., “new”) masculinity ideology and men's meat consumption are well established, such that greater conformity to traditional masculinity is associated with greater meat consumption, whereas non-traditional masculinity is associated with lower meat consumption. However, all studies have measured conformity to these masculinity ideologies as unidimensional constructs. As masculinity is multidimensional, it is important to understand which dimensions of masculinity ideology explain the meat-masculinity relationship. Only one study has investigated which traditional masculine norms contribute to meat consumption (Campos et al., 2020). However, this study used only a single-item measure of meat consumption, which has less predictive validity and power than multi-item scales (Diamantopoulos et al., 2012). Moreover, only violence, playboy, disdain for homosexuals, and risk-taking norms were included, excluding numerous dimensions of traditional masculinity ideology (i.e., pursuit of social status, importance of sex, toughness, emotional control, and heterosexual self-presentation). Moreover, to the author's knowledge, no existing studies that have investigated which dimensions of non-traditional masculinity ideology explain the meat-masculinity relationship. Therefore, the aim

of the first thesis study was to identify which dimensions of traditional and non-traditional masculinity ideology predict men's meat consumption and willingness to reduce their meat consumption.

Research Question 1:

Which dimensions of traditional and non-traditional masculinity ideology predict men's meat consumption and willingness to reduce their meat consumption?

Study 1 Hypotheses:

1. Regarding traditional masculine ideology, it was hypothesised that *pursuit of status; violence; toughness; importance of sex; being a playboy; emotional control; and heterosexual self-presentation* would positively predict men's red and processed meat consumption and total meat consumption, and negatively predict willingness to reduce meat consumption. Due to limited evidence regarding other common traditional masculine norms, the relationships between outcome variables and other traditional masculine norms (*winning, power over women, risk-taking, primacy of work, self-reliance*) were exploratory.
2. Regarding non-traditional masculine ideology, it was hypothesised that *questioning definitions of masculinity and authenticity* would negatively predict men's RPMC and total meat consumption, and positively predict willingness to reduce meat consumption. The relationships between outcome variables and the remaining three non-traditional masculine norms (*sensitivity to male privilege; holistic attentiveness; domesticity/nurturing*) were exploratory.

4.1.2. Study 2 Rationale and Aims

The literature on the meat-masculinity link demonstrates that male meat consumers have a unique relationship with meat. This highlights the need to understand men's meat consumption as a distinct phenomenon. However, there is a paucity of studies on male meat

consumers. Moreover, studies on the role of gender in meat consumption often prioritise comparisons between men and women, overlooking the diversity among male meat consumers and the nuances of the meat-masculinity link. While male-female differences in meat consumption are well documented, within-gender variations among men remain largely neglected (Modlinska et al., 2020). Therefore, to build understandings of men's meat consumption, the second empirical study aimed to explore within-gender psychological differences amongst male consumers.

Research Question 2:

What meat-related psychological characteristics distinguish male meat consumers?

Study 2 Hypotheses:

1. It was hypothesised that there would be at least two latent subgroups within the population of male consumers.
2. It was hypothesised that the latent subgroups would exhibit distinct psychological characteristics by differing significantly on psychological variables related to meat consumption.
3. It was hypothesised that profiles would differ significantly in their self-reported meat consumption and in their willingness to reduce their meat intake.

4.1.3. Study 3 Rationale and Aims

Doing gender and masculinity ideology theories of the meat-masculinity link emphasise the individual whilst neglecting the broader social dynamics influencing men's meat consumption. Connell's (1987) hegemonic masculinity theory may contribute to understandings of why men are resistant to meat reduction. However, most studies have examined the link between hegemonic masculinity and meat consumption from veg*n men's perspectives, with only one study including both meat-eating and veg*n participants (Bogueva et al., 2020). Concerningly, hegemonic masculinity in the meat consumption

literature is often mistakenly interpreted as conformity to traditional masculinity ideology. This assumes rather than demonstrates that the meat-masculinity link is hegemonic, and moreover, neglects to elucidate the broader social processes of domination and consent between masculinities and femininity that may be contributing to the masculinity dilemma. Therefore, the aim of the third study was to explore how hegemonic masculinity contributes to men's meat consumption, through mechanisms of domination and consent, from the perspectives of men with varying diets.

Research Question 3:

How, if at all, does hegemonic masculinity, through mechanisms of domination and consent, contribute to men's resistance to meat reduction?

4.1.4. Data Integration Phase

The purpose of the data integration phase was to address the study's overarching aim. The results of each of the three empirical studies were analysed separately before the data integration phase, which addressed the following *mixed methods research question*: When converging the quantitative and qualitative data, in what ways does the data compliment, contradict, extend or validate each other?

Chapter 5: Methodology

This chapter describes this dissertation's methodology. The chapter begins with the theoretical perspective on which the research methodology was based. Then, the study's mixed methods research design is outlined followed by a detailed description of methods used for the quantitative and qualitative research phases.

5.1. Theoretical Perspective

A pragmatist methodological approach was taken in this dissertation. Pragmatism incorporates both positivist and constructivist ontological and epistemological assumptions, emphasising the importance of and connection between action and outcomes in the development of knowledge (Morgan, 2017). For pragmatists, knowledge is based on *warranted beliefs*, which are formed by observing the consequences of actions (Morgan, 2017). Warranted beliefs are continually adjusted in response to observing and experiencing new consequences. In this sense, human *subjective experience* (through taking actions and learning from the results of these actions) is key to knowledge development. Moreover, human actions (and consequences) take place in specific and unique contexts, which change over time (Morgan, 2017). Therefore, there are *multiple* versions of reality and knowledge (though knowledge can be shared among groups of individuals) rather than one universal truth. These elements of subjectivity, individual interpretation of reality, and multiple, socially contextual realities, are consistent with the socially constructed nature of reality and knowledge essential to the constructivist paradigm which often informs qualitative research. While the pragmatic ontological stance proposing multiple realities conflicts with (post)positivist assumptions of a universal, independently existing reality, the pragmatic focus on action and consequence, and using observations to form warranted beliefs, is compatible with positivist and realist paradigms that emphasise cause-and-effect relationships and the necessity of empirical testing and verification procedures, which are fundamental to

quantitative research (Crotty, 2020). Hence, the pragmatist paradigm rejects the dichotomisation and separation of positivism and constructivism, and is compatible with both qualitative and quantitative research methods and philosophies.

Importantly, pragmatists argue that ontological and epistemological debates about reality and truth are distractions from, and secondary to, the practical purpose of research—to solve real-world problems (Kaushik & Walsh, 2019; Morgan, 2007). Thus, pragmatists prioritise research *outcomes* and *utility*, believing that choice of methods should depend on whether these can effectively achieve research goals. Hence, the research question(s) and aim(s) are paramount in the pragmatist paradigm, and the validity of research is judged on its *effectiveness* in answering the research question, rather than whether it accurately captures “reality”, or whether it commits to methodological procedures espoused by a particular epistemological or ontological stance (Morgan, 2017). Therefore, unlike traditional positivist and constructivist paradigms, whose philosophical assumptions preclude the use of particular research methods, a pragmatist approach supports the use of any type of research method—so long as it is appropriate and effective for achieving research goals. In other words, pragmatism allows for the mixing of quantitative and qualitative methods.

5.2. Study Design: Sequential Convergent Mixed Methods Design

A mixed methods research design was utilised, selected for its advantages over single method designs. Mixed methods approaches are optimal for understanding complex social phenomena, as they provide greater breadth (from the quantitative component) and depth (from the qualitative component) than is possible with a single method design (Creswell, 2018; Patton, 2015). Specifically, the quantitative component can capture broader patterns of relationships that can be generalised to wider populations, while the qualitative component can capture rich and detailed accounts and understandings of the experiences of participants, uncover new findings that may not have been preconceived, and explain *how* and *why*

questions regarding the relationships between variables (Creswell, 2018; Patton, 2015). Each approach brings its own strengths and compensates for the weaknesses of the other, providing insights that go beyond those that can be obtained from only one method (Creswell, 2018). Thus, mixed method approaches can provide a more comprehensive understanding of a theory or phenomenon (Turner et al., 2017). Triangulation—combining evidence from multiple independent sources—is another advantage of mixed methods research, allowing stronger inferences to be made (Teddle & Tashakkori, 2009). Combining quantitative and qualitative methods produces more valid results that enable researchers to answer research questions with more certainty and accuracy.

In line with the pragmatic emphasis on outcomes and utility, a mixed methods design was selected as the most appropriate methodological approach for answering this dissertation's research questions. The first and second research questions focused on prediction and (latent) group differences, and therefore, were best answered with quantitative methods. The third research question sought to understand the processes underlying men's resistance to meat reduction, and therefore, was best answered with qualitative methods (Patton, 2015).

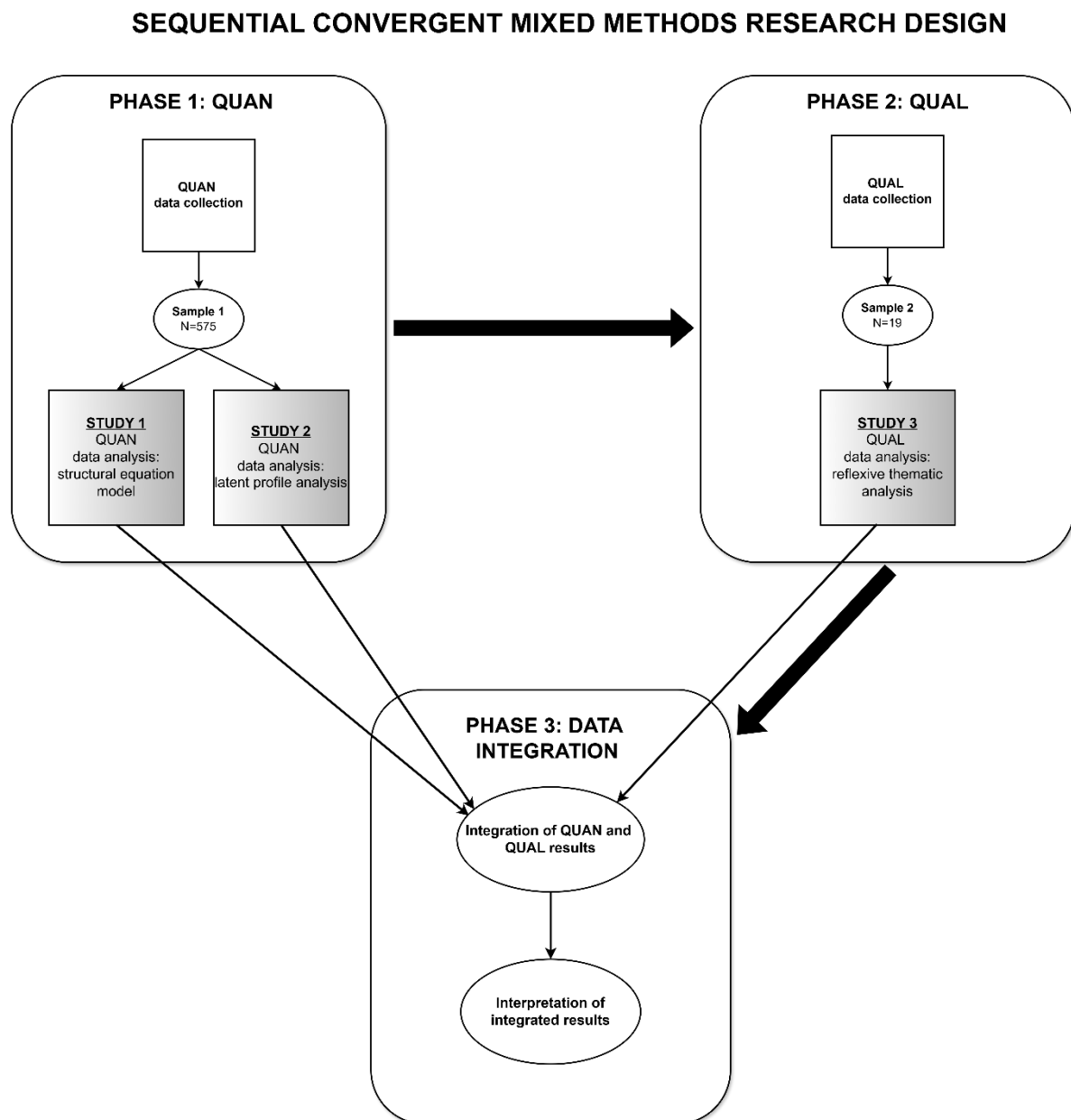
Specifically, this dissertation adopted a hybrid sequential and convergent mixed methods design, using sequential data collection with convergent data analysis. In a sequential design, the quantitative and qualitative phases are conducted in sequence, such that the second research phase is informed by and aims to explain the results of the first research phase, which is afforded primary importance (Creswell, 2018). As such, data analysis in the second phase is dependent on the first phase. In a convergent design the quantitative and qualitative data are collected simultaneously, but data are analysed independently before the results are integrated, with quantitative and qualitative results afforded equal importance (Creswell, 2018). This dissertation was sequential, such that the quantitative phase was

conducted before the qualitative phase. However, consistent with a convergent design, the qualitative data was analysed independently of the quantitative data and afforded equal importance.

Figure 1 visually illustrates the research design, with the study being conducted in three distinct phases. The first quantitative phase comprised two empirical studies: Study 1 addressed the first research question by testing which masculine norms predicted men's meat consumption and willingness to reduce; Study 2 addressed the second research question, investigating the differences between male consumers on important psychological characteristics related to meat consumption. In the second qualitative phase, Study 3 addressed the third research question, exploring how hegemonic masculinity, through mechanisms of domination and consent, contributes to men's resistance to meat reduction. In the third data integration phase, results of the first two phases were combined to address the mixed methods research question.

Figure 1.

Visual Representation of this Dissertation's Sequential Convergent Mixed Methods Design



Note. This image illustrates the three research phases of the sequential convergent mixed methods research design utilised in this dissertation. Study 1, Study 2, and Study 3 addressed the first, second, and third research questions, respectively. The quantitative and qualitative data were collected and analysed sequentially and independently before the results of each study were integrated and interpreted in phase 3 to answer the mixed methods research question.

5.3. Participants

5.3.1. Sample 1 – Quantitative Sample

As the study population was male consumers living in Western countries, a convenience sample of Australian and British participants, who self-identified as male, was obtained through an online recruitment site “Prolific” (<https://www.prolific.co/>) and social media. The British sample only included men from England. A total of 614 participants returned the survey through Prolific. Participants were reimbursed \$12 AUD. An additional 45 Australian participants were recruited on Facebook via survey participant recruitment groups as well as the principal researcher’s personal network. Eighty-four incomplete surveys were deleted, leaving 575 participants. Sample 1 demographics are reported in Table 1.

Table 1

Demographics Characteristics of Quantitative Phase (Sample 1)

Demographic Variable	Frequency (N=575)
Self-reported diet	
Unrestricted meat-eater	344 (59.8%)
Meat-reducer	184 (32.0%)
Pescetarian	12 (2.1%)
Vegetarian	22 (3.8%)
Vegan	25 (4.3%)
Country of residence	
Australia	322 (56.0%)
England	253 (44.0%)
Age	
18-29	164 (28.8%)
30-44	247 (43.4%)
45-59	106 (18.6%)
≥ 60	51 (9.0%)
Education	
< Tertiary	224 (39.0%)
≥ Tertiary	351 (61.0%)
Geographic Location	
Urban	452 (78.6%)
Rural	119 (20.7%)
Income	
Low	166 (28.9%)
Medium	235 (40.9%)
High	173 (30.1%)

Sexual Orientation	
Heterosexual	512 (89.0%)
Bi/homosexual	42 (11.0%)
Political Orientation	
Left-wing	286 (49.7%)
Centre	168 (29.2%)
Right-wing	121 (21.0%)
Religion	
Buddhism	11 (1.9%)
Christianity	131 (22.9%)
Judaism	4 (0.7%)
Islam	13 (2.3%)
Hindu	7 (1.2%)
No religion	381 (66.7%)
Other	24 (4.2%)

Note. Meat-reducer = attempts to limit the amount of meat consumed; pescetarian = consumes fish & seafood but not land-animal meat; vegetarian = does not eat fish/seafood or land-animal meat but does eat dairy & eggs; vegan = does not consume any animal products. Low income (\leq \$AUD59,999/£9,999), medium income (\$60,000 – 99,999/£10,000 – 39,999), high income (\geq \$100,000/£40,000).

The sample of 575 met sample size requirements for latent profile analysis.

Simulation analyses suggest that a minimum sample size of 500 participants is necessary to reliably detect latent profiles with a Cohen's d of 0.8, provided there are at least 10 profile indicators (Tein et al., 2013). This recommendation aligns with findings from other researchers, who similarly highlight the need for a minimum sample of 500 participants for latent profile analysis (Nylund et al., 2007; Spurk et al., 2020). Additionally, according to Kock and Hadaya's (2018) inverse square root method (assuming a significance level of 5% and minimum path coefficient of 0.10), the minimum sample size required for structural equation modeling was 618, exceeding the $N=575$ sample. However, simulation analyses show that the inverse square root method consistently overestimates minimum sample size requirements (Kock & Hadaya, 2018).

5.3.2. Sample 2 – Qualitative Sample

Nineteen Australian and British adults who self-identified as male participated in the qualitative study. Results of the quantitative phase informed the purposive sampling strategy

for the qualitative phase. In the quantitative phase, three latent meat consumer groups were identified (Resistant, Ambivalent, and Meat-averse). A stratified sampling strategy ensured that all three latent consumer groups were equally represented in the qualitative study.

Sample 2 demographics are displayed in Table 2.

Table 2*Demographic Characteristics of Qualitative Phase (Sample 2)*

Pseudonym	Diet	Age	Country	Ethnicity	Location	Income	Occupation	Religion
Ahmad	Meat-eater	24	Australia	South African Australian	Urban	Low	Student / fast-food cashier	Islamic
Alessandro	Pescatarian	60	Australia	Italian Australian	Urban	Low	Disability pension	None
Allan	Meat-reducer	40	Australia	White Australian	Urban	High	Business analyst	Agnostic
Brendan	Vegetarian	32	England	White British	Urban	High	Music manager	Atheist
Brian	Meat-reducer	53	Australia	White Australian	Urban	Average	IT business analyst	Jewish
Christos	Vegan	50	Australia	Greek Australian	Urban	Undisclosed	Draftsman	Greek Orthodox (NP)
Jack	Vegan	55	Australia	White Australian	Regional	Low	Almond farmer	Atheist
James	Pescatarian	37	England	White British	Urban	High	University archives curator	None
Justin	Meat-eater	28	England	White British	Urban	High	Accountant	None
Kevin	Meat-eater	30	England	White British	Regional	Low	Unemployed	Agnostic
Marco	Vegan	35	Australia	Italian Australian	Urban	High	Podiatrist	Spiritual
Nam	Meat-eater	26	Australia	Vietnamese Australian	Urban	High	Office administration	Buddhist (NP)
Owen	Meat-reducer	65	Wales	White British	Regional	High	Electronic engineer	Agnostic
Richard	Meat reducer	48	England	White British	Urban	High	Data scientist	Agnostic
Steve	Meat-eater	47	England	White British	Urban	Low	Accountant	Atheist
Sunil	Meat-eater	31	England	Sri Lankan British	Urban	Average	Supermarket customer assistant	Hindu
Tom	Meat-eater	44	Australia	White Australian	Urban	High	Forensic scientist	Atheist
William	Meat-eater	50	England	White British	Urban	Low	Automotive manufacturing	Christian (NP)
Zev	Meat-eater	29	Australia	Sri Lankan Australian	Urban	Average	Pharmacy cashier	Hindu (NP)

Note. Meat-eater = completely unrestricted diet; meat reducer = intentionally limits or has reduced their meat consumption; pescetarian = does not eat land-based animals but eats fish, seafood, and other animal products such as eggs and dairy; vegetarian = does not consume meat but eats other animal products such as eggs and dairy; vegan = does not consume any animal products; NP = not practicing religion. Low income = <\$59,999AUD/£9,999; medium = \$60-99,999/£10-39,999; high = ≥ \$100,000/£40,000.

5.4. Materials

5.4.1. Quantitative Materials

The following variables were measured for use in the quantitative phase:

Meat Consumption Scale: A 21-item Meat Consumption scale asked participants to report their consumption of beef, lamb, poultry, pork, bacon/ham, other processed meats, and fish/seafood in the past two weeks, indicating for each meat category a) meat frequency: the number of times they ate each type of meat; and b) meat quantity: the average quantity of each serving for each meat type (1 = very small (less than 10% of a typical meal); 2 = small (10-20% of a typical meal); 3 = medium (21-30% of a typical meal); 4 = large (31-40% of a typical meal); and 5 = very large (more than 40% of a typical meal)), and c) meat-eating intention: their intention to eat this type of meat in the next two-weeks (-4=greatly decrease, -2=somewhat decrease, 0=not change, 2=somewhat increase, 4=greatly increase). For scoring, when meat type frequency = 0, the corresponding portion size question was skipped and automatically given a score of zero. The Meat Consumption Scale was developed and underwent psychometric testing to establish evidence of reliability and validity prior to use in the current study (see Chapter 6 for psychometric evidence). The scoring of the Meat Consumption Scale for Study 1 and Study 2 differed slightly due to developments of the scale in the peer-review process. Therefore, scale scoring for each study is reported in Chapter 7 and Chapter 8, respectively.

Willingness to Reduce Meat Consumption: This 3-item scale adapted from previous research ($\alpha=0.91$ in Graça et al., 2015b) included three items asking participants to indicate on a scale from 1 (very unwilling) to 5 (very willing) the extent to which they were willing to: 1) “slightly reduce your meat consumption”; 2) “drastically reduce your meat consumption”; and 3) “stop eating meat altogether”. Higher scores indicated greater

willingness to reduce one's meat consumption. The scale demonstrated acceptable reliability ($\alpha=0.87$) in the current sample.

Traditional Masculinity: Traditional masculine norms were taken from the 30-item Conformity to Masculine Norms Inventory Short Form (CMNI-30; Levant et al., 2020) and the Male Role Norms Inventory Short Form (MRNI-SF; Levant et al., 2013). Ten subscales of the CMNI-30 (Levant et al., 2020), each containing three items, measured: *winning* (current $\alpha=.73$); *emotional control* (current $\alpha=.92$); *playboy* (current $\alpha=.83$); *violence* (current $\alpha=.76$); *heterosexual self-presentation* (current $\alpha = .75$); *pursuit of status* (current $\alpha=.68$); *primacy of work* (current $\alpha=.87$); *power over women* (current $\alpha=.79$); *self-reliance* (current $\alpha=.82$); and *risk-taking* (current $\alpha=.88$). The CMNI-30 subscales have demonstrated good model fit, convergent validity, test-retest reliability, and internal reliability (α between .71 and .94) in various ethnic groups (Krivoshchekov et al., 2022; Levant et al., 2020). Two subscales from the MRNI-SF (Levant et al., 2013) measured *toughness* (current $\alpha=.75$) and *importance of sex* (current $\alpha=.84$). The MRNI-SF subscales have demonstrated good construct, discriminant, and concurrent validity and good internal reliability in previous research (Levant et al., 2015; Levant et al., 2016). All items were answered on a 1 (*strongly disagree*) to 6 (*strongly agree*) scale. Subscale items were summed to create total subscale scores. *Non-traditional Masculinity:* Five subscales from the New Masculinity Inventory (NMI; Kaplan et al., 2017) measured: *holistic attentiveness* (current $\alpha=.76$, 4 items); *questioning definitions of masculinity* (current $\alpha=.68$, 4 items); *sensitivity to male privilege* (current $\alpha=.36$, 2 items); *authenticity* (current $\alpha=.74$, 4 items); and *domesticity/nurturing* (current $\alpha=.59$, 3 items). The order of all masculinity-related scale items was randomised. Subscale items were summed to create total subscale scores and all subscale scores were summed to create a global non-traditional masculinity score (current $\alpha=.88$), with higher scores indicating greater conformity to the masculine norm. The NMI has demonstrated good

convergent validity (Kaplan et al., 2017). The low internal reliability of the sensitivity to male privilege subscale in our sample was higher than Kaplan et al.'s (2017) Israeli sample ($\alpha=.18$).

Attitude: This 3-item scale was adapted from previous research investigating attitudes to eating meat ($\alpha=0.93$ in Graça et al., 2015b; $\alpha=0.94$ in Lentz et al., 2018). Participants rated from 1 to 5 the extent to which they believed the act of eating meat was (1) bad–good; (2) unpleasant–pleasant; (3) unfavourable–favourable. Scores were summed, with higher scores indicating a more positive attitude towards eating meat. The scale demonstrated acceptable reliability in the current sample ($\alpha=0.88$).

Subjective norm: This 8-item scale was adapted from previous research investigating perceived social support (i.e., social pressure) regarding meat reduction (Cheah et al., 2020; Povey et al., 2001). The scale has shown acceptable reliability in previous studies (composite reliability =0.91, Cheah et al., 2020; $\alpha=.71-.85$, Povey et al., 2001). Participants indicated the extent to which they agreed that members of their social circle (male/female friends [2 items]; male/female family members [2 items]; male/female work colleagues [2 items]; partner [1 item]; health expert [1 item]) would approve of them reducing their meat consumption, from 1 (strongly disagree) to 5 (strongly agree). Unapplicable items (i.e., participants without partners) were given a neutral score of 3 (neither agree nor disagree). Higher scores indicated greater social support (current sample $\alpha=.87$).

Perceived behavioural control: This 4-item scale was adapted from previous studies that had measured meat-related PBC ($\alpha=0.69$ in Graça et al., 2015b; composite reliability = 0.79 in Lentz et al., 2018) as well as Ajzen's (2002) theory of PBC. From 1 (strongly disagree) to 5 (strongly agree), participants rated their agreement that (1) I am confident that I could change my meat consumption habits if I wanted to; (2) Whether I change my meat consumption habits or not is entirely up to me; (3) Changing my meat consumption habits or

not is something that is under my control; and (4) Changing my meat consumption habits would be difficult (reverse coded). Scores were summed, with higher scores indicating greater PBC regarding meat reduction (current sample $\alpha=.67$).

Meat-related cognitive dissonance: The 27-item Meat-Eating Justifications scale (Rothgerber, 2013) assessed meat-related cognitive dissonance strategies. The *direct MRCD* scale is comprised of seven 3-item subscales: pro-meat (i.e., loving the taste of meat); health (believing that meat is necessary for health); hierarchical (believing that animals are lower than humans in a natural hierarchy); human destiny/ fate (believing that humans are biologically evolved and thus destined to eat animals); religious (believing that God created animals for human use); denial of animal suffering (denying the suffering caused to livestock animals in meat production); and dichotomisation (making a psychological distinction between animals used for food from other types of animals). Two 3-item subscales comprised the *indirect MRCD* scale: dissociation (dissociating meat from the living, sentient animal from which it came); and avoidance (avoiding thinking about how meat is produced). The direct and indirect scales have demonstrated acceptable reliability in previous samples (direct $\alpha=0.91$; indirect $\alpha=.73$ in Hartmann & Siegrist, 2020) and the current sample (direct $\alpha=0.89$; indirect $\alpha=.80$). Participants indicated the extent to which they agreed with each item on a scale of 1 (strongly disagree) to 5 (strongly agree), with higher scores indicating greater reliance on the MRCD strategy. The order of Meat-Eating Justifications scale items was randomised.

Sensory disgust: The 4-item Animal Flesh Disgust subscale from the Food Disgust Scale (Hartmann & Siegrist, 2018) measures an individual's level of sensory disgust towards meat. Participants indicate on a scale from 1 (not at all disgusting) to 6 (extremely disgusting) how disgusted they feel 1) seeing raw meat; 2) eating a steak that is still bloody inside; 3) seeing a whole pig on a spit roast; and 4) putting animal cartilage into my mouth. Higher

scores indicate greater sensory disgust towards meat (current sample $\alpha=.87$). This scale has demonstrated acceptable reliability ($\alpha=.79$) and construct validity in previous research (Hartmann & Siegrist, 2018).

Moral disgust and animal empathy: This 4-item scale was adapted from a previous emotional self-report image-based measurement instrument (Anderson et al., 2019), an effective method for eliciting emotions in research (Branco et al., 2023). Participants viewed three images of farm animals in distressing conditions (Appendix A), and read one statement “when I think about the fact that animals are killed so that humans can eat them I feel...”, indicating the extent to which they felt “sad”, “disgusted”, “empathetic”, and “happy” on a scale of 0 (not at all) to 100 (very much so). “Disgusted” items were summed to create a total moral disgust score (current sample $\alpha=.91$), and “empathetic” items were summed to create a total animal empathy score (current sample $\alpha=.93$), with higher scores indicating stronger feelings of moral disgust and animal empathy.

Meat-reduction motives: The 15-item Vegetarian Eating Motives Inventory (Hopwood et al., 2020) measures the three primary motives for meat reduction: the extent to which participants were motivated to reduce their meat consumption for *health* (4 items; current sample $\alpha=.93$), *environmental* (5 items, current sample $\alpha=.97$), or *animal welfare* reasons (5 items, current sample $\alpha=.97$), from 1 (*not important reason to reduce my meat intake*) to 7 (*very important reason to reduce my meat intake*). One item (“animals’ rights are respected”) was accidentally excluded during data collection. Higher scores indicated greater motivation to reduce one’s meat intake. This scale has demonstrated acceptable reliability (health $\alpha=.88-.91$, environment $\alpha=.90-.94$, animal $\alpha=.93-.96$) and convergent and predictive validity in previous research (Hopwood et al., 2020). The order of scale items was randomised.

Convenience and *price* were measured with an adapted version of the convenience and price subscales from Steptoe et al.'s (1995) Food Choice Questionnaire, which have demonstrated acceptable reliability, construct and convergent validity (convenience $\alpha=.81$, price $\alpha=.82$; Steptoe et al., 1995; Markovina et al., 2015). From 1 (*strongly disagree*) to 5 (*strongly agree*), for convenience, participants rated the extent to which they believe meat-free meals are: (1) easy to prepare; (2) convenient; (3) can be cooked very simply; (4) are easily available in shops, restaurants, and supermarkets; and (5) are quick to prepare; and for price, the extent to which (1) meat is cheap; (2) meat is good value for money; (3) meat is cheaper than plant-based foods; (4) a meat-based diet is more affordable than a plant-based diet; and (5) meat is expensive (reverse coded). Higher convenience scores indicated participants believed meat-free meals are convenient (current sample $\alpha=.84$); higher price scores indicated participants believed meat is more affordable than plant-based food (current sample $\alpha=.85$). The order of convenience, price, and habit scale items were randomised.

Habit: The 5-item Habit scale (Rees et al., 2018), adapted from the 12-item Self-Report Habit Index (Verplanken & Orbell, 2003), measured meat-eating habit strength. Participants rated their agreement with the following statements from 1 (*strongly disagree*) to 5 (*strongly agree*): "Eating meat is something... (1) I do automatically; (2) I do without having to consciously remember; (3) I do without thinking; (4) I have no need to think about doing; and (5) that is typically me. Items were rated from 1 (*strongly disagree*) to 5 (*strongly agree*). Scores were summed, with higher scores indicating stronger meat-eating habits (current sample $\alpha=.89$).

Social Dominance Orientation was measured using the 4-item Short Social Dominance Orientation Scale (Pratto et al., 2013), which has demonstrated reliability and construct validity in 20 countries (Braunsberger et al., 2021; Pratto et al., 2013). On a scale of 1 (*extremely oppose*) to 5 (*extremely favour*) participants rated four statements: 1) In setting

priorities, we must consider all groups (reverse coded); 2) We should not push for group equality; 3) Group equality should be our ideal (reverse coded); and 4) Superior groups should dominate inferior groups. Higher scores indicated greater SDO (current sample $\alpha=.82$)

National identity: This 13-item scale (Nguyen & Platow, 2021) measured strength of national identity. Participants rated their agreement with each statement from 1 (strongly disagree) to 5 (strongly agree). One item (“I identify with being a(n) Australian/Briton”) was accidentally excluded from data collection. Higher scores indicated stronger national identity. The national identity scale showed acceptance reliability in the current sample ($\alpha=.94$) and previous research ($\alpha=.95$; Nguyen & Platow, 2021).

Dietary Identity: One item asked participants to select one of the following statements that best described their diet: unrestricted meat-eater (I eat as much meat as I like); meat-reducer (I try to limit the amount of meat I eat); pescatarian (I don’t eat meat, but I eat seafood and fish); vegetarian (I don’t eat meat, seafood or fish, but I eat dairy and eggs); vegan (I don’t consume any animal products).

Dietary Motivation: One item asked participants to select one of the following to indicate the main reason for their dietary preference: price; animal welfare/rights; environment; taste; habit; ease/convenience; health/nutrition; someone else cooks for me or does the shopping; everyone I know eats what I eat; religious/spiritual beliefs; other (please specify).

5.4.2. Qualitative Materials

A qualitative interview schedule was developed with the aim of allowing participants to discuss their beliefs and experiences regarding three broad areas: 1) meat consumption; 2) masculinity; and 3) the connection between meat consumption and masculinity (see Appendix B for the final interview schedule). It focused on exploring participants’ experiences of and attitudes towards eating meat and meat reduction/abstention; and their

perceptions of male meat-eaters and meat-avoiders. This broad approach enabled participants to bring up their own topics, rather than imposing pre-determined concepts. In response to several participants raising the topic of lab-grown meat, a short-answer survey was created to allow all participants to share their views on this topic (see Appendix C for lab-meat survey).

5.5. Procedure

5.5.1. Ethics, Survey Distribution, and Recruitment of Participants in the Quantitative Phase

The quantitative sample was recruited in May-August 2022, after receiving ethics approval from the Victoria University Human Research Ethics Committee in March 2022 (ID: HRE21-162; Appendix D). The quantitative survey was posted on an international paid participant recruitment site “Prolific” (<https://www.prolific.co/>), that enables researchers to recruit study participants with specific demographics from most OECD countries. Australian male Prolific members were emailed a brief description of the study, outlining the topic, aims, reimbursement fee, estimated completion time, and a link to the Qualtrics survey. A detailed Information to Participants description (Appendix E) was provided at the beginning of the online survey, specifying that by completing the survey participants’ informed consent was implied. At the beginning of the survey participants provided their unique Prolific ID which ensures anonymity. Upon completion of the survey participants were given a completion code, which they submitted to Prolific to prove they had completed the survey and receive payment. As there were insufficient Australian Prolific participants to meet sampling requirements, the researcher recruited additional Australian participants via Facebook, posting an invitation to participate (Appendix F) on her personal Facebook page as well as in several Facebook groups (Survey Exchange; Survey Circle; Dissertation Survey Exchange; Get Survey Responses; Survey Sharing 2022; Psychology Research; Research Participants; Vegans of Australia; Friendly Vegans in Melbourne; Australian Down Under).

The same procedure was followed, however, these additional participants were not paid for their time. Only 45 additional participants were recruited over social media, therefore the Australian sample was supplemented with English participants (chosen due to cultural and meat-eating similarities between Australia and the UK). An identical Qualtrics survey was constructed, with slight wording changes to make questions relevant for British participants (e.g., education/income levels). Due to participant changes an amended ethics application was approved on the 23rd June 2022 (Appendix D). The same Prolific recruitment, data collection, and payment procedure was followed as with the Australian participants.

5.5.2. Ethics, Recruitment Participants, and Interviewing Procedures in the Qualitative Phase

Qualitative data collection commenced after receiving amended approval from the VUHREC in April 2023, after making changes to the participant recruitment, remuneration, and informed consent methods (Appendix D). Participants from the quantitative phase were invited to interview in the qualitative phase. Cases in the quantitative dataset contained each participant's unique Prolific ID, in addition to which latent profile they belonged to. This enabled the researcher to invite specific participants who had previously completed the quantitative survey to participate in the qualitative phase, via the Prolific platform. Quotas were set with limited places available to ensure only six participants from each of the three latent profiles could sign up (three from Australia and three from England in each profile group). As only two Australian Meat-averse participants volunteered to participate in the qualitative interview, an additional Australian vegan participant was recruited from a Facebook group *Vegans in Australia* to ensure the final participant would fall into the non-meat-eating Meat-averse profile. Prospective participants received an invitation to participate in a 60–90-minute, one-on-one Zoom interview about “men’s attitudes to meat consumption”. Interested participants followed a link to the Qualtrics survey platform, which

contained a detailed description of the study (Appendix G) and a question obtaining informed consent. Participants were reimbursed £41 for their time, paid into their Prolific account upon completion of the interview. Participants were directed to an online scheduling system Calendly.com (<https://calendly.com/lauren-camilleri6/men-s-attitudes-to-eating-meat>), where they selected an interview time. Participants were given time to email the researcher before the interview, and again at the beginning of the Zoom interview, to ask any questions regarding the study. Verbal informed consent was obtained again at the beginning of the Zoom interview.

After interviews were completed, an additional Meat-averse participant was opportunistically recruited from the researchers' personal vegan activist network. In a conversation with the researcher, the prospective participant shared the difficulties he faced in the dating world as a single vegan man, due to his experiences dating single women who expressed preferences to form romantic relationships with meat-eating men. As one of the key predictors of meat consumption identified in the quantitative phase was *importance of sex*, and because no other qualitative participants had shared experiences of this nature, the researcher felt this individual's experiences could contribute to explaining the relationship between men's meat consumption and sexual relations. The prospective participant was invited to share his experiences in a formal interview. The interview was conducted at a later date over Zoom, following the same informed consent procedures as the other qualitative interviews.

Throughout the interviews it became apparent that participants' attitudes to meat alternative products, especially lab-grown meat, was relevant to their willingness to reduce their meat consumption. To gain all participants' perspectives on this issue, a survey invitation was sent via the Prolific platform to the qualitative participants. Eleven participants filled in the 10-minute online Qualtrics short-answer survey at a time of their convenience

(Appendix C). Participants were reimbursed approximately £10 for their time, paid into their Prolific account upon completion of the interview. Qualitative data collection was completed in March 2024.

5.6. Data preparation and analyses

5.6.1. Preparation of Quantitative Data (Sample 1)

5.6.1.1. Missing Data.

Missing case analysis conducted in SPSS showed only a small percentage of values were missing. Each questionnaire item had between 0% and 0.7% values missing, and 8.7% of participants had missing data. The percentage of data missing from the total dataset was negligible (0.07%). Little's MCAR test was significant (Chi-square = 8257.415, $df = 7112$, $p < .001$), indicating that the data were not missing completely at random (MCAR). Single and multiple imputation methods were considered for handling missing cases. As multiple imputation methods are only recommended when missingness is greater than 5% (Madley-Dowd et al., 2019), personal mean replacement was selected as a single imputation method, as it does not depend on the data being MCAR (Jakobsen et al., 2017) and can be applied when missingness is $<5\%$ (Tabachnick & Fidell, 2013). Although single imputation methods can create biased estimates by underestimating standard errors (Lang & Little, 2018), simulation studies demonstrate this is only when missingness $>10\%$ (Eekhout et al., 2014; Peyre et al., 2011). When it was not possible to use the participant's mean score (i.e., single item questions), sample mean replacement was used.

5.6.1.2. Outliers.

Outlier treatment was based on suggestions by Sullivan et al., (2021):

A guiding principle for the treatment of outliers should be the goal of enhancing the representativeness of the sample in relation to the population of interest. A central

matter is the extent to which some or all cases identified as outliers are representative of that population. (p. 541)

Each outlier was assessed to determine whether the value was a legitimate (albeit unusual) score or a result of error (i.e., exceeding the possible range of values in a questionnaire or data entry errors; Aguinis et al., 2013). Error outliers were corrected or removed (Sullivan et al., 2021). As removing legitimate outliers can decrease the generalisability of results (Aguinis et al., 2013; Sullivan et al., 2021), when possible, legitimate outliers were retained or modified (using Winsorisation) rather than deleted.

Thirty-six univariate outliers were identified by z-scores outside ± 3.29 SDs from the mean (Tabachnick & Fidell, 2013). All were examined individually and deemed to be legitimate values (scores falling within the scale's possible range were considered "legitimate"). Eleven univariate outliers were treated with Winsorisation, an outlier modification technique enabling researchers to retain outliers while reducing their influence on the results (Liao et al., 2016). The outlier is modified to one unit above or below the closest non-outlier (Kwak & Kim, 2017). In the remaining 25 univariate outliers, Winsorisation was not appropriate (i.e., the value was already plus or minus one unit from the closest non-outlier), therefore, these were left unmodified and included in the dataset in line with the goal of enhancing sample representativeness.

Multivariate outliers were assessed separately for the two quantitative studies with Mahalanobis and Cook's distance. Values greater than the chi-square critical value (adjusted degrees of freedom depending on the number of variables in the model) were considered as potential outliers. In Study 1, thirteen multivariate outliers were detected with Mahalanobis distance exceeding the chi-square critical value of 49.73 ($df=23$, $p<.001$). Results were compared when including versus excluding the outliers. As the multivariate outliers influenced the results they were excluded from the analysis. In Study 2, ten multivariate

outliers were detected with Mahalanobis distance exceeding the chi-square critical value of 45.31 ($df=20, p<.001$). Results were compared when including versus excluding the outliers. The multivariate outliers were retained in the analysis because (a) all were legitimate cases, (b) Cook's distance <1 , indicating the efficacy of the model was not impacted (Allen et al., 2014), and (c) results did not change when comparing analyses with and without the outliers.

5.6.2. *Quantitative Data Analysis Procedures*

5.6.2.1. Study 1: Partial Least Squares Structural Equation Model.

To investigate the first research question, a partial least squares structural equation model (PLS-SEM) analysis was conducted. Structural equation modeling (SEM) is a statistical analysis procedure that tests relationships among theoretical constructs, while controlling for measurement error (Gallagher & Brown, 2013). In contrast to covariance-based SEM, used for confirmatory factor analysis and to test established theoretical models, PLS-SEM is used to predict and explain a particular construct and/or to test exploratory theoretical models (Hair & Alamer, 2022). Unlike covariance-based SEM, PLS-SEM does not have data distribution requirements (Samani, 2016), making PLS-SEM suitable for multivariate non-normal data. As PLS-SEM has greater statistical power than covariance-based SEM, it can handle complex structural models with a larger number of variables (Sarstedt et al., 2021). It was also selected over more traditional regression techniques, as PLS-SEM controls for measurement error (Hair & Alamer, 2022; Samani, 2016).

5.6.2.2. Study 2: Latent Profile Analysis and One-way ANOVA.

Latent profile analysis (LPA), a person-centred latent variable mixture modelling analysis technique, was conducted to address the second research question. Variable-centred data analysis techniques (e.g. regression) test relationships between variables and predict outcomes (Howard & Hoffman, 2018), whereas person-centred techniques, such as latent class analysis and LPA, focus on similarities and differences between groups of people and

are ideal for exploring within-group differences (Howard & Hoffman, 2018; Marsh et al., 2009). Specifically, LPA identifies latent (i.e., unobserved) subgroups of people within a population, where individuals are grouped together based on a shared set of characteristics, which are unique and distinct from other latent subgroups (Berlin et al., 2014). These characteristics are determined by indicator variables, selected by the researcher, which are of relevance to the research question. Latent class and LPA differ only in the type of indicator variables used, with LPA using continuous and latent class analysis using categorical variables. To determine whether the latent profiles differed significantly in their mean scores on each indicator variable, as well as scores on two validation variables (meat consumption and willingness to reduce meat consumption), a series of one-way analysis of variance (ANOVA) tests were conducted.

5.6.3. Assumptions Testing for Quantitative Analyses

5.6.3.1. Assumptions for Study 1.

As PLS-SEM is based on ordinary least squared regression, multiple linear regression assumptions should be met (Goller & Hilkenmeier, 2022), with the exception of normal data distribution (Hair & Alamer, 2022). There should be linearity between variables, homoscedasticity, no multicollinearity, and no influential outliers (Allen et al., 2014). Linearity was met, confirmed by visual inspection of partial regression plots between all variables in the model. All variance inflation factors (VIF) were less than 3, indicating no multivariate multicollinearity (Hair et al., 2021). Standardised residuals plotted against standardised predicted values indicated that the assumption of homoscedasticity was met.

5.6.3.2. Assumptions for Study 2.

Latent profile analysis assumes that data are sampled from a heterogeneous population and that indicator variables are normally distributed (Spurk et al., 2020). Previous meat-related latent variable studies performed on mixed gender samples have been heterogeneous,

finding that men fall into different consumer segments, which suggests that male meat consumers are a heterogeneous population (Apostolidis & McLeay, 2016; Lacroix & Gifford, 2019). All 20 indicator variables fell into the acceptable range of ± 3 for skewness and ± 10 for kurtosis (Harrington, 2008), meeting the assumption of normality.

Study 2 also ran a one-way independent ANOVA, which assumes continuous data, independence of participants, and homogeneity of variance (Allen et al., 2014). All indicator and validation variables were measured on an interval scale, and all participants filled out the questionnaire only once, meeting the first and second criteria. Levene's test of homogeneity of variance was assessed for every ANOVA performed on each of the indicator variables and the two validation variables. For 13 of the 22 ANOVAs conducted, Levene's test was significant, indicating the assumption of homogeneity of variance was violated. In these cases, Welch's statistic was used, which assumes unequal variances (Allen et al., 2014). As profile sizes were unequal, for ANOVAs with equal variances assumed, Gabriel's post hoc test was used, which has greater power when group sizes are unequal (Allen et al., 2014). For ANOVAs with unequal variances assumed, Games-Howell post hoc test was used, which assumes unequal variances (Allen et al., 2014).

5.6.4. Qualitative data preparation and management (Sample 2)

Qualitative data were organised and analysed in Nvivo version 1.5.1, qualitative data management and analysis software. After the researcher completed each interview, the audio recording was stored in the password-protected VU R: Drive. A memo was created in Nvivo for each new participant, with a brief participant description. Pseudonyms were used for all file names, notes, and memos. Upon completion of data collection, audio recordings were professionally transcribed. Transcribed interviews were checked for accuracy by listening to the full recording while reading the transcript.

5.6.5. *Qualitative Data Analysis Procedure*

5.6.5.1. **Theoretical Framework.**

Qualitative data was analysed through the theoretical framework of Connell's (1987, 1995) hegemonic masculinity theory integrated with critical animal and ecofeminist perspectives. Critical animal theorists critique academia's assumed political neutrality, combining activism with scholarship to advocate for transformative change in animals' lives, with a particular focus on dismantling societal structures sustaining animal oppression (Pedersen, 2011; Taylor & Twine, 2014). From a critical animal theoretical perspective, "meat consumption" is viewed as one of the many practices reflecting human's power over, oppression, and exploitation of nonhuman animals (Weitzenfeld & Joy, 2014). Meat-eating individuals are recognised as "carnists", highlighting their invisible and taken-for-granted ideological assumptions about the position and rights of nonhuman animals in relation to humans, which defends meat consumption on the premise that it is "normal, natural, and necessary" (Joy, 2009; Weitzenfeld & Joy, 2014). Critical animal theorists highlight the anthropocentric biases in mainstream social sciences, which fail to recognise the deep immersion of human existence within, and in relation to, other forms of life on the planet (Almiron, 2016).

Similarly, ecofeminists critique mainstream feminist theories, such as hegemonic masculinity theory, for being anthropocentric in their exclusion of nonhuman animals from analyses of patriarchy (Adams, 2015; Gruen, 1993). Ecofeminists argue that patriarchal structures dominate women *and nature* (Birkeland, 1993; Hunnicutt, 2019; Kheel, 2007). Therefore, acknowledging the anthropocentric limitations of Connell's hegemonic masculinity theory, the qualitative analysis applied a critical animal theoretical lens to conceptualise meat consumption as a form of animal oppression and ecofeminist perspectives to examine power relations among men, women, and animals.

5.6.5.2. Personal Reflexivity.

The trustworthiness and credibility of qualitative research depends on the researcher's reflexivity, particularly their awareness of how personal perspectives may influence the research (Patton, 2015). The first author, a white, cisgender, middle-class, heterosexual Millennial woman from Melbourne, Australia, conducted the interviews and analysis. As a vegan activist aligned with critical animal studies, she approached the research with the aim of challenging psychosocial structures sustaining animal oppression. Viewing meat consumption as a form of animal abuse, she kept her vegan identity and opinions private during interviews to ensure participants felt comfortable expressing themselves. Drawing on the stance that researcher subjectivity can be "capitalised" on (Olmos-Vega et al., 2023), the researcher's vegan perspective provided insights into taken-for-granted ideologies surrounding animal consumption. Reflexive practices, including journaling and critical questioning, were employed to mitigate bias and consider alternative interpretations.

The researcher's identity as a woman was a key consideration, given the male sample and study's focus on masculinity. The researcher's visible gender positioned her as an outsider, likely shaping how participants expressed themselves, particularly when discussing experiences of and views on masculinity. It also introduced some limitations in that the researcher at times felt uncomfortable probing too much into topics that might be perceived as sensitive or confrontational, such as the relationship between meat consumption and sexuality. However, this outsider status also encouraged participants to articulate aspects of masculinity that might have been overlooked with a male interviewer. Drawing on feminist methodologies heightened her awareness of her own gender identity and its influence on the research process. She recognised how conforming to feminine norms—such as being passive and agreeable—contributed to hesitancy in critiquing men's meat consumption. This hesitancy was amplified by hostile responses from men on social media following the

publication of related research. Despite concerns that critiquing hegemonic masculinity might provoke defensiveness and hinder the vegan movement, the researcher proceeded, motivated by a commitment to understanding systems of animal oppression.

5.6.5.3. Reflexive Thematic Analysis.

The six phases of reflexive thematic analysis (RTA) outlined by Braun and Clarke (2021) were followed to analyse the qualitative data. As a method, “rather than fully-embedded methodology,” RTA can be used for both inductive and deductive analytic approaches, and does not prescribe the use of any particular theoretical framework to guide the analysis (Braun & Clarke, 2021, p. 331). Reflexive thematic analysis “emphasises the importance of the researcher’s subjectivity as analytic *resource*, and their reflexive engagement with theory, data and interpretation” (Braun & Clarke, 2021, p. 330). That is, RTA embraces and utilises the researcher’s subjectivity as a resource in the analytic process, and therefore, “a research team is not required or even desirable for quality”, unlike other types of thematic analysis that take a neopositivist stance, and therefore, require measures of coding reliability to ensure coding is “objective” and “unbiased” (Braun & Clarke, 2021, p. 333).

The first phase, *familiarisation*, involves the researcher immersing themselves in the dataset to become “deeply and intimately familiar with the content” (Braun & Clarke, 2021, p. 35). The researcher goes beyond passively taking in information and critically engages with the data to attempt to make sense of the participants’ experiences, perspectives, and worldviews. Data familiarisation and immersion began immediately after conducting each participant interview. The researcher created a participant memo, which included the researcher’s reflections on their initial impressions, thought processes, and emotional responses that arose during the interview. Familiarisation continued after data collection by reading and re-reading interview transcripts and listened to interview recordings whilst noting

down analytic insights in Nvivo about individual data items and the dataset as a whole. Questions for reflection throughout this process included “why might the participant be making sense of things in this way and not in another way?”, “what assumptions do they make in describing the world?”, and “what ideas about masculinity are being drawn on?” (see Appendix H for full list of critical reflection questions). The researcher also examined her own interpretations of the data, reflecting on reasons underlying these interpretations, what assumptions these interpretations relied on, and alternative interpretations. The familiarisation process enabled the researcher to develop an understanding of the participants’ perspectives and gain greater awareness of the concepts, assumptions, and theoretical frameworks informing the analysis.

The second phase, *coding*, involved systematically tagging and assigning meaning to specific segments of the dataset, guided by the qualitative research question. Reflexive thematic analysis involves only coding data that the researcher believes is relevant to the research question, rather than coding line-by-line (Braun & Clarke, 2021). Each code pertains to one specific interpretation of the data; however, one segment of data can be assigned multiple codes. Data was coded by only one member of the research team, as recommended by Braun and Clarke (2021, p. 55): “Having only one person coding—usually the researcher—is normal practice, and indeed good practice, for reflexive TA”.

Two coding strategies were applied concurrently throughout the analysis. The first took an inductive approach, identifying *participant*-generated constructions, concepts, and meanings in the data. The inductive approach aimed to provide insights into the participants’ perspectives, experiences, and the personal meanings they ascribed to the research topic. The second approach was deductive, whereby data were interpreted and coded using *researcher*-generated concepts informed by the study’s theoretical framework. Moreover, coding was both semantic (capturing explicitly expressed perspectives and meanings) and latent

(capturing more abstract or conceptual interpretations of implicit meanings underlying the participants' explicitly expressed views; Braun & Clarke, 2021).

Throughout the coding process the researcher refrained from developing ideas and assumptions about broader themes, instead focusing on the specific meaning of the individual data items in isolation from the rest of the dataset. This approach reduces the risk of “analytic foreclosure” (i.e., prematurely moving to theme development before fully engaging with the data at a deep level, which fails to “realise the full potential of the data”), “cherry picking” (i.e., where researchers “select ‘patterns’ in their data to fit their own predetermined ideas about what meanings are evident”), and enhances analytic rigour by applying a systematic analytic process (Braun & Clarke, 2021, p.54). Codes were refined throughout the analytic process, with initial codes being renamed to better reflect shared meanings in the data.

Throughout the analytic process the researcher made regular entries in a reflexivity journal, reflecting on emotional reactions, initial interpretations and impressions of the data, in a similar but less formal/structured process of personal reflection than the data familiarisation phase of analysis.

Themes were developed in a recursive process through phases three to five. The third phase, *generating initial themes*, generated provisional “candidate” themes from the codes. The researcher stepped away from the raw data and looked through the codes for patterns of shared meaning. Codes were grouped together into a provisional theme that formed a conceptually cohesive central organising concept, capturing an idea that was repeatedly expressed (both implicitly and explicitly) throughout the dataset. Codes were initially grouped together according to concepts and shared meanings that had stood out in the familiarisation process. The researcher looked through the codes multiple times for new connections and created alternative groupings. The similarities and relationships between the provisional themes were also considered, exploring potential superordinate themes and

subthemes. In phase four, *developing and reviewing themes*, the viability of each candidate theme was assessed by reengaging with the raw interview data. A theme definition and description was written to clarify the scope/boundary of each theme, and to specify the various facets of each theme. The researcher grouped together and reviewed all interview data quotations that pertained to all codes within each theme's facet, to assess the richness and quality of data to support each theme. Only themes that contained sufficient rich and meaningful data and were of high significance to the research question were retained. The fifth phase, *refining, defining, and naming themes*, was undertaken firstly by creating a visual map of all themes, subthemes, and superordinate themes, including the facets of each theme, to conceptualise how the different themes related to one another, and to plan the most effective, cohesive, and logical manner in which to write up the results. The sixth phase, *writing up the analysis*, the researcher selected clear, concise, but vivid quotes to illustrate each theme and made analytic notes outlining the researcher's interpretation of each theme and its various facets and quotes. The researcher consulted the visual mapping of the themes to structure the write-up.

5.7. Data Integration

The data integration phase aims to answer the mixed methods research question. The aim of data integration is to bring data from both methods into a coherent whole so that additional insights can emerge (Creswell, 2018). This dissertation followed data integration procedures outlined by Creswell (2018), which entails examining and comparing the key results from both quantitative and qualitative phases to identify how they align, contradict, or build upon one another (Creswell, 2018). "The researcher interprets to what extent and in what ways the two sets of results converge or diverge from each other, relate to each other, and/or combine to create a better understanding in response to the study's overall purpose" (Creswell, 2018, p. 70). Data integration commenced only after each empirical study from

both the quantitative and qualitative phases were completed. That is, the data from each empirical study were analysed independently prior to the converging of results. The results of each phase were compared by summarising key findings of each study, pertaining to key concepts, in joint display tables. The joint display tables are presented in the integrated discussion in Chapter 10. This enabled consistent findings across studies to be identified and the quantitative results to be reinterpreted through the theoretical framework developed in the qualitative study.

Chapter 6: Development and Preliminary Validation of the Meat Consumption Scale

This chapter presents a preliminary adjunct study conducted prior to conducting the main thesis project. Upon planning this study, a review of the meat consumption literature revealed that there were no psychometrically validated survey questionnaires available to measure participants' self-reported meat consumption in a one-off assessment tool. Therefore, to enhance the methodological quality of this thesis, The Meat Consumption Scale, a self-report meat consumption questionnaire, was developed and underwent preliminary psychometric validation for use in the quantitative research phase. The final scale is available in Appendix I of this thesis.

Please note that this article represents a two-year scale development process involving multiple iterations of the Meat Consumption Scale. Consequently, the two quantitative studies presented in this thesis in Chapters 7 and 8 use slightly different versions of the Meat Consumption Scale, due to variations in timing of data analysis for each quantitative article and the peer-review process. Details of how the Meat Consumption Scale was administered and scored in each quantitative study are detailed in the method sections of Chapters 7 and 8. The final version of the Meat Consumption Scale is presented in this chapter. To the author's knowledge, this was the first study to develop a psychometrically validated self-report meat consumption questionnaire that can be administered on one occasion.

This article has been accepted for publication at *BMC Psychology*, an international peer-reviewed journal that publishes studies within all fields of psychology. In 2024 the journal had a SCImago ranking of 1.03 and a Scopus quartile ranking of Q1. As of 21st August 2025, the pre-print for this article, posted on 4th March 2023, has been downloaded 1,648 times. The declaration of co-authorship for this publication can be found in Appendix J.

Development and Preliminary Validation of the Meat Consumption Scale

Abstract

Background: The psychology of eating meat has emerged as a major field of study due to growing awareness of the negative impacts of excessive meat consumption on human and planetary health. Examining psychological profiles and testing strategies to address psychological barriers to meat reduction has become a prominent focus in psychology and various other disciplines. However, given the critical importance of psychometrically valid measurement tools in quantitative research, it is concerning that studies have largely relied on unvalidated, ad hoc survey instruments to measure meat consumption. To address this methodological gap this study aimed to develop and conduct an initial validation of a self-report questionnaire to measure an individual's meat consumption and meat-eating intentions.

Methods: The questionnaire was developed and evaluated through exploratory factor analysis (sample 1: $N=183$ Australians) and confirmatory factor analysis (sample 2: $N=495$ Australians). Construct validity was evaluated by confirming the scale's underlying factor structure and through correlations with demographic variables and ten theoretically related constructs. Internal consistency reliability was assessed with mean inter-item correlations, corrected total-item correlations, and coefficient H .

Results: Exploratory factor analysis did not identify a latent meat-eating intention scale, but did reveal a unidimensional latent factor representing total land-based meat consumption, which was named The Meat Consumption Scale (MCS). Confirmatory factor analysis verified the unidimensional structure of the MCS, with all model fit indices demonstrating excellent model fit. All correlations between the MCS and ten theoretically related constructs and demographic variables were significant and in the hypothesised directions, providing preliminary evidence of construct validity. Internal consistency reliability of the MCS was

acceptable in both samples when evaluated by mean inter-item correlations and corrected item-total correlations, though coefficient H fell just shy of the recommended threshold.

Conclusions: Findings provide preliminary evidence of reliability and construct validity of the Meat Consumption Scale (MCS), which is the first psychometrically evaluated tool designed to measure an individual's meat consumption requiring a fast (<5 mins) one-time assessment. This 12-item self-report questionnaire measures consumption of land-based animal meat—red meat (beef and lamb), poultry products, pork products, and other processed meats—over the past two-week period and is indicative of trait Western meat-eating patterns. The MCS is designed for cross-sectional and experimental research and applied contexts. Further validation of the scale, including assessment of criterion and discriminant validity and cross-cultural adaptations, is recommended.

Keywords: psychology of meat consumption; intentions to reduce meat consumption; dietary change; psychometrics; self-report questionnaire; measurement of meat consumption.

1. Introduction

The psychology of meat consumption has emerged as a major field of study due to growing awareness of its negative effects on human and planetary health. As global meat consumption levels continue to rise,¹ there is increasing scientific consensus that substantial reductions in meat consumption will be required to reduce greenhouse gas emissions and meet Paris Agreement climate change targets.²⁻⁶ Meat consumption is positively associated with GHG emissions,^{7,8} with studies estimating that animal-based diets produce twice the emissions of plant-based diets,⁶ and that a vegan diet produces 30.3% of the carbon dioxide and 6.5% of the methane emissions of a heavy meat diet.⁸ Similarly, large-scale industrial fishing is unsustainable and environmentally destructive, with overfishing disrupting marine ecosystems^{9,10} and releasing blue carbon into the atmosphere that would otherwise be sequestered at the ocean floor.¹¹ Hence, in 2019, the EAT-Lancet Commission—comprised of scientists from the fields of human health, agriculture, political sciences, and environmental sustainability across 16 countries—proposed a healthy and sustainable plant-based diet, with minimal meat consumption, as a solution to achieving the United Nation’s Sustainable Development Goals and Paris Agreement targets.¹² The scientists emphasised that a major transformation in global food systems is needed to ensure food security, sustainability, planetary health, and human health, requiring “unprecedented global collaboration and commitment”.^{12(p.448)} Furthermore, with processed meats classified as “carcinogenic” and red meats as “probably carcinogenic”,¹³ along with their links to various chronic diseases,^{14,15} many health organisations now recommend limiting the consumption of both.¹⁶⁻¹⁸

Consequently, meat consumption is a popular multidisciplinary research focus, particularly in the field of psychology. Meat is more than a source of nutrition and energy—meat consumption is deeply embedded in cultural norms and traditions,^{19,20} notions of

masculinity,^{21,22} and personal, group, and national identities.^{23,24} Hence, individuals are strongly emotionally and psychologically attached to eating meat²⁵ and there are significant psychological barriers and defence mechanisms impeding meat reduction and the adoption of plant-based diets.²⁶ To better understand how meat consumption can be reduced, researchers commonly investigate the psychosocial predictors of individuals' meat consumption preferences, attitudes, and behaviours.²⁷⁻³⁰ Numerous studies have explored psychological profiles of consumers who eat meat³¹⁻³³ and personality traits related to meat consumption.³⁴⁻³⁶ Many experiments have tested strategies and interventions for reducing consumers' meat consumption.³⁷⁻³⁹ These studies require quantification of individuals' meat consumption intake, through accurate, efficient, and easy-to-administer self-report questionnaires. However, currently, psychometrically validated measures of self-reported meat consumption and meat-eating intentions are lacking, diminishing the methodological quality of research in numerous fields. To address this gap, the current study aimed to develop and psychometrically evaluate a quantitative survey measure of meat consumption.

1.1. Existing Measures of Meat Consumption

The current selection of psychometrically validated self-report meat consumption questionnaires is limited. Food frequency questionnaires (FFQs) utilised in nutritional sciences measure all food categories, resulting in unnecessarily long completion times for researchers only needing to capture meat consumption. Without psychometric testing, selecting only meat-related items from FFQs may not accurately or comprehensively assess overall meat consumption patterns. Food frequency questionnaires also tend to be expensive to administer, and measure consumption over a long (12-month) period, which increases recall bias.⁴⁰ One existing Meat Frequency Questionnaire measures consumption of certain meat types/cuts, cooking methods, and “doneness” level to estimate heterocyclic amine intake for use in cancer studies,⁴¹ requiring more detail than necessary for most meat

consumer researchers. Alternatively, the Oxford Meat Frequency Questionnaire measures changes in meat consumption over time, tracking participants meat intake once a day over a seven-day period.⁴² Meat intake fluctuates from day-to-day, varying across days of the week.⁴³ Therefore, as Stewart et al. acknowledge, to accurately assess typical meat consumer behavior, instruments need to measure meat intake over at least several days. This longitudinal-style tracking method of measurement is not suitable for studies where it is only feasible to survey participants on one occasion.

In the absence of available questionnaires, researchers often rely on ad hoc, non-validated measures of self-reported meat consumption and frequently omit reporting psychometric statistics for these instruments (see Supplementary A for examples). For example, several studies have utilised single-item measures of meat consumption,⁴⁴⁻⁴⁶ which have greater measurement error and weaker predictive validity than multi-item scales.^{47, 48} Others have stated that their meat consumption measure has “formed a reliable scale” but did not report any psychometric statistics.^{30(p.138)} Hence, there is a need for a short scale that can be used as a one-off assessment tool to capture an individual's meat consumption. In this study we argue that self-reported consumption based on the past two weeks gives an indication of typical consumption patterns. The accuracy of a trait meat consumption estimate could also be improved by factoring in future intentions to increase or decrease meat consumption. It is also important that any scale developed is psychometrically validated and follows consensus-based health measurement standards. Using measurement scales with sound psychometric properties increases the trustworthiness of results.⁴⁹

1.2. Existing Measures of Meat-eating Intention

Understanding consumers’ intentions to change their dietary habits is especially important in the context of global efforts to meet the United Nations’ Sustainable Development Goals and the Paris Agreement climate targets. These objectives highlight the

need to transform global food systems, particularly by transitioning from meat-based to plant-based diets. To facilitate such dietary changes, it is crucial to understand consumers' intentions regarding meat consumption. Intention refers to an individual's decision and motivation to engage in a behaviour,⁵⁰ and plays a central role for researchers focused on consumption behaviour and, specifically, on behavioural change.⁵¹ The Theory of Planned Behavior,⁵² a model of behaviour in which intention is the primary behavioural antecedent, is the most commonly applied behavioural model in the psychology of meat consumption^{29, 53-60} The Transtheoretical Model of Behaviour Change is also commonly used, which emphasises the role of intentional contemplation, decision-making, and planning in behaviour change.⁶⁰⁻

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Despite the prevalence of studies on meat-eating intentions, there remains a lack of psychometrically validated scales to measure the intention to alter meat consumption. In the absence of such scales, many researchers have relied on single-item measures to assess meat-eating intentions,^{46,63-67} which are limited in terms of psychometric robustness. Although some researchers have used multiple items to measure intentions to eat specific types of meat,^{28,68,69} the lack of a validated intention scale has led to the use of ad hoc measures that may be more vulnerable to construct validity issues. For example, some studies have conflated intention with related but distinct constructs such as *willingness* to reduce meat consumption.^{38,70} A person may be willing to reduce their meat intake at some point in the future, *given the right conditions*, but may not yet *intend* to do so—that is, they have not yet formed the motivation or decision to change their behaviour.^{71,72} Conceptual ambiguity is further illustrated in studies that have, for instance, used an item assessing intention to “eat chocolate only once a week,” but labelled this variable as an intention to reduce meat consumption.^{55,73} The development of a psychometrically validated meat-eating intention

scale would help to address these issues and improve construct clarity and measurement precision in this field.

1.3. Study aims

Given the importance of psychometrically valid measurement tools in quantitative research, it is concerning that studies have largely relied on unvalidated, ad hoc survey instruments to measure meat consumption and intentions to change dietary patterns. Therefore, to improve the validity of meat consumer studies, this study aimed to develop and validate a scale to measure an individual's meat consumption, and intentions to eat meat, keeping in mind the need for a succinct scale that can be administered on one occasion.

2. Method

2.1. Questionnaire Development

2.1.1. Scale theory and conceptualisation

Scale development was guided by Classical Test Theory (CTT), a foundational psychometric framework aimed at maximising reliability and validity by estimating the extent to which observed scores reflect true scores, while accounting for measurement error.^{74,75} CTT assumes unidimensionality, whereby all items measure a single underlying construct.⁷⁵ Following standard CTT procedures,⁷⁵ the development process involved defining the construct, generating items, conducting factor analysis, and assessing reliability and validity.

The scale was conceptualised using a reflective measurement model, in which each item is assumed to reflect a common underlying trait. This approach was appropriate for measuring meat consumption, based on the assumption that consumption across various meat types is interrelated and represents a coherent, trait-like dietary pattern.⁷⁶⁻⁷⁸ Individuals who consume more meat overall are expected to report higher frequencies across multiple meat types.

The reflective model was also appropriate given the cultural relativity of the concept “meat”.⁷⁹ For instance, in French, the words *viande* (red meat), *volaille* (poultry), and *poisson* (fish) are distinct and lack a unifying term equivalent to the English word “meat.” In contrast, in English-speaking Western cultures, “meat” commonly refers to all terrestrial and avian animals (e.g., beef, pork, chicken), and sometimes includes aquatic animals.⁸⁰ Accordingly, the scale focused on meat types commonly consumed in English-speaking contexts (e.g., Australia, Canada, the United States, the United Kingdom), where the term *meat* typically refers to the consumption of cows, pigs, poultry, sheep, and often includes fish and seafood. It does not include other animal meats commonly consumed in many non-English-speaking cultural contexts—such as dog, goat, or camel—which may be considered part of the meat category in parts of Asia, the Middle East, and Africa.^{81–83} This culturally specific framing supports the use of a reflective model, in which items are treated as indicators of a unidimensional construct representing meat consumption as it is typically understood in English-speaking Western contexts.

Similarly, intention was conceptualised as a reflective construct—an underlying motivational disposition reflected in participants’ responses about their planned changes in consumption of various meat types. This approach aligns with behavioural theories such as the Theory of Planned Behaviour,⁵² where intention is treated as a coherent latent construct predictive of specific behaviours. Intention was operationalised as the direction and strength of participants’ planned behavioural change—whether they intended to increase, decrease, or maintain their meat consumption across different categories. Because the same underlying disposition was expected to influence intentions across all meat types, a reflective model was considered appropriate. This conceptualisation also allowed us to distinguish intention from related but distinct constructs such as willingness or openness to change, which are less strongly tied to planned action and behavioural commitment.

2.1.2. Item generation

Scale items were generated deductively by reviewing existing meat consumption questionnaires^{41,42} and measures utilised in 35 previous studies conducted in countries such as Australia, New Zealand, the USA, and Western European countries such as the Netherlands, Switzerland, and Germany (Supplementary A). There is disagreement about the definition of “meat” due to dispute about the inclusion of fish and seafood. For example, the American Meat Science Association includes fish and seafood in their definition of meat,⁸⁰ whereas the European Union excludes fish and seafood.⁸⁴ As most studies we reviewed included fish and seafood, this approach was taken. Meat categories were refined through discussion and consensus between the research team, in reference to the literature. Bacon and ham were separated from pork and other processed meat consumption because of the popularity of these products in Western cultures such as Australia,⁸⁵ Canada,⁸⁶ the US,⁸⁷ and UK.^{88,89} As inattention to long surveys can lead to lower response rates and less accurate data,⁹⁰ we aimed to balance comprehensive measurement with brevity when generating scale items. This resulted in a multi-item scale that captures the nuances of meat consumption while minimising participant burden. While a shorter scale could have been considered, we prioritised psychometric rigour to ensure the scale’s reliability and validity, acknowledging that a more succinct scale may be suitable for some applications but could sacrifice measurement precision.

Meat-eating frequency is the most common method for assessing meat intake. However, only measuring frequency may fail to account for important individual differences. For example, a person who eats a 400-gram steak three times a week is eating considerably more than a person who eats 100 grams of steak three times a week. Hence, we included a measure of portion size, based on previous dietary questionnaires (Supplementary A). Portion size is then multiplied by frequency when administrators are scoring the scale.

Two weeks was selected as an optimal recall timeframe, attempting to minimise recall bias whilst providing enough time to account for typical consumption patterns and daily fluctuations in meat intake. In a systematic literature review of influences on recall bias, Stull et al.^{91(p.937)} suggested that “different phenomena can and should be measured with different recall periods”. They concluded that food intake, like other highly frequent and fluctuating phenomenon, should have a shorter recall period, closer to days or weeks, compared to recall of rare events, major life events, or psychological traits.⁹¹ This is because, generally, accurate recall diminishes as the recall period increases and habitual behaviours, like eating, have less salience than rare or major events, making them more difficult to recall.⁹¹ Stull et al. warned that a 24-hour period only provides a momentary snapshot which cannot represent an individual’s “usual diet”. Given that meat consumption and dietary patterns change over the week, with the biggest differences observed on the weekend^{43,92} it was important to include at least one weekend. The recall period included two weekends to account for variations in weekend consumption whilst minimising the recall period.

Intention items that refer to general constructs have less predictive validity than items that refer to specific behaviours; and intention scales have greater predictive validity when measured with more than one item.⁵⁰ Hence, the intention scale included multiple items asking participants’ intentions to consume each of the meat categories. We used the phrase “I intend to...”, which has greater predictive validity than terms such as “I will...” or “How likely are you to...”.⁵⁰ Behavioural intentions comprise the *direction* and *intensity* of the intention.⁶⁸ Therefore, we used a semantic differential style scale to capture the direction (increase versus decrease) and intensity (somewhat or greatly) of intended meat consumption changes.

2.2. Materials

The initial 24-item scale included the following categories: (1) beef; (2) lamb; (3) poultry (e.g., chicken, turkey, duck, other game birds); (4) pork; (5) bacon/ham; (6) other processed meats (e.g., sausages, salami, hot dogs, meat pies, jerky, junk food meats); and (7) fish/seafood. A definition with examples, which specified included/excluded meat products, was provided for each category. For each meat category participants indicated (i) frequency of consumption in the last two-weeks (entered as a whole number); (ii) average portion size (1=very small (less than 10% of a typical meal); 2=small (10-20% of a typical meal); 3=medium (21-30% of a typical meal); 4=large (31-40% of a typical meal); and 5=very large (more than 40% of a typical meal)); and (iii) intention to eat this meat in the next two-weeks (-4=greatly decrease, -2=somewhat decrease, 0=not change, 2=somewhat increase, 4=greatly increase). When meat frequency = 0, the corresponding portion size question was skipped and given a score of zero. On average the questionnaire took participants less than five minutes to complete. The final psychometrically validated 12-item version of the MCS is provided in Appendix A.

Total scores for each meat category were calculated by multiplying the frequency by quantity of each meat type. Preliminary analyses showed better model fit when summing the bacon/ham score with the pork score to form a total pork/bacon/ham score. This also made theoretical sense given these products derive from the same animal. The total pork score was summed with the bacon/ham score to form a total pork/bacon/ham score. Therefore, the scale used in the EFA and CFA analyses included six meat categories (beef, lamb, poultry, pork/bacon/ham, other processed meat, and fish/seafood) which were summed to create a total *Meat Consumption* score. Higher meat scores indicated greater meat consumption. An *Intention to Eat Meat* score was calculated by summing the intention items. Higher intention scores indicated the intention to *increase* meat consumption in the next two weeks, whereas lower scores indicated intention to *decrease* meat consumption.

The following measures assessed convergent validity (see Supplementary File B for full questionnaire): Based on the Theory of Planned Behaviour,⁵² three variables that predict intention to change behaviour are attitude (i.e., towards the behaviour), subjective norm (i.e., perceived social pressure to perform the behaviour), and perceived behavioural control (i.e., perceived ease or difficulty of performing the behaviour). *Attitude* to eating meat ($\alpha = .82$) was measured with a 4-item scale adapted from previous research.^{44, 93} Higher scores indicated a more positive attitude towards eating meat. *Subjective norm* ($\alpha = .86$) was measured with a scale adapted from previous research.^{65, 94} Participants rated the extent to which they agreed that various members of their social circle would approve of them reducing their meat consumption. Higher scores indicated greater approval from others to reduce. *Perceived behavioural control* ($\alpha = .66$) was measured with four items adapted from previous research.^{44, 93} Higher scores indicated greater perceived behavioural control regarding meat reduction. Additional validation variables associated with meat consumption were selected. *Willingness to reduce meat consumption* ($\alpha = .81$) was measured with an adapted 3-item scale used in previous research.⁹³ Higher scores indicated greater willingness to reduce meat consumption. *Meat-eating justifications* ($\alpha = .88$) were measured with the 27-item Meat-Eating Justifications scale.⁹⁵ Higher scores indicated greater use of meat-eating justifications. *Meat-eating habit strength* was measured using a 5-item scale ($\alpha = .89$)³⁰ adapted for meat consumption from the Self-Report Habit Index.⁹⁶ *Meat-related disgust* ($\alpha = .84$) was measured with the 4-item Animal Flesh Disgust subscale from the Food Disgust Scale.⁹⁷ Higher scores indicated greater disgust towards meat. *Animal empathy* ($\alpha = .93$) was measured with a scale adapted from a previous self-report emotional instrument in which participants rated their emotions when looking at images of farm animals in distressing conditions.⁹⁸ *Traditional masculinity* ($\alpha = .83$) was measured with the 30-item Conformity to Masculine Norms Inventory Short Form.⁹⁹ Higher scores indicated greater conformity to

traditional masculine norms. *Social dominance orientation* (preference for group-based hierarchies; $\alpha=.80$) was measured with the 4-item Short Social Dominance Orientation Scale.¹⁰⁰ Higher scores indicated greater social dominance orientation. Reported alphas pertain to the current study sample.

2.3. Participants and procedure

Data for exploratory factor analysis (EFA; sample 1) was collected in Australia via an online questionnaire from mid-August to mid-September in 2021. This period did not include any public holidays or major cultural or religious celebrations that might have influenced participants' typical meat-eating habits. However, during this period, three states of Australia went into COVID-19 related lockdown, which was likely to have influenced normal meat-eating patterns. It is unknown how many participants were situated in these lockdown areas. The questionnaire was administered to a convenience sample of 262 Australian participants recruited over social media and through snowballing techniques in the researchers' social networks. Thirty incomplete cases were deleted. Due to the purpose of the scale, a further 49 participants who had not consumed any meat in the previous two weeks were excluded. The final sample consisted of 183 participants (84 male, 92 female, 1 trans, 3 non-conforming, 2 prefer not to say, and 1 missing gender (mean age = 40.15, $SD = 13.05$)). This met the minimum of 120 cases, calculated using the sample-to-item ratio rule-of-thumb of 5-to-1 for EFA,¹⁰¹ and the minimum of 100 cases recommended for EFA.¹⁰² Participants were well educated, with 22.9% completing high school or below, 4.9% completing a trade/vocational training, 29.5% completing a certificate or diploma, and 42.6% completing a university degree.

A second sample was collected to perform confirmatory factor analysis (CFA). Data was collected via an online questionnaire in two phases. The first phase (May-August 2022) collected data from male participants as part of a broader study on men's meat

consumption.^{31, 103} This period included the Queen’s birthday long weekend in Australia, which may have influenced participants’ typical meat consumption habits. The questionnaire was administered to a convenience sample of Australian and English men recruited from a paid online recruitment site “Prolific” (<https://www.prolific.co/>) and social media. A total of 614 male participants returned the survey through Prolific. An additional 45 Australian participants were recruited on Facebook via survey recruitment groups as well as the principal researcher’s personal network. Eighty-four incomplete surveys were deleted, leaving 575 participants who self-identified as male. To replicate the Australian data from sample 1, UK participants were excluded. The second phase (December 2023) collected data from 202 Australian females recruited from Prolific to combine with the Australian male sample specifically for the purpose of validating the scale. Participants who had not eaten meat over the past two weeks were excluded, leaving 495 participants for the CFA (mean age = 35.79, $SD = 12.25$). This exceeded the recommended minimum sample size of 411 using Soper’s¹⁰⁴ structural equation model A-priori sample size calculator for two latent variables, 14 observed variables, statistical power level of 0.8, and anticipated effect size of 0.15. Sample 2 was similar to study 1 in terms of nationality, age, and education level. See Table 1 for demographic information.

Table 1

Sociodemographic Characteristics of Study Participants

Demographic Variable	Sample 1		Sample 2	
	<i>N</i> = 183	%	<i>N</i> = 495	%
Gender				
Male	84	45.9%	293	59.2%
Female	92	50.3%	202	40.8%
Trans	1	0.55%	0	0%
Non-conforming	3	1.64%	0	0%
Prefer not to say	2	1.1%	0	0%
Age				
18-29	41	22.5%	179	36.2%
30-44	77	42.3%	207	41.9%
45-59	46	25.3%	82	16.6%
≥ 60	18	9.9%	26	5.3%

Education				
≤ Secondary school	42	23%	81	16.4%
Trade/vocational training	9	4.9%	15	3.0%
Certificate/Diploma/TAFE	54	29.5%	83	16.8%
Bachelor's degree	50	27.3%	203	41.0%
Postgraduate degree	28	15.3%	113	22.8%
Geographic Location				
Metropolitan	—	—	421	85.1%
Rural	—	—	74	14.9%
Political Views				
Left-wing	—	—	286	57.8%
Centre	—	—	146	29.5%
Right-wing	—	—	63	12.7%

2.5. Data Analysis

To assess construct validity, EFA was conducted in SPSS v.28 to assess the latent dimensionality of the scale and reduce questionnaire items. If the factor pattern is consistent with expectations regarding the scale's dimensionality, there is evidence of construct validity.¹⁰⁵ A principal axis factoring method was selected, as this method has superior accuracy over principal components analysis, has less stringent distribution requirements than maximum likelihood,¹⁰⁶ and is recommended for the development of measurement instruments.¹⁰⁷ The number of factors were determined by Velicer's revised minimum average partial (MAP) test,¹⁰⁸ in conjunction with VSP analysis (i.e., visual inspection of scree plot) and factor interpretability.¹⁰⁹ A factor should have at least three scale items, each item's factor loading should be above .40,^{106, 110} and each item should have a corrected item-total correlation above .30.^{111,112}

To further assess construct validity, CFA was conducted in AMOS version 28.0 to verify the latent structure identified in the EFA. The scale of latent variables was set by fixing the factor loading of one item from each factor to 1.0.¹¹³ Maximum likelihood estimation method was used. To correct for multivariate non-normality, bootstrapped estimates were obtained (5000 samples) and a Bollen-Stine bootstrapped chi-square estimate.^{114,115} Model fit

was assessed according to the criteria outlined in Table 2. Evidence of construct validity was further assessed by performing correlation analyses and *t*-tests in SPSS between the MCS and theoretically related validation variables.

Reliability was assessed with mean inter-item correlations, corrected item-total correlations, and coefficient *H*. Cronbach's alpha, a classic estimate of internal consistency reliability, is often criticised because it depends on several statistical assumptions that often aren't met, which can lead to inaccurate reliability estimates.¹¹⁶⁻¹¹⁹ Thus, researchers recommend using multiple indicators of internal consistency reliability.^{75, 120,121}

Cronbach's alpha and McDonald's omega were deemed inappropriate indicators of internal consistency as they assume that each test item is normally distributed, tau equivalence, and that there aren't large differences in factor loadings.¹²² Most of the Meat Consumption Scale items' skewness and kurtosis values exceeded ± 2 , violating the assumption of normality in Sample 1 (beef kurtosis = 5.52; lamb kurtosis = 13.24; pork kurtosis = 7.08; bacon/ham kurtosis = 4.78; OPM kurtosis = 9.72; fish/seafood skewness = 4.07 and kurtosis = 23.25) and Sample 2 (beef kurtosis = 3.06; lamb kurtosis = 3.62; pork kurtosis = 4.07; bacon/ham kurtosis = 3.35; OPM kurtosis = 4.03, fish/seafood kurtosis = 2.78). Furthermore, tau equivalence assumes that "each test item has approximately the same discriminating proportion (i.e., each test item contributes roughly the same amount of stability to the total scale score)"^{120(p.94)} If tau-equivalence is not met, Cronbach's alpha is a lower-bound estimate of reliability, meaning true reliability is likely to be higher.¹²³ Tau equivalence can be determined by heterogeneous inter-item correlations.⁷⁵ Inspection of inter-item correlations (in Sample 2) indicated that the assumption of tau equivalence was not met, mainly due to lower correlations with the lamb item, which did not contribute equally to the scale.

As data did not meet assumptions for Cronbach's alpha or McDonald's omega, mean inter-item correlations, corrected item-total correlations, and coefficient H were chosen as indicators of reliability. As Cronbach's alpha can underestimate reliability in shorter scales due to its sensitivity to the number of scale items,¹¹⁹ it is recommended to assess internal consistency with mean inter-item correlations, which is not influenced by scale length.^{116,123} The mean inter-item correlation should fall between .2 and .4.^{124, 125} Corrected item-total correlations are used in scale development to assess how well each item contributes to the overall scale and its internal consistency.^{126,127} Coefficients $>.30$ suggest that the item measures the same underlying construct, indicating internal consistency.^{111,112} Coefficient H is recommended when data violate alpha assumptions.^{117,120} Unlike Cronbach's alpha and omega, which are based on unit-weighted scaling, coefficient H does not assume tau equivalence, as the estimate is based on optimally weighted scales, allocating less weight to low loading items.^{117,120} Kalkbrenner^{120(p.96)} recommends coefficient H should be $\geq .70$, though emphasises that "deciding on the minimum acceptable value, cutoff, or threshold for a reliability estimate should be done on a tentative case-by-case basis.". Given that Cronbach's alpha $\geq .60$ is acceptable in exploratory research and scale development,¹²⁸ and that coefficient H is conceptually similar to Cronbach's alpha,¹¹⁷ .60 was chosen as an acceptable cutoff.

Table 2

Psychometric analyses conducted on the Meat Consumption Scale (MCS)

Psychometric Measure	Criteria	MCS Psychometrics
Construct Validity		
Bollen-Stine bootstrapped chi-square exact-fit hypothesis test	An absolute fit index assessing model "badness of fit", ¹⁵⁴ adjusted for sample size and number of model parameters; recommended when data are nonnormal. ¹¹⁵ A significant p -value ($p < .05$) indicates poor model fit.	$p = .406$
Chi-square/degrees of freedom ratio (CMIN/DF)	An absolute fit index that is less sensitive to sample size than the chi-square exact-fit test. CMIN/DF < 3 ¹⁵⁵ or < 2 ¹⁵⁴ indicates good model fit.	CMIN/DF = 1.275

Root Mean Square Error of Approximation (RMSEA)	An absolute fit index that assesses model fit while compensating for model complexity; RMSEA <.06 indicates good model fit. ¹⁵⁶	RMSEA=.024
Standardised Root Mean Square Residual (SRMR)	An absolute model fit index of the average standardised difference between observed and estimated correlations. Values <.08 are acceptable; values closer to 0 indicate better fit. ¹⁵⁶	SRMR=.0178
Bentler Comparative Fit Index (CFI)	An incremental model fit index that assesses the fit of a specified model relative to a null model, accounting for sample size and complexity. CFI >.90 = acceptable, >.95 = excellent model fit. ^{155,156}	CFI=.996
Tucker-Lewis Index (TLI)	An incremental fit index which evaluates model fit by comparing its chi-square statistic to a baseline model while adjusting for complexity. TLI >.90 = acceptable, >.95 = excellent model fit. ^{155,156}	TLI=.988
Normed Fit Index (NFI)	An incremental model fit index which measures the improvement in fit of a specified model over a baseline null model. NFI >.90 = acceptable, >.95 = excellent model fit. ^{155,156}	NFI=.983
Akaike Information Criterion (AIC)	Assesses a model's relative goodness of fit, balancing model fit and complexity. The model with the lowest AIC indicates optimal model fit amongst competing models. ¹⁵⁷	AIC was lowest in final MCS model.
Bayesian Information Criterion (BIC)	A measure of the relative fit of a model, penalising for complexity more heavily than AIC. The model with the lowest BIC indicates optimal model fit amongst competing models. ¹⁵⁷	BIC was lowest in final MCS model.

Convergent Validity

Pearson's correlation coefficient	Convergent validity evidence is obtained when "two measures that we expect to be related are actually related in an empirically demonstrable manner". ^{110(p.139)}	The MCS correlated as hypothesised. See Table 6.
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Internal Consistency Reliability

Corrected item-total correlation	The correlation between an individual scale item and the total scale score (excluding that item) assesses the item's contribution to scale reliability; coefficients >.30 suggests the item measures the same underlying construct and indicates internal consistency. ^{111,112}	Sample 1 = .34-.60 Sample 2 = .32-.39
Mean inter-item correlation	The average correlation between all pairs of scale items, indicating overall internal consistency of a scale. Recommended in scales with <10 items. ^{116,125} The mean inter-item correlation should fall between .2 and .4. ^{124,125}	Sample 1 = .32 Sample 2 = .25
Coefficient <i>H</i>	A measure of a scale's internal consistency accounting for factor loadings and residual errors. Ideally should be $\geq .70$ ¹²⁰ ; however, $\geq .60$ is acceptable in exploratory research and scale development. ¹²⁸	Sample 1 = .76 Sample 2 = .59

Note. Absolute fit indices "demonstrate which proposed model best fits all available models and determine the match between sample data and a priori model".^{155(p.2)} Incremental fit indices "are part of a family of relative fit measures for structural equation modeling that involves locating a model of interest within a continuum of models from the worst fitting baseline model to the perfect fitting or saturated model".^{158(p.935)}

3. Results

Descriptive statistics of both samples are displayed in Table 3. Initially, when entering all meat and intention items into the analysis at once, EFA indicated the presence of two latent factors, representing a *Meat Consumption* factor and an *Intention to Eat Meat* factor. However, CFA model fit indices did not support the two-factor structure (see Supplementary C). Therefore, we ran separate analyses, firstly on the meat items and secondly on the intention items, to explore the validity of these items as stand-alone scales.

Table 3
Descriptive Statistics

Variable	Sample 1 N=183		Sample 2 N=460	
	M	SD	M	SD
Meat Consumption Total	48.09	35.91	50.58	27.12
Meat Items				
Beef	13.10	13.74	13.49	10.75
Lamb	3.28	5.57	2.80	4.05
Poultry	16.66	12.88	20.44	13.08
Pork/bacon/ham	9.66	11.57	9.25	9.44
OPM	5.39	8.25	4.59	5.40
Fish/seafood	7.53	11.50	6.96	7.34
Meat-Eating Intention Total	-1.63	4.77	-.29	3.21
Intention Items				
Beef Intention	-.28	1.26	-.17	.94
Lamb Intention	-.07	1.22	-.00	1.07
Poultry Intention	-.06	1.04	.09	.87
Pork/bacon/ham Intention	-.57	2.09	.05	1.47
OPM Intention	-.66	1.36	-.25	.97
Fish/seafood Intention	.20	1.19	.47	1.10
Validation Variables				
Meat-eating habit strength	—	—	19.20	4.66
Attitude to eating meat	—	—	11.73	2.65
Subjective norm	—	—	25.53	5.35
Perceived behavioural control	—	—	15.12	2.71
Willingness to reduce meat	—	—	6.62	2.75
intake	—	—	10.71	5.32
Meat disgust	—	—	234.28	114.59
Animal empathy	—	—	84.35	84.35
Meat-eating justifications	—	—	79.56	16.68
Traditional masculinity	—	—	7.57	3.18
Social dominance orientation	—	—		

Note. M = mean; SD = standard deviation; OPM = other processed meat.

3.1. Exploratory and confirmatory factor analysis of the Meat Consumption Scale (MCS)

3.1.1. Preliminary EFA Analyses of the Meat Consumption Scale (Sample 1)

There were no major violations in the data, according to assumptions outlined by Allen, Bennett, and Heritage (2014), except for lamb (skewness=3.06, kurtosis=13.24) and fish/seafood (skewness=4.07, kurtosis=23.25) consumption, which exceeded the recommended cut-off of ± 3 for skewness, and ± 10 for kurtosis,¹²⁹ indicating non-normality. However, EFA is robust against violations of normality.¹⁰² Seventeen missing values were replaced using personal mean substitution. Bartlett's test of sphericity was significant, and Kaiser-Meyer-Olkin's test of sampling adequacy value of .707 indicated the data were suitable for factor analysis.¹⁰⁹ The determinant value (.341) was greater than .00001, indicating no multicollinearity.¹⁰²

3.1.2. EFA Results of the Meat Consumption Scale

Velicer's Revised MAP test indicated the presence of one factor, with the smallest average 4th power partial correlation = .0055. Moreover, a one-factor solution made theoretical sense, encompassing an individual's overall meat consumption. A principal axis factoring analysis specifying one fixed factor was run, converging in 9 iterations. Visual inspection of a scree plot supported the presence of one factor (Figure 1). For the fish/seafood item the factor loading fell below .40 and the corrected item-total correlation fell below .30 (see Table 4), indicating this item did not adequately represent the latent factor and should be removed from the scale.^{110, 127} Therefore, we reran Velicer's test and the EFA excluding the fish/seafood item. All factor loadings exceeded the .4 threshold, and all corrected item-total correlations exceeded the .30 threshold (Table 5). Again, Velicer's test determined the presence of one factor (smallest average 4th power partial correlation = .0095), which was supported by the scree plot (Figure 2). The final meat consumption factor (excluding fish/seafood), representing The Meat Consumption Scale (MCS), explained 46.03% of

variance in the questionnaire data and demonstrated acceptable internal consistency reliability (all corrected item-total correlations $>.30$, mean inter-item correlation $=.32$, $H = .757$). The EFA results suggest that the scale captured land-based meat consumption, consistent with the European Union definition of meat.⁸⁴

Table 4

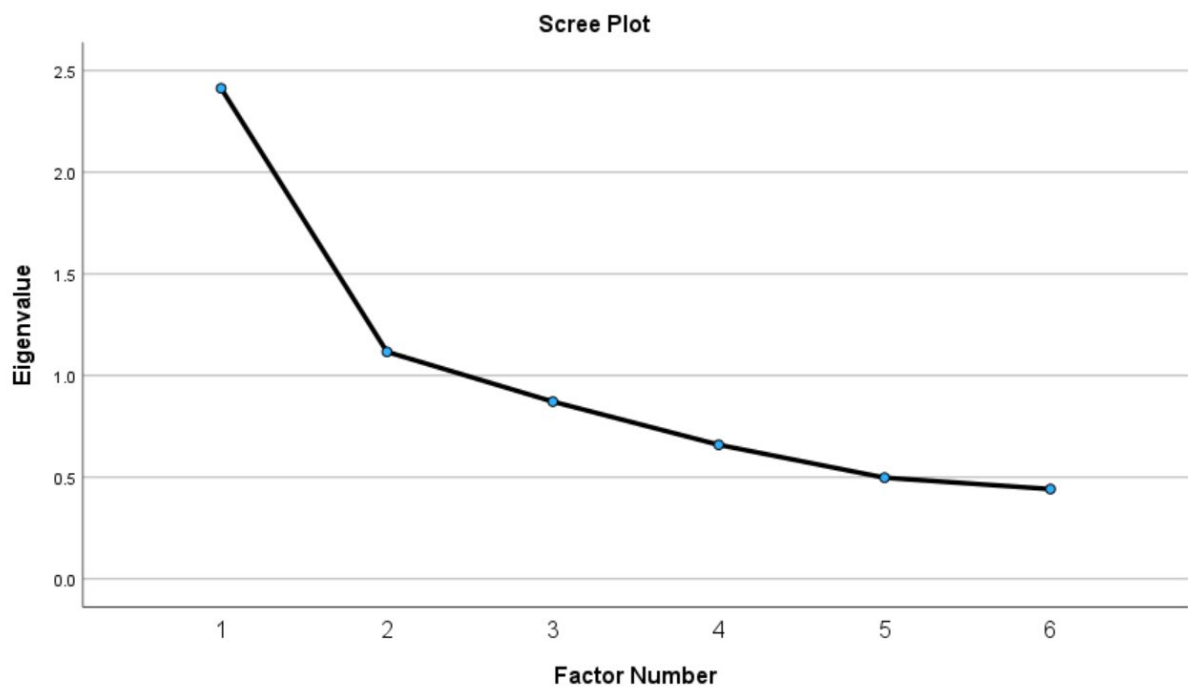
First EFA of Meat Items Including Fish/seafood

Scale Item	Factor loadings	Corrected item-total correlation
Beef	.756	.574
OPM	.665	.547
Pork/bacon/ham	.516	.397
Lamb	.455	.412
Poultry	.451	.356
Fish/seafood	.302	.232

Note. Exploratory factor analysis conducted on MCS items with sample 1, using principal axis factoring. OPM = other processed meats.

Figure 1.

Scree Plot of First EFA on Meat Items (Including Fish/seafood)



Note. The scree plot in Figure 1 displays the eigenvalues from the exploratory factor analysis run on meat consumption items when including the fish/seafood consumption item. A distinct decline after the first factor indicates that a single underlying factor accounts for the majority of variance. This suggests that the MCS is best represented by one primary construct.

Table 5

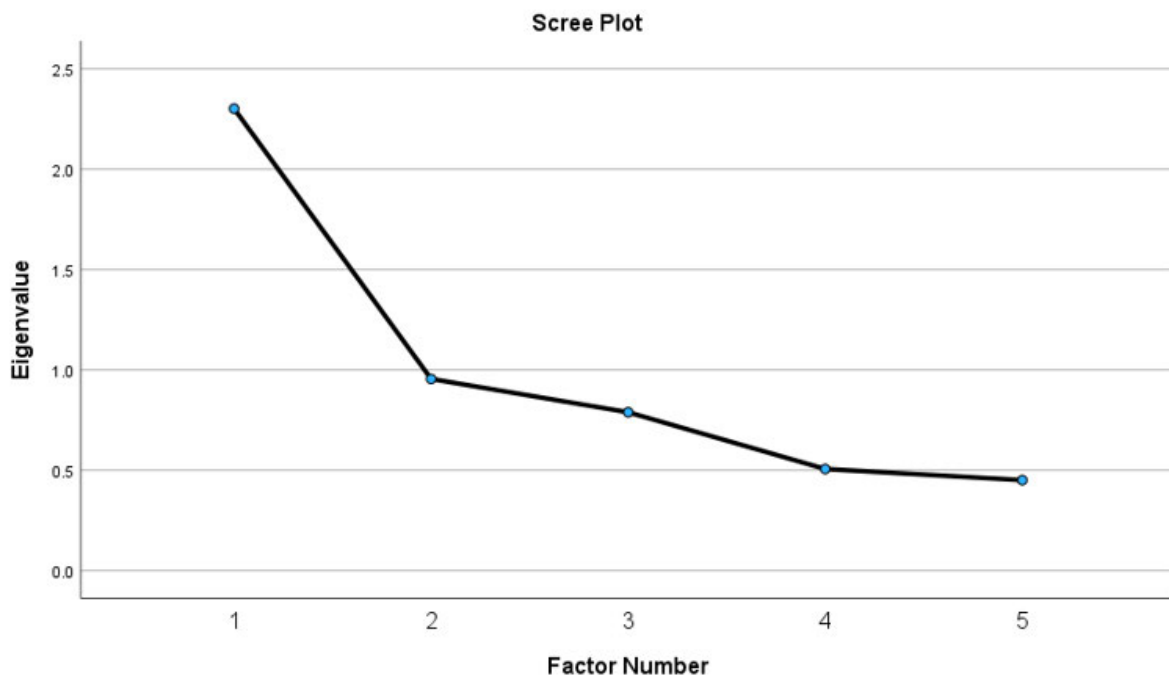
Second EFA of Meat Items Excluding Fish/seafood

Scale Item	Factor loadings	Corrected item-total correlation
Beef	.765	.596
OPM	.679	.563
Pork/bacon/ham	.530	.413
Poultry	.461	.382
Lamb	.403	.339

Note. Exploratory factor analysis conducted on MCS items with sample 1, using principal axis factoring. OPM = other processed meats.

Figure 2.

Scree Plot of Second EFA of Meat Items (Excluding Fish/seafood)

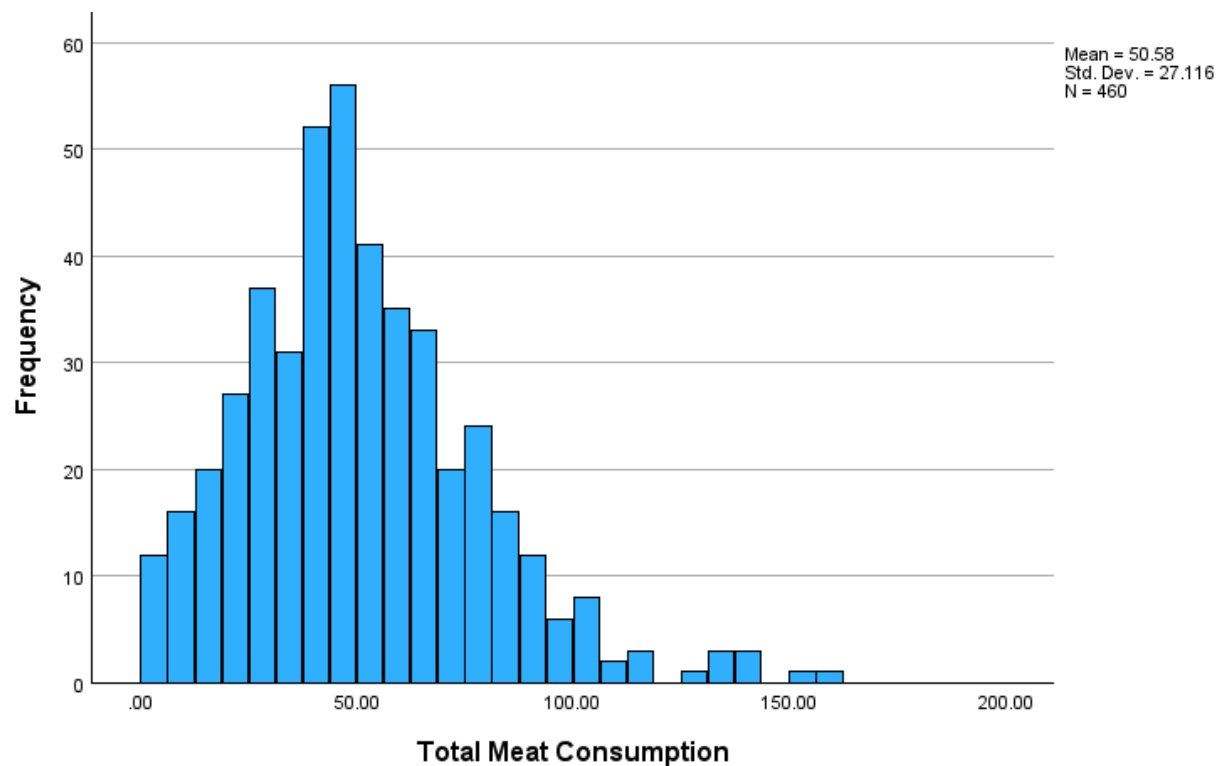


Note. The scree plot in Figure 2 displays the eigenvalues from the exploratory factor analysis run on meat consumption items when excluding the fish/seafood consumption item. A distinct decline after the first factor indicates that a single underlying factor accounts for the majority of variance, and hence, that the MCS is best represented by one primary construct.

3.1.3. Preliminary CFA Analyses of the Meat Consumption Scale (Sample 2)

Skewness and kurtosis values fell into the acceptable range of ± 2 for skewness and ± 10 for kurtosis for CFA,¹²⁹ indicating univariate normality. Thirty-five multivariate outliers were detected with Mahalanobis distance and removed from the dataset.

Bootstrapping was performed (5000 samples), as the multivariate kurtosis critical ratio value of 25.87 indicated that multivariate normality was violated.¹³⁰ A frequency distribution of the total meat consumption scores are displayed in Figure 3.

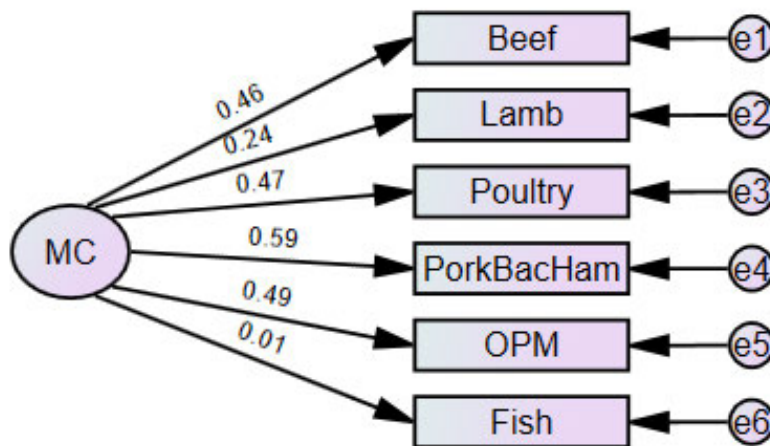
Figure 3.*Distribution of Meat Consumption Scores in Sample 2*

3.1.4. CFA Results of the Meat Consumption Scale (Model 1)

Confirmatory factor analysis was conducted to assess the validity of the latent unidimensional meat consumption construct identified in the EFA. We first ran a CFA including the fish/seafood item (Figure 4). Consistent with the EFA results, all standardised path coefficients were significant ($p < .001$), except for fish/seafood ($\beta = .014$, $p = .846$), confirming that the fish/seafood item should be excluded from the scale.

Figure 4.

Meat Consumption Factor Tested in CFA Model (Including Fish/seafood)

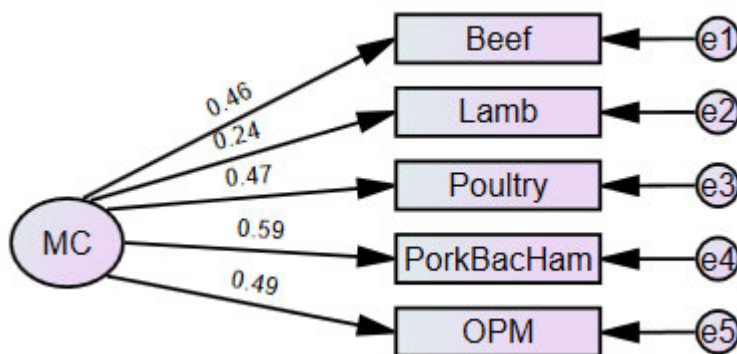


Note. Figure 4 shows the confirmatory factor analysis model testing the validity of the unidimensional latent meat consumption construct identified with EFA in sample 1. We included fish/seafood in this model to confirm the exclusion of fish/seafood determined by the EFA. Standardised factor loadings are displayed. All loadings were significant except for fish/seafood consumption, confirming that fish/seafood should be excluded from the scale.

Figure 5 represents the tested meat consumption CFA model when excluding fish/seafood. Standardised path coefficients were all significant ($p < .001$) and of moderate strength, except for lamb, which again had a weak but significant coefficient (.238, $p < .001$). All errors and squared multiple correlations were significant ($p < .001$). The Bollen-Stine chi-square fit index was not significant ($p = .063$), indicating the exact-fit hypothesis should be not be rejected (i.e., good model fit). All additional fit indices met recommended thresholds, indicating good model fit (CMIN/DF=2.623, NFI=.924, TLI=.900, CFI=.950, RMSEA=.059, SRMR=.0355). Corrected item-total correlations exceeded the minimum .30 threshold (ranging from .335-.386), with the exception of lamb (.179). Coefficient $H = .593$.

Figure 5.

Meat Consumption Factor Tested in CFA model (Excluding Fish/seafood)



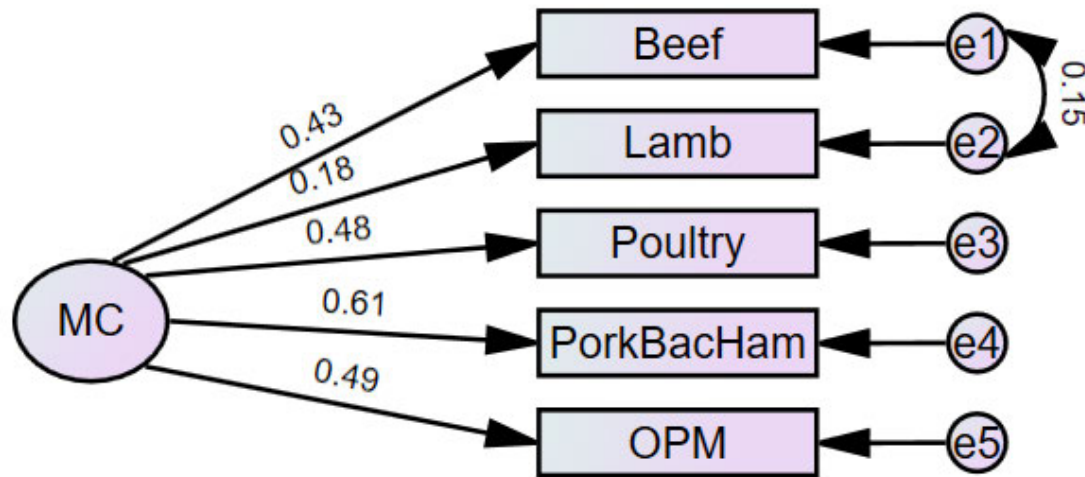
Note. Figure 5 shows the confirmatory factor analysis model testing the validity of the unidimensional latent meat consumption construct identified with EFA in sample 1. Standardised factor loadings are displayed. All loadings were significant.

3.1.5. CFA Results of the Meat Consumption Scale (Model 2)

Modification indices suggested that the model could be improved by covarying e1 (beef error) with e2 (lamb error). The revised model was rerun, applying a covariance between e1 and e2 (Figure 6). Standardised path coefficients were all of moderate strength and significant, except for lamb. The covariance between e1 and e2 was significant (estimate = 5.644, $p=.010$, 95% CI [1.555, 10.560]), and the correlation between e1 and e2 was significant (estimate=.147, $p=.014$, 95% CI [.036, .259]), suggesting that beef and lamb may represent a single construct (red meat). All errors and squared multiple correlations were significant ($p<.001$). The Bollen-Stine chi-square index was not significant ($p=.375$), indicating good model fit. Additional model fit indices showed good model fit (CMIN/DF=1.293, NFI=.970, TLI=.982, CFI=.993, RMSEA=.025, SRMR=.0208). Coefficient $H = .594$.

Figure 6.

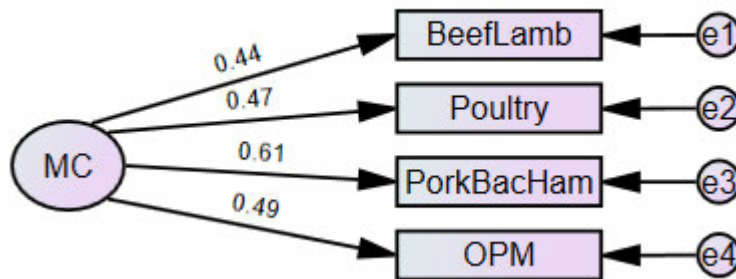
CFA of Revised Meat Consumption Model (Covariance Between e1 and e2).



Note. Figure 6 shows the confirmatory factor analysis model testing the validity of the unidimensional latent meat consumption construct adjusted with modification indices (covariance between e1 and e2). The displayed standardised factor loadings were all significant. The covariance between e1 and e2 was significant.

3.1.6. CFA Results of the Meat Consumption Scale (Final Model)

Modification indices showed that error terms for the beef and lamb items were correlated, suggesting that beef and lamb may represent a single “red meat” construct. Therefore, the CFA model was rerun with beef and lamb summed together as a single item (Figure 7).

Figure 7.*Revised and Final Meat Consumption CFA Model*

Note. Figure 7 shows the confirmatory factor analysis model testing the validity of the final version of the MCS, when beef and lamb consumption items are summed together into one item to represent a single “red meat” consumption item. The displayed standardised factor loadings were all significant. All seven model fit indices showed excellent model fit. Notably, the AIC and BIC values were lowest in this model, suggesting it provided the best fit compared to the previous CFA models.

In the final Meat Consumption CFA model, all standardised regression coefficients were of moderate strength and significant ($p \leq .001$). All errors were significant ($p < .001$). Squared multiple correlations for OPM (.243, $p < .001$), pork/bacon/ham (.373, $p < .001$), poultry (.224, $p < .001$), and beef/lamb (.192, $p = .001$) were all significant. The Bollen-Stine chi-square value was not significant ($p = .406$), indicating good model fit. All fit indices showed excellent model fit (CMIN/DF=1.275, NFI=.983, TLI=.988, CFI=.996, RMSEA=.024, SRMR=.0178). Additionally, AIC (18.551) and BIC (51.601) were lower than values in the original model which included fish/seafood (AIC=45.550, BIC=95.125), the model where beef and lamb were entered as separate items (AIC=33.114, BIC=74.426), and the model covarying e1 with e2 (AIC=27.174, BIC=72.617), indicating that the final model combining beef and lamb into one item was the best fitting model. Modification indices showed no suggestions for model improvement.

The final MCS showed acceptable internal consistency reliability, as all corrected inter-item correlations exceeded .30 (beef/lamb=.324, poultry=.346, pork/bacon/ham=.386, OPM=.335) and the mean inter-item correlation of .25 fell within the optimal range of .2-.4 (Pallant, 2004). Coefficient $H = .590$ fell just below the .60 threshold.

3.2. Evaluation of Construct Validity Based on Relationships with Theoretically Related Variables

3.2.1. Correlations Between the Meat Consumption Scale and Demographic Variables (Sample 1)

In sample 1, correlation analyses were conducted with the MCS (excluding fish/seafood) and three demographic variables: age, gender (female=0, male=1, other genders excluded from analysis), and education (0=below university education, 1=completed university education). Gender is a strong predictor of meat consumption, with men more likely than women to eat meat.¹³⁰ Higher education tends to be associated with lower meat consumption.¹³¹ Various studies have found meat consumption to be negatively correlated with age.^{43,133,134}

Consistent with the literature, the MCS was significantly, moderately positively correlated with gender ($r=.34, p<.001$), indicating that men tended to eat more meat. An independent samples t -test showed that men ($M = 60.99, SD = 4.18$) consumed significantly more meat than women ($M = 36.89, SD = 28.93$), $t(174) = -4.74, p<.001$, with a large effect size (Cohen's $d = -0.72$). Meat consumption and education were significantly but weakly negatively correlated ($r=-.15, p=.039$), indicating, in line with the literature, that there was a tendency for people who had completed university education to eat less meat. An independent samples t -test showed that participants with a university-level education ($M = 41.74, SD = 33.73$) consumed significantly less meat than those with lower levels of education ($M = 52.81, SD = 36.90, t(181) = 2.08, p=.020$, with a small-to-medium effect size

(Cohen's $d = 0.31$). As expected, there was a weak but significant negative correlation between the MCS and age ($r = -.17, p = .024$), with older people tending to eat less meat.

To further explore the validity of the MCS, we ran correlations between these demographic variables using the MCS when *including* the fish/seafood item. The MCS (including fish/seafood) was significantly, moderately positively correlated with gender ($r = .32, p < .001$), but was no longer significantly correlated with education ($r = -.14, p = .055$) or age ($r = -.13, p = .093$). Hence, the correlations showed stronger evidence of convergent validity for the MCS when *excluding* the fish/seafood item, further supporting the land-based meat consumption construct identified in the EFA and CFA analyses.

3.2.2. Correlations Between the Meat Consumption Scale and Theoretically Related Variables (Sample 2)

In sample 2, correlations were performed between the final version of the MCS and variables known to be associated with meat consumption (Table 6). Meat consumption is positively associated with having a positive attitude towards eating meat,^{135,136} meat-eating habit strength,³⁰ social dominance orientation,^{137,138} meat-eating justifications,^{95, 139} and traditional masculinity.^{95, 140} Meat consumption is negatively associated with disgust,¹⁴¹ animal empathy,^{142,143} subjective norms regarding meat-reduction,^{33, 62} perceived behavioural control regarding meat-reduction,^{30, 62} and willingness to reduce meat consumption.^{144,145} Results of bivariate correlations indicated that the MCS correlated weakly to moderately, and significantly, in the expected direction with all validation variables (Table 6).

Table 6
Convergent Validity: Correlations between the Meat Consumption Scale (MCS) and Theoretically Related Variables

Validation Variable	MCS
Meat-eating habit strength	.40***
Attitude	.37***
Subjective norm	-.10*
Perceived behavioural control	-.16***

Willingness to reduce meat consumption	-.35***
Meat disgust	-.36***
Animal empathy	-.20***
Meat-eating justifications	.27***
Traditional masculinity	.21***
Social dominance orientation	.17***

Note. Pearson's r bivariate correlation coefficient values reported between the final MCS (excluding fish/seafood consumption) and ten meat-related constructs, run with sample 2.

* $p < .05$, ** $p < .01$, *** $p < .001$.

3.3. EFA & CFA of the Intention to Eat Meat Scale

3.3.1. Preliminary EFA of Intention to Eat Meat Items

There were no major violations in the data, according to EFA assumptions.¹⁰²

Skewness and kurtosis values indicated univariate normality. Ten missing intention scores were replaced with a zero, indicating no intended changes. Bartlett's test of sphericity was significant, and Kaiser-Meyer-Olkin's test of sampling adequacy value of .662 was greater than .50, indicating the data were suitable for factor analysis.¹⁰⁹ The determinant value (.361) was greater than .00001, indicating no multicollinearity.

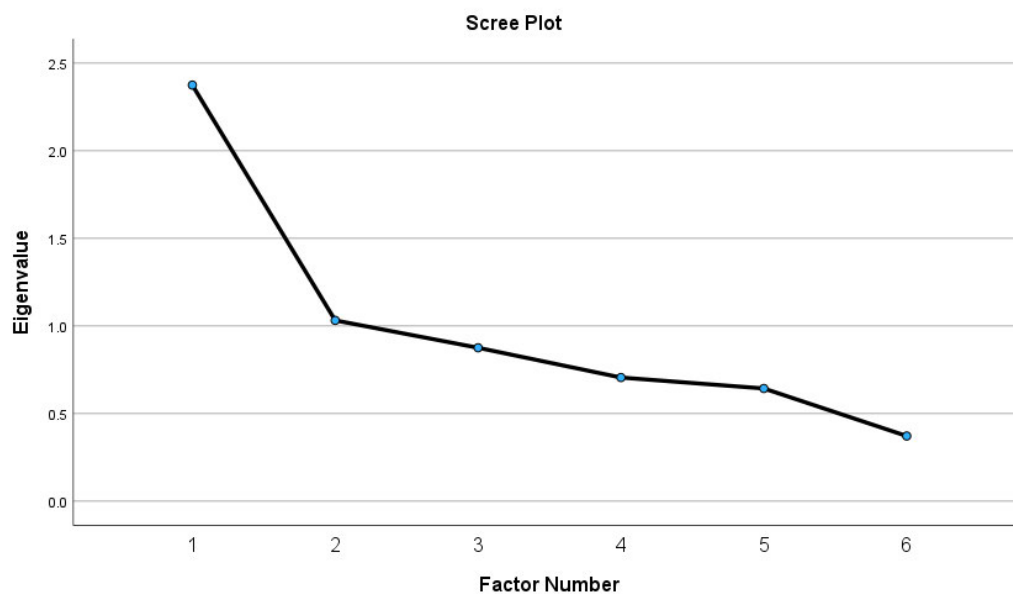
3.3.2. EFA Results of Intention to Eat Meat Factor

Velicer's Revised MAP test indicated the presence of one factor, with the smallest average 4th power partial correlation = .0083. A one-factor solution was supported by visual inspection of a scree plot (Figure 8). Moreover, a one-factor solution made theoretical sense, encompassing an individual's overall intention to eat meat. A principal axis factoring analysis specifying one fixed factor was run, converging in 6 iterations. The intention to eat meat factor (including fish/seafood) explained 39.57% of variance in the questionnaire data and demonstrated acceptable internal consistency reliability (mean inter-item correlation = .27; $H = .72$). All intention scale item loadings exceeded 0.40, and all corrected item-total correlations exceeded .30, except for fish/seafood, indicating this item should be dropped (see Table 7). Therefore, we reran the analysis excluding fish/seafood. According to Velicer's

Revised MAP test, the smallest average 4th power partial correlation = .0171, indicating no latent factors in the data when fish/seafood intention was excluded from the scale. As the EFA did not reveal a latent construct representing the participants' intention to eat meat, no further analyses were performed on the intention items.

Figure 8.

Scree Plot of First EFA of Intention to Eat Meat Items Including Fish/seafood



Note. Figure 8 displays the eigenvalues from the exploratory factor analysis of intention items when including the fish/seafood intention item. A distinct decline after the first factor indicates that a single underlying factor accounts for the majority of variance, and hence, that the meat-eating intention items are best represented by one primary construct.

Table 7

EFA of Meat-Eating Intention Items

Scale Item	Factor loadings	Corrected item-total correlation
Beef intention	.652	.496
Pork/bacon/ham intention	.620	.507
OPM intention	.556	.469

Lamb intention	.530	.425
Poultry intention	.448	.365
Fish/seafood intention	.307	.258

Note. Exploratory factor analysis conducted on intention to eat meat items using principal axis factoring. OPM = other processed meats.

4. Discussion

Due to the lack of psychometrically validated meat consumption and meat-eating intention questionnaires, the current study aimed to develop a questionnaire to measure an individual's meat consumption and their intentions to eat meat in the future. Analyses did not yield psychometric support for the meat-eating intention items. However, psychometric evidence was obtained from two independent Australian samples, providing preliminary evidence of construct the validity of a final 12-item Meat Consumption Scale (MCS) as a stand-alone questionnaire. The MCS measures an individual's total land-based animal meat consumption (red meat, poultry, pork products, and other processed meats), reflecting a Western-style conceptualisation of meat consumption. It is the first psychometrically validated scale to measure meat consumption efficiently in a fast, free, one-time assessment tool, taking an average of less than five minutes to complete.

4.1. The Meat Consumption Scale (MCS)

The MCS measures a person's meat consumption over the previous 2-week period, capturing consumption of meat typical in a Western diet: red meat (beef and lamb), poultry products (e.g., chicken, turkey, and duck), pork products (pork, bacon and ham) and other processed meats (e.g., sausages, salami, hot dogs etc.). Exploratory factor analysis of meat items provided preliminary evidence of construct validity, revealing a unidimensional latent factor representing overall consumption of land-based animal meat products (excluding fish/seafood). Further evidence of construct validity was obtained from confirmatory factor analysis, which confirmed the exclusion of fish/seafood and indicated that the unidimensional

MCS showed excellent model fit on all seven fit indices. Significant correlations in the hypothesised direction between the MCS and ten meat-related constructs, and three demographic variables, provided additional evidence of construct validity.

The reliability of the MCS was generally satisfactory. Mean inter-item correlations and corrected total-item correlations fell within acceptable ranges in both samples. However, coefficient *H* in the CFA sample (.59) fell just below the .60 threshold. This suggests that while individual items demonstrated adequate reliability, the internal consistency of the overall scale was slightly weaker. From an item response theory perspective, this is less concerning, as reliability at the item level is often prioritised over the internal consistency of the total scale.⁷⁵ Given that “there is no absolute interpretive guideline or cutoff score for any reliability index”,^{120(p.99)} this does not necessarily undermine the scale’s reliability, particularly because as it can be expected to see some variability in people’s preferences for different meat types. Unfortunately, it is difficult to compare the reliability of the MCS with previous meat consumption measures, as we found that researchers did not report reliability statistics of their scales and often used single-item measures. Only one study reported internal consistency reliability of their overall meat consumption total score, which included three items measuring frequency of meat, poultry, and fish consumption, also finding relatively low internal consistency reliability ($\alpha=.52$).¹⁴⁶ Importantly, since previous researchers have not psychometrically validated their meat consumption measurement tools, the MCS provides a more robust measure of individual meat consumption behaviour than previously available.

Results suggested that the fish/seafood item did not belong to the latent construct representing meat consumption, consistent with the European Union definition of “meat”.⁸⁴ This may not be the case in other samples and other cultures. There are language and cultural variations in whether there is a generic term or construct for the consumption of animal flesh. We recognise that the American Meat Association,⁸⁰ and numerous researchers, have

included fish/seafood in their conceptualisation of “meat”. We encourage further validation testing of the MCS to establish the inclusion status of fish/seafood in other samples. We also included only one item to capture fish and seafood consumption rather than separating these into distinct categories, which could have influenced fit.

4.1. Implications

To mitigate the detrimental impacts of excessive meat consumption on human and planetary health it is important to understand the psychology of meat consumption to develop effective meat reduction interventions and policies. Accurately measuring consumers’ meat consumption is crucial for quantitative studies aiming to understand, compare, predict, and change meat consumption patterns. The MCS is a rigorously developed, fast, affordable, and easy to use self-report questionnaire measuring an individual’s meat consumption behaviour, taking on average less than five minutes to complete. The scale enables researchers to take a snapshot of consumers’ meat consumption patterns within a 2-week period, ideal for use in cross-sectional or experimental studies. The MCS provides a total meat consumption score, or can provide total scores for four different meat categories (red meat, poultry, pork products, other processed meats) which may be useful in certain applied or research contexts.

Our analyses confirmed that the MCS has a well-fitting unidimensional latent structure that correlated accurately with ten meat-eating related constructs commonly used in meat consumer research, such as meat-eating habit strength, meat disgust, meat-eating justifications, animal empathy, social dominance orientation, masculinity, and willingness to reduce meat consumption. The MCS correlated accurately with the Theory of Planned Behaviour constructs (meat-eating attitude, subjective norm, and perceived behavioural control), which are frequently used in psychological studies predicting meat consumption behaviour. The MCS contains multiple items, which makes it suitable for structural equation modeling¹⁴⁷ and enhances predictive validity compared to single-item measures.⁴⁸

The MCS can potentially enhance the methodological quality of meat consumption research in psychology, particularly in the key areas of environmental, moral, and consumer psychology where meat consumer behaviour has gained the most interest. Moreover, as the study of individual meat consumption spans multiple disciplines, the MCS can be used by researchers and organisations in the areas of environmental science and sustainability, personal and public health, nutrition, food policy, sociology, ethics, and marketing and consumer behaviour.

4.2. Limitations & Future Research

This study provides preliminary psychometric evidence supporting the validity of the MCS. As a newly developed instrument, additional validation studies would enhance the psychometric validity of the scale. Test-retest reliability could be assessed in future research. One limitation of this study was the lack of criterion validity to test how well the MCS corresponds with actual meat consumption. Future validation studies could establish criterion validity for the MCS by using dietary records, where participants record their meat consumption over the two-week period at the time of the eating occasion to avoid recall error, or using a 24-hour dietary recall diary.¹⁴⁸ At minimum future research will need to establish criterion validity by comparing the MCS to existing FFQ meat-eating items. Moreover, this study did not assess discriminant validity, which should be a priority in future validation testing. Some confounding variables were also not controlled for such as food attitudes, dietary requirements, and religiosity.

Another limitation was that the MCS was developed using two convenience (i.e., non-representative) Australian samples, introducing self-selection bias. The samples were not comparable to the general Australian population. In 2021, 50.7% of the Australian population were female and 49.3% were male.¹⁴⁹ The mean age of the Australian population in 2023 was 38.3, compared to a mean of 40.15 in Sample 1 and 35.79 in Sample 2. Of people aged 15-74,

63% of the Australian population had a non-school (i.e., higher education) qualification,¹⁵⁰ compared to 72.1% in Sample 1 and 80.6% in Sample 2. Approximately 73% of the Australian population live in major cities¹⁵¹; in Sample 2 85.1% were living in a metropolitan area (Sample 1 not measured). Therefore, results cannot be generalised to the Australian population or other cultures.

In addition, although the scale was developed with reference to common meat types consumed across English-speaking nations, the use of an exclusively Australian sample reflects cultural nuances that may limit generalisability. For example, in Australia, lamb holds symbolic national significance and is promoted as part of Australian identity, particularly through industry-driven campaigns around Australia Day.^{152,153} In other English-speaking countries such as the United States or Canada—where lamb is consumed less frequently and is not culturally prominent¹⁵⁴—the structure or interpretation of meat types may differ. The merging of the beef and lamb items is consistent with findings that Australian consumers who like beef also tend to consume more lamb compared to consumers who are indifferent to red meat.¹⁵⁵ However, this pattern may not apply in other cultural contexts where lamb is less commonly consumed or lacks the same symbolic or economic relevance. As such, further validation of the MCS in other national and cultural settings—including within other English-speaking Western populations—is necessary to assess whether the factor structure and item relevance generalise beyond the Australian context.

As with all recall-based questionnaires, recall bias is an inherent limitation of the MCS. The task of recalling meat consumption and portion sizes over the past two weeks may be challenging, particularly for irregularly consumed items. However, we selected a two-week recall period to balance recall accuracy and feasibility, as shorter periods are more suitable for frequent behaviours like eating.⁹¹ This approach minimises recall bias compared to the typical 12-month period used in standard food frequency questionnaires.

Researchers should also note that the MCS showed acceptable internal consistency reliability in both samples when measured by mean inter-item correlations and corrected item-total correlations, but only reached acceptable levels in one sample when measured by coefficient *H*. Item wording may have affected the scale reliability. For example, the term “junk food meats” in the definition provided for the other processed meats category may have introduced bias by eliciting negative associations. Hence, we removed this term from the final scale. Another factor that may have affected reliability is the scoring method, which multiplies frequency by quantity. While a frequency-only scale might yield higher reliability, we believe incorporating quantity provides a more accurate measure of meat consumption, as portion sizes vary significantly and reflect real-world consumption patterns. Therefore, the lower reliability scores may reflect genuine variability in participants’ meat consumption, offering a more accurate representation of their “true” score despite the lower internal consistency. As reliability estimates under classical test theory scale development approaches rely on participants characteristics as well as performance of the measurement instrument itself,⁷⁵ reliability of the MCS may be different when assessed with an item response theory approach to reliability assessment (e.g., item parameters like difficulty or discrimination; personal reliability). Item response theory approaches to scale validation assess reliability of scale items independent of participant variation and emphasise the reliability of individual items rather than the scale as a whole.⁷⁵ Alternatively, the meat consumption scale may work better as a formative construct, where each item contributes a unique facet to the overall construct (i.e., the construct of “meat consumption” is defined as the combination of its components). In this case, internal consistency reliability is not a relevant measure of reliability, as formative scale items are not expected to correlate.⁷⁵ To improve methodological rigour and facilitate the evaluation of meat consumption measures in future

research, we encourage researchers to report reliability estimates of their meat consumption measures.

It is also important to consider how the MCS's frequency \times quantity scoring method may influence score interpretation. While this approach enhances ecological validity by more closely reflecting real-world consumption, it also introduces greater variability, which may contribute to lower internal consistency—even when accurately capturing individual differences in consumption patterns. Because total scores reflect the product of two dimensions—how often (frequency) and how much (quantity) meat is consumed—they do not indicate which component is driving a higher score. For example, a high score may reflect habitual consumption (i.e., higher frequency), large portion sizes, or both. This means that individuals with different consumption patterns can yield similar total scores. Moreover, the total score does not represent an objective quantity of meat consumed (e.g., in grams), but rather serves as a relative measure that is most meaningful when interpreted comparatively or used in statistical analyses.

In addition, the item wording may have introduced ambiguity that could influence response accuracy. Some items required participants to exclude certain meats from one category and reassign them to another (e.g., excluding corned beef and beef jerky from “beef,” or turkey slices from “poultry”), which may not reflect how participants typically classify these foods. Estimating portion size as a percentage of a “typical meal” also introduces a subjective reference point that likely varies across individuals, increasing cognitive burden and response variability. Future research could explore alternative scoring methods or simplified item formats to determine whether psychometric properties can be improved without compromising measurement accuracy.

As we did not find psychometric evidence supporting validity of the Intention to Eat Meat Scale, further refinement, development, and validation of this scale is needed. A scale

measuring meat-eating intentions would be useful for researchers applying theories where intention is a key construct (e.g., Theory of Planned Behaviour⁵²; Protection Motivation Theory¹⁵², Theory of Interpersonal Behaviour¹⁵³). A key difference between the current and previous studies' meat-eating intention items is that we measured intention to eat various types of meat, whereas previous studies measured intentions regarding *overall* meat consumption. This may explain why the items did not form a coherent latent construct. Another potential limitation of our Intention to Eat Meat Scale was that we measured intentions regarding the upcoming two-week period, which is relatively short. Given that meat consumption is highly habitual and unconscious,³⁰ intention may be less relevant in the short term. Consumers may have clearer intentions regarding their meat consumption over a longer timeframe, such as the next six months or year. Therefore, the 2-week intention period may be more appropriate for intervention studies aimed at immediate behavioural change, though less suitable for cross-sectional surveys assessing general intentions to change behaviour.

4.3. Conclusion

Overall, results provide preliminary psychometric evidence supporting the reliability and construct validity of the 12-item Meat Consumption Scale (MCS), measuring an individual's total consumption of land-based animal meats (i.e., red meat, poultry, pork products, and other processed meats), which captures a typical Western-style meat-eating pattern. This is the first psychometrically evaluated scale measuring overall meat consumption that can be administered within minutes as a fast, one-time assessment tool. However, as this represents an early stage of scale development, further validation is recommended—including assessment of criterion validity, discriminant validity, test-retest reliability, and cross-cultural generalisability—before the scale is presented as fully validated and ready for general use. Given that the MCS has undergone more rigorous psychometric

testing than other ad-hoc meat consumption measures utilised in the literature, the MCS currently stands as the best available option for those seeking to measure meat consumption as a one-off assessment tool. We encourage other researchers to provide further evidence for the reliability and validity of the scale in other samples.

Declarations

Ethics approval and consent to participate

This study was conducted in accordance with the Code of Ethics of the World Medical Association and with approval from the Victoria University Human Research Ethics Committee (application ID: HRE21-162, 14/3/22). All participants provided informed consent.

Consent for publication

Not applicable.

Availability of data and materials

The final psychometrically validated 12-item version of the Meat Consumption Scale is provided in Appendix A. The datasets supporting the conclusions of this article are available in the EASY data repository, <https://doi.org/10.17026/dans-z9x-8cpw>.

Competing interests

The authors declare that they have no competing interests.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Author Contributions

Lauren Camilleri: conceptualisation, methodology, data curation, formal analysis, writing – original draft. Abdul Rehman: conceptualisation, data collection. Andrew Jago,

Peter Richard Gill: conceptualisation, methodology, supervision, writing – review and editing.

Acknowledgements

The authors would like to thank the research participants and the anonymous reviewers for their valuable feedback.

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Appendix A (Chapter 6)

The Meat Consumption Scale (MCS)

For any use of the Meat Consumption Scale, please cite:

Camilleri, L., Jago, A., Rehman, A., & Gill, P. R. (2025). Development and preliminary validation of the Meat Consumption Scale. *BMC Psychology*, <https://doi.org/10.1186/s40359-025-03270-2>.

Instructions for participants:

The following questions relate to your consumption of meat in the **past two weeks**, including *all* meals (main meals and snacks). Please ensure you read the definition of each meat category, as some meat products may be excluded.

You will be asked to estimate how many times you have consumed different types of meat in the past 2 weeks – please answer numerically (e.g., 5) rather than in words (e.g., “most days”). Please give an *exact* numerical value (e.g., 7) rather than a range (e.g., 6-7).

As this survey relies on memory, please give your *best estimation* of what you have eaten.

Questionnaire:

A: Beef (including steak, minced/ground beef, and beef burgers. Please exclude processed beef like jerky or corned beef)

1. Beef Frequency

Please indicate approximately how many times you have eaten **beef** in the past 2 weeks:

2. Beef Quantity

On these occasions you have eaten **beef** how would you describe your typical portion size?

- 1= Very Small (less than 10% of a typical meal)
- 2= Small (10- 20% of a typical meal)
- 3= Medium (21-30% of a typical meal)
- 4= Large (31-40% of a typical meal)
- 5= Very Large (more than 40% of a typical meal)

B: Lamb (including lamb and mutton)

3. Lamb Frequency

Please indicate approximately how many times you have eaten **lamb** in the past 2 weeks:

4. Lamb Quantity

On these occasions you have eaten **lamb** how would you describe your typical portion size?

- 1= Very Small (less than 10% of a typical meal)
- 2= Small (10- 20% of a typical meal)

- 3= Medium (20-30% of a typical meal)
- 4= Large (30-40% of a typical meal)
- 5= Very Large (more than 40% of a typical meal)

**C: Poultry (chicken, turkey, duck, and other game birds such as quail or pheasants etc.
Please exclude processed poultry meats such as chicken loaf or turkey slices)**

5. Poultry Frequency

Please indicate approximately how many times you have eaten **poultry** (such as turkey or duck) in the past 2 weeks: _____

6. Poultry Quantity

On these occasions you have eaten **poultry** how would you describe your typical portion size?

- 1= Very Small (less than 10% of a typical meal)
- 2= Small (10- 20% of a typical meal)
- 3= Medium (20-30% of a typical meal)
- 4= Large (30-40% of a typical meal)
- 5= Very Large (more than 40% of a typical meal)

D: Pork (please exclude processed pork such as bacon or ham)

7. Pork Frequency

Please indicate approximately how many times you have eaten **pork** in the past 2 weeks:

8. Pork Quantity

On these occasions you have eaten **pork** how would you describe your typical portion size?

- 1= Very Small (less than 10% of a typical meal)
- 2= Small (10- 20% of a typical meal)
- 3= Medium (20-30% of a typical meal)
- 4= Large (30-40% of a typical meal)
- 5= Very Large (more than 40% of a typical meal)

E: Bacon or Ham

9. Bacon/ham Frequency

Please indicate approximately how many times you have eaten **bacon or ham** in the past 2 weeks: _____

10. Bacon/ham Quantity

On these occasions you have eaten **bacon or ham** how would you describe your typical portion size?

- 1= Very Small (less than 10% of a typical meal)
- 2= Small (10- 20% of a typical meal)

- 3= Medium (20-30% of a typical meal)
- 4= Large (30-40% of a typical meal)
- 5= Very Large (more than 40% of a typical meal)

F: Other Processed Meats (including preserved, cured, salted, or smoked meats such as salami, chicken loaf, corned beef, canned meat, sausages, beef jerky and other meats such as hot dogs, meat pies and dim sims. Exclude bacon and ham)

11. Other Processed Meat Frequency

Please indicate approximately how many times you have eaten other **processed meats** in the past 2 weeks: _____

12. Other Processed Meat Quantity

On these occasions you have eaten **processed meats** how would you describe your typical portion size?

- 1= Very Small (less than 10% of a typical meal)
- 2= Small (10- 20% of a typical meal)
- 3= Medium (20-30% of a typical meal)
- 4= Large (30-40% of a typical meal)
- 5= Very Large (more than 40% of a typical meal)

Scoring Instructions for the Meat Consumption Scale

Step 1: For each of the six meat categories—

- A (beef)
- B (lamb)
- C (poultry)
- D (pork)
- E (bacon & ham)
- F (other processed meats)

—multiply the frequency score (number of times consumed in the past 2 weeks) by the quantity score (typical portion size) to create a total score for each meat category.

Step 2: Sum the total beef score with the total lamb score to create a total “red meat” score.

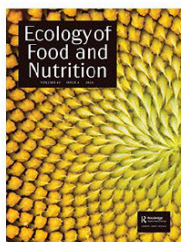
Step 3: Sum the total pork score with the total bacon & ham score to create a total “pork products” score.

Step 4: Sum these total scores together (red meat + poultry + pork products + other processed meats) to calculate a total *Meat Consumption* score.

Chapter 7: Understanding the Meat-Masculinity Link: Traditional and Non-Traditional Masculine Norms Predicting Men's Meat Consumption

This chapter presents the first main empirical study of this thesis, which sought to extend knowledge of the meat-masculinity link by identifying the masculine norms that predict men's meat consumption and their willingness to reduce their meat intake. While numerous studies have established an association between conformity to masculine norms and meat consumption, it is unclear which specific traditional and non-traditional masculine norms account for this relationship. To the author's knowledge, this was the first study to include both traditional and non-traditional masculinity ideology in a single analysis, allowing the identification of the most important masculine norms contributing to men's meat consumption. By taking a multidimensional approach, the study demonstrated that measuring masculinity as a unidimensional construct overlooks important facets of masculinity that act as barriers and facilitators of meat reduction. The study provides a more nuanced account of the meat-masculinity link.

This article was published in *Ecology of Food and Nutrition*, an international peer-reviewed journal that publishes a broad range of studies within the field of food and nutrition, such as food taboos and preferences; changing dietary habits; the relationship between food, culture and identity; food security and sustainability; and the political economy of food. In 2024 the journal had a SCImago ranking of 0.532 and a Scopus quartile ranking of Q2. In 2024, two articles were published in the media about this study; the first article was published in the Wall Street Journal, and the second was published in the Herald Sun in November 2024. According to Google Scholar, as of 21st August 2025, the article has been cited 10 times. The declaration of co-authorship for this publication can be found in Appendix K.



Understanding the Meat-Masculinity Link: Traditional and Non-Traditional Masculine Norms Predicting Men's Meat Consumption

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To cite this article: Lauren Camilleri, Melissa Kirkovski, Jessica Scarfo, Andrew Jago & Peter Richard Gill (2024) Understanding the Meat-Masculinity Link: Traditional and Non-Traditional Masculine Norms Predicting Men's Meat Consumption, Ecology of Food and Nutrition, 63:4, 355-386, DOI: [10.1080/03670244.2024.2361818](https://doi.org/10.1080/03670244.2024.2361818)

To link to this article: <https://doi.org/10.1080/03670244.2024.2361818>



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Understanding the Meat-Masculinity Link: Traditional and Non-Traditional Masculine Norms Predicting Men's Meat Consumption

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ABSTRACT

Conformity to masculinity ideology predicts men's meat consumption and willingness to reduce their meat intake, but it is unknown which specific masculine norms account for these relationships. This study investigated which traditional and non-traditional masculine norms predict meat consumption, red and processed meat consumption, and willingness to reduce meat consumption in 557 Australian and English males. Men who support the use of physical violence and place high importance on sex ate more meat. Willingness to reduce was highest among men with gender egalitarian views. Targeting these specific masculine norms may be important for mitigating men's over-consumption of meat.


KEYWORDS

Conformity to masculine norms; gendered eating; meat-masculinity link; men's red and processed meat consumption; willingness to reduce meat consumption

Introduction

Meat has played a key role in the evolution of the human species, serving as an important source of nutrition and energy (Mann 2018). Currently, proponents of the meat-heavy “carnivore” diet assert that a high meat, low plant-based diet offers health benefits, such as improved sleep, gut health, mental health, cardiovascular health, hormone regulation, weight loss, increased energy levels and reduced inflammation (Cho 2020; Lennerz et al. 2021; Saladino 2020). Indeed, research has found that the majority of carnivore diet adherents self-report many of these health benefits (Lennerz et al. 2021). However, in 2015, a strong body of research evidence prompted the International Agency for Research on Cancer (IARC) to classify processed meat as carcinogenic, and red meat as probably carcinogenic (De Smet and Vossen 2016). As such, the IARC and other research bodies, such as the American Institute of Cancer Research (2024) and the World Cancer Research Fund International (n.d.), recommend that people limit their red and processed meat consumption

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 Supplemental data for this article can be accessed online at <https://doi.org/10.1080/03670244.2024.2361818>

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(RPMC). Other studies support the recommendation that people should limit their red and processed meat intake, finding links between high levels of RPMC and diseases, such as colorectal and prostate cancer, cardiovascular disease, stroke, type 2 diabetes, obesity, and overall mortality (Grosso et al. 2022; Libera, Iłowiecka, and Stasiak 2021; Zheng et al. 2019).

As the biggest meat consumers worldwide (Graça, Godinho, and Truninger 2019; Horgan et al. 2019), men are at greater risk than women of early death from overconsumption of red and processed meat (Battaglia Richi et al. 2015; Rohrmann et al. 2013). Despite these poor health consequences, men demonstrate less willingness than women to reduce their meat intake (Graça, Godinho, and Truninger 2019), and are less likely to reduce their meat consumption, or choose meat-free meals, in intervention studies (Campbell-Arvai, Arvai, and Kalof 2014; Jalil, Tasoff, and Bustamante 2020; Pohlmann 2022). Therefore, it is important to investigate factors contributing to men's meat consumption and reduction, to help inform men's dietary interventions.

One distinguishing factor explaining men's greater meat consumption and unwillingness to reduce their meat intake is conformity to masculine norms. Some men have expressed unwillingness to reduce their meat intake due to their adherence to traditional masculine ideals and expectations of how "real" men ought to behave (Bogueva, Marinova, and Gordon 2020). Many male meat-eaters in the study believed that it is "unmanly" for men to abstain from eating meat. Hence, adherence to traditional masculine norms presents a unique challenge for reducing men's meat intake, and has thus been dubbed a "masculinity dilemma" (Bogueva, Marinova, and Gordon 2020). The present study aimed to expand understandings of the link between men's meat consumption and masculinity by investigating which masculine norms predict men's meat-eating behaviors and attitudes.

The meat-masculinity link

Men's consumption of meat is often investigated through a gender lens, with numerous scholars observing the nexus between eating meat and masculinity (e.g., Adams 1990; Buerkle 2009; Carroll, Capel, and Gallegos 2019; De Backer et al. 2020; Kramer 2011; Lapiņa and Leer 2016; Leary et al. 2023; Nakagawa and Hart 2019; Peeters et al. 2022; Rosenfeld 2023; Rothgerber 2013; Rozin et al. 2012; Salmen and Dhont 2023; Sobal 2006; Stanley, Day, and Brown 2023). For example, in many Western cultures, eating meat is viewed as a stereotypically masculine behavior (Johnston, Baumann, and Oleschuk 2021; Rozin et al. 2012), and meat-eaters are perceived to be more masculine than vegetarians (Bogueva, Marinova, and Gordon 2020; Ruby and Heine 2011). Conversely, vegetarianism and the consumption of meat-alternatives is stereotypically associated with femininity (Bogueva, Marinova, and Gordon 2020; Cavazza, Graziani, and

Guidetti 2020; Clemens and Flannery 2022). It has been theorized that eating meat is a means of gender performance, enabling men to present a traditionally masculine self-image (e.g., Buerkle 2009; Carroll, Capel, and Gallegos 2019; Nakagawa and Hart 2019). Indeed, various experiments have demonstrated that in certain contexts men eat meat to enhance and manage their masculine identity (Leary et al. 2023; Mertens and Oberhoff 2023; Mesler, Leary, and Montford 2022; Pohlmann 2022).

Several researchers have proposed that this meat-masculinity link is perpetuated and explained by conformity to traditional masculinity ideology (e.g., De Backer et al. 2020; Rosenfeld and Tomiyama 2021; Timeo and Suitner 2018). Over the past four decades, a set of dominant and widely adhered to masculine norms have repeatedly been identified, particularly in Western cultures, collectively referred to as “traditional” masculinity (Levant and Wong 2017). Traditional masculinity ideology is multifaceted, encompassing a range of norms that assert, for example, that men should be stoic, powerful, competitive, self-reliant, and sexually virile (Levant and Wong 2017). The core tenants of traditional masculinity ideology are captured in psychometrically validated instruments such as the Conformity to Masculine Norms Inventory (CMNI; Mahalik et al. 2003) and the Male Role Norms Inventory (Levant, Hall, and Rankin 2013).

It is recognized that multiple versions of masculinity coexist and vary according to culture and context (Levant and Wong 2017). However, men in Western countries such as Australia, the UK, and the US are consistently found to conform to traditional masculine norms (Gattario et al. 2015; Wong et al. 2017), with these dominant ideological standards of masculinity even permeating into niche subcultures such as Australian surf and rock culture (Whiting, Klimentou, and Rogers 2019) or British police force culture (Broomfield 2014). Moreover, men of various cultures, races, and sexual orientations have been found to conform to traditional masculine norms (e.g., Isacco and Wade 2017; Rochelle 2019; Vogel et al. 2011). Hence, traditional masculinity ideology appears to influence most men to some degree, and represents what would currently be the most universal, dominant, and widely adhered to set of gender role ideals for men. These traditional masculine norms serve as implicit guides for how men ought to behave (Isacco and Wade 2017).

Research has found that men who conform strongly to traditional masculinity ideology are more likely to eat meat – a stereotypically masculine behavior – and less likely to consider adopting a vegetarian diet, which is stereotypically viewed as more feminine (Rosenfeld and Tomiyama 2021; Rothgerber 2013; Stanley, Day, and Brown 2023). Conversely, men who subscribe to emerging, non-traditional masculine norms have been found to eat less meat and have greater willingness to reduce their meat consumption (De Backer et al. 2020; Peeters et al. 2022). While these studies show that

conformity to masculine norms is associated with meat consumption when masculinity is measured as a single overarching (i.e., unidimensional) construct, this method does not capture the multidimensional nature of masculinity ideologies.

To the authors' knowledge, only one study has investigated which dimensions of masculinity predict men's meat consumption. In a study of the relationship between four traditional masculine norms and food intake in Portuguese men and women, Campos, Bernardes, and Godinho (2020) found that conformity to norms regarding the use of violence (i.e., whether using physical violence is acceptable), being a "playboy" (i.e., having multiple sexual partners), disdain for homosexuals, and risk-taking did not predict men's meat consumption. However, this study did not measure other traditional masculine norms, nor non-traditional norms. By including a broad range of masculine norms, the current study aimed to extend knowledge of the meat-masculinity link by highlighting the specific masculine norms related to men's meat consumption, and provide insights into the potential barriers and facilitators of men's dietary change.

Masculine norms related to men's meat consumption

Although evidence regarding the relationship between specific masculine norms and men's meat consumption is limited, findings from various studies suggest that certain traditional masculine norms may be the strongest predictors of men's meat consumption. Conformity to the use of violence may be an important predictor of men's meat consumption. Meat consumption is positively associated with having a more accepting attitude to various forms of violence, such as the use of nuclear weapons, capital punishment, and blood sports (Hamilton 2015). Moreover, although Campos, Bernardes, and Godinho (2020) found that conformity to violence did not directly correlate with or predict men's meat consumption, it mediated the relationship between sex and meat consumption, such that men's conformity to the violence norm explained their higher meat intake.

Meat consumption is also associated with traditional masculine ideals, such as social status, being physically tough, and having emotional control. Experiments have found that people have a greater preference for meat when motivated to enhance their perceived social status (Chan and Zlatevska 2019b), suggesting that men who pursue social status may be more likely to eat meat. Men commonly believe that eating meat is necessary for building muscles and physical strength (i.e., being "tough"; Bogueva, Marinova, and Raphaely 2017; Hartmann and Siegrist 2020; Kildal and Syse 2017). Moreover, people who feel empathy for animal suffering are less willing to eat meat (Earle et al. 2019; Kunst and Hohle 2016), and men consistently exhibit less empathy for animals than women (Angantyr, Eklund, and Hansen

2015; Camilleri, Gill, and Jago 2020; Estévez-Moreno et al. 2021). It has been theorized that men may fail to express concern for animal suffering, and therefore, eat more meat, because it conflicts with the masculine norm of restricting and controlling one's emotions (Dillon-Murray, Ward, and Soar 2023; Rothgerber 2013).

Experiments have also found that men show a greater preference for meat when sexually motivated (Chan and Zlatevska 2019a; Timeo and Suitner 2018) and that some women perceive meat-eating men as more sexually attractive (Timeo and Suitner 2018). Hence, heterosexual men in particular may be motivated to eat meat to enhance their sexual appeal. Alternatively, some men believe that eating meat enhances sexual virility (Bogueva, Marinova, and Raphaely 2017). Therefore, when controlling for sexual orientation, men who conform to traditional masculine norms regarding sexuality, such as placing high importance on sex drive, or on being a "playboy" (i.e., obtaining multiple sexual partners), may eat more meat. Although Campos, Bernardes, and Godinho (2020) found that the playboy norm did not predict men's meat consumption, it may predict their willingness to reduce their meat consumption.

Meat consumption has also been linked to male heterosexuality, with scholars observing the glorification of meat consumption in stereotypically heterosexual masculine popular culture and social settings (Buerkle 2009; Lapiņa and Leer 2016). Homophobic comments questioning heterosexual vegetarian men's sexuality also reveal that some people expect heterosexual men to eat meat (Bogueva, Marinova, and Gordon 2020; Mycek 2018). Hence, men who believe it is important to present as heterosexual may be more motivated to eat meat. This need not apply solely to heterosexual men; in heteronormative culture, non-heterosexual men can at times feel pressure to present themselves as heterosexual (Ozbilgin et al. 2022).

In addition to traditional masculine norms, an alternate set of five non-traditional masculine norms have recently been identified and linked to men's meat consumption (De Backer et al. 2020; Kaplan, Rosenmann, and Shuhendler 2017). These new norms endorse non-traditional masculine ideals, including holistic attentiveness (men prioritizing their health by supporting and integrating their mental and physical wellbeing); authenticity (men openly expressing their feelings and self); domesticity and nurturing (men prioritizing and playing a more hands on role in parenting); sensitivity to male privilege (men holding greater gender egalitarian attitudes); and questioning societal definitions of masculinity (men questioning and rejecting traditional gender roles). Men who conform to non-traditional masculinity ideology overall (i.e., as a global construct) have been found to eat less meat and be more willing to reduce their meat intake (De Backer et al. 2020; Peeters et al. 2022). However, no previous studies have investigated the relationship between specific non-traditional norms and meat consumption. Theoretically, because men who

conform to the “questioning definitions of masculinity” norm reject traditional gender roles, they should be more likely to reject stereotypical gender roles related to food (i.e., that men should eat meat), and hence, eat less meat or be more willing to reduce their meat intake. Additionally, “authenticity” endorses the open expression of emotion, potentially removing the barrier to showing empathy for animals, which is a common motivator of meat avoidance (Graça, Godinho, and Truninger 2019; Rosenfeld 2018).

Masculinity and social dominance orientation

Social dominance orientation (SDO; i.e., endorsement of establishing social hierarchies and maintaining power over outgroups) has been linked to meat consumption and avoidance behavior (Dhont and Hodson 2014), being positively associated with meat consumption (Allen et al. 2000; Holler et al. 2021), with meat-eating men scoring higher on SDO than vegetarian or vegan men (Veser, Taylor, and Singer 2015). Conceptually, SDO is a closely related and overlapping construct with facets of traditional masculinity ideology emphasizing the importance of men attaining power (physical, social, and sexual) and high social status. In developing the CMNI, Mahalik et al. (2003) found that the masculine norms emotional control, violence, power over women, and playboy, as well as overall conformity to the CMNI, were positively moderately correlated with SDO. Other studies have found SDO to be positively correlated with the CMNI norms winning, risk-taking, heterosexual self-presentation, and power over women (Fox and Tang 2014). To ensure our results were not explained by men’s SDO, we included this factor as a control variable.

Hypotheses

Based on the available empirical evidence in the literature, the following hypotheses were made:

- (1) Regarding traditional masculinity, it was hypothesized that, when controlling for demographic variables and SDO, *pursuit of status; violence; toughness; importance of sex; being a playboy; emotional control; and heterosexual self-presentation* would positively predict men’s RPMC and total meat consumption, and negatively predict willingness to reduce meat consumption. Due to limited evidence regarding other common traditional masculine norms, the relationships between outcome variables and the remaining traditional masculine norms in the CMNI (Mahalik et al. 2003; *power over women; winning; risk-taking; primacy of work; self-reliance*) were exploratory.
- (2) Regarding non-traditional masculinity, it was hypothesized that, when controlling for demographic variables and SDO, *questioning definitions*

of masculinity and authenticity would negatively predict men's RPMC and total meat consumption, and positively predict willingness to reduce meat consumption. The relationships between outcome variables and the remaining non-traditional masculine norms (*sensitivity to male privilege; holistic attentiveness; domesticity/nurturing*) were exploratory.

Methods

Data Analysis

A partial least squares structural equation model (PLS-SEM) analysis was conducted in SmartPLS4 version 4.1.0.1 (Ringle, Wende, and Becker 2024) to test the study hypotheses. PLS-SEM is preferable to Covariance-Based SEM (CB-SEM) for exploratory and non-established theoretical frameworks and recommended when the research aim is to predict and explain a particular construct (Dash and Paul 2021; Hair and Alamer 2022; Sarstedt, Ringle, and Hair 2021). Additionally, unlike CB-SEM, PLS-SEM does not have data distribution requirements (Hair and Alamer 2022; Samani 2016), making PLS-SEM the more suitable choice for the current study's data, which had a multivariate non-normal distribution according to Mardia's skewness and kurtosis values.

PLS-SEM model evaluation involves two parts. Firstly, measurement (outer) model evaluation assesses the reliability and validity of study constructs by investigating the relationships between latent constructs and their items. The reliability of the indicator is assessed first, whereby construct items with factor loadings $< .7$ are deleted, unless the loading is $> .4$ and removing the item detracts from the construct's internal consistency and convergent validity; however, all items with loadings $< .4$ should be deleted (Hair and Alamer 2022; Hair et al. 2021). Internal consistency reliability is measured with Cronbach's alpha and composite reliability (CR), the recommended threshold for both being ≥ 0.70 , though values ≥ 0.60 for exploratory research are acceptable (Dash and Paul 2021; Hair et al. 2021). Convergent validity is assessed with average variance extracted (AVE) above 0.5 (Dash and Paul 2021). Discriminant validity ensures study constructs are distinct, confirmed with Fornell and Larcker's (1981) criterion whereby the square root of the AVE for each construct should be greater than correlations with other model constructs.

Secondly, structural (inner) model evaluation assesses the relationships between latent variables. Goodness of model fit is assessed with the Standardized Root Mean Square Residual (SRMR) score < 0.08 (Hu and Bentler 1999). The model's in-sample explanatory power (R^2) indicates the amount of variance in the outcome variable explained by the model (≈ 0.25 ,

≈ 0.50 , and ≈ 0.75 indicating weak, moderate, and strong explanatory power, respectively; Hair et al. 2021). Path coefficient and significance values with bootstrapping (10,000 samples) assess relationships between latent constructs in the model and test study hypotheses. The model's out-of-sample predictive power is assessed with Shmueli et al.'s (2019) k-fold cross validation technique using the $PLS_{predict}$ algorithm, by testing the root-mean-square error (RMSE) values, which quantify the degree of prediction error. Strong predictive power is demonstrated when the RMSE value of each indicator of the outcome construct is less than the naïve linear regression model (LM) benchmark RMSE values (Shmueli et al. 2019). Q^2 values evaluate the model's predictive relevance, with values > 0 , ≈ 0.25 , and ≈ 0.50 indicating adequate, medium, and strong predictive relevance (Hair et al. 2022).

PLS-SEM assumptions outlined by Goller and Hilkenmeier (2022) were addressed before conducting the analysis. Twenty-one missing values were treated with personal mean replacement, a method with minimal impact on PLS-SEM results when missingness $< 5\%$ (Hair et al. 2021). Univariate outliers were treated using a Winsorisation technique (Kwak and Kim 2017). Thirteen multivariate outliers detected with Mahalanobis distance exceeding the chi-square critical value of 49.73 ($df = 23$, $p < .001$) and were excluded from the analysis. All variance inflation factors (VIF) were less than 3, indicating no multivariate multicollinearity (Hair et al. 2021). Standardized residuals plotted against standardized predicted values indicated that the assumption of homoscedasticity was met. The studied variables met the assumption of strict exogeneity. According to Kock and Hadaya's (2018) inverse square root method, assuming a significance level of 5% and a minimum path coefficient of 0.10, the minimum sample size required for the analysis was 618. This value exceeds the current sample size of 557 participants, however, simulation analyses show that the inverse square root method consistently overestimates minimum sample size requirements (Kock and Hadaya 2018).

Participants & procedure

The study was approved by the Victoria University Human Research Ethics Committee (Application ID: HRE21-162). A convenience sample of Australian and English participants, who self-identified their gender as male, was obtained from an online recruitment site "Prolific" (<https://www.prolific.co/>) as part of a broader study on men's meat consumption (Camilleri et al. 2023). An additional 45 Australian participants were recruited on Facebook via survey participant recruitment groups as well as the principal researcher's personal network. Participants provided informed consent before completing the survey online via Qualtrics, and were paid \$12 AUD for their time. Twenty-nine incomplete datasets were deleted, leaving 575 men who had completed all survey measures. Twenty-

one missing values were replaced with the participant's mean score on that variable. Five cases with single-item demographic questions missing (income and geographic location), which could not be replaced with the participant's mean score, were deleted listwise from the analysis. Thirteen multivariate outliers were deleted, leaving a final sample of 557 Australian and English men (56.2% Australian; mean age 38.5, $SD = 13.3$). Overall, the sample was predominantly heterosexual, left-wing, well-educated men living in metropolitan areas, aged 18–44 (Table 1).

Materials

See Supplementary A for the complete questionnaire used in the current study; Supplementary B for the complete list of questionnaire materials used as part

Table 1. Sociodemographic Statistics of Sample.

Demographic Variable	<i>N</i>	%
Country		
Australia	313	56.2%
England	244	43.8%
Self-identified diet		
Unrestricted meat-eater	330	59.2%
Meat-reducer	181	32.5%
Meat-avoider	46	8.3%
Age		
18–29	164	29.4%
30–44	240	43.1%
45–59	103	18.5%
≥60	50	9.0%
Education		
≤ Secondary school	121	21.7%
Trade/vocational training	95	17.1%
Bachelor's degree	236	42.4%
Postgraduate degree	105	18.9%
Geographic Location		
Metropolitan	440	79.0%
Rural	117	21.0%
Sexual Orientation		
Heterosexual	496	89.0%
Homo/bisexual	61	11.0%
Political Views		
Left-wing	281	50.4%
Centre	161	28.9%
Right-wing	115	20.6%
Religion		
None	370	66.9%
Buddhism	10	1.8%
Christianity	126	22.8%
Hindu	7	1.3%
Islam	12	2.2%
Judaism	4	0.7%
Other	24	4.3%

Note. "Meat reducer" refers to self-identified pescatarians and participants who reported intentionally limiting their meat consumption; "meat avoider" refers to vegetarians and vegans. $N = 557$.

Table 2. Internal Consistency Reliability and Convergent Validity Evaluation of Study Constructs.

Variable	Meat Consumption Model			RPMC Model			WRMC Model		
	α	CR	AVE	α	CR	AVE	α	CR	AVE
Meat consumption	0.51	0.75	0.50	—	—	—	—	—	—
Red & processed meat consumption	—	—	—	0.30	0.73	0.58	—	—	—
Willingness to reduce meat consumption	—	—	—	—	—	—	0.86	0.92	0.79
Social dominance orientation	0.82	0.88	0.65	0.82	0.88	0.65	0.82	0.88	0.65
Authenticity (NTM)	0.71	0.87	0.77	0.79	0.87	0.68	0.79	0.87	0.69
Domesticity/nurturing (NTM)	0.60	0.78	0.55	0.60	0.79	0.55	0.60	0.79	0.56
Holistic attentiveness (NTM)	0.65	0.78	0.55	0.65	0.78	0.55	0.73	0.82	0.54
QDOM (NTM)	0.75	0.86	0.67	0.75	0.86	0.67	0.75	0.86	0.67
Sensitivity to male privilege (NTM)	0.36	0.76	0.61	0.36	0.76	0.61	0.36	0.76	0.61
Emotional control (TM)	0.91	0.94	0.83	0.91	0.94	0.84	0.91	0.94	0.85
Heterosexual presentation (TM)	0.93	0.96	0.88	0.93	0.96	0.88	0.93	0.96	0.88
Importance of sex (TM)	0.83	0.90	0.75	0.83	0.90	0.75	0.83	0.90	0.75
Playboy (TM)	0.82	0.90	0.74	0.72	0.86	0.75	—	—	—
Power over women (TM)	0.78	0.87	0.70	0.78	0.87	0.70	0.78	0.87	0.69
Primacy of work (TM)	0.88	0.92	0.80	0.88	0.92	0.80	0.88	0.92	0.79
Pursuit of status (TM)	0.68	0.81	0.59	0.68	0.81	0.59	0.68	0.80	0.57
Risk-taking (TM)	0.89	0.93	0.81	0.89	0.93	0.81	0.89	0.92	0.79
Self-reliance (TM)	0.76	0.88	0.79	0.76	0.89	0.81	0.76	0.84	0.73
Toughness (TM)	0.74	0.85	0.66	0.74	0.85	0.66	0.74	0.85	0.66
Violence (TM)	0.75	0.85	0.65	0.75	0.84	0.64	0.75	0.85	0.65
Winning (TM)	0.70	0.83	0.62	0.69	0.85	0.74	0.70	0.83	0.63

Note. α = Cronbach's alpha; CR = composite reliability; AVE = average variance extracted. α and CR should be $\geq .60$ to demonstrate reliability; AVE should be $\geq .50$ to demonstrate convergent validity (Hair et al. 2021). The playboy norm was not used in the willingness to reduce meat consumption model due to poor indicator reliability. RPMC = red and processed meat consumption; WRMC = willingness to reduce meat consumption; QDOM = questioning definitions of masculinity; NTM = non-traditional masculine norm; TM = traditional masculine norm.

of the broader meat consumption study (Camilleri et al. 2023); and Table 2 for each construct's psychometric values in the current study.

Outcome variables

Participants completed a scale developed to measure *meat consumption*. Prior to running the PLS-SEM analysis, exploratory factor analysis (EFA) and confirmatory factor analyses (CFA) were conducted on two independent Australian samples to validate the meat consumption scale. In the EFA, Velicer's minimum average partial test (Velicer, Eaton, and Fava 2000) confirmed the presence of one factor representing overall meat consumption. The single factor model was confirmed in the CFA, with the meat consumption scale demonstrating good model fit (CMIN/DF = 2.28, NFI = 0.965, TLI = 0.980, CFI = 0.979, RMSEA = 0.052, SRMR = 0.0246) according to model fit criteria for structural equation modeling (Dash and Paul 2021). In the EFA sample, the meat consumption scale demonstrated good internal consistency reliability ($\alpha=.68$, CR = .71), however, reliability was lower in the CFA sample ($\alpha=.50$, CR = .55). Participants reported their consumption of beef, lamb, poultry, pork, bacon/ham, and other processed meats in the past 2 weeks, indicating for each meat category 1) meat frequency: the number of times they ate each type of meat; and 2) meat quantity: the average quantity of each serving for each meat type (1 = very small (less than 10% of a typical meal); 2 = small (10–20% of a typical meal); 3 = medium (21–30% of a typical meal); 4 = large (31–40% of a typical meal); and 5 = very large (more than 40% of a typical meal)). For scoring, when meat type frequency = 0, the corresponding portion size question was skipped and automatically given a score of zero. For each of the six meat categories, frequency scores were multiplied by quantity scores to produce indicators for the meat consumption construct. A single combined pork/bacon/ham indicator item was created by summing the total pork score with the total bacon/ham score. A single combined beef/lamb indicator item was created by summing the total beef score with the total lamb score. This created four indicators for the meat consumption construct: MC1 (beef/lamb), MC2 (poultry), MC3 (pork/bacon/ham), and MC4 (other processed meats), and three indicators for the RPMC construct: RPMC1 (beef/lamb), RPMC2 (pork/bacon/ham), RPMC3 (other processed meats). Higher scores indicated greater meat consumption.

To measure *willingness to reduce meat consumption* we adapted a 3-item scale used in the previous research that has demonstrated good reliability (Graça et al., 2015). The scale comprised three items asking the extent of the participants' willingness to 1) "slightly reduce your meat consumption;" 2) "drastically reduce your meat consumption;" and 3) "stop eating meat altogether," from 1 (*very unwilling*) to 5 (*very willing*). Higher scores indicated greater willingness to reduce one's meat consumption.

Predictors

For traditional masculine norms, ten subscales of the Conformity to Masculine Norms Inventory Short Form (CMNI-30; Levant et al. 2020), a short version of the original CMNI (Mahalik et al. 2003), each containing three items, measured: *winning*; *emotional control*; *playboy*; *violence*; *heterosexual self-presentation*; *pursuit of status*; *primacy of work*; *power over women*; *self-reliance*; and *risk-taking*. The CMNI-30 subscales have demonstrated good model fit, convergent validity, test-retest reliability, and internal reliability (α between .71 and .94) in various ethnic groups (Krivoshchekov, Gulevich, and Ostroverkhova 2022; Levant et al. 2020). Additionally, two subscales were taken from the Male Role Norms Inventory Short Form (MRNI-SF; Levant, Hall, and Rankin 2013) to test the hypotheses regarding *toughness* and *importance of sex*. The MRNI-SF subscales have demonstrated good construct, discriminant, and concurrent validity and good internal reliability in previous research (Levant et al. 2015, 2016). All traditional masculinity subscale scores ranged from 3 to 18.

For non-traditional masculine norms, five subscales from the New Masculinity Inventory (NMI; Kaplan, Rosenmann, and Shuhendler 2017) measured: *holistic attentiveness* (4 items; scores ranging from 4 to 24); *questioning definitions of masculinity* (4 items; scores ranging from 4 to 24); *sensitivity to male privilege* (2 items; scores ranging from 2 to 12); *authenticity* (4 items; scores ranging from 4 to 24); and *domesticity/nurturing* (3 items; scores ranging from 3 to 18). The NMI has demonstrated good convergent and discriminant validity (Kaplan, Rosenmann, and Shuhendler 2017). The low internal reliability of the sensitivity to male privilege subscale in our sample is consistent with Kaplan, Rosenmann, and Shuhendler (2017) Israeli sample. Participants answered all traditional and non-traditional masculinity items on a 1 (*strongly disagree*) to 6 (*strongly agree*) scale. Higher scores indicated greater conformity to the masculine norm.

Control variables

Social Dominance Orientation was measured using the 4-item Short Social Dominance Orientation Scale (Pratto et al. 2013), which has demonstrated reliability and construct validity in 20 countries (Braunsberger et al. 2021; Pratto et al. 2013). Higher scores indicate greater SDO. People from urban areas are more likely to follow plant-based diets than people living in rural areas (Graça, Godinho, and Truninger 2019), therefore geographic location was also controlled for (0=urban; 1=rural). As older (Horgan et al. 2019; Pfeiler and Egloff 2020) and more educated (Corrin and Papadopoulos 2017; Ruby 2012) people tend to eat less meat, age (measured continuously) and education (above versus below university education) were also controlled for. People's meat consumption may be partly explained by the affordability of certain meats, hence, personal income was also used as a control variable (measured continuously). Finally, heterosexual men may have more reason to

eat meat than non-heterosexual men, if they believe women find meat-eaters more sexually attractive. Hence, sexual orientation was controlled for (0=heterosexual, 1=non-heterosexual).

Results

Measurement Model Evaluation

Indicator reliability for each construct was assessed according to Hair and Alamer's (2022) recommendations, where indicators with loadings < 0.7 were deleted, except when to do so reduced the construct's internal consistency reliability and validity and the item loading was greater than 0.40. In the meat consumption model, the factor loading of authenticity (item #4) fell below the 0.4 cut-off and was deleted. Factor loadings of self-reliance (item #3), questioning definitions of masculinity (item #4), pursuit of status (item #3), holistic attentiveness (items #1, #2, and #3), authenticity (item #1), domesticity/nurturing (item #1), and meat consumption (items #3 and #4) fell between 0.4 and 0.7, and were evaluated further. The model was rerun, removing the lowest loading item from each of these constructs, to assess whether factor loadings, reliability, and validity improved after removing the items (by comparing α , CR, and AVE values). For authenticity, questioning definitions of masculinity, holistic attentiveness, self-reliance, and meat consumption, CR and AVE values improved after removing the lowest loading indicators. Therefore, these items were dropped and the final model was run predicting meat consumption measured with three indicators (MC1=beef/lamb, MC2=poultry, MC3=pork/bacon/ham). However, as CR and AVE values fell below recommended thresholds when removing indicators from domesticity/nurturing and pursuit of status constructs, and all indicators were significant, these items were retained.

In the RPMC model, the factor loadings of authenticity (item #4) and questioning definitions of masculinity (item #4) fell below the 0.4 cut-off and were deleted. Factor loadings of self-reliance (item #3), pursuit of status (item #3), holistic attentiveness (items #1, #2, and #3), domesticity/nurturing (item #1), winning (item #3), and RPMC (items #2 and #3) fell between 0.4–0.7 and were evaluated further. When rerunning the model deleting the lowest loading item from these constructs, reliability, and validity improved for authenticity, holistic attentiveness, questioning definitions of masculinity, self-reliance, and winning. Therefore, these items were removed and the model was run predicting RPMC measured with two indicators (RPMC1=beef/lamb, RPMC2=pork/bacon/ham). Removing domesticity/nurturing and pursuit of status items reduced reliability and validity, and these indicators were significant, they were retained. Playboy (item #2) was $> .7$ but not significant, therefore this item was dropped.

In the willingness to reduce meat consumption model, two playboy items (#1 and #2) did not load significantly onto the construct. To avoid including a single-item construct the playboy norm was excluded from the WRMC model as it did not demonstrate adequate indicator reliability. The factor loadings of questioning definitions of masculinity (item #4) and self-reliance (item #3) fell below the 0.4 cut-off and were deleted. Factor loadings of authenticity (item #4), domesticity/nurturing (item #3), holistic attentiveness (items #1 and #3), self-reliance (item #1), pursuit of status (item #3), and winning (item #3) fell between 0.4 and .7, and were evaluated further. For authenticity, questioning definitions of masculinity, and self-reliance, α , CR and AVE values improved after removing the lowest loading indicators. However, removing indicators caused α , CR, and AVE to fall below acceptable thresholds for holistic attentiveness, domesticity/nurturing, pursuit of status, and winning; and as these indicators loaded significantly onto their constructs these items were retained. In the final meat consumption, RPMC, and willingness to reduce meat consumption models, all indicators for all constructs loaded significantly onto their respective constructs with a minimum factor loading of 0.50 (see Figures 1–3), providing evidence of indicator reliability (Fornell and Larcker 1981; Goller and Hilkenmeier 2022).

Internal consistency reliability was assessed with Cronbach's alpha (α) and composite reliability (CR) ≥ 0.60 (Hair et al. 2021). Convergent validity was assessed with average variance extracted (AVE) values $\geq .50$ (Dash and Paul 2021). Results are displayed in Table 2. All constructs met the minimum α , CR and AVE thresholds except for STMP ($\alpha=.36$), meat consumption ($\alpha=.51$), and RPMC ($\alpha=.30$). These constructs were retained in the analysis because indicator reliability, CR, and AVE were acceptable, and CR is a more accurate and preferable measure of scale reliability in SEM than Cronbach's α (Cheung et al. 2023; McNeish 2018). Discriminant validity was assessed with Fornell and Larcker's criterion (1981), whereby the square root of the AVE for each construct should be greater than correlations with other model constructs (Supplementary C). All constructs met this criterion, demonstrating discriminant validity.

Structural model evaluation

The PLS-SEM was run with 10,000 bootstrapped samples (two-tailed), with the models converging in 11 (meat consumption), 13 (RPMC), and 7 (willingness to reduce meat consumption) iterations. The meat consumption (SRMR = 0.055), RPMC (SRMR = 0.055), and willingness to reduce (SRMR = 0.057) models demonstrated good fit, with SRMR < 0.08. Income, conformity to the violence norm, and conformity to the importance of sex norm were significant positive predictors, and age was a significant negative predictor, of

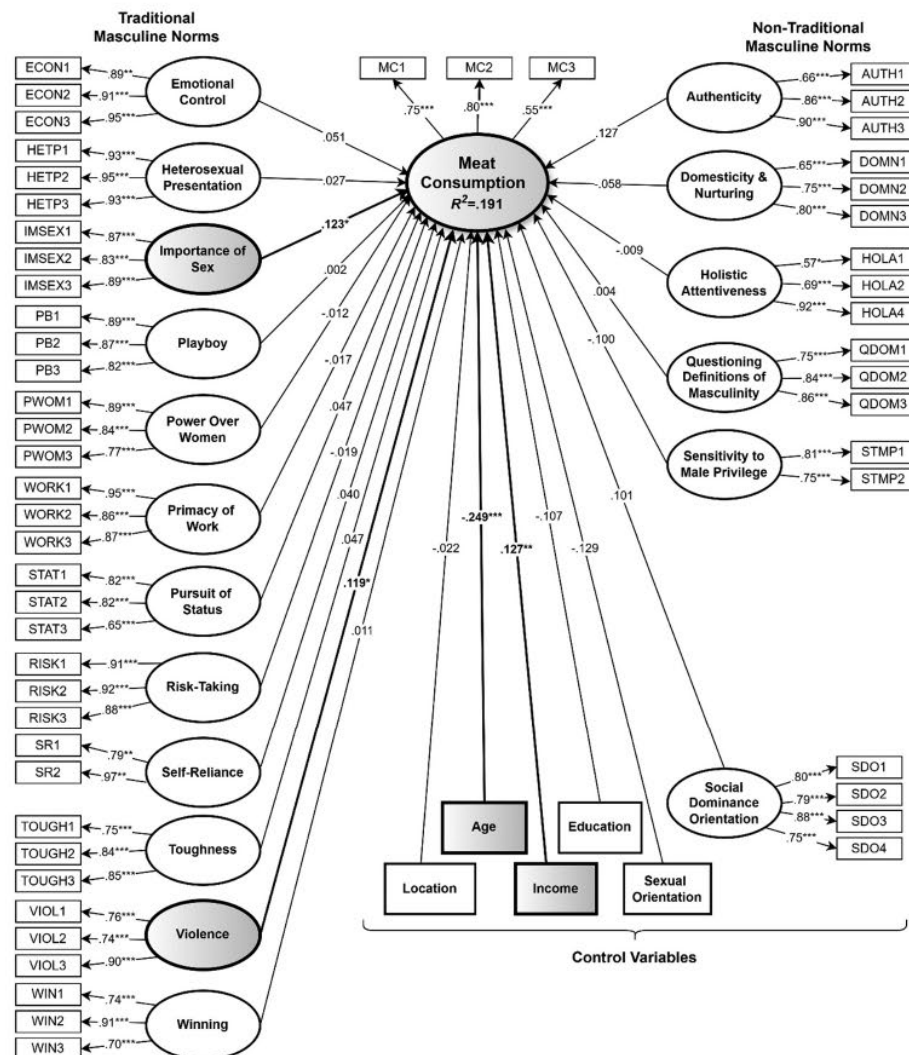


Figure 1. PLS-SEM model predicting meat consumption, including both the measurement (outer) and structural (inner) models. Note. ***= $p \leq .001$, **= $p \leq .01$, *= $p \leq .05$. Significant predictors are displayed with shading and bold.

meat consumption. That is, younger men, those with higher incomes, those who endorse the use of physical violence, and place greater importance on sexual virility, tended to eat more meat. Social dominance orientation, violence, and importance of sex were significant positive predictors, and age and sexual orientation were significant negative predictors, of RPMC. That is, younger, heterosexual men, who place a higher importance on sexual virility, and endorse hierarchical inter-group relations and the use of physical violence, tended to eat more red and processed meat. Social dominance orientation was

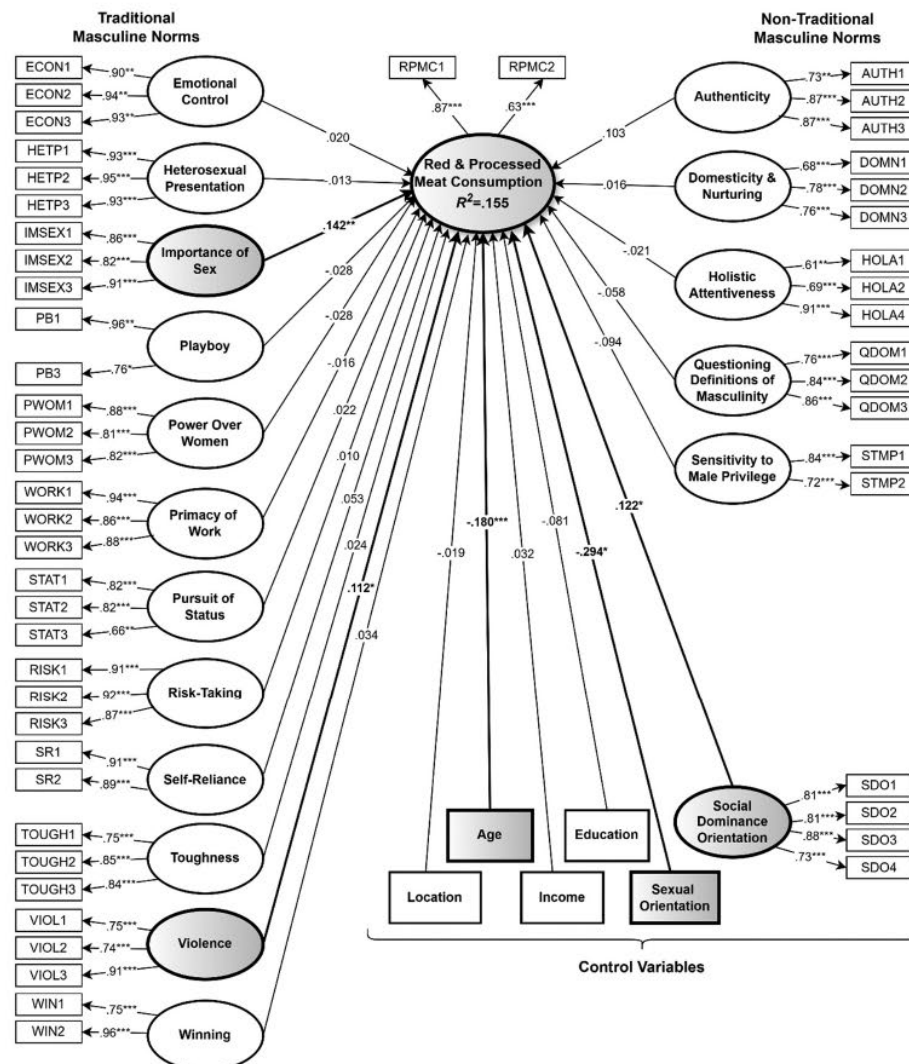


Figure 2. PLS-SEM model predicting red and processed meat consumption, including both the measurement (outer) and structural (inner) models. Note. ***= $p \leq .001$, **= $p \leq .01$, * $p < .05$. Significant predictors are displayed with shading and bold.

a significant negative predictor, and sensitivity to male privilege was a significant positive predictor, of willingness to reduce meat consumption, such that men with greater preferences for inter-group equality, and those with greater gender egalitarian views, tended to be more willing to reduce their meat consumption.

The models explained 19.1% variance in men's meat consumption ($R^2=.191$, $p < .001$), 15.5% variance in men's RPMC ($R^2=.155$, $p < .001$), and

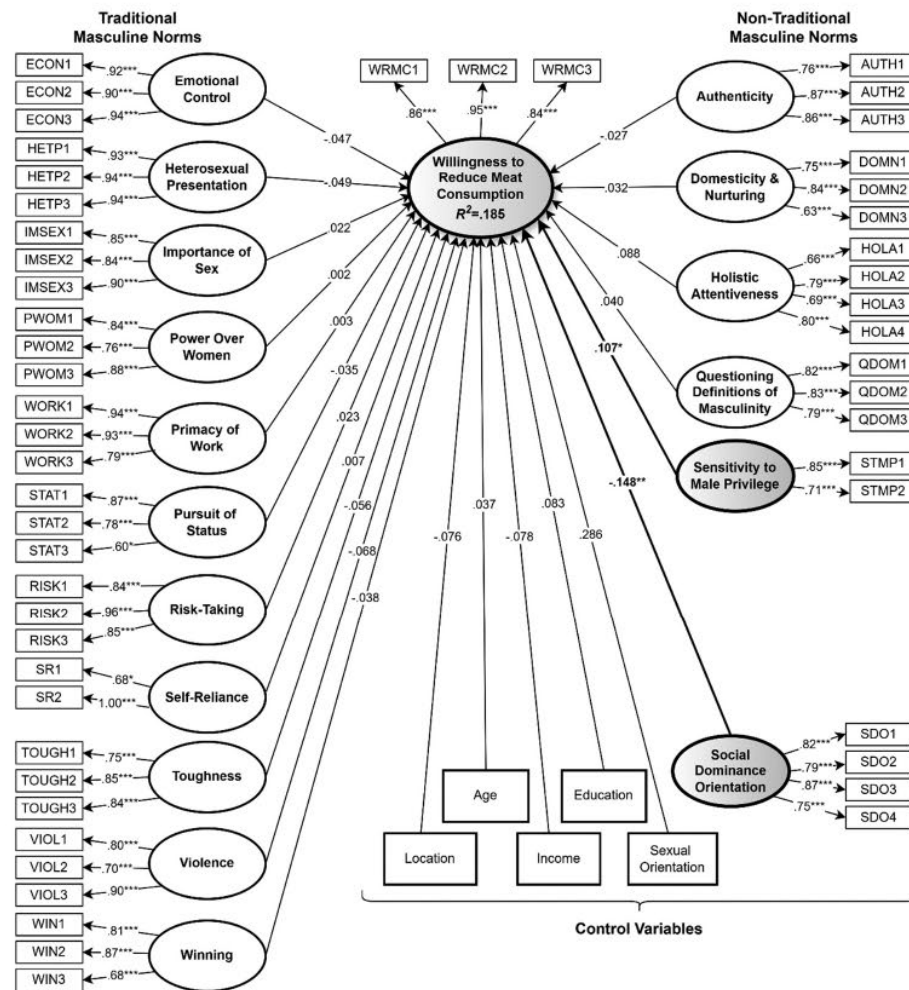


Figure 3. PLS-SEM model predicting willingness to reduce meat consumption, including both the measurement (outer) and structural (inner) models. Note. ***= $p \leq .001$, **= $p \leq .01$, * $p \leq .05$. Significant predictors are displayed with shading and bold.

18.5% variance in men's willingness to reduce their meat consumption ($R^2=.185$, $p < .001$), which is considered weak explanatory power (Hair et al. 2021). All Q^2 values were greater than 0, but below 0.25 (Table 3), indicating that all models had adequate predictive relevance. The models' predictive power was assessed with Shmueli et al. (2019) k-fold cross validation using the SmartPLS $PLS_{predict}$ algorithm, run with 10 folds and 10 repetitions. As can be seen in Table 3, for all meat consumption, RPMC, and willingness to reduce meat consumption indicators, the PLS-SEM RMSE values were less than the naïve linear regression model benchmark (LM) RMSE values, indicating that all models had high predictive power (Shmueli et al. 2019).

Table 3. Predictive Power of PLS-SEM Models.

Model	Model Indicators	Q ²	PLS-SEM RMSE	LM-RMSE
Meat Consumption	MC1 (beef/lamb)	0.055	14.43	15.00
	MC2 (poultry)	0.070	14.88	15.57
	MC3 (pork/bacon/ham)	0.012	11.87	12.43
Red & Processed Meat Consumption	RPMC1 (beef/lamb)	0.048	14.48	15.01
	RPMC2 (pork/bacon/ham)	0.009	11.88	12.39
Willingness to Reduce Meat Consumption	WRMC1	0.100	1.19	1.23
	WRMC2	0.081	1.22	1.27
	WRMC3	0.063	1.25	1.30

Note. To demonstrate predictive power, Q² should be > 0, and the PLS-SEM RMSE values must be lower than the LM-RMSE values. PLS-SEM < LM for no indicators = no predictive power; PLS-SEM < LM for a minority of indicators = low predictive power; PLS-SEM < LM for a majority of indicators = medium predictive power; PLS-SEM < LM for all indicators = high predictive power (Shmueli et al. 2019).

Discussion

Throughout Western countries there is a pervasive association between meat and masculinity. Although masculinity ideologies are multifaceted, previous studies have only investigated the relationship between meat consumption and masculinity measured as a global construct. Hence, it is unclear which dimensions of masculinity account for the meat-masculinity link. To extend knowledge of the meat-masculinity link, the current study sought to identify which masculine norms predicted men's total meat consumption, red and processed meat consumption (RPMC), and willingness to reduce meat consumption, while controlling for age, education, personal income, geographic location, sexual orientation, and social dominance orientation (SDO). Insights can potentially refine models of men's meat consumption and improve men's health by informing interventions of which masculine norms may serve as barriers and facilitators to men's meat reduction.

Overall, younger men, and men with higher incomes, tended to eat more meat overall, consistent with findings in UK, US, and Australian samples (Horgan et al. 2019; Neff et al. 2018; Pfeiler and Egloff 2020). Younger, heterosexual men, and those high on SDO tended to eat more red and processed meat. Conformity to the traditional masculine norms of *violence* and *importance of sex* positively predicted men's overall meat consumption and RPMC, whereas conformity to the non-traditional masculine norm *sensitivity to male privilege* positively predicted men's willingness to reduce their meat consumption.

Masculine norms contributing to the meat-masculinity link

In line with hypotheses, the traditional masculine norms supporting the use of violence and placing greater importance on sex were positive predictors of men's meat consumption and RPMC. That is, men who believed that it is acceptable to use physical violence, and placed greater importance on sexuality virility, tended to eat more meat. Campos, Bernardes, and

Godinho (2020) also found a connection between meat and conformity to violence, such that the violence norm mediated the relationship between participant sex and RPMC. They found that men's higher conformity to the violence norm explained why male participants ate greater quantities of meat than female participants. It appears that people who hold more accepting views toward violence are more likely to eat meat (Hamilton 2015), perhaps because this accepting attitude about violence toward others may extend to animals, as animal slaughter is an inherently violent act. It is likely that an individual who feels morally comfortable perpetrating violence against humans would have less objection with violence toward farm animals – as farm animals are generally attributed a low moral status and can be perceived as unworthy of moral consideration (Caviola, Everett, and Faber 2019).

Regarding men's sexuality, the importance of sex norm asserts that men should desire and “be ready” for sex at all times, indicating that men who placed greater importance on being sexually virile tended to eat more meat. It's possible that some men believe that eating meat enhances sex drive, as this was reported as a reason for eating red meat by 22.4% of Australian male meat-eating participants in a previous study (Bogueva, Marinova, and Raphaely 2017) and has been mentioned by European male athletes as a reason for eating meat (van der Horst, Sällylä, and Michielsen 2023). Consistent with Campos, Bernardes, and Godinho (2020) findings, in the current study the playboy norm – that men should have multiple sexual partners – did not predict men's meat consumption. Previous studies have found that men showed a greater preference for meat when sexually motivated (Chan and Zlatevska 2019a; Timeo and Suitner 2018). In both studies, researchers attributed men's preference for meat to the intention to increase their sexual attractiveness. Arguably, men who desire multiple sexual partners have greater motivation to enhance their sexual attractiveness. Therefore, as the playboy norm was not related to men's meat consumption in the current study, our results suggest that men may prefer meat when sexually motivated to enhance their sexual virility, rather than their sexual attractiveness.

Although the heterosexual self-presentation norm was not a significant predictor as hypothesized, sexual orientation was the strongest predictor of RPMC, though not overall meat consumption, such that heterosexual men ate more red and processed meat than non-heterosexual men. This supports the link previous scholars have drawn between meat consumption and heterosexuality, and in particular, red and processed meats such as hotdogs, smoked meats, and beef burgers (Buerkle 2009; Lapiņa and Leer 2016). Our results confirm that heterosexuality is linked specifically to red and processed meat consumption, rather than overall meat consumption patterns, indicating that heterosexual men are more at risk of developing health issues associated with RPMC.

The finding that men's meat consumption and RPMC was predicted only by traditional masculine norms (i.e., violence and importance of sex), but not any of the non-traditional masculine norms, is inconsistent with previous research finding that global conformity to non-traditional masculinity negatively predicts meat consumption (De Backer et al. 2020; Peeters et al. 2022). However, these previous studies used a different measure of meat consumption, did not include both traditional and non-traditional masculinity within the same analysis, nor control for SDO. When considering both types of masculinity ideologies, as well as SDO, the current study demonstrates that traditional masculine norms, and in particular, violence and importance of sex, better predict men's meat consumption than non-traditional masculine norms.

Sensitivity to male privilege was the only masculine norm that predicted men's willingness to reduce their meat consumption, in addition to the control variable SDO. Specifically, men who held greater gender egalitarian views, and who favored egalitarian social structures, were more willing to reduce their meat intake. Both constructs promote values of social equality, which is consistent with previous research finding that values related to power and hierarchy are associated with greater meat consumption and a more negative attitude to meat reduction, whereas values of universalism (i.e., concern for welfare of all people and nature; Schwartz, 2012) are associated with reduced meat consumption and a more positive attitude to meat reduction (Hayley, Zinkiewicz, and Hardiman 2015; Holler et al. 2021). The connection between meat consumption and gender relations has been highlighted by Adams (1990), who argued that meat consumption is a manifestation of patriarchal social structures, in which animals are dominated, objectified, and consumed in the same manner as women. However, in the current study, the traditional masculine norm "power over women" – the belief that women should submit to men's authority – was not a predictor in any model, as would be expected according to Adams' theory. This is potentially a result of controlling for SDO, a conceptually overlapping construct which is likely to share a high amount of variance with power over women (i.e., both SDO and power over women endorse dominance over others; the former more generally, the latter specifically toward women). Moreover, the sensitivity to male privilege norm emphasizes the *male* gender role, and specifically, advantages afforded to men, whereas the power over women norm emphasizes the *female* gender role, and specifically, the need for women to submit to men's control. It may be that sensitivity to male privilege better accounts for the aspect of gender relations related to men's meat consumption, over and above an individual's domination tendency. Although our findings cannot explain how or why higher sensitivity to male privilege relates to men's willingness to reduce their meat intake, it appears that this dimension of non-traditional masculinity is important and warrants further exploration.

Notably, willingness to reduce meat consumption was predicted only by a non-traditional masculine norm, but none of the traditional masculine norms, suggesting that non-traditional masculinity ideology, and specifically, sensitivity to male privilege, is more important than traditional masculine norms for predicting meat reduction-related behaviors. This is supported by findings from a hypothetical food choice experiment that tested the influence of traditional and non-traditional masculinity on men's preference for a meat versus plant-based burger (Leary et al. 2023). Men high in conformity to non-traditional masculinity were more likely to select the plant-based burger, whereas conformity to traditional masculinity did not influence burger choice, suggesting that non-traditional masculinity, rather than traditional masculinity, is instrumental in men's willingness to eat plant-based meat alternatives.

Implications and practical applications

Masculine norms explained a significant but small proportion of variance in men's overall meat consumption, RPMC, and willingness to reduce meat consumption, with all models demonstrating weak explanatory power but strong predictive power. Shmueli et al. (2019) suggest that when a PLS-SEM model has weak explanatory power but strong predictive power the theory may need to be extended. Results therefore indicate that masculine norms are likely to play an important but ancillary role in men's meat consumption and willingness to reduce, and hence, that additional factors are needed to provide a comprehensive model of men's meat consumption. Masculine norms should be considered in conjunction with other important psychosocial factors known to predict meat consumption, such as emotions like empathy and disgust, attitudes, habit, meat-related cognitive dissonance strategies, and practical factors such as perceived behavioral control and the perceived price and convenience of meat and meat-free meals (Graça, Godinho, and Truninger 2019, Rothgerber and Rosenfeld 2021; Stoll-Kleemann and Schmidt 2017). Nevertheless, several masculine norms had a strong ability to predict men's meat consumption over and above six control variables, and results were consistent with previous research demonstrating that conformity to masculine norms predict men's meat consumption and willingness to reduce their meat intake (e.g., Peeters et al. 2022; Rosenfeld and Tomiyama 2021; Stanley, Day, and Brown 2023). Considering that numerous experiments have consistently shown that men's meat consumption is influenced by concerns about feeling or appearing masculine and about meeting gender role expectations (Leary et al. 2023; Mesler, Leary, and Montford 2022; Pohlmann 2022), we argue that a model of men's consumption would be incomplete without the inclusion of masculine norms, and that researchers investigating men's meat consumption should consider the role of masculinity alongside other psychosocial factors.

Only a subset of masculine norms predicted men's meat consumption and willingness to reduce, which has methodological implications for investigating the meat-masculinity link. Global measures of masculinity are a more parsimonious option for predictive models of meat consumption, and may have greater predictive value, but can overlook the specific dimensions of masculinity impeding men's meat reduction or moderating experimental effects. Investigating specific masculine norms may have greater practical utility for informing men's meat reduction interventions. For example, as importance of sex was a positive predictor of meat consumption, there may be an underlying belief that meat enhances men's sex drive, possibly because red meat is rich in zinc, a mineral that supports men's fertility and libido (Fallah, Mohammad-Hasani, and Colagar 2018; Zitzmann, Faber, and Nieschlag 2006). Informing men about alternate sources of zinc could be accompanied with information on the impacts of diet on sexual functioning. For example, a systematic review found high meat consumption is positively associated with erectile dysfunction, against which the Mediterranean diet offers the best protection (Defeudis et al. 2022), which includes higher consumption of vegetables, fruits, nuts, legumes, cereals and fish, and lower meat and dairy consumption (Davis et al. 2015).

In conjunction with the literature, our findings suggest that non-traditional masculinity, particularly sensitivity to male privilege, has the most impact on men's willingness to reduce and meat-reduction-related behaviors. It may therefore be important to promote gender egalitarian attitudes among younger generations to indirectly foster greater openness to meat reduction in the long term, whilst challenging antifeminist and patriarchal ideologies promoted by the "manosphere" (Han and Yin 2023) and social media "manfluencers" such as Andrew Tate, currently popular and highly influential among young males (Roberts and Wescott 2024; Wescott, Roberts, and Zhao 2024). A notable finding was that younger, heterosexual men, high on SDO were more unhealthy meat consumers, tending to eat more red and processed meat. It would therefore be worthwhile for meat-reduction interventions to target this demographic of meat consumers.

Limitations & future research

Several limitations should be noted. Cronbach's alpha for the meat consumption, RPMC, and sensitivity to male privilege constructs was low. This was to be expected with the two-item sensitivity to male privilege scale, which demonstrated low internal consistency ($\alpha=.18$) in the original validation study (Kaplan, Rosenmann, and Shuhendler 2017), and the two-item RPMC scale, due to the very low number of scale items (Taber 2018). Low internal consistency is also expected with any frequency scale, and especially meat preferences, where there are a wide variety of consumption patterns among

individuals, such as meat lovers, compulsive meat-eaters, flexitarians, pescatarians, and vegetarians/vegans (Kemper et al. 2023). As Cronbach's alpha is a measure of consistency in participants' scale item response patterns, we could therefore expect some level of inconsistency in the response patterns of different types of consumers in our sample, which included participants with meat-eating and meat-avoiding dietary patterns. As CR is a more appropriate measure of reliability for SEM (Cheung et al. 2023; McNeish 2018), and the meat consumption scale underwent psychometric testing with EFA and CFA prior to the analysis, the low Cronbach's alpha for these scales was not viewed as majorly problematic, though researchers may wish to interpret the results cautiously.

Notably, the PLS-SEM analysis needed a minimal sample of 618 participants; hence, with our sample of 557 the analysis may not have had adequate power to detect all effects. However, given the very small effect sizes detected in the study, it's unlikely the current study was underpowered. Moreover, simulation experiments have shown that the inverse square root method consistently overestimates minimum sample sizes requirements (Kock and Hadaya 2018), and PLS-SEM has less stringent sample size requirements than CB-SEM (Willaby et al. 2015); "compared with its covariance-based counterpart, PLS-SEM has higher levels of statistical power in situations with complex model structures and smaller samples sizes" (Hair et al. 2021, 16). Another limitation was that effect sizes in the current study were small. However, considering that a substantial body of literature has consistently identified a relationship between men's meat consumption and masculinity, and that masculine norm effect sizes were similar in Campos, Bernardes, and Godinho's (2020) study, we consider the small effects observed in this sample to be meaningful and more broadly generalizable to male populations, at least in Australian and British culture. Of course, further research is necessary to confirm the results of the current study, as findings were based on data from a convenience sample of Australian and English men. As cross-sectional designs cannot infer causal relationships, future studies could determine whether conformity to the masculine norms highlighted in this study influences meat-preferences in experimental designs or interventions. Moreover, explanations for why these masculine norms predicted men's meat consumption remain speculative. Investigating how and why these norms predict men's meat consumption can better inform theory and interventions.

Conclusion

By modifying the methodological approach commonly used in the previous meat-masculinity research, whereby we utilized a multidimensional rather than global measure of masculinity, the current study extended knowledge of the meat-masculinity link by highlighting which specific masculine

norms contribute to men's meat consumption and reduction. Men who believe it is acceptable to use physical violence and who place a high importance on sexual virility tended to eat more meat overall and more red and processed meat. Willingness to reduce meat consumption tended to be highest among men who hold gender egalitarian views. By controlling for several variables, results were not attributed to differences in participants' age, education, personal income, geographic location, sexual orientation, or endorsement of social dominance orientation. Importantly, by controlling for social dominance orientation, results confirm that the relationships between meat consumption and conceptually related masculine norms (i.e., violence, sensitivity to male privilege) were not explained by participants' preference for hierarchical social structures (i.e., high social dominance orientation), but more specifically, by men's attitudes regarding physical violence toward others and their sensitivity to the advantages afforded to men in patriarchal social structures. By demonstrating that specific dimensions of masculinity predict men's meat consumption, results support a multidimensional perspective of the meat-masculinity link.

The models explained a small but significant portion of variance in outcome variables, indicating that a comprehensive model of men's meat consumption should include masculine norms alongside various additional factors. As the models had strong predictive power, conformity to masculine norms regarding violence, importance of sex, and sensitivity to male privilege appear to have a strong capacity to predict men's meat consumption and level of willingness to reduce their meat intake. Overall, the study highlights the importance of gender role norms for understanding and changing men's meat-eating patterns. Challenging and modifying men's attitudes to violence and beliefs about meat and sexual virility, while fostering gender equality, may be important strategies to reduce men's meat intake and ultimately improve men's health outcomes.

Acknowledgments

The authors would like to thank the research participants and anonymous reviewers for their feedback.

Authors' contributions

Lauren Camilleri: conceptualization, methodology, data curation, formal analysis, writing – original draft. Peter Richard Gill, Andrew Jago, Jessica Scarfo, Melissa Kirkovski: conceptualization, methodology, supervision, writing – review and editing.

Availability of data and materials

Data is available upon reasonable request at <https://doi.org/10.17026/dans-zbe-dzn4>.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

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Chapter 8: Resolving the Masculinity Dilemma: Identifying Subtypes of Male Meat Consumers Using Latent Profile Analysis

This chapter presents the second empirical study of the thesis, which identified latent profiles of male meat consumers based on twenty psychosocial variables known to predict meat consumption and reduction. As an alternative to the overemphasis on male versus female differences in meat consumption literature, this study was undertaken to provide more nuanced insights into male meat consumers by examining within-group differences in a male population. This study contributed to the literature by identifying three types of male meat consumers with distinct psychosocial profiles. These latent subgroups potentially explain why previous attempts to reduce men's consumption have been relatively unsuccessful. The study also underscores the importance of moving beyond treating men as a homogeneous group. Future research should investigate within-gender differences to better understand the variations among male consumers, thereby contributing to theory development and informing the design of targeted interventions for distinct male consumer segments.

This article was published in *Food Quality and Preference*, an international peer-reviewed journal that publishes studies pertaining to food-related consumer behaviours and preferences. In 2024 the journal had a SCImago ranking of 1.139 and a Scopus quartile ranking of Q1. The journal has an impact factor of 6.345. According to Google Scholar, as of 21st August 2025, the article has been cited 10 times. The declaration of co-authorship for this publication can be found in Appendix L.



Contents lists available at ScienceDirect

Food Quality and Preference

journal homepage: www.elsevier.com/locate/foodqual

Resolving the masculinity dilemma: Identifying subtypes of male meat consumers with latent profile analysis

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ARTICLE INFO

Keywords:

Men's meat consumption
Masculinity dilemma
Meat reduction
Intervention strategies
Latent profile analysis
willingness to reduce meat intake

ABSTRACT

Reducing meat consumption is necessary to meet Paris Agreement climate change targets. Efforts to reduce meat consumption should target male consumers, who are the biggest meat-eaters worldwide. However, men are often unwilling to reduce their meat intake, due partly to pressures to conform to dominant masculine ideological expectations that “real” men should eat meat (i.e., the masculinity dilemma). To build theoretical insights and more accurately inform interventions, the current study sought to identify latent subgroups of male consumers based on 20 psychosocial indicators related to meat consumption. A latent profile analysis of 575 Australian and English participants who self-identified as male yielded three distinct latent subgroups that differed significantly in indicator variables, self-reported meat consumption, and willingness to reduce their meat intake: “Resistant” consumers ate the most meat and were very unwilling to reduce, “Ambivalent” consumers ate moderate-to-high amounts of meat and were slightly unwilling to reduce, and “Meat-averse” consumers ate minimal quantities of meat and were very willing to reduce. Results suggest that previous meat-reduction intervention attempts may have been impeded by failing to target latent male consumer groups. Efforts to reduce men’s meat consumption will require further focus on within- rather than between-gender differences in male populations.

1. Introduction

The planet is exponentially warming (Gleick, 2010), leading to potentially catastrophic consequences for ecosystems, human life, and overall planetary health (Heshmati, 2020; Letcher, 2021). To mitigate this threat, in 2015, 196 countries signed a legally binding international treaty on climate change, with the goal to “limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels” (United Nations Framework Convention on Climate Change, n.d.). The global food system accounts for approximately one third of global greenhouse gas (GHG) emissions, but is often overlooked, with focus directed towards fossil fuel emissions (Clark et al., 2020). Alarmingly, a recent assessment of current food system trends estimated that, even if all fossil-fuel emissions were immediately reduced to zero, GHGs emitted by the food system alone would likely exceed the 1.5 °C target by 2063 (Clark et al., 2020). The analysis was based on conservative estimates of the food system, excluding emissions from transportation, processing, packaging, retail, and food preparation. Other researchers have come to similarly grim estimations regarding current food-related emission trends (Hedenu et al., 2014, p. 86).

Plant-based diets offer one of the most effective solutions to cutting emissions in the food sector. A systematic review comparing the environmental impacts of various diets found that vegan diets produced the lowest GHG emissions, followed by vegetarian, then omnivorous diets (Chai et al., 2019). Greenhouse gas output decreases in direct proportion to animal-based food consumption reductions (Aleksandrowicz et al., 2016). Transitioning from meat-based to plant-based diets offers an effective, and most likely necessary, step towards reaching climate targets, potentially cutting agriculture’s GHG emissions by 49% (Poore & Nemecek, 2018). Despite this need, current economic development and population growth continue to push meat consumption trends upwards (Parlasca & Qaim, 2022). In response, interventions to reduce meat consumption are increasingly being developed and tested (e.g. Bianchi et al., 2018a; Bianchi et al., 2018b; Harguess et al., 2020).

1.1. The masculinity dilemma

As men are consistently the biggest meat consumers worldwide (Graça et al., 2019; Horgan et al., 2019), efforts to reduce meat consumption should target male consumers—particularly in developed

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<https://doi.org/10.1016/j.foodqual.2023.104890>

Received 22 January 2023; Received in revised form 10 May 2023; Accepted 12 May 2023

Available online 13 May 2023

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countries where per capita meat consumption is the highest (Whitton et al., 2021). While a broad range of psychosocial factors influence people's meat intake, men experience additional gender role norm constraints. In many Western cultures, meat is associated with masculinity (Rozin et al., 2012), and as such, "real" men are expected to eat meat (Bogueva et al., 2020; Nath, 2011). In addition to this social pressure, evidence suggests that some men perform stereotypically "masculine" behaviours, such as eating meat, to affirm their masculine identity and present a masculine self-image (e.g. Mesler et al., 2022; Nakagawa & Hart, 2019; Rosenfeld & Tomiyama, 2021; Vartanian, 2015). This so-called "masculinity dilemma" (Bogueva et al., 2020) places men in a conflicting position when faced with the proposition of giving up meat. Thus, despite the detrimental consequences of meat consumption, men are consistently unwilling to reduce their meat consumption (Graça et al., 2019; Graça et al., 2015; Nakagawa & Hart, 2019; Schösler et al., 2015) and less likely than women to reduce their meat consumption, choose meat-free options, or change their attitudes towards meat-reduction, in intervention studies (Campbell-Arvai et al., 2014; Jalil et al., 2020; Pohlmann, 2022). The "masculinity dilemma" calls for more research focusing on men's meat consumption, to enable effective male-specific meat-reduction interventions to be developed.

As gender is one of the most consistent predictors of meat consumption, researchers have recommended that gender should be considered in meat consumption studies (Cordts et al., 2014; De Backer et al., 2020; Modlinska et al., 2020), and when designing interventions (Bogueva & Marinova, 2018; Graça et al., 2019). Despite these recommendations, the majority of meat consumption research neglects a gendered approach. Furthermore, researchers have drawn attention to the misdirected focus on male versus female comparisons, and the assumption that, regarding meat consumption, men comprise a homogenous group (De Backer et al., 2020; Rosenfeld & Tomiyama, 2021). This assumption overlooks potentially important within-group differences. Thus, the purpose of this study was to build a more fine-grained understanding of men's meat consumption by identifying the psychosocial profiles of male consumers. Both meat-eating and meat-avoiding (i.e., vegetarian and vegan) consumers were of interest to understand the differences between male consumers with different meat consumption preferences. Previous studies have demonstrated that successful interventions can be developed by firstly identifying latent subgroups of meat-eaters (Lacroix & Gifford, 2019) and then tailoring interventions to target these subgroups (Lacroix & Gifford, 2020).

1.2. Key profiling indicators

Selection of profile indicators was guided by the authors' own literature review in conjunction with Stoll-Kleemann and Schmidt's (2017) systematic review of factors influencing meat consumption and reduction. The main factors fall into "personal", "sociocultural", and "external" categories. While external factors (economic, political, food infrastructure) are important, this study assessed only personal and sociocultural factors.

1.2.1. Personal factors

Emotions and cognitive dissonance strategies are two of the strongest influencing factors on meat-reduction (Stoll-Kleemann & Schmidt, 2017). Meat-related cognitive dissonance (MRCD) is the psychological discomfort that arises when people realise their meat consumption conflicts with their values (e.g., concern for animal suffering; Rothgerber & Rosenfeld, 2021). Multiple strategies—such as rationalisation (Piazza et al., 2015), dehumanisation (Bilewicz et al., 2011), and denial of animal mind (Tian et al., 2016)—enable people to eat meat without psychological discomfort, and are associated with higher meat consumption and unwillingness to reduce meat intake. Regarding emotions, people who feel disgusted by meat's sensory qualities (i.e., sensory disgust) are less likely and less willing to eat meat (Becker & Lawrence, 2021; Kunst and Palacios Haugestad, 2018); and some people feel

disgust in response to farm animal cruelty or slaughter (i.e., moral disgust; Buttlar & Walther, 2022; Graça et al., 2015; Khara et al., 2021), which is associated with lower meat consumption (Graça et al., 2015) and meat avoidance (Anderson et al., 2019; Rozin et al., 1997). Empathy for farm animal suffering is also negatively associated with intentions and willingness to eat meat (Earle et al., 2019; Herrewijn et al., 2021; Kunst & Hohle, 2016).

Regarding practical factors, people are more likely to reduce their meat consumption if they believe plant-based food is more affordable than meat (Lacroix & Gifford, 2019; Lentz et al., 2018; Neff et al., 2018), and more likely to eat meat if they believe it is more convenient than plant-based food (Malek et al., 2019; Schenk et al., 2018; Tucker, 2014). Furthermore, people only engage in behaviour with sufficient confidence in their ability to perform it (i.e., perceived behavioural control (PBC); Ajzen, 2002). High PBC towards meat-reduction is negatively associated with meat consumption (Lacroix & Gifford, 2019; Rees et al., 2018; Weibel et al., 2019), and positively associated with willingness to reduce (Graça et al., 2015; Wang & Scrimgeour, 2021). Habit (i.e., unconscious, automatic, and routine behaviour) also strongly impacts people's everyday actions (Wood & Rünger, 2016). Meat-eating habit strength is positively related to meat consumption (Mullee et al., 2017; Rees et al., 2018; Schösler et al., 2014), and can be a strong barrier to reducing meat consumption among men (Cordts et al., 2014; Lea et al., 2006).

Other personal factors include attitudes, ideological beliefs, and motivations. Attitude towards meat is a strong and consistent predictor of meat consumption (De Houwer & De Bruycker, 2007; Lentz et al., 2018). Social dominance orientation (SDO; i.e., endorsement of establishing social hierarchies and maintaining power over outgroups) is a consistent positive predictor of meat consumption (Holler et al., 2021). Finally, the main motives driving meat-reduction are for personal health benefits, ethical concern for animals, and preservation of the environment (Graça et al., 2019; Hopwood et al., 2020; Rosenfeld, 2018).

1.2.2. Sociocultural factors

Sociocultural factors also have a strong impact on meat-reduction (Stoll-Kleemann & Schmidt, 2017). People who believe others in their social circle would approve of or support them reducing their meat consumption are more likely to reduce (Lacroix & Gifford, 2019; Weibel et al., 2019) or intend to reduce their meat intake (Cheah et al., 2020; Schenk et al., 2018; Wyker & Davison, 2010). Conformity to traditional masculine norms positively predict, whereas new (non-traditional) masculinity norms negatively predict, men's meat consumption (Rosenfeld & Tomiyama, 2021; Rothgerber, 2013). Specifically, a recent analysis using the same dataset as the current study found that traditional masculine norms endorsing violence, the importance of sex, and heterosexual self-presentation were the key positive predictors of men's meat consumption (Camilleri et al., 2023b). Finally, people living in cultures where meat production is embedded in the country's economy, or where meat is a central part of cultural traditions (e.g., barbeques, the Sunday roast, etc.), have more positive attitudes to eating meat, and tend to eat more meat, when they have a stronger national identity (Bogueva et al., 2017, 2020; Nguyen & Platow, 2021).

1.3. Aims and hypotheses

The aims of this study were to: (1) identify the number of latent subgroups of men who differ according to psychosocial variables known to influence meat consumption; (2) assess the similarities, differences, and relative importance of each psychosocial indicator for each profile; and (3) validate the profiles by determining whether subgroups differ significantly in self-reported meat consumption and willingness to reduce meat consumption.

As male consumers have not previously been profiled on the basis of meat-related indicators, broadly speaking the current analysis was exploratory. However, previous latent variable mixture modelling

studies have found three (Lacroix & Gifford, 2019) and six (Apostolidis and McLeay, 2016; Latvala et al., 2012) latent subgroups of meat consumers in mixed gender samples, with profiles showing differences on a range of psychosocial variables. Therefore, our first hypothesis was that there would be latent subgroups within the population of male consumers (i.e., at least two), however the precise number of latent groups was unknown. Secondly, we hypothesised that the latent subgroups would exhibit distinct psychosocial characteristics by differing significantly on indicator scores. Thirdly, assuming that profiles would exhibit unique psychosocial characteristics relevant to meat consumption and reduction, we hypothesised that profiles would differ significantly in their self-reported meat consumption and in their willingness to reduce.

2. Methods and materials

2.1. Participants & procedure

Upon ethics approval, a convenience sample of Australian and English participants who self-identified as male was obtained through “Prolific” (<https://www.prolific.co/>). Participants were reimbursed \$12 AUD for approximately 30 min of their time. We aimed for a minimum of 500 participants as this is the recommended minimum sample size for latent profile analysis (Nylund et al., 2007; Spurk et al., 2020). 596 participants returned the survey through Prolific, and an additional 45 Australian participants were recruited on Facebook via survey recruitment groups as well as the principal researcher’s personal network. Sixty-six incomplete surveys were deleted, leaving a total of 575 participants (322 Australian, 253 English, mean age = 38.53, SD = 13.38). As the total dataset contained <1% of missing values, single imputation personal mean score replacement was appropriate to replace missing data (Eekhout et al., 2014; Hair Jr. et al., 2013).

2.2. Indicator variables

Twenty indicators were used to profile participants. There is some disagreement regarding the number of indicators that should be included in latent profile analysis, with studies using as little as three (Kovacs et al., 2022) and as many as 24 indicators (De Guzmán et al., 2016). Monte-Carlo simulations have shown that a greater number of indicators can “lead to more converged and proper replications, as well as few boundary parameter estimates and less parameter bias” and that using a greater number of indicators can compensate for small sample sizes (Wurpts & Geiser, 2014, p. 1). The most important point is that the researcher should have sound theoretical rationale for each indicator’s inclusion (Weller et al., 2020). The current study used the following measures:

Rothgerber’s (2013) Meat-Eating Justifications scale captures a broad range of MRCD strategies that can be categorised into “direct” or “indirect”. Seven 3-item subscales comprised the *direct MRCD* scale ($\alpha = 0.89$): pro-meat (i.e., loving the taste of meat); health (believing that meat is necessary for health and strength); hierarchical (believing that animals are lower than humans in a natural hierarchy); human destiny/fate (claiming that humans are biologically evolved and thus destined to eat animals); religious (believing that God created animals for human use); denial of animal suffering (denying the suffering caused to livestock animals in meat production); and dichotomisation (making a psychological distinction between animals used for food from other types of animals). Two 3-item subscales comprised the *indirect MRCD* scale ($\alpha = 0.80$): dissociation (dissociating meat from the living, sentient animal from which it came); and avoidance (avoiding thinking about where meat comes from or how it is processed). Higher scores indicated greater use of MRCD strategies.

Sensory disgust was measured with the Animal Flesh Disgust subscale from Hartmann and Siegrist’s (2018) Food Disgust Scale. Four items (e. g., “to see raw meat”) were rated from 1 (*not at all disgusting*) to 6 (*extremely disgusting*). Higher scores indicated greater disgust towards

meat ($\alpha = 0.87$). *Moral disgust* and *animal empathy* were measured using an adapted method based on previous self-report emotional measurements (Anderson et al., 2019), where participants were shown three images of farm animals in distressing situations (Appendix A), and read one statement “when I think about the fact that animals are killed so that humans can eat them I feel...”, indicating the extent to which they felt (1) sad, (2) disgusted, (3) empathetic, and (4) happy, on a scale of 0 (not at all) to 100 (very much so). The four “disgusted” items were summed to create a moral disgust score ($\alpha = 0.91$); the four empathetic items were summed to create an animal empathy score ($\alpha = 0.93$). Higher scores indicated greater moral disgust/animal empathy.

Convenience and *price* were measured with an adapted version of the convenience and price subscales from Steptoe et al.’s (1995) Food Choice Questionnaire. From 1 (*strongly disagree*) to 5 (*strongly agree*), for convenience, participants rated the extent to which they believe meat-free meals are: (1) easy to prepare; (2) convenient; (3) can be cooked very simply; (4) are easily available in shops, restaurants, and supermarkets; and (5) are quick to prepare; and for price, the extent to which (1) meat is cheap; (2) meat is good value for money; (3) meat is cheaper than plant-based foods; (4) a meat-based diet is more affordable than a plant-based diet; and (5) meat is expensive (reverse coded). Higher convenience scores indicated participants believed meat-free meals are convenient ($\alpha = 0.84$); higher price scores indicated participants believed meat is more affordable than plant-based food ($\alpha = 0.85$). *Habit strength* was measured using Rees et al.’s (2018) habit scale: “Eating meat is something... (1) I do automatically; (2) I do without having to consciously remember; (3) I do without thinking; (4) I have no need to think about doing; and (5) that is typically me. Items were rated from 1 (*strongly disagree*) to 5 (*strongly agree*). Higher scores indicate a stronger habit ($\alpha = 0.89$). *Perceived behavioural control (PBC)* was measured with three items taken from previous scales of meat-related PBC (Graça et al., 2015; Lentz et al., 2018), and a fourth item created to cover the self-efficacy component of PBC based on Ajzen’s (2002) theory of PBC. On a scale from 1 (*strongly disagree*) to 5 (*strongly agree*), participants rated agreement that: (1) I am confident I could change my meat consumption habits if I wanted to; (2) whether I change my meat consumption habits or not is entirely up to me; (3) changing my meat consumption habits or not is something that is under my control; and (4) changing my meat consumption habits would be difficult (reverse coded). Higher scores indicated greater PBC ($\alpha = 0.67$).

Attitude to eating meat was measured with a 3-item scale adapted from previous research (Graça et al., 2015; Lentz et al., 2018). Participants rated from 1 to 5 the extent to which they believed the act of eating meat was (1) bad-good; (2) unpleasant-pleasant; (3) unfavourable-favourable. Higher scores indicated a more positive attitude towards eating meat ($\alpha = 0.88$). *Social dominance orientation (SDO)* was measured with the 4-item Short Social Dominance Orientation Scale (Pratto et al., 2013) on a scale of 1 (extremely oppose) to 5 (extremely favour). Higher scores indicated greater endorsement of SDO ($\alpha = 0.82$). Three subscales from the 15-item Vegetarian Eating Motives Inventory (Hopwood et al., 2020) measured the extent to which participants were motivated to reduce their meat consumption for *health* (4 items; $\alpha = 0.93$), *environmental* (5 items; $\alpha = 0.97$), or *animal welfare* reasons (5 items; $\alpha = 0.97$), from 1 (*not important reason to reduce my meat intake*) to 7 (*very important reason to reduce my meat intake*). One item (“animals’ rights are respected”) was accidentally excluded during data collection. Higher scores indicated greater motivation to reduce one’s meat intake.

Perceived social support to reduce meat consumption was measured using a scale adapted from previous research (Cheah et al., 2020; Povey et al., 2001). Participants indicated the extent to which they agreed that members of their social circle (male/female friends (2 items); male/female family members (2 items); male/female work colleagues (2 items); partner (1 item); health expert (1 item)) would approve of them reducing their meat consumption, from 1 (*strongly disagree*) to 5 (*strongly agree*). Unapplicable items (i.e., 78 Australian and 59 English men without partners) were given a neutral score of 3 (*neither agree nor*

disagree). Higher scores indicated greater social support ($\alpha = 0.87$). For conformity to traditional masculine norms, the *violence* (3 items; $\alpha = 0.76$) and *heterosexual self-presentation* (3 items; $\alpha = 0.75$) subscales were taken from the Conformity to Masculine Norms Inventory Short Form (Levant et al., 2020); the *importance of sex* (3 items; $\alpha = 0.84$) subscale was taken from the Male Role Norms Inventory Short Form (Levant et al., 2013). *Non-traditional masculinity* ($\alpha = 0.88$) was measured with the 17-item New Masculinity Inventory (Kaplan et al., 2017). Participants rated agreement with statements from 1 (*strongly disagree*) to 6 (*strongly agree*). Higher scores indicated greater conformity. *National identity* ($\alpha = 0.94$) was measured with Nguyen and Platow's (2021) 13-item national social identification scale (e.g., "I feel a bond with other Australians/Britons"). Participants rated their agreement with each statement from 1 (*strongly disagree*) to 5 (*strongly agree*). One item ("I identify with being a(n) Australian/Briton") was accidentally excluded from the data collection. Higher scores indicated stronger national identity.

Meat Consumption: We used the Meat Consumption subscale of the Meat Consumption and Intention Scale (MCIS) that we developed through exploratory and confirmatory factor analysis prior to this analysis (Camilleri et al., 2023a). For seven different meat types (beef; lamb; poultry; pork; bacon/ham; other processed meats (e.g., sausages, salami, hot dogs); and fish/seafood) participants indicated 1) the total number of times they ate each meat type in the past two-weeks; and 2) the average quantity of each serving for each type of meat (*very small* (less than 10% of a typical meal); *small* (10–20% of a typical meal); *medium* (21–30% of a typical meal); *large* (31–40% of a typical meal); and *very large* (more than 40% of a typical meal). Scores for each meat type were calculated by multiplying the frequency by the quantity. A total meat consumption score was created by summing each meat score ($\alpha = 0.54$). Removal of scale items did not improve the scale's alpha value, therefore we retained the scale as is. Although Cronbach's alpha was low, inter-item correlations of the total meat consumption scale was 0.161, falling into the acceptable range of 0.15 to 0.50, indicating sufficient internal consistency (Clark & Watson, 1995). An adapted *willingness to reduce meat consumption* scale was used based on a previous measurement (Graça et al., 2015), comprising three items asking the extent of the participants' willingness to 1) slightly reduce your meat consumption; 2) drastically reduce your meat consumption; and 3) stop eating meat altogether, using a scale from 1 (*very unwilling*) to 5 (*very willing*). Higher scores indicated greater willingness to reduce ($\alpha = 0.87$).

Demographics: Participants were asked about their age; geographic location (urban versus rural); education; income; sexual orientation (heterosexual or non-heterosexual); and political orientation ("How would you describe your political view?" 1 = very liberal/left-wing, 2 = slightly liberal/left-wing, 3 = centre, 4 = slightly conservative/right-wing, 5 = very conservative/right-wing). Based on the distribution of incomes among participants, as well as data from the Office for National Statistics (2022; <https://www.ons.gov.uk/employmentandlabourmarket/peopleinwork/employmentandemployeetypes/bulletins/averageweeklyearningsinbritain/latest>), and the Australian Taxation Office (2022; <https://www.ato.gov.au/Individuals/Income-and-deductions/Offsets-and-rebates/Low-and-middle-income-earner-tax-offsets/>), UK participants earning \leq £9,999 annually before tax were classed as low income, those earning £10,000 – 39,999 were classed as medium, and £40,000 + were classed as high; and Australian participants earning \leq \$59,000 were classed as low income, \$60,000 – 99,999 were class as medium, and \geq \$100,000 were classed as high.

2.3. Data analysis

Data was analysed with the tidyLPA package (Rosenberg et al., 2018) in the software program R using latent profile analysis (LPA), a person-centred latent variable mixture modelling analysis technique, which identifies unobserved subgroups of people within a population. The individuals within a subgroup share a unique set of characteristics (based on a set of indicator variables relevant to a phenomenon of

interest) that distinguish them from other subgroups in the population (Berlin et al., 2014). Whereas variable-centred approaches focus on the relationships between variables, person-centred approaches focus on similarities and differences between individuals (Marsh et al., 2009), and can provide more detailed information by estimating parameters for multiple subpopulations (Howard & Hoffman, 2018). Latent class and latent profile analyses are similar techniques that are both able to identify latent subgroups within a population, however, latent class analysis uses categorical indicator variables, whereas LPA uses continuous indicators (Gunzler et al., 2021). As the indicators of interest to the current study were continuous, LPA was selected.

Further analyses were conducted in IBM SPSS Statistics v28.0. A series of one-way between-group analysis of variance (ANOVA) tests assessed differences between profiles on indicator scores. When Levene's test was significant, indicating that homogeneity of variance was violated, Welch's test was used. Additionally, to establish criterion-related validity for the profiles, ANOVAs tested differences between profiles on meat consumption and willingness to reduce (Table 2). Chi-square tests assessed whether the profiles differed on demographic variables (Table 3).

Five univariate outliers determined to be legitimate values were treated using a Winsorisation technique, in which the outlier is modified to one unit above or below the closest non-outlier (Kwak & Kim, 2017). Winsorisation was not appropriate for 11 legitimate remaining outliers, as scores were only one unit higher/lower than non-outliers, thus, these were left untreated. Multivariate outliers were assessed using Mahalanobis distance. With 20 indicators the chi-square cut-off value ($p = .001$) was 45.31, revealing ten potential multivariate outliers. As unusual or extreme cases occur naturally in populations, some researchers argue that outliers deemed legitimate cases (i.e., neither data entry errors nor intentional misreporting) should be retained to ensure that an entire population is represented (Hair et al., 2018, p. 91; Kwak & Kim, 2017). In a normally distributed dataset, approximately 1% of legitimate cases can be expected to fall outside three standard deviations from the mean (Osborne & Overbay, 2004). Moreover, unusual cases can lead to important theoretical advancements (Aguinis et al., 2013). The profile of each potential multivariate outlier was individually inspected, and all

Table 1
Latent profile analysis model testing.

Model	Number of Profiles	AIC	BIC	Entropy
1	1 Profile	32695.57	32869.74	1.00
1	2 Profiles	30645.17	30910.78	0.92
1	3 Profiles	29799.79	30156.85	0.9
1	4 Profiles	29322.06	29770.56	0.91
1	5 Profiles	29042.82	29582.76	0.89
1	6 Profiles	28982.02	29613.4	0.87
2	1 Profile	32695.57	32869.74	1.00
2	2 Profiles	30272.33	30625.03	0.94
2	3 Profiles	29503.95	30035.18	0.93
2	4 Profiles	28818.79	29528.56	0.92
2	5 Profiles	28454.57	29342.86	0.92
2	6 Profiles	28289.32	29356.14	0.92
3	1 Profile	28303.81	29305.31	1.00
3	2 Profiles	28102.07	29195.01	0.97
3	3 Profiles	28008.04	29192.43	0.88
3	4 Profiles	27972.99	29248.82	0.85
3	5 Profiles	27927.28	29294.55	0.84
3	6 Profiles	27892.25	29350.97	0.81
6	1 Profile	28303.81	29305.31	1.00
6	2 Profiles	28049.93	30057.3	0.99
6	3 Profiles	27835.74	30848.97	0.9
6	4 Profiles	27771.27	31790.36	0.93
6	5 Profiles	27675.2	32700.15	0.96
6	6 Profiles	27739.6	33770.41	0.97

Note. Output of latent profile analysis model testing. AIC = Akaike Information Criterion; BIC = Bayesian Information Criterion. Underlined values indicate the lowest (i.e., optimal) model fit statistic. Bold values highlight key information for model assessment.

Table 2
Profile Means, Standard Deviations, and Z-scores of Indicator and Validation Variables.

Indicator Variable	Resistant			Meat-averse			Ambivalent		
	Mean	(SD)	Z score	Mean	(SD)	Z score	Mean	(SD)	Z score
Direct MRCD	72.35	(12.45)	0.67 ^a	30.92	(7.44)	-1.76 ^b	59.32	(13.48)	-0.09 ^c
Indirect MRCD	17.23	(5.83)	-0.37 ^a	16.15	(4.95)	-0.56 ^a	21.19	(5.30)	0.31 ^b
Sensory Disgust	8.03	(4.21)	-0.51 ^a	20.76	(3.85)	1.72 ^b	11.01	(4.83)	0.01 ^c
Moral Disgust	114.97	(88.69)	-0.65 ^a	332.91	(91.83)	1.20 ^b	210.88	105.66	0.17 ^c
Animal Empathy	147.81	(99.56)	-0.67 ^a	328.36	(98.69)	0.87 ^b	254.69	(103.24)	0.24 ^c
PBC	14.96	(2.85)	-0.12 ^a	17.51	(3.45)	0.77 ^b	15.14	(2.65)	-0.06 ^a
Habit	21.22	(3.58)	0.54 ^a	7.78	(2.32)	-2.00 ^b	18.51	(4.17)	0.03 ^c
Price	14.22	(4.48)	0.13 ^a	9.29	(3.87)	-0.97 ^b	14.05	(4.19)	0.09 ^a
Convenience	16.23	(3.87)	-0.27 ^a	21.35	(4.05)	0.97 ^b	17.33	(3.89)	-0.01 ^c
Attitude to Eating Meat	13.32	(1.81)	0.67 ^a	4.15	(1.63)	-2.19 ^b	11.16	(2.19)	-0.01 ^c
SDO	9.56	(3.91)	0.44 ^a	6.71	(3.10)	-0.37 ^b	7.34	(3.05)	-0.19 ^b
Health Motive	15.25	(7.56)	-0.49 ^a	23.05	(5.88)	0.68 ^b	19.62	(5.35)	0.17 ^c
Animal Motive	10.65	(4.50)	-1.20 ^a	33.47	(3.62)	1.16 ^b	26.99	(5.43)	0.49 ^c
Environment Motive	13.73	(8.18)	-0.81 ^a	32.05	(4.35)	1.15 ^b	23.82	(7.21)	0.27 ^c
Social Support	25.03	(6.00)	-0.38 ^a	29.00	(5.34)	0.33 ^b	28.05	(4.93)	0.16 ^b
Violence	9.44	(3.98)	0.25 ^a	6.62	(3.48)	-0.51 ^b	8.31	(3.51)	-0.06 ^c
Heterosexual Presentation	7.68	(4.72)	0.28 ^a	5.49	(4.31)	-0.23 ^b	5.96	(3.81)	-0.12 ^b
Importance of Sex	6.44	(3.67)	0.21 ^a	4.73	(2.80)	-0.31 ^b	5.54	(3.07)	0.07 ^b
Non-Traditional Masc	75.45	12.51	-0.30 ^a	85.40	(10.06)	0.52 ^b	80.12	(11.68)	0.08 ^c
National Identity	40.14	11.33	0.16 ^a	33.91	(11.90)	-0.38 ^b	37.92	(11.33)	-0.03 ^a
Validation Variable									
Meat Consumption	68.82	(33.26)	0.41 ^a	4.53	(10.27)	-1.51 ^b	56.20	(28.04)	0.02 ^c
WRMC	5.09	(2.11)	-0.62 ^a	13.51	(2.67)	1.85 ^b	7.38	(2.72)	0.05 ^c

Note: Differences between profiles on raw and standardised mean indicator scores analysed with Welch's *F* ANOVAs and Games-Howell/Gabriel's post-hoc tests. Different letters within a row indicate significant differences between profiles ($p < .05$). Differences between profiles on validation variables (Meat Consumption and WRMC) were $p < .001$. PBC = perceived behavioural control; MRCD = meat-related cognitive dissonance strategies; "masc" = masculinity; SDO = social dominance orientation; WRMC = willingness to reduce meat consumption.

Table 3
Differences between profiles on demographic variables using chi-square tests.

Demographic Variable	Total Sample (<i>n</i> = 575, 100%)	Resistant (<i>n</i> = 188, 32.7%)	Meat-averse (<i>n</i> = 55, 9.6%)	Ambivalent (<i>n</i> = 332, 57.7%)	χ^2 -statistic	Cramer's <i>V</i>	<i>p</i> -value
Self-reported diet					382.577	0.577	<0.001
Unrestricted	344 (59.8%)	156 (83.0%) ^a	1 (1.8%) ^b	187 (56.3%) ^c			
Meat-reducer	184 (32.0%)	32 (17.0%) ^a	14 (25.5%) ^{a,b}	138 (41.6%) ^b			
Meat-avoider	47 (8.2%)	0 (0%) ^a	40 (72.7%) ^b	7 (2.1%) ^a			
Country of residence					12.686	0.149	0.002
Australia	322 (56.0%)	122 (64.9%) ^a	35 (63.6%) ^{a,b}	165 (49.7%) ^b			
England	253 (44.0%)	66 (35.1%) ^a	20 (36.4%) ^{a,b}	167 (50.3%) ^b			
Age					13.283	0.108	0.039
18–29	164 (28.8%)	62 (33.0%) ^a	13 (23.6%) ^a	91 (27.5%) ^a			
30–44	247 (43.4%)	78 (41.5%) ^a	19 (34.5%) ^a	151 (45.6%) ^a			
45–59	106 (18.6%)	27 (14.4%) ^a	14 (25.5%) ^a	67 (20.2%) ^a			
≥ 60	51 (9.0%)	21 (11.2%) ^{a,b}	9 (16.4%) ^b	22 (6.6%) ^a			
Education					0.225		0.894
< Tertiary	224 (39.0%)	72 (38.3%)	23 (41.8%)	129 (38.9%)			
≥ Tertiary	351 (61.0%)	116 (61.7%)	32 (58.2%)	203 (61.1%)			
Geographic Location		2 missing		2 missing	2.555		0.279
Urban	452 (78.6%)	140 (75.3%)	45 (81.8%)	267 (80.9%)			
Rural	119 (20.7%)	46 (24.7%)	10 (18.2%)	63 (19.1%)			
Income		1 missing			9.517	0.049	0.049
Low	166 (28.9%)	64 (34.2%) ^a	21 (38.2%) ^{a,b}	81 (24.4%) ^b			
Medium	235 (40.9%)	70 (37.4%) ^a	23 (41.8%) ^a	142 (42.8%) ^a			
High	173 (30.1)	53 (28.3%) ^a	11 (20.0%) ^a	109 (32.8%) ^a			
Sexual Orientation					14.962	0.161	<0.001
Heterosexual	512 (89.0%)	179 (95.2%) ^a	43 (78.2%) ^b	290 (87.3%) ^b			
Bi/homosexual	42 (11.0%)	9 (4.8%) ^a	12 (21.8%) ^b	42 (12.7%) ^b			
Political Orientation					25.860	0.150	<0.001
Left-wing	286 (49.7%)	72 (38.3%) ^a	39 (70.9%) ^b	175 (52.7%) ^c			
Centre	168 (29.2%)	59 (31.4%) ^a	9 (16.4%) ^a	100 (30.1%) ^a			
Right-wing	121 (21.0%)	57 (30.3%) ^a	7 (12.7%) ^b	57 (17.2%) ^b			

Note. Bold values indicate significant differences between profiles on that demographic variable. Different superscript letters within a row indicate significant differences between profiles. χ^2 = chi-square statistic.

were determined to contain legitimate data. Considering firstly that the ten outliers represented only 1.7% of the sample, and secondly, that Cook's distance was <1 for all outliers, these cases were retained in the analysis.

3. Results

3.1. Selecting profiles

Assumptions regarding normality, multicollinearity, and outliers were addressed before conducting the analyses. LPA can utilise four different within-class variance–covariance structural parameter specifications to estimate latent profiles. As these specifications can dramatically influence the nature and number of latent profiles (Masyn, 2013), all four parameter specifications (TidyLPA Models 1, 2, 3, and 6) were assessed. To determine the optimal profile solution, we compared model fit statistics between one- and six-profile solutions for Models 1, 2, 3 and 6 (Table 1). Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) fit indices were analysed, with the lowest value indicating the best fitting model (Spurk et al., 2020). The lowest AIC value indicated a 5-profile solution was the best fitting model, whereas the lowest BIC value indicated that a 3-profile solution best fit the data. These two models were assessed further to select the optimal profile solution.

By comparing the 3- versus 5-profile solutions on several criteria, the 3-profile solution was selected as the most appropriate. Firstly, the proportion sizes of profiles were considered. Ideally in LPA, a profile group should not contain less than 5% of the total sample (He & Fan, 2018). As neither solution contained a profile with less than 5% of the sample, both solutions were deemed acceptable. Secondly, the 3-profile solution had the lowest BIC value, which researchers agree is more accurate at profile classification than the AIC (Nylund et al., 2007; Sinha et al., 2021; Tein et al., 2013; Weller et al., 2020). Thirdly, entropy values give an indication of “the confidence with which individuals have been classified as belonging to one profile or another” (Spurk et al., 2020, p. 13), and should exceed 0.80, with higher values indicating more distinct and accurate profile classification (Clark & Muthén, 2009). Both solutions provided a high level of confidence (entropy >0.80) that profiles were classified accurately. Lastly, theoretical and practical considerations should be used as a guide to model selection (Masyn, 2013; Ram & Grimm, 2009), with parsimony given priority if additional profiles do not provide “meaningful new insights” (Spurk et al., 2020, p. 13). Inspection of mean indicator plots showed that the 5-profile solution split the largest profile from the 3-profile solution into three smaller segments; these segments followed a similar mean pattern on all indicators, with the exception of two masculinity indicators. The additional profiles added little new insights, yet made the model substantially more difficult to interpret (considering the large number of indicators). The 3-profile solution offered greater simplicity and parsimony. In summary, the 3-profile solution had adequate profile proportions, the lowest BIC index, strong entropy, and offered the most parsimonious solution.

3.2. Profile descriptions

Profile 1 (32.7% of the total sample), which we named “Resistant” consumers, was overwhelmingly comprised of unrestricted meat-eaters (83.0%), and no meat-avoiders. Profile 2 (9.6% of the total sample), named “Meat-averse” consumers, contained mostly meat-avoiders (72.7%) and meat-reducers (25.5%). Profile 3, named “Ambivalent” consumers (57.7% of the sample), contained mostly unrestricted meat-eaters (56.3%) and meat-reducers (41.6%).

Significant differences in indicator scores were examined to identify distinguishing profile features. The biggest differences between profiles was in their attitudes towards eating meat, emotions, direct MRCD strategies, habit strength, and meat-reduction motives. Meat-averse consumers had very negative attitudes towards meat, very strong feelings of sensory disgust towards meat, strong emotional reactions to farm animal suffering (i.e., high moral disgust and animal empathy), and scored very low on direct MRCD strategies and meat-eating habit strength. They scored highly on all meat-reduction motives, but

especially believed animals and the environment were important reasons to reduce. Conversely, Resistant consumers had very positive attitudes towards eating meat, the lowest meat disgust and emotional reactions to farm animal suffering, the highest use of direct MRCD strategies, and the strongest meat-eating habits. They did not believe that health, animals, or the environment were important reasons for meat-reduction, especially the animal welfare motive. Ambivalent men held somewhat positive attitudes towards meat, slightly below average sensory disgust, above average emotional responses to farm animal suffering, and moderate level habit strength. Like the Meat-averse group, Ambivalent men tended to use indirect rather than direct MRCD strategies. They agreed that health, animals, and the environment were important reasons for meat-reduction, especially animal welfare.

For other personal factors, Resistant and Ambivalent consumers had equally lower confidence than Meat-averse consumers in their ability to reduce their meat consumption if they wanted to (i.e., PBC), and were equally less likely to believe that plant-based diets are more affordable than meat-based diets (i.e., price). Meat-averse men tended to view meat-free meals as convenient; Ambivalent men viewed meat-free meals as somewhat convenient; whereas Resistant men felt neutral about this. Although none of the profiles strongly endorsed SDO, Resistant consumers scored significantly higher than the other two profiles.

Profiles also differed on sociocultural factors. While none of the profiles conformed strongly to traditional masculine norms, Resistant consumers scored significantly higher than other profiles, and lower on non-traditional masculine norms; conversely, the Meat-averse men scored the lowest on traditional masculine norms and highest on non-traditional masculinity. Perceived social support was significantly lower for Resistant men than other profiles, indicating that they were less likely to believe that others in their social circle would approve of them reducing their meat consumption. Finally, national identity was lower amongst Meat-averse men.

3.3. Profile validation

Welch’s ANOVAs using Games-Howell or Gabriel’s post hoc tests found significant differences between profiles on all indicator and validation variables, supporting all hypotheses (Table 2). A guide to interpreting raw indicator scores is provided in Appendix A. Standardised mean indicator scores are displayed in Fig. 1. Resistant consumers had the highest meat consumption and lowest willingness to reduce, whereas Meat-averse consumers had the lowest meat consumption and highest willingness to reduce (Fig. 2). Chi-square tests found significant differences between profiles in self-reported diet, country of residence, age, income, sexual orientation, and political orientation (Table 3).

4. Discussion

This study aimed to identify psychosocial profiles of male consumers to build theoretical insights into men’s meat consumption and better inform meat-reduction interventions. Supporting the first hypothesis—that there would be at least two latent subgroups within the population of male consumers—latent profile analysis of 20 indicators yielded three distinct latent profiles: “Resistant”, “Meat-averse”, and “Ambivalent”. One-way ANOVAs supported the second hypothesis that profiles would differ significantly on indicator scores, highlighting the psychosocial similarities and differences between profiles. Supporting the third hypothesis, significant differences between profiles on meat consumption and willingness to reduce provided evidence supporting the validity of the distinct profiles. Profile summaries and intervention recommendations are presented in Table 4.

The overarching feature of the Resistant profile—the heaviest meat-eaters—was their resistance to meat-reduction. They utilised direct MRCD strategies (which justify and defend meat consumption), lacked motivations to reduce as well as emotional sensitivity to farm animal

Standardised Indicator Scores for Resistant, Meat-Averse & Ambivalent Consumers

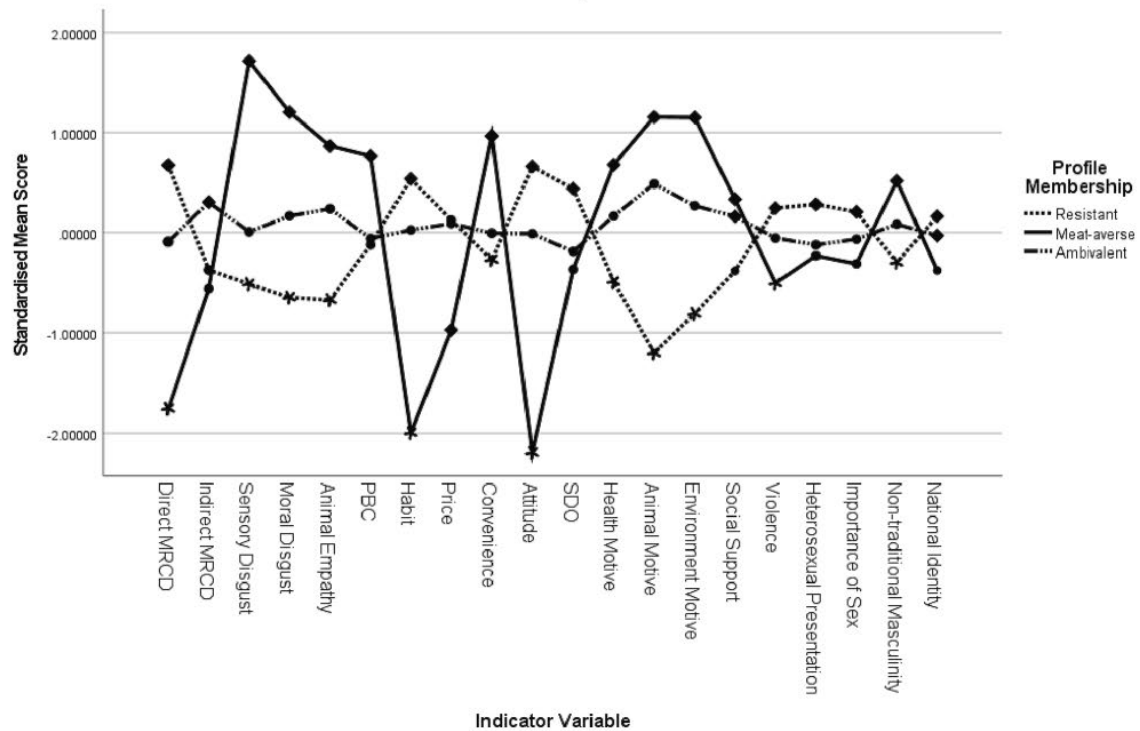


Fig. 1. The standardised mean scores of all 20 indicator variables are plotted above for the Resistant, Meat-averse, and Ambivalent profiles. Each line represents a different profile. For each indicator, differently shaped markers (either a square, circle, or star) indicate there is a significant difference between profiles in their mean indicator scores on that variable. MRCD = meat-related cognitive dissonance; PBC = perceived behavioural control; SDO = social dominance orientation.

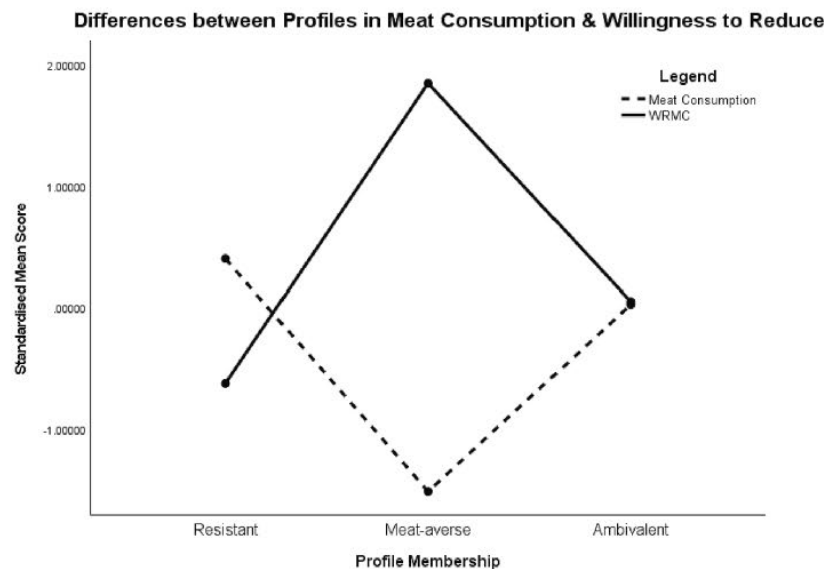


Fig. 2. Differences between Resistant, Meat-averse, and Ambivalent consumers in their standardised meat consumption and willingness to reduce meat consumption (WRMC) scores. Significant differences were found between all three profiles in their meat consumption and WRMC.

suffering, and had more ingrained meat-eating habits. This, in conjunction with higher SDO and right-wing political conservatism (a preference for preserving the status quo; Jost et al., 2008), and their

strong unwillingness to reduce, suggests that the Resistant consumers would actively resist dietary change. Moreover, there was a lack of social support for Resistant consumers to reduce, as people in their social circle

Table 4

Key characteristics of profiles and corresponding intervention recommendations.

Profile	Key Characteristics	Intervention Recommendations
Resistant	<ul style="list-style-type: none"> • High use of direct MRCD strategies. • Unconcerned about farm animal welfare. • Most likely to perceive meat-free meals as inconvenient. • Highly unconscious, routinised meat-eating habits. • Lower perceived social support to reduce meat consumption. • Higher SDO & right-wing conservatism. • High conformity to traditional masculine norms (especially heterosexual self-presentation); low conformity to non-traditional masculinity. 	<ul style="list-style-type: none"> • Avoid animal welfare appeals, as they are likely to incite defensive reactions and increase meat attachment (e.g., Dowsett et al., 2018; Rothgerber & Rosenfeld, 2021). • Improve the visibility, accessibility, and convenience of meat-alternatives (e.g., Vandenbroele et al., 2019). • Break meat-eating habits with methods that facilitate dietary awareness and self-monitoring: e.g., smart phone tracking (Piazza et al., 2022); text message reminders and food-diary (Carfora et al., 2019); goal-setting (Rees et al., 2018). • Increase perceived social support for meat-reduction by engaging the individual's entire household in intervention and promote meal-sharing (Kemper & White, 2021), communicating dynamic social norm information (Sparkman et al., 2020), and/or creating widespread public awareness and acceptance of the need for meat-reduction (e.g., via educational or social marketing campaigns). • Appeal to conservative values of purity (e.g., highlight meat contamination and the role of meat production in the spread of diseases and antibiotic resistant bacteria; Espinosa et al., 2020; Rothgerber, 2020). • Methods effective for high SDO: frame meat-alternatives as "superior" to meat (Gohary et al., 2023); frame the negative impacts of meat (e.g., health, environmental) as a superordinate threat (to the nation) rather than as a self-oriented threat (to the individual; Mesler et al., 2022); nudging (setting plant-based options as the default) effective at reducing meat preferences regardless of SDO/conservatism (Prusaczyk et al., 2021). • Market and frame plant-based foods and meat-alternatives as "masculine" to appeal to and align with traditional masculine norms; reduce the association between vegetarianism and femininity (e.g., Brough et al., 2016).
Meat-averse	<ul style="list-style-type: none"> • Strong negative attitude to eating meat. • Concerned about animal welfare & empathetic to farm animal suffering. • Strong sensory & moral disgust towards eating meat. 	<ul style="list-style-type: none"> • Reinforce negative attitude towards meat with reminders of negative aspects of meat consumption. • Animal welfare appeals; elicit empathy for farm animal suffering (Mathur et al., 2021).

Table 4 (continued)

Profile	Key Characteristics	Intervention Recommendations
	<ul style="list-style-type: none"> • High conformity to non-traditional masculinity; low endorsement of traditional masculine norms (especially violence). • Stronger left-wing political orientation. • Very weak meat-eating habit strength 	<ul style="list-style-type: none"> • Strengthen/reinforce sensory and moral disgust towards eating meat (Feinberg et al., 2019; Palomo-Vélez et al., 2018; Tybur et al., 2016). • Men who conform to non-traditional masculinity are more likely to be higher in masculinity stress, and thus, are more likely to choose meat-free options when these are framed as "masculine" (Leary et al., 2023). • Emphasise association between meat and violence. • Appeal to liberal/left-wing values (e.g., social equality/justice; social progressivism/change). • Left-wing/liberals more likely to support government regulations of (animal agricultural) industries (e.g., taxation; removing subsidies) versus private sector initiatives (e.g., Gillis et al., 2021; Lalot et al., 2022).
Ambivalent	<ul style="list-style-type: none"> • Ambivalent about meat: positive attitude to eating meat while simultaneously concerned about animal welfare. • Motivated to reduce meat consumption for the environment, health, and especially for animal welfare. • Emotionally responsive to farm animal suffering (i.e., moderate feelings of animal empathy and moral disgust). • High use of indirect MRCD strategies (dissociation & avoidance). 	<ul style="list-style-type: none"> • Induce and/or amplify ambivalent feelings towards eating meat; this may be particularly effective if ambivalence is induced before presenting persuasive meat-reduction messages (Pauer et al., 2022). • Raise awareness of the negative consequences of meat consumption on animal welfare, the environment, and health to increase reduction motivations (e.g., Aberman & Plaks, 2022; Cordts et al., 2014; Jalil et al., 2020). • Elicit and increase animal empathy and moral disgust by highlighting animal suffering caused to farm animals in the meat industry (e.g., Feinberg et al., 2019; Herrewijn et al., 2021) or presenting ethical arguments highlighting moral transgressions against farm animals (e.g., Schwitzgebel et al., 2023); however, masculinity should be affirmed before implementing animal welfare appeals (Pohlmann, 2022). • Overcome dissociation and avoidance by making the meat-animal connection salient (e.g., Earle et al., 2019; Kunst & Hohle, 2016); using interactive and engaging approaches such as virtual reality (Herrewijn et al., 2021) or interactive dialogues (Buttler et al., 2021); or using graphic warning labels on meat products (Choueiki et al., 2021; Kranzbühler & Schifferstein, 2023). • Foster other Meat-averse characteristics: increase PBC, perceived convenience & affordability of plant-based

(continued on next page)

Table 4 (continued)

Profile	Key Characteristics	Intervention Recommendations
		diets; break meat-eating habits.

Note. Intervention recommendations are based on various studies in the literature (referenced in the table). A systematic literature review of meat-reduction experiments found that combining multiple intervention strategies/techniques (e.g., educational information + emotional messages) is more effective than single strategy approaches (Harguess et al., 2020). Convenience, habit, and social support intervention techniques recommended for Resistant men are also likely to benefit Ambivalent men. SDO = social dominance orientation; MRCD = meat-related cognitive dissonance.

were significantly less likely to approve of them reducing their meat consumption compared to other profiles. Hence, interventions are unlikely to be effective reducing Resistant consumers' meat intake. Nevertheless, potential meat-reduction intervention strategies most suitable for Resistant consumers are outlined in Table 4.

The Meat-averse men ate minimal quantities of meat (if at all) and were characteristically opposite to Resistant men. The most distinctive feature was their strong meat aversion, demonstrated by an extremely negative attitude, and strong feelings of sensory and moral disgust, towards meat. Meat-averse men had minimal barriers to meat-reduction: they did not use direct MRCD strategies, had confidence in their ability to reduce (i.e., high PBC), believed meat-free meals are convenient, very weak meat-eating habit strength, and strong motivations and willingness to reduce. Another distinguishing feature of Meat-averse men was their lower scores on national identity and traditional masculine norms than other profiles, suggesting that dominant cultural norms may influence their identity and behaviour to a lesser extent. Overall, the Meat-averse characteristics were consistent with low meat consumption and meat-avoider traits (e.g., Becker & Lawrence, 2021; Holler et al., 2021; Ruby, 2012).

The Ambivalent men ate less meat and displayed fewer barriers to meat-reduction than the Resistant profile: they believed others would approve of them reducing their meat consumption; that meat-free meals were reasonably convenient; had moderate confidence in their ability to reduce their meat intake; believed that health, animal welfare, and the environment were all important reasons for meat-reduction; and were only slightly unwilling to reduce their meat intake. Notably, the Ambivalent men were characterised by ambivalence towards meat: on the one hand, they held positive attitudes towards and ate moderate-to-high amounts of meat; on the other, they were concerned about farm animals, citing animal welfare as the most compelling reason to reduce their meat intake, and showing empathy for farm animal suffering. Hence, Ambivalent men may be the best candidates for dietary change, as meat-related ambivalence is associated with lower meat consumption, greater willingness to reduce, and is an antecedent state to meat-reduction (Pauer et al., 2022). Their concern for animals suggests that animal welfare appeals may be an effective intervention technique for this consumer group. However, interventions will need to overcome their tendency to use indirect MRCD strategies: avoiding thinking about animal slaughter and dissociating meat from its sentient animal origins. The fact that most men in our sample used dissociation and avoidance strategies is inconsistent with literature that classifies these as "female" strategies (Rothgerber, 2013) and that finds men tend to score higher in direct strategies (Hartmann & Siegrist, 2020; Piazza et al., 2015). This discrepancy further highlights how important information can be overlooked when examining men as a single population.

4.1. Research implications

Our findings yielded three distinct types of male consumers who varied in 20 meat-related psychosocial characteristics. Thus, treating

men as a single homogenous population of meat consumers may fail to capture within-group differences that are important for understanding, predicting, and influencing men's meat consumption. Previous meat-reduction interventions may have had less success with male participants because they did not consider differences between latent consumer groups. For example, studies have found that men increase their attachment to meat in response to animal empathy appeals (e.g., Dowsett et al., 2018), however, this response may occur mainly in Resistant consumers. In other words, profile membership is likely to moderate intervention effects.

This study has implications for the masculinity dilemma (i.e., men's willingness to reduce impeded by expectations that "real" men must eat meat). In line with the literature (Graça et al., 2019), most men in our sample were unwilling to reduce their meat intake. However, we found that the extent of this unwillingness varied according to profile membership. Notably, most men were only *slightly* unwilling to reduce their meat intake, and had ambivalent meat-related attitudes, indicating that (some) men may be more psychologically open to dietary change than previously assumed. The results suggest that the masculinity dilemma may only affect Resistant men, who were more influenced by dominant traditional standards of masculinity and experienced more social pressure to eat meat. Conformity to traditional masculine norms and perceived social support may interact, together increasing the likelihood of Resistant men eating meat and impeding their willingness to reduce. The masculinity dilemma may not affect Ambivalent or Meat-averse consumers, as they believed others would approve of them reducing their meat consumption and did not conform strongly to traditional masculine norms, indicating a lower degree of conflict.

Rather than expending time and resources on men who are unlikely to change their meat consumption habits, we argue that dietary interventions should target Ambivalent men, who exhibited less barriers to meat-reduction, and greater potential for meat-reduction than low-meat-intake Meat-averse men. Theoretical models of critical mass posit that when minority groups reach a certain size or "tipping point" (anywhere between 10% (Xie et al., 2011) to 40% (Grey, 2006) of the population), they can initiate the rapid widespread adoption of new social norms (Centola et al., 2018). Currently, men living on plant-based diets are the minority. Initiating a transition to plant-based eating among Ambivalent men can help reach this critical tipping point, spreading greater acceptance of plant-based diets among men.

In considering intervention design, the Meat-averse profile highlights which characteristics could be fostered in Ambivalent men to facilitate their meat-reduction. Identity (e.g., national or gender identity) and ideological/value-based factors (e.g., SDO), tend to remain stable over time (Jost et al., 2008; Mader & Schoen, 2023; Mahalik, 2014), and therefore may be difficult to change. However, intervention techniques (outlined in Table 4) can capitalise on these characteristics. Habits, attitudes, and perceptions (e.g., convenience, price, PBC) can be shifted, as can awareness of and concern for health, animal welfare, or environmental issues related to meat consumption. Intervention studies have also shown that emotions (animal empathy and disgust) can be manipulated and reduce people's willingness to eat meat (Kwasny et al., 2022; Palomo-Vélez et al., 2018). Therefore, interventions may wish to target a combination of these factors. For Ambivalent consumers, animal welfare appeals may be most effective, however, interventions will need to overcome indirect MRCD strategies, and consider that men can respond defensively to animal welfare appeals when their masculinity is threatened (Pohlmann, 2022).

4.2. Limitations & future directions

As this study was based on a relatively small sample of Australian and English men, results may not be generalisable to other cultures; replication studies are needed to support and generalise these findings. Our sample had a disproportionately high percentage of left-wing participants, which may have biased the results (particularly of the

Ambivalent group which represented the typical or most common type of consumer), as left-wing individuals tend to have more positive attitudes towards meat-reduction (Rosenfeld, 2018). Moreover, our intervention recommendations are based on cross-sectional data and are thus purely theoretical. Experimental evidence is needed to test how men from different profiles respond to various intervention techniques. As per our “tipping point” strategy, researchers should investigate the efficacy of different behaviour change techniques on Ambivalent men’s meat consumption.

The MCIS meat consumption subscale may not have distinguished participants’ meat consumption with a high level of precision, due to the low Cronbach’s alpha (0.54), therefore results may not be replicable. Due to the lack of psychometrically validated meat consumption scales available, there is a wide and inconsistent range of meat consumption measures utilised in the literature, and a lack of reporting of Cronbach’s alpha; hence, it is difficult to compare the reliability and validity of our measure to previous studies. Earlier development of the MCIS in a mixed gender sample found that the scale produced a higher reliability estimate in a mixed gender sample ($\alpha = 0.67$; Camilleri et al., 2023a). Therefore, reliability index differences may be due partly to sampling differences. Nevertheless, as the current study did not use meat consumption as a profiling variable the validity of the consumer profiles was not impacted.

Finally, we did not include all indicators relevant to men’s meat consumption. Differences between male consumers in other masculinity factors, such as masculinity contingency (Burkley et al., 2016), masculinity stress (Swartout et al., 2015), or masculinity overcompensation (Willer et al., 2013), may further distinguish male consumers. The influence of profile membership on men’s meat consumption behaviour should also be investigated, potentially extending current theories regarding the role of meat consumption in men’s masculinity maintenance and gender performances. For example, men are more likely to prefer meat when sexually motivated (Chan & Zlatevska, 2019), or when their masculinity is threatened (Mesler et al., 2022; Pohlmann, 2022). Profile membership may moderate these effects.

4.3. Conclusions

The probability of meeting climate targets can be significantly improved by reducing meat consumption among consumers with the biggest demand for meat—men in developed countries. This study identified three distinct latent profiles of male consumers from Australia and the UK who varied in their meat consumption, willingness to reduce, and important psychosocial characteristics. Meat-reduction interventions should be designed with the unique characteristics of different types of male consumers in mind, and would obtain the most dramatic meat consumption reductions by targeting Ambivalent male consumers, who showed the most potential for meat reduction. Animal welfare appeals that overcome dissociation and avoidance strategies among Ambivalent male consumers may be an effective approach. Tackling the masculinity dilemma will require further focus on within-rather than between-gender differences in male populations.

Ethical statement

This study was conducted in accordance with the Code of Ethics of the World Medical Association and with approval from the Victoria University Human Research Ethics Committee. Application ID: HRE21-162, 14/3/22. All participants provided informed consent.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

CRedit authorship contribution statement

Lauren Camilleri: Conceptualization, Methodology, Data curation, Formal analysis, Writing – original draft. **Peter Richard Gill:** Conceptualization, Methodology, Data curation, Formal analysis, Supervision, Writing – review & editing. **Jessica Scarfo:** Conceptualization, Methodology, Data curation, Formal analysis, Supervision, Writing – review & editing. **Andrew Jago:** Conceptualization, Methodology, Formal analysis, Supervision, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

We have included the URL link for the online data repository at the end of the manuscript for readers wishing to access the data <https://easy.dans.knaw.nl/ui/datasets/id/easy-dataset:271459>

Acknowledgements

The authors would like to acknowledge and thank Daniel Zarate for his technical assistance using the tidyLPA package in R.

Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.foodqual.2023.104890>.

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Chapter 9: Hegemonic Carnist Masculinity: Mechanisms of Domination and Consent

Sustaining the Oppression of Women and Animals

This chapter presents the third empirical study of this thesis, which sought to understand how hegemonic masculinity contributes to men's resistance to meat reduction through gendered power dynamics. To the author's knowledge, this was the first study to apply Connell's (1987) hegemonic masculinity theory through an ecofeminist and critical animal lens to explore power dynamics between masculinities, femininity, and animals, including both meat-eating (i.e., carnist) and veg*n male participants. The study identified various mechanisms of domination and consent between masculinities within the gender order that uphold the hegemonic status of carnist men over veg*n men, nonhegemonic masculinities (veg*n and homosexual men), women, and animals. Results elucidate how these mechanisms interact with one another to sustain men's resistance to meat reduction and the subordination of women and animals.

This article is ready for submission to a peer-reviewed journal. The declaration of co-authorship for this publication can be found in Appendix M.

Abstract

Through critical animal and ecofeminist theoretical frameworks, this study explored how hegemonic masculinity contributes to men's resistance to plant-based diets. A reflexive thematic analysis was conducted on data obtained from 19 semi-structured interviews with carnist (i.e., meat-eating) and veg*n (vegetarian and vegan) Australian and British self-identified men. Theme 1 highlighted the culturally exalted status of carnist masculinity, rewarding men's meat-eating gender performances with enhanced status, pride, belonging and sex appeal. Theme 2 revealed three mechanisms of domination (feminisation, ridicule, and social exclusion) subordinating veg*n masculinity to carnist masculinity. Theme 3 illustrated two mechanisms of consent whereby participants, regardless of diet, reinforced the hegemony of carnist masculinity through self-policing and anthropocentric "free choice" discourse. Collectively, these themes explicate a carnist gender order that makes plant-based diets unappealing for men by reinforcing the hegemony of heterosexual carnist masculinity above "feminised" masculinities (veg*n, homosexual), women, and animals. This hegemonic system perpetuates the oppression of women and animals by reinforcing a masculine/feminine dualistic hierarchy and suppressing veg*n ideology. Moreover, the feminisation of veg*n men sustains the hegemonic status of "masculine" carnist men, reinforcing a hierarchical masculine/feminine binary that subordinates femininity. Results support the ecofeminist "linked oppression thesis"—that women's subordination reinforces animal oppression—and suggest that the subordination of nonhegemonic masculinities also plays a role in maintaining animal oppression. Findings offer a non-anthropocentric framework for understanding why men are resistant to plant-based diets and meat reduction.

Keywords

Ecofeminism; animal oppression; hegemonic masculinity; carnist ideology; veganism; meat consumption; linked oppression thesis; critical animal studies.

1. Introduction

Animal product consumption is globally pervasive, particularly in affluent countries and in developing nations experiencing economic growth (Whitton et al., 2021). Over 80 billion land animals and trillions of aquatic animals are killed annually for human consumption (Mood et al., 2023; Mood & Brooke, 2024), excluded from anti-cruelty laws protecting other species and treated as commodities rather than sentient beings (Mood et al., 2023; Gullone, 2017). As evidence mounts that meat consumption is environmentally unsustainable (Chai et al., 2019; Raihan, 2023; Scarborough et al., 2023) and detrimental to human health (Abebe et al., 2020; De Smet & Vossen, 2016; Grosso et al., 2022), the ethical justification for these practices becomes increasingly untenable. Plant-based diets, particularly vegetarian and vegan (i.e., veg*n) diets, are gaining popularity in Western countries like Australia, the US, and the UK (Curtain & Grafenauer, 2019; North et al., 2021), providing a viable solution for challenging systemic animal cruelty.

However, there is widespread resistance to the adoption of plant-based diets, particularly amongst men. Men in Western developed countries eat significantly more meat than women (James et al., 2022; Ritzel & Mann, 2021; Rozin et al., 2012), display stronger psychological attachment to meat (Graça et al., 2015), and greater resistance to meat reduction and plant-based diets (Graça et al., 2019; Pohlmann, 2022). Conversely, women are twice as likely to follow plant-based diets (Modlinska et al., 2020). These gender differences reflect the link between meat and masculinity (Rozin et al., 2012), with some men viewing plant-based diets as “unmanly” (Bogueva et al., 2020; Bogueva & Marinova, 2020; Modlinska et al., 2020). This study explores the meat-masculinity link through the theoretical framework of hegemonic masculinity (Connell, 1987), informed by critical animal and ecofeminist theoretical perspectives, to better understand how masculinity many contribute to men’s resistance to plant-based diets.

1.1. Understanding the meat-masculinity link with hegemonic masculinity theory

The meat-masculinity link is often understood as a gender performance strategy (Butler, 1990; West & Zimmerman, 1987), such that men resist meat reduction because they construct and “do” masculinity by eating meat (Bogueva et al., 2020; Greenebaum & Dexter, 2018; Nakagawa & Hart, 2019; Rosenfeld & Tomiyama, 2021; Vartanian, 2015). Men’s resistance to meat reduction is also often explained by conformity to masculinity ideologies (Bogueva et al., 2020; Camilleri et al., 2024; De Backer et al., 2020; Rosenfeld & Tomiyama, 2021), whereby men conform to implicit norms and expectations about how to behave (Thompson & Bennett, 2015). While these theories acknowledge the influence of sociocultural conditions, they emphasise the role of the individual (i.e. personal motivations) in men’s resistance to meat reduction. Alternatively, scholars have examined Western men’s dietary choices with Connell’s (1987) hegemonic masculinity theory, adapted from Gramsci’s (1971) theory of class hegemony with a feminist lens. Hegemonic masculinity represents a culturally idealised form of masculinity at the apex of a hierarchal “gender order” above subordinate masculinities and femininity. Power dynamics between masculinities and femininities construct and sustain this social hierarchy, reinforcing gender inequalities. Hegemonic masculinity theory offers a broader approach to understanding the meat-masculinity link; whereas doing gender and masculinity ideology theories focus on men as individuals, hegemonic masculinity theory considers broader gender relations.

Several scholars have explained men’s dietary choice as a *gender performance* of hegemonic masculinity (Dubisar, 2023; Greenebaum & Dexter, 2018; Mycek, 2018; Oliver, 2023). For example, Greenebaum and Dexter (2018) explained, “By equating meat eating with ‘masculine traits’ of emotional stoicism, strength and virility, food consumption becomes a performance by which men are able to assert their dominance as hegemonic men in patriarchal culture” (p. 637). From this perspective, men’s meat-eating gender

performances are “hegemonic” because eating meat symbolically aligns with traditional masculine traits (i.e., traditional masculinity ideology). Others have understood the meat-masculinity link as *conformity to* hegemonic masculine norms (De Backer et al., 2020; Nath, 2011; Oliver, 2023), where men’s meat consumption is viewed as the “social embodiment of patriarchal norms” (Oliver, 2023, p. 63) or as conformity to “socially constructed norms of hegemonic masculinity” (De Backer et al., 2020, p. 1). These explanations emphasise performances of, or conformity to, masculine norms or “traits”, which by equating hegemonic masculinity with traditional masculinity ideology, is a common misapplication of Connell’s theory (Everitt-Penhale & Ratele, 2015; Wedgwood et al., 2023). Importantly, these explanations overlook Connell’s (1987) focus on hierarchical power relations between masculinities and femininity, and how these inequalities are legitimated. Hence, it remains uncertain whether the relationship between meat and masculinity is in fact *hegemonic*. It is important to go beyond focusing on how men’s meat consumption is a performance of, or conformity to, traditional masculinity, to explore *if*, and *how*, gendered power relations contribute to men’s meat consumption.

Masculinity is only hegemonic when it achieves cultural ascendancy, and reinforces gender inequality, through mechanisms of domination and consent (Connell & Messerschmidt, 2005; King et al., 2021; Yang, 2020). Hegemony is achieved “in a play of social forces that extends beyond contests of brute power into the organisations of private life and cultural processes” (Connell, 1987, p. 23). That is, through subtle dominance mechanisms rather than brute force (Connell, 1995). Furthermore, a hierarchical system is hegemonic only when sustained by consent from all groups within the gender order (Connell & Messerschmidt, 2005; King et al., 2021; Yang, 2020). Currently, there is very limited research establishing if and how the hegemony of meat-eating masculinity is achieved and sustained, through mechanisms of domination and consent.

Understanding power dynamics between masculinities is essential for analyses of hegemonic masculinity (Yang, 2020). Regarding the meat-masculinity link, two salient groups emerge: carnist and veg*n men. Vegetarians and vegans (veg*ns) abstain from meat consumption, driven by ethical and ideological beliefs about animal rights to freedom from exploitation and oppression by humans. The term “carnist” is used by critical animal theorists to describe individuals who eat meat (Joy, 2009). It highlights meat-eaters’ underlying and taken-for-granted ideological assumptions about the position and rights of nonhuman animals in relation to humans, encompassing beliefs that it is normal, natural, and necessary for humans to consume animals (Joy, 2009; Weitzenfeld & Joy, 2014). Ideologies are motivational, serving to defend and justify, or challenge and change, existing social systems (Gerring, 1997). Unlike veg*n ideologies, which advocate for animal liberation and the cessation of animal consumption, carnist ideology defends and promotes meat consumption. Thus, veg*ns and carnists hold opposing ideological agendas and represent two distinct and salient masculinities of relevance to understanding the meat-masculinity link.

To the author’s knowledge, only three studies have explored relations between carnist and veg*n masculinities. Nath’s (2011) interviews with Australian vegetarian men revealed that carnist men often sought to assert dominance as part of “hegemonic masculine norm enforcement,” using social tactics such as disapproval, criticism, and intrusive questioning (p. 14). Aavik’s (2023) study of Estonian and Finnish vegan men’s social interactions found that carnists attempted to discredit veganism; that vegan men avoided talking about veganism to maintain social relationships and avoid presenting as a “preachy vegan”; and refrained from disclosing their concerns about animal rights to carnist men. However, Bogueva et al. (2020) were the first to examine gender relations from both the perspectives of carnist and veg*n men, suggesting that vegetarian men might face subordination to hegemonic masculinity similar to other marginalised groups. They found that carnist men positioned themselves as

exemplars of “real” masculinity above vegetarian men, who were portrayed as inferior “unmanly” men. At times vegetarian men displayed “apologetic” behaviour to avoid clashes with carnist men, suggesting they may consent to their subordinate status. While neither study explicitly identified mechanisms of domination or consent, the findings suggest that the meat-masculinity link may operate hegemonically, with veg*n men subordinated to carnist men. These studies provide early insights into how hegemonic processes may influence men’s meat consumption, yet a comprehensive understanding of both domination and consent in this context remains underexplored.

Beyond relations between carnist and veg*n masculinities, scholars have argued that men’s meat consumption reinforces women’s subordination, further suggesting that hegemonic masculinity may contribute to the meat-masculinity link. Adams (2015) contended that men’s meat consumption contributes to women’s oppression both symbolically and materially, through the unequal distribution of meat and the legitimisation of violence, domination, objectification, and consumption of women. Gelfer (2013) examined the role of hunting and meat consumption in men’s ministries in Australia and the US, arguing that meat consumption within these contexts is hegemonic, symbolising and reinforcing men’s power over women. Therefore, while this study primarily focused on the dynamics between carnist and veg*n masculinities, it also sought to explore how these relations may relate to women.

Overall, the connection between hegemonic masculinity and meat consumption remains underexplored. Hegemonic masculinity theory is often misapplied, with research typically focusing on gender performance and conformity to traditional masculinity rather than power dynamics and inequalities between masculinities and femininities. Furthermore, the specific processes through which hegemonic masculinity may influence meat consumption remain unclear. Some studies have begun to explore relations between carnist

and veg*n men (Bogueva et al., 2020; Nath, 2011), but have not explicitly or comprehensively identified how mechanisms of domination and consent might collectively influence men's meat consumption or contribute to the broader gender order. This study aimed to address this gap by applying Connell's (1987) theory of hegemonic masculinity to examine how domination and consent mechanisms may contribute to men's meat consumption and reduction.

1.2. Study aims and research questions

By examining the relations between carnist and veg*n masculinities, this study aimed to understand how hegemonic masculinity may contribute to the meat-masculinity link in Australia and the UK. The overarching research question was: *How, if at all, does hegemonic masculinity, through mechanisms of domination and consent, contribute to the meat-masculinity link (i.e., men's resistance to plant-based diets)?* A secondary aim was to explore how, if at all, men's meat consumption may contribute to the subordination of women.

2. Methodology

2.1. Design

Guided by a pragmatic methodological approach—compatible with both positivist and constructivist paradigms—this study prioritised methodological flexibility and utility in addressing research aims (Morgan, 2014). Given the strengths of qualitative research in understanding social processes (Patton, 2015), and the study's aim to explore processes and relations contributing to the meat-masculinity link, rather than testing pre-existing constructs, a qualitative design was deemed most appropriate. Additionally, qualitative methods provided the flexibility to explore the complexities of context-specific social behaviours and processes in greater depth.

This study applied a critical animal theoretical lens to conceptualise meat-eating participants as carnists and meat consumption as a form of animal oppression (Weitzenfeld &

Joy, 2014). Moreover, this study incorporated an ecofeminist theoretical framework.

Ecofeminists recognise that the oppression of nonhuman animals and gender inequality are deeply intertwined, focusing on how gender oppression intersects with anthropocentrism, an ideology of human supremacy that privileges humans over nonhuman beings (Hunnicut, 2019). Ecofeminists critique mainstream feminist theories for excluding nonhuman animals from analyses of patriarchy (Adams, 2015; Gruen, 1993), arguing that patriarchal structures dominate women *and nature* (Birkeland, 1993; Hunnicutt, 2019; Kheel, 2007).

Acknowledging the anthropocentric limitations of Connell's hegemonic masculinity theory, this study incorporated critical animal and ecofeminist theoretical frameworks to examine power relations among men, women, *and animals*.

Data were analysed using Braun and Clarke's (2022) reflexive thematic analysis, advantageous for its flexibility and methodological openness. This approach is not tied to a specific theoretical framework or methodological assumption, allowing it to be applied to this study's theoretical frameworks. Reflexive thematic analysis can be employed both inductively and deductively, facilitating the exploration of both semantic (surface, explicit) and latent (underlying, implicit) meanings. Reflexive thematic analysis is a structured and systematic type of thematic analysis that integrates researcher reflexivity throughout the analytic process, enhancing its credibility (Ahmed, 2024). The study followed the Standards for Reporting Qualitative Research (O'Brien et al., 2014).

2.2. Participants

Nineteen self-identified men aged 24-65 from Australia (n=10) and the UK (n=9) participated in the study. Nine participants were unrestricted meat-eaters, four intentionally limited their meat consumption, and six were veg*n (pescatarian, vegetarian or vegan). Participant demographic information is presented in Table 1. Participants' names were replaced with pseudonyms for confidentiality purposes.

As part of a larger mixed-methods project (Camilleri et al., 2023; Camilleri et al., 2024), this study employed a purposive sampling strategy to recruit participants from a prior latent profile analysis of men's meat consumption, which identified three distinct profiles: Resistant, Ambivalent, and Meat-Averse. Initially, 12 participants were recruited—four from each profile, with equal representation of two Australian and two British participants per profile, ensuring a balanced representation of men with varying diets and attitudes toward meat consumption. In qualitative research, sample size is determined by saturation, “the point at which no new codes or concepts emerge” (van Rijnsoever, 2017, p. 2). Saturation was evaluated at the coding stage of analysis, achieved at “the point in coding when you find that no new codes occur in the data. There are mounting instances of the same codes, but no new ones” (Urquhart, 2013, p. 194). Twelve initial participants were selected based on previous research indicating that saturation typically occurs in homogenous samples around 12 interviews (Guest et al., 2006). After coding the first 12 participants' data, new codes were still emerging, prompting the recruitment and coding of data from one additional participant from each profile. The process continued until saturation was reached, with six participants from the Resistant profile, six from the Ambivalent profile, and seven from the Meat-Averse profile.

Table 1
Participant Demographic Information

Pseudonym	Diet	Age	Country	Ethnicity	Sexual Orientation	Income	Occupation	Religion
Ahmad	Unrestricted Carnist	24	Australia	South African Australian	Heterosexual	Low	Student / fast-food cashier	Islamic
Alessandro	Pescatarian	60	Australia	Italian Australian	Heterosexual	Low	Disability pension	None
Allan	Flexitarian	40	Australia	White Australian	Heterosexual	High	Business analyst	Agnostic
Brendan	Vegetarian	32	England	White British	Heterosexual	High	Music manager	Atheist
Brian	Flexitarian	53	Australia	White Australian	Heterosexual	Average	IT business analyst	Jewish
Christos	Vegan	50	Australia	Greek Australian	Heterosexual	Undisclosed	Draftsman	Greek Orthodox (NP)
Jack	Vegan	55	Australia	White Australian	Heterosexual	Low	Almond farmer	Atheist
James	Pescatarian	37	England	White British	Homosexual	High	University archives curator	None
Justin	Unrestricted Carnist	28	England	White British	Heterosexual	High	Accountant	None
Kevin	Unrestricted Carnist	30	England	White British	Heterosexual	Low	Unemployed	Agnostic
Marco	Vegan	35	Australia	Italian Australian	Heterosexual	High	Podiatrist	Spiritual
Nam	Unrestricted Carnist	26	Australia	Vietnamese Australian	Homosexual	High	Office administration	Buddhist (NP)
Owen	Flexitarian	65	Wales	White British	Heterosexual	High	Electronic engineer	Agnostic
Richard	Unrestricted Carnist	48	England	White British	Heterosexual	High	Data scientist	Agnostic
Steve	Unrestricted Carnist	47	England	White British	Heterosexual	Low	Accountant	Atheist
Sunil	Unrestricted Carnist	31	England	Sri Lankan British	Heterosexual	Average	Supermarket assistant	Hindu
Tom	Unrestricted Carnist	44	Australia	White Australian	Heterosexual	High	Forensic scientist	Atheist
William	Unrestricted Carnist	50	England	White British	Heterosexual	Low	Automotive manufacturing	Christian (NP)
Zev	Unrestricted Carnist	29	Australia	Sri Lankan Australian	Heterosexual	Average	Pharmacy cashier	Hindu (NP)

Note. Carnist = completely unrestricted meat-eating diet; flexitarian = intentionally limits or has reduced their meat consumption; pescetarian = does not eat land-based animals but eats fish, seafood, and other animal products such as eggs and dairy; vegetarian = does not consume meat but eats other animal products such as eggs and dairy; vegan = does not consume any animal products; NP = not practicing religion. Low income = <\$59,999AUD/£9,999; medium = \$60-99,999/£10-39,999; high = ≥ \$100,000/£40,000.

2.3. Materials

The semi-structured interview schedule was developed using Castillo-Montoya's (2016) four-phase Interview Protocol Refinement Framework. The first author drafted the initial schedule, which aimed to gather rich, experiential data about meat-eating and meat-abstaining experiences, focusing on participants' thoughts, feelings, and sensations. Questions also explored participants' perceptions of gender roles, masculinity, and their connection to meat consumption. To ensure a conversational tone, the questions were presented in an intuitive order, beginning with a broad introduction to meat consumption, progressing to views on masculinity, and concluding with how the two intersect. Feedback was obtained from two members of the research team, who independently evaluated each question for clarity, simplicity, and answerability (Castillo-Montoya, 2016). Questions that did not meet criteria were refined through team discussion. The schedule was then piloted with the first three participants, and any questions that failed to elicit rich, descriptive data were revised through discussions between the first and second authors.

2.4. Procedure

Ethics approval was obtained from the university's Human Research Ethics Committee (ID: HRE21–162). Participants were invited to participate via the Prolific recruitment site (<https://www.prolific.co/>). Due to challenges in recruiting participants from the Meat-Averse profile (representing veg*n men), one participant was recruited through the Facebook group "Vegans in Australia," and another from the first author's vegan activist network in Melbourne. The study was advertised as a 60–90-minute one-on-one Zoom interview about "men's attitudes to meat consumption", which would discuss "emotions, attitudes and beliefs related to eating meat, animals, and reducing your meat intake" and "beliefs about gender roles and your sociocultural context". Verbal informed consent was obtained at the start of each interview. Participants were reimbursed \$80AUD for their time.

The interview schedule (Supplementary A) covered topics such as attitudes toward meat consumption, meat reduction, meat alternatives, meat-eating and veg*n men, and the meat-masculinity link. Several participants raised lab-grown meat as an appealing meat alternative, prompting a follow-up open-ended survey for earlier participants to share their views on this topic (see Supplementary B).

2.5. Analysis

Zoom interview audio recordings were transcribed verbatim and organised using NVIVO version 1.5.1 qualitative analysis software. Pseudonyms replaced participants' names across all files and memos. Data was initially analysed by the first author using reflexive thematic analysis (Braun & Clarke, 2022). In the familiarisation stage, transcripts were read and re-read alongside audio recordings. The researcher noted analytic insights while critically engaging with the data using reflective questions (see Supplementary C). This deepened understanding of participant perspectives and considered multiple interpretations of the data. Transcripts were coded concurrently using both inductive (participant-driven) and deductive (theory-informed) approaches, applying semantic and latent codes. Provisional themes were identified by grouping conceptually cohesive codes around central organising concepts. Themes were assessed based on data quality (e.g., richness, cohesion) and relevance to the research questions. Themes were refined with co-authors by specifying central concepts and boundaries and exploring relationships between themes through conceptual maps. The first author maintained a reflexive journal throughout, documenting reactions, impressions, and interpretations to ensure critical engagement with the data.

2.6. Trustworthiness

The quality of qualitative research is determined by its trustworthiness—"the systematic rigor of the research design, the credibility of the researcher, the believability of the findings, and applicability of the research methods" (Rose & Johnson, 2020, p. 434).

Trustworthiness rests on four criteria: credibility, transferability, dependability, and confirmability (Nowell et al., 2017). Credibility depends on researchers' reflexivity, their awareness of how personal perspectives may shape the research process (Patton, 2015). The first author—a white, heterosexual Millennial cisgender Australian woman—conducted the interviews and preliminary analysis. As a vegan activist aligned with critical animal studies—a discipline that combines activism and scholarship to challenge human oppression of animals (Taylor & Twine, 2014), this ethical and political stance informed her approach to the research. To ensure participants felt comfortable sharing their views, her vegan identity remained undisclosed during interviews. The interview protocol and data analysis were developed in collaboration with co-authors who brought differing positionalities: the second author, a carnist Cypriot Turkish Muslim Australian cisgender woman, and the third and fourth authors, both white, heterosexual, Generation X, Australian carnist cisgender men.

Given the first author's alignment with veg*n participants' views, she engaged in ongoing reflexive practice following Braun and Clarke's (2022) guidelines for critical engagement with the data. This included interrogating assumptions, reflecting on initial impressions, seeking disconfirming evidence, and considering alternative interpretations. Her codes and analytic decisions were critically reviewed and discussed with carnist co-authors, providing a form of analyst triangulation, another method for enhancing credibility and analytical rigour (Patton, 2015). Reflexivity was further embedded through Braun and Clarke's (2022) six-phase analytic process, which encourages systematic reflection on meaning-making, researcher influence, and interpretive decisions.

Transferability “refers to the generalisability of inquiry” (Nowell et al., 2017, p. 3). Thick descriptions of the research context, participants and methods have been provided in this section to enable readers to evaluate the applicability of results to their own context (Ahmed, 2024). To establish dependability, researchers need to “ensure the research process

is logical, traceable, and clearly documented” (Nowell et al., 2017, p. 3). The first author recorded notes throughout each stage of the analytic process, including reflections in a reflexivity journal and decisions regarding data collection, coding, analysis, and theme development (Nowell et al., 2017). Confirmability refers to the extent to which research findings are grounded in the data rather than shaped by researcher bias (Nowell et al., 2017). Illustrative quotes were included throughout the findings to ground the analysis in participants’ own words and enable readers to make informed judgments about the plausibility of the interpretations presented. Another strategy to support confirmability is peer debriefing—consulting with colleagues or experts to validate interpretations and minimise potential bias (Ahmed, 2024). In this study, this was addressed through analyst triangulation, as described above. Additionally, confirmability is established when credibility, transferability, and dependability are also demonstrated (Guba & Lincoln, 1989; Nowell et al., 2017).

3. Results and Discussion

Three themes elucidated the gendered power dynamics underpinning the meat-masculinity link. The first theme, *the exalted status and rewards of carnist masculinity*, highlights how the achievement of masculinity through meat-eating gender performances reflect the exalted status of carnist masculinity in Australian and British culture and reinforce men’s meat consumption with various social rewards. The second theme, *hegemonic mechanisms of domination subordinating veg*n masculinity*, illustrates how feminisation, ridicule, and social exclusion subordinate veg*n men (and by extension, veg*n ideology) to carnist men (and carnist ideology). The third theme, *consent to hegemonic carnist masculinity: complicity through anthropocentric “free choice” discourse and concealment of veg*nism*, revealed how both carnist and veg*n men consented to and reinforced hegemonic carnist masculinity, firstly under the guise of dietary “free choice”, and secondly, through

concealment of veg*n dietary practices and ideology. Given that hegemony is achieved through domination of and consent from subordinated groups, the exalted carnist masculinity identified in theme 1 is hegemonic due to the mechanisms identified in themes 2 and 3. Collectively, this system of social rewards for carnist men, social “policing” (i.e., domination), and widespread consent sustains carnist masculinity as the hegemonic construction of manhood.

Another notable theme among carnist participants was *the romanticisation of meat*, reflecting their strong emotional and affective attachment to eating meat. Meat was loved and appreciated, not only for its sensory pleasure and satisfaction, but also for its associations with joy, social connection, and emotional comfort. Participants described feelings of nostalgia tied to memories of connecting with friends and family members while sharing meat-based meals. While most carnist participants were open to at least trying meat alternatives (e.g., mock meats, lab-grown meat), they resisted making dietary changes due to their “love” for real meat and the feeling that meat was special and irreplaceable. This attachment was marked by a fear of losing the joy, pleasure and comfort that meat provided, alongside an expectation of enduring cravings and longing for meat if they were to give it up.

Although the romanticisation of meat was an important observation, this theme centred primarily on men’s affective and hedonic dependence on meat, which has been examined extensively in existing research under Graça et al.’s (2015a, 2015b) concept of *meat attachment*. By contrast, the aim of this study was not to explore the affective dimensions of meat consumption, but rather to provide an in-depth analysis of the gendered power relations underpinning the meat–masculinity link. To maintain a coherent analytic focus and to contribute new insights into the operation of hegemonic carnist masculinity, the analysis foregrounded the three themes most directly related to gender dynamics—exalted status, subordination, and consent. The romanticisation of meat is therefore acknowledged as

a relevant theme, particularly because this phenomenon of meat attachment is stronger amongst men (Graça et al., 2015a; Günelan et al., 2024; Lentz et al., 2018). However, it was not elaborated further so that the article could remain centred on its primary contribution: advancing theoretical understanding of hegemonic masculinity in the context of men's resistance to plant-based dietary practices.

3.1. Theme #1: The exalted status and rewards of carnist masculinity

Meat-eating gender performances highlighted the exalted status of carnist masculinity and the social rewards afforded to men who eat meat in Australian and British culture. For example, William (50, carnist) remembered “showing off” to his male friends when he was younger by eating “The Jawbreaker”, a gigantic burger containing 12 meat patties:

After going to the pub we'd always go to the burger van... I remember one called the Jawbreaker, which had twelve burgers, bacon, eggs, the whole works... And it was just more eating for, almost, like to show off and just to show, yeah, I can eat the Jawbreaker... It was just because no one else would dare do it, would they?

Similarly, Marco (35, vegan) recounted participating in a 1kg steak challenge in his twenties to exhibit masculinity amongst his male friends:

It was something that you did with your guy friends to show and prove that you could eat a kilo of meat, like, it's such a manly thing to do. It's such a thing worthy of praise and admiration, that you can literally eat a kilo of dead animal... I did it to impress my friends... It's a sign of, I dunno, strength, or it's a sign of coolness, I dunno. It was definitely for social validation, that's for sure.

William and Marco ate excessive quantities of meat to “show off” to male peers, demonstrating their masculinity to obtain “social validation”. Consistent with “doing gender” theory (West & Zimmerman, 1987), the participants achieved masculinity through their presentation of self to others. The "praise," "admiration," "social validation", and group

belonging participants gained for eating meat reveal its exalted status among some groups of men and the social rewards that incentivise men's meat consumption.

Many participants connected masculinity with the barbeque—a culturally “institutionalised” meat-eating ritual in Australia (Carroll et al., 2019; Nath, 2011). “In Australia you see men usually gather around on BBQ day, drink beers and eat meats which is the reason why the masculinity is more defined by eating meat.” (Nam, 26, carnist). Gender performances around the barbeque were used to assert masculinity. One participant described “larrikinism”¹ and competition for control over cooking the barbeque to assert masculinity amongst other men. Moreover, hosting a barbeque was a way to enhance one's status. Alessandro, once a self-professed meat-lover and barbecue enthusiast, who shifted to pescetarianism for health reasons, recounted:

I used to be really proud of everything I used to do. I never used to worry about the expense, because I was making good money. So, I'd always buy good cuts of meat, good whisky, good beer, good everything, and put it all on the table there, and people would come in and see this is all good top-quality stuff, you spared no dollars.

Because pride signals achievement and social worth (Tracy et al., 2023), Alessandro's sense of pride suggests that hosting impressive barbecues reinforced a feeling of superior status. Masculine performances around the barbeque were also described as a means of enhancing sexual attractiveness:

It was almost like, it's almost for show... [B]ecause it's a man thing to do, it's almost like, hey, if I stand around the barbeque, women will see this, that I'm manly, because I'm doing something that men do... It's that kind of like, if I'm seen by the girls

¹ “Larrikin” is an endearing term used to describe a stereotypical white Australian male who embodies traditional working-class masculinity—typically associated with roughness, toughness, cheeky irreverence, and rowdy behaviour (Milner Davis & Foyle, 2017; Thompson, 2007). “Larrikinism” therefore refers to the expression or performance of these qualities.

hanging around the barbeque, they'll know I'm a man, whereas if I hang out and eat fruit while there's a barbeque on, I'm not a man. (Marco, 35, vegan).

Christos (50, vegan) had a similar interpretation of barbequing: "A lot of men think that actually when you look more masculine doing things women want them more, so it's probably aligned with those things." Previous research suggests that some women find meat-eating men more sexually desirable than vegetarian men (Timeo & Suitner, 2018) and that eating meat enhances men's sexual appeal by signalling higher status (Chan & Zlatevska, 2019). Indeed, "Hegemonic masculinity is as much for women as for men a cultural ideal of manhood, which is rewarded by women's interests [and] attentions" (Jewkes et al., 2015, p. 114). This not only reflects the exalted status of meat-eating men but also shows that women reinforce the hegemony of carnist masculinity through their sexual preferences.

3.2. Theme #2: Hegemonic mechanisms of domination subordinating veg*n masculinity

The second theme captures three hegemonic mechanisms of domination—feminine stereotyping, ridicule, and social exclusion—which serve to subordinate veg*n masculinity to a hegemonic carnist masculinity.

3.2.1. Subtheme #1: Feminisation of veg*n men.

Participants described how (social) media reinforces the stereotype of meat-eating men as masculine and veg*n men as feminine. As Brendan (32, vegetarian) stated, "Meat is often associated with 'muscle' and wellbeing whereas being vegan/vegetarian is often seen as meek or feminine." Meat-eating men were linked to traits like strength and muscularity (Edwards et al., 2017). Ahmad (24, carnist) noted, "Social media influencers often say that eating meat is vital for a man as it makes you look manly and helps grow muscle." Sunil (30, carnist) observed, "Meat eaters are portrayed as big men with muscles, always in the gym." Fitness influencers reinforce this link by sharing images of themselves eating meat while showcasing muscular physiques. For younger participants, muscle-building was their primary

motivation for eating meat. Meat-eating men were also stereotyped as aggressive, powerful, and dominant, particularly through association with traditional male roles of hunting and killing.

Conversely, veg*n men were stereotyped as feminine, weak, and emotional. Kevin (30, carnist), who previously followed a plant-based diet for a year, felt his family had judged his diet as feminine, and believed that veg*n men were more emotional due to their empathy for animals. Some participants encountered people who believed that abstaining from meat can “feminise” men. For example, Christos (50, vegan) experienced this attitude amongst women he had dated:

They always give their objections... How do men become men without their protein? And you know, eating anything with soy will make you have boobs. And I say to them, well I’ve had soy for a long time, where are my boobs?... Even if you show them body builders, vegan body builders, they’ll still say they look feminine.

“Masculine” meat-eating men versus “feminine” veg*n men reflects a longstanding hierarchical binary stereotype or “dualism” (Gambert & Linné, 2018; Plumwood, 1993). This masculine/feminine binary was also evident in Bogueva et al.’s (2020) study, where carnist men characterised themselves as masculine above feminine and unmasculine vegetarian men. Such stereotypes serve to oppress groups of people by associating them with devalued attributes (Hinton, 2019). Historically, femininity and emotions have been depicted as “irrational” and inferior to masculine qualities like reason and logic (Plumwood, 1993). For example, femininity has been associated with constructs like the “hysterical woman” (Arslanoğlu Yıldiran, 2020; Bankey, 2001). By feminising veg*n men, they are devalued and discredited, depicted as irrational in contrast to masculine (i.e., rational) meat-eating men. Indeed, meat-eating men regard emotions, such as compassion for animals, as an irrational justification for avoiding meat, whilst accepting male vegetarians motivated by religion

(Bogueva et al., 2020). Hence, maintenance of a masculine/feminine binary reinforces the hegemonic position of carnist men over veg*n men.

The subordinating effect of feminisation was evident to Marco (35, vegan), who acknowledged that “It definitely drops you down the social hierarchy a little bit by being vegan”, and to Christos (50, vegan), who found many carnist women dismissed him as a potential romantic partner for being too feminine and “weak”: “[M]ost of them would say to me that they probably would struggle being with a vegan because they don’t want to feel like they, they want to be with a man, like, not a pussy, in that sense.”

Veg*n men were sometimes feminised through association with homosexuality, a masculinity historically subordinated through its association with femininity (Blondé et al., 2024; Connell, 1995). Like Nath’s (2011) vegetarian participants who often received “heteronormative-scorn”, Jack (55, vegan) frequently encountered hostility from heterosexual carnist men:

I think that's quite prevailing in most men, you know, heterosexual men... they just seem to run this script all the time of, well you gotta eat meat, why aren't you eating meat? What's wrong with you? Are you gay? Are you a girl?

Jack highlights how carnist heterosexual men assert dominance by equating veg*n men with subordinated groups (homosexuals and women). Misogynistic and homophobic slurs function as tools of hegemonic domination, commonly employed in the military to "feminise" and police men who fail to conform to hegemonic masculine ideals (Duncanson, 2015). Consistent with findings that heterosexual men consume more red and processed meat than homosexual and bisexual men (Camilleri et al., 2024), this highlights the heteronormative nature of carnist masculinity.

3.2.2. Subtheme #2: Ridiculing veg*n men.

Dealing with negative attention was a significant challenge for many participants, with ridicule being the most common form directed at meat-avoiding men. Jack (55, vegan) recalled a barbeque he attended:

[T]hey'll have a plate in their hand, and they've just got one lettuce leaf on it, and they come up to you and they make an announcement to the whole group, 'Here we go, I've made something for the vegan!', and they'll put a plate down in front of you with one lettuce leaf on it... that's pretty awful on a number of levels, trying to embarrass someone in front of a whole group of people for their food choices.

Ridicule often involved feminising veg*n men, reinforcing their subordination in the masculine/feminine binary. Humour and ridicule can serve as socially acceptable ways to exert dominance, allowing the aggressor to elevate their status while undermining the target (Ringblom, 2022; Willet, 2017). Ridicule also justifies and reinforces intergroup hierarchies by delegitimising the target outgroup (Hodson & MacInnis, 2016). Jack believed that these “humorous” interactions were thinly veiled attempts to dominate him:

[W]hen you call people out about it... their response is, 'Oh, I was only jokin'! No, you take it too seriously man, don't be a snowflake, I'm only jokin'!' And I know now that they're not joking, they really meant to say it. But you know, that's just part of the toxic masculinity, you know... trying to control people.

Connell and Messerschmidt (2005) argue that “to sustain a given pattern of hegemony requires the policing of men” (p. 844). Reflecting prior research (Abedinifard, 2016; Hickey-Moody & Laurie, 2017; McCann et al., 2010; Nath, 2011), participants accounts suggest that humour and ridicule served to enforce (i.e., police) conformity to masculine carnist norms. Richard (48, carnist) explained how this often manifests as “toxic” banter in male-dominated social settings:

[P]eople call it banter—it actually means toxic constant insulting of someone... It's the idea of conforming to the norm, and their norm of course [in male-dominated environments] is eating lots of meat, and drinking lots of beer... What happens inevitably, if someone is not adhering to the norm, whatever that norm is, is that they then become a constant target.

The threat of ridicule deterred some participants from deviating from meat-eating norms. For example, when discussing why he would find it difficult abstaining from meat at a barbeque, Allan (40, flexitarian) emphasised his trepidation about being ridiculed:

You'd probably be the butt of a few jokes if you weren't eating meat. And I'm not talking about in a particularly bad way, but just enough to think, oh, just go away, leave me alone, you know. So as a bit of a typically anxious person as it is, it would be enough to go, oh, I don't even want to deal with that.

This aligns with previous research showing that meat-eating men feared they would be ridiculed for not eating meat (Bogueva et al., 2022). This theme illustrates how ridicule subordinates veg*n men and polices men's behaviour, reinforcing the hegemonic status of carnist masculinity and deterring meat-eating men from plant-based diets.

3.2.3. Subtheme #3: Socially excluding veg*n men

Social exclusion was a common experience amongst meat-avoiding participants:

[T]he hardest part was telling our friends... Because we all socialised and ate together, so when we told them we were vegan, they were like, 'No, that's too hard for us now', and so we were cut out of our social circuit eating out. (Christos, 50, vegan).

And then my brother just didn't want to be a part of [the weekly family dinner], he thought that I was making the wrong choice, and he was resolute that he didn't want to sit down at a table with me if I wasn't going to eat meat. (Jack, 55, vegan).

Abstaining from meat poses an increased risk of social ostracism (MacInnis & Hodson, 2017), because carnist men intentionally avoid associating with vegetarian men (Bogueva et al. 2020). Notably, Alessandro was socially included when he was willing to reinforce the legitimacy of hegemonic masculinity (e.g., drinking beer at the pub), but excluded from barbeques, where his meat-abstention would challenge the legitimacy of carnist masculinity:

[T]here were certain times where I wasn't invited to places where everyone was a meat eater, and I just didn't get the phone calls anymore to come to the barbecue or to come to that event... But we still caught up at the bar, we had beers there, or something like that. But whenever he had a barbecue, because everyone was a meat eater there, I wasn't welcome anymore. (Alessandro, 60, pescetarian).

This selectivity shows how exclusion serves as a power tactic to marginalise and suppress veg*n masculinity. Zev (29, carnist), who grew up in a Hindu family that abstained from meat twice a week, explained that being the only meat-abstainer among meat-eaters led to feelings of exclusion and isolation. Alienation was particularly heightened in male-dominated environments. Owen (65), a flexitarian since adolescence, felt like “an outsider” when eating with his male meat-eating friends, and believed he had missed out on “male bonding experiences.” Thus, the hegemonic status of carnist masculinity marginalises veg*n men, particularly among male peers, while reinforcing a sense of belonging for meat-eating men.

Additionally, the *threat* of social exclusion policed adherence to carnist masculinity. Several carnist participants *anticipated* that they would feel excluded if they didn't eat meat. For example, Ahmad (24, carnist) speculated:

When you're eating out with like friends and stuff, and they're all eating meat, and then if the place doesn't even have vegan meals, it'd be awkward... I'd feel left out for

sure... I guess I'd just feel like the special case that, you know, has to go out and eat their own thing, while everyone else is just enjoying their meat together.

Therefore, the anticipation of exclusion may deter some carnist men from adopting a meat-free diet.

3.3. Theme #3: Consent to hegemonic carnist masculinity: Anthropocentric “free choice” discourse and self-policing via concealment and avoidance of visibility

The third theme explores how both carnist and veg*n men reinforce the hegemonic status of carnist masculinity through *consent*, a component of hegemonic masculinity (King et al., 2021; Yang, 2020). Participants consented in two ways: through anthropocentric “free choice” discourse and self-policed conformity to carnist masculinity via concealment of veg*nism and avoiding visibility in food-related social contexts.

3.3.1. Subtheme #1: Consent to hegemonic carnist masculinity under the guise of “free choice”

Carnist men consented with “free choice” discourse to convey an attitude of tolerance and acceptance towards veg*n masculinity, whilst surreptitiously reinforcing the hegemonic order. Many downplayed the association between meat-eating and masculinity, framing it as outdated due to increasing normalisation of plant-based diets. For example, Steve (47, carnist) said:

Twenty, thirty years ago and beyond, yes, very much so, people would've probably given a double take to someone, especially a male being a vegetarian. But now, I don't, I think it's just so common.

This aligns with research on European male athletes who noted growing acceptance of men on plant-based diets, leading van der Horst et al. (2023) to suggest that meat-eating masculinity may be losing its hegemonic status. However, exhibiting social acceptance of meat-free masculinities may be a “hybridisation” strategy, where elements of nonhegemonic

masculinities are accepted to make hegemonic masculinity appear “softer” and less oppressive while covertly reinforcing hierarchical power structures (Demetriou, 2001).

In particular, tolerating men’s “free choice” to avoid meat, framed as respecting autonomy, served to justify and defend carnists’ own “right to choose” meat. Participants frequently emphasised that dietary choices are a personal decision deserving of respect. For instance, Sunil (31, meat-eater) said:

If someone’s vegetarian, for me that’s their choice. I wouldn’t go round saying to them, you shouldn’t eat this, you shouldn’t eat that... there’s one lady at my work who’s vegetarian... She does her own stuff and I respect that. That’s her choice.

Participants drew on (neo)liberal individualist values rooted in Western society, which prioritise the rights of individuals to pursue their own interests (Zhao, 2024). Scholars have noted similar appeals to free choice as a defence of meat consumption (Adams, 1993; Jenkins & Twine, 2014; Weitzenfeld & Joy, 2014). Statements like “I respect your choice not to eat meat” implicitly demand reciprocity: “and therefore, you need to respect my choice to eat meat.” Thus, while appearing tolerant of veg*n men, such logic subtly reinforces hegemonic power structures that uphold animal oppression. Nam (26, carnist) expressed this sentiment more explicitly:

I accept everyone’s opinions, whatever you say about me or my decisions. But it doesn’t stop me from what I want to do... People who don’t agree with me [about eating meat], yeah, they can tell me, but you can’t lecture me and tell me that I’m wrong... That’s their life. This is my life choices.

Bogueva et al. (2022) found a similar hybridisation strategy amongst heterosexual carnist men who dined at plant-based restaurants to appear open-minded and impress female veg*n romantic partners. Such behaviour demonstrates how hegemonic heterosexual carnist

masculinity can strategically co-opt subordinate groups' veg*n practices, for self-serving purposes, in a manner that appears open-minded and supportive.

While society's attitudes toward plant-based diets have improved, with more plant-based businesses emerging (Gagnon et al., 2023; Zhao et al., 2023), the hegemonic position of carnist men over animals is sustained by appeals to individual autonomy. Notably, references to the animals killed for their meat were absent from the carnist men's free choice discourse, revealing an anthropocentric bias. Their emphasis on human autonomy overlooks the impact of their choices on animals, shifting the debate from animal oppression to human liberties (Adams, 1993; Jenkins & Twine, 2014; Weitzenfeld & Joy, 2014).

Furthermore, most meat-avoiding participants indirectly consented to hegemonic carnist masculinity by appealing to free choice, withholding their moral objections to respect carnists' decisions and thus silencing their veg*n ideological stance. Alessandro (60, pescetarian) explained:

I don't mind other people eating meat, that's their choice... I do look at animals differently now, where I think they've got a right to be on the planet just like I do... But if people decide, well no, I want to make that a food source, well that's your decision.

Similar discourse was present among US veg*ns, who framed veg* nism as a personal choice in the presence of carnists to avoid social stigma (Buttny & Kinefuchi, 2020). This free-choice rhetoric was only absent from Marco and Christos, the two vegan participants involved in animal rights activism. While the remaining veg*ns recognised animals' rights, they upheld the hegemonic gender order by prioritising carnist preferences (and ideology) over their own moral beliefs (veg*n ideology) and animals' lives. Thus, both carnist and veg*n groups employed anthropocentric free choice discourse: carnists excluded animals from harm considerations, while veg*ns subordinated animal rights to carnists' desires.

3.3.2. Subtheme #2: Self-policed conformity to carnist masculinity: concealment and avoiding visibility

In Theme 2, carnists policed veg*n men through feminisation, ridicule and social exclusion to uphold the dominance of carnist masculinity. However, veg*n men also consented to their own subordination by *self*-policing, employing strategies like concealing, downplaying, or modifying their nonhegemonic meat-avoidance practices.

Like the vegan men in Aavik's (2023) study, who avoided disclosing or discussing their veganism, several participants avoided drawing attention to their dietary choices. James (37, pescetarian) described the social scrutiny as the most challenging aspect of his diet, leading him to hide his preferences: "I don't like making my food preferences visible... I want to just quietly eat my food." To avoid standing out, he sometimes adjusted his diet in social settings, such as reluctantly eating vegetables cooked on the same barbecue as meat: "Ideally, I would have not wanted to have eaten it. But I didn't want to come across as picky, so I just ate it." Brendan, a vegetarian with food allergies, tried to "downplay" his dietary needs when dining with meat-eaters and preferred to eat with vegetarians so he wouldn't stand out:

If you're the only one that's not eating meat, it becomes more of a hassle, just like my allergies. But if there's several people that aren't [eating meat], it's definitely an easier thing to approach... It means you're not an anomaly amongst everything else... I definitely try to downplay it.

Some participants modified their nonhegemonic eating habits to conceal their dietary preferences, blend in, and avoid social scrutiny. For example, when previously following a plant-based diet, Kevin (30, carnist) stopped attending social events to escape feeling "awkward", "stupid" and "alienated" as the only non-meat-eater. He eventually resumed eating meat, citing a desire for dietary balance and to avoid the social awkwardness.

Similarly, Owen (65, flexitarian) recounted eating meat to fit in at a new workplace: “I didn’t want to be the awkward, you’ve got the weird new guy that doesn’t eat meat”. This aligns with previous findings that some vegetarian men occasionally ate meat to fit in and avoid conflict with meat-eating men (Bogueva et al., 2020).

In contrast to the pride- and status-enhancing meat-eating performances in Theme 1, participants’ descriptions of feeling “stupid” or “awkward”, and their desire to hide, reflect shame—an emotion tied to diminished self-worth (Sznycer, 2019). Some vegetarian men exhibited a similar shame response about their dietary preference in Bogueva et al.’s (2020) study. Whereas pride affirms masculinity, shame can be experienced as a failure to meet masculine standards (Waitt & Clifton, 2013, 2015). Thus, the shame associated with men’s meat avoidance further highlights the subordinate status of veg*n masculinity. Through self-policing behaviours such as concealing, downplaying, or altering their nonhegemonic dietary practices—driven by unpleasant self-conscious emotions—participants conformed to and inadvertently reinforced the hegemony of carnist masculinity, whilst suppressing veg*n masculinity.

Some veg*n participants self-policed by intentionally concealing their ideological beliefs. When explaining their dietary choice to others, Alessandro (65, pescetarian) and Jack (55, vegan) emphasised health while intentionally omitting their beliefs in animal rights. This strategy has also been employed by Estonian and Finnish vegan men (Aavik, 2023). This enabled them to avoid ideological clashes with carnist people, but indirectly reinforces the hegemony of carnist masculinity by suppressing veg*n masculinity and ideology.

Furthermore, carnist men were deterred from plant-based diets due to concerns about standing out awkwardly in social settings. The prospect of standing out as a “special case” or “causing a fuss” for not eating meat was an anticipated source of embarrassment. Richard (48, carnist) speculated, “I’d think I was causing a fuss. And I think I’d be embarrassed that I

had to cause people extra effort to make something particular for me”. William (50, carnist) explained:

If you have to do something special and out of the ordinary, then it might get a bit embarrassing... If you're in a restaurant or somewhere where they don't have vegetarian options and you're putting them to trouble to make you something, then it becomes more embarrassing.

Embarrassment signals the threat of social devaluation (Bastin et al., 2016), and as a self-conscious emotion, is closely tied to self-image and identity goals (Sznycer, 2019). Given that gender is omnirelevant—constructed and judged by others in all social situations (West & Zimmerman, 1987)—this suggests that carnist men feared that abstaining from meat would undermine their masculine image. Thus, anticipated embarrassment contributed to the carnist participants' conformity to masculine carnist norms.

Two flexitarian men, while motivated to reduce their meat consumption, felt that completely abstaining from meat would cause embarrassment in meat-centric social contexts. Having observed other men being ridiculed for abstaining from meat, Brian (53, flexitarian) anticipated that he too would be put on the spot in social contexts if he were to adopt a fully plant-based diet:

Some people get joked around or ridiculed that they're not having. It's like, oh, he's not a meat eater... I pictured if I was going to not eat meat, I might get looked at as if like, oh, you know, what's wrong with you... I'd have to stand there and justify it to them... Thinking, well, what am I going to say in defence if someone says, why aren't you having any?... I could always say I don't feel like it and just cover it up.

Like the veg*n participants who concealed their dietary practices, Brian anticipated he would need to “cover up” his meat-free diet, highlighting the perceived threat of shame and masculine devaluation associated with the subordinated status of veg*n masculinity. This

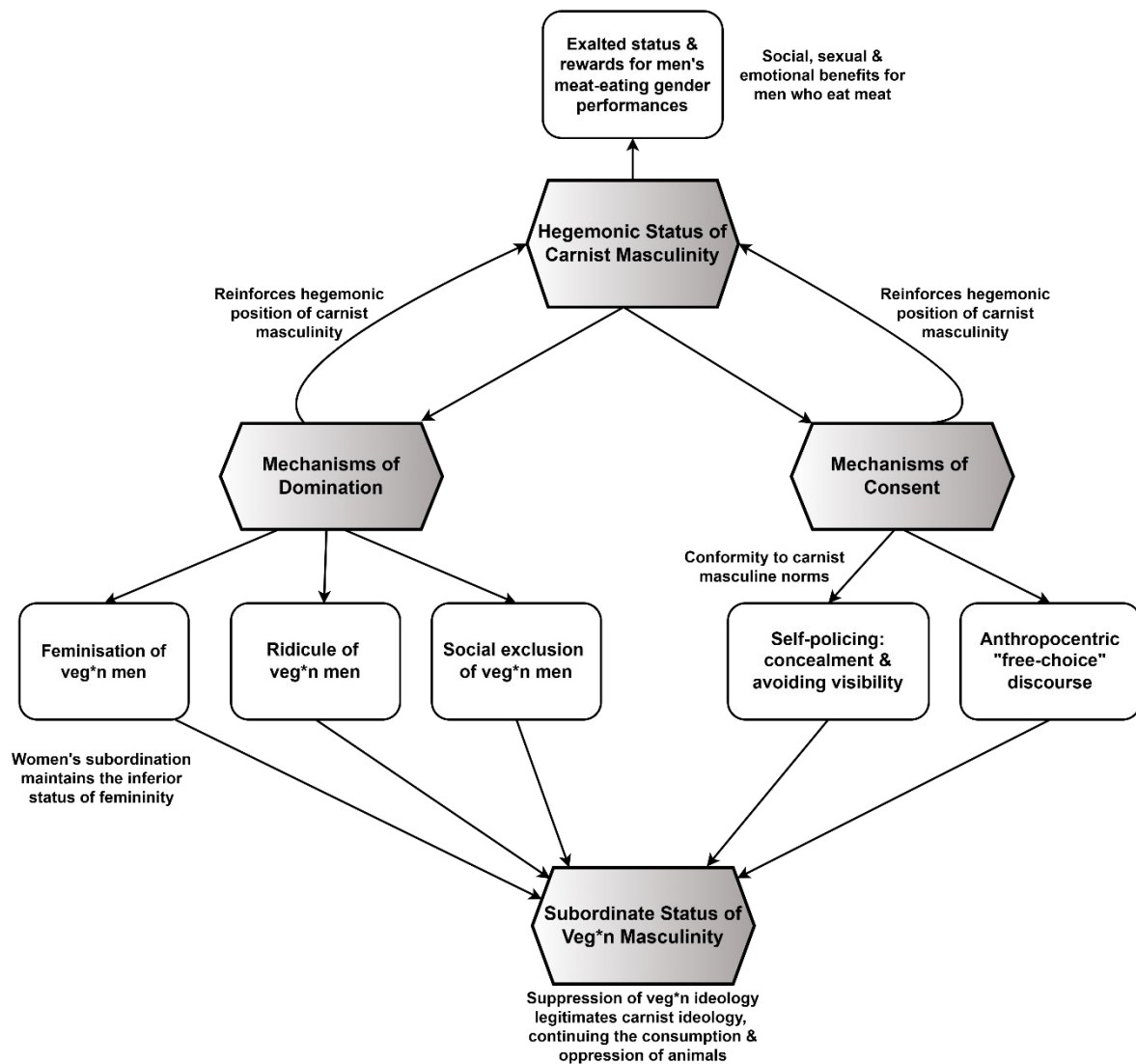
shows that even men motivated to reduce their meat consumption at times feel pressured to conform to masculine carnist norms for fear of being singled out.

3.4. General discussion

The results align with and extend previous studies on hegemonic masculinity and meat consumption. Consistent with Bogueva et al. (2020), veg*n men were subordinated to carnist men through feminisation and social exclusion, while in line with Nath (2011), they were ridiculed and subjected to heteronormative scorn from heterosexual carnist men. The concealment of veg*nism—whether by downplaying meat-free dietary choices, eating meat despite personal reluctance, omitting beliefs about animal rights, or avoiding food-related social interactions—was accompanied by feelings of embarrassment and shame, echoing the submissive and apologetic behaviours reported by vegetarian participants in Bogueva et al.’s (2020) study. This theme also emerged in Aavik’s (2023) research, where vegan men avoided discussing veganism or their concerns about animals. Such concealment reflects conformity to (carnist) social norms, aligning with findings from a social conformity experiment in which veg*ns, under perceived social pressure from carnist peers, self-silenced their ideological preferences (Bolderdijk & Cornelissen, 2022). Free-choice discourse among veg*n men also mirrored findings from Buttny and Kinefuchi (2020), where participants framed their veg*nism as a personal choice to deflect social stigma. Notably, this study found that carnists also employed free-choice discourse, suggesting it operates not only as a veg*n deflection strategy but as a dominant cultural narrative that sustains consent to the hegemonic carnist gender order.

Collectively, the themes revealed a hegemonic gender order sustaining the ascendant position of carnist masculinity over subordinated veg*n masculinity (Figure 1). Theme 1 showed that men who perform and conform to carnist masculinity are rewarded with positive emotions (e.g., joy, pride), enhanced status, sex appeal, social connection and a sense of

belonging—reflecting the culturally exalted position of carnist masculinity. Theme 2 showed how mechanisms of domination— (threats of) feminisation, ridicule, and social exclusion—reinforce the subordinate status of veg*n masculinity and police conformity to carnist masculinity. Theme 3 illustrated how the gender order is upheld through widespread consent. Veg*n men self-policed (i.e., conformed to masculine norms) by concealing or modifying their nonhegemonic eating practices and subordinating their ideology out of respect for carnist men’s “free choice” to consume animals. Carnist men conformed to carnist norms to avoid the anticipated embarrassment and masculinity threat of standing out in social contexts and defended their hegemonic position using free choice discourse, while outwardly appearing tolerant of veg*n masculinity. Coupled with the carnist participants’ “romanticisation of meat”—the intense hedonistic pleasure and emotional attachment they derived from consuming meat—this system sustains the meat-masculinity link, explaining the marked gender differences in dietary patterns and men’s resistance to plant-based diets (Modlinska et al., 2020).

Figure 1.*The Mechanisms of Domination and Consent Upholding Hegemonic Carnist Masculinity*

Note. This figure illustrates the hegemonic carnist gender order sustaining men's resistance to plant-based diets and the legitimation of animal consumption (i.e., carnism). Social policing through mechanisms of domination (feminisation, ridicule, and social exclusion of veg*n men) reinforces the hegemonic position of carnist masculinity above veg*n masculinity, femininity, and animals. Mechanisms of consent further reinforce the gender order through, firstly, self-policed conformity to masculine carnist norms through concealment, downplaying, modification and/or avoidance of veg*n dietary practices and beliefs, and secondly, anthropocentric "free choice" discourse prioritising carnist dietary choices over animal rights. The hegemonic status of carnist masculinity reproduces and rewards men's meat-eating gender performances with enhanced status, belonging, pride, and/or sex appeal.

The analysis revealed the interconnected processes of a hierarchical gender-based system reinforcing a culturally exalted construction of masculinity that positions heterosexual carnist men at the apex of the social hierarchy, above feminised masculinities (veg*n and homosexual men), women, and animals. This explains why (heterosexual) men are most resistant to meat reduction (Camilleri et al., 2023, 2024): mechanisms of domination and consent collectively maintain the culturally hegemonic status of heterosexual carnist masculinity, which in turn, reproduces and rewards men's meat-eating gender performances, and compels conformity to carnist norms, ultimately deterring men from plant-based diets.

When considering the ideological underpinnings of the masculinities examined in this analysis, results suggest that this gender order sustains the hegemony of carnist ideology, ensuring widespread acceptance of animal consumption and oppression. Gramsci (1971) emphasised that hegemonic social orders are sustained through mass internalisation of and consent to the ruling class's ideological worldview. Given that ideologies are motivational belief systems serving to defend or challenge existing social systems (Gerring, 1997), ultimately, the hegemony of carnist masculinity sustains animal oppression (i.e., consumption) by suppressing veg*n ideology and maintaining widespread consent to carnist ideology—belief systems that entitle humans to eat and exploit animals. Connell (1995) and Demetriou (2001) argued that subordinating nonhegemonic masculinities is not an end in itself, but rather, a means of oppressing women. If certain men are feminised and deemed “lesser”, then the subordination of women appears as a natural extension of this hierarchy. Similarly, the subordination of veg*n masculinity is likely an ideologically motivated strategy to maintain animal oppression, through the delegitimisation of veg*n ideology, which promotes animal liberation. Veg*n men are a greater threat because, compared to veg*n women, they have greater power within patriarchal systems to change oppressive institutional structures. Indeed, carnist men express more prejudice towards veg*n men than

they do towards veg*n women (MacInnis & Hodson, 2017). As veg*n men pose a greater threat to carnist agendas, they are silenced and discredited, whilst carnist men are policed to prevent “defection”. While veg*n men do not face systemic institutional oppression or discrimination, they occupy a *culturally* inferior position that delegitimises their masculinity relative to carnist masculinity.

Additionally, results are consistent with Adams’ (2015) and Gelfer’s (2013) contention that men’s meat consumption reinforces women’s subordination. Feminising veg*n men was a key domination mechanism—which is only effective if femininity remains subordinate to masculinity. As Salmen and Dhont (2023) note, “the ‘feminisation’ of men who abstain from animal exploitation is only derogatory if the feminine is devalued” (p. 7). Positioning inferior “feminine” veg*n men in direct opposition to superior “masculine” carnist men reinforces a masculine/feminine hierarchical binary, which sustains women’s subordinate status (Plumwood, 1993). This highlights that carnist ideology both relies on and reinforces gender inequality, explaining why meat consumption and pro-meat-eating attitudes are positively associated with sexist attitudes and lack of sensitivity to men’s privileges over women (Allcorn & Ogletree, 2018; Camilleri et al., 2024). These findings support the ecofeminist linked oppression thesis, which asserts that the oppression of women and animals are mutually reinforcing (Adams, 2015; Wyckoff, 2014). Specifically, Adams’ (2015) argued that vegetarianism is delegitimised by its association with women’s subordinated status, suggesting that the subordination of women is crucial for suppressing veg*n ideology and, ultimately, maintaining animal oppression. Supporting and extending Adams’ argument, this study highlights that the subordination of nonhegemonic *men* (veg*n, homosexual), alongside women, is crucial to maintaining animal oppression. Overall, this study suggests that the link between meat and masculinity is indeed *hegemonic*, because it is upheld by gender relations that reinforce the subordination of women, nonhegemonic masculinities, and animals.

3.5. Implications

This study has important implications for understanding hegemonic masculinity. Connell (1987) argued, “The most important feature of contemporary hegemonic masculinity is that it is heterosexual... and a key form of subordinated masculinity is homosexual. This subordination involves both direct interactions and a kind of ideological warfare.” (p. 24). This remains a valid point. However, from a non-anthropocentric perspective, this study also highlights that one of the key features of hegemonic masculinity is that it is *carnist*, and that a key form of subordinated masculinity is veg*n, driven, as Connell notes, by “a kind of ideological warfare”—that is, motivated by a carnist ideological agenda to defend animal exploitation by suppressing veg*n ideologies. The intersectional nature of hegemonic masculinity is often emphasised (e.g., Connell, 2016; Messerschmidt & Messner, 2018; Wesley, 2015). By highlighting the centrality of carnism to hegemonic masculinity, this study underscores its intersection with anthropocentrism and speciesism, and how it reinforces species-based inequalities alongside human inequalities.

The centrality of carnism to hegemonic masculinity is an important feature to recognise—not because of its relatively minor effect on veg*n men (particularly white veg*n are relatively shielded from social stigma directed towards them; Mycek, 2018; Nath, 2011), but because of the lived, material consequences for the trillions of animals exploited and killed annually for human consumption. Moreover, it exposes the anthropocentric bias in existing theories of the meat-masculinity link; while gender performance and conformity to masculine norm theories of the meat-masculinity theories have acknowledged men’s relationships with other humans (i.e., emphasising the need for an audience to validate gender performances or the influence of societal expectations), both theories *ignore the animal*, whose presence (or more accurately, absence) is fundamental to the interaction. In this way, previous meat-masculinity theories reinforce animals as the “absent referent” (Adams, 2015)

and fail to recognise men's meat consumption as a manifestation of their *relationships* with both human and nonhuman others and the (androcentric and anthropocentric) ideologies that shape these interactions.

This study addresses these limitations by offering a broader, non-anthropocentric understanding of the meat-masculinity link. This study suggests that the meat-masculinity link is *hegemonic*—meat consumption not only enables men to perform masculinity but also reinforces the subordination of nonhegemonic masculinities (veg*n men, homosexuals), women, and animals, through mechanisms of domination and consent. The concept of a hegemonic carnist gender order presented here situates existing meat-masculinity theories within a broader sociocultural and ideological framework. Scholars have argued that men eat meat as a form of gender performance (e.g., Nakagawa & Hart, 2019; Rosenfeld & Tomiyama, 2021) or out of conformity to masculine norms (Camilleri et al., 2024; Campos et al., 2020; De Backer et al., 2020; Rosenfeld & Tomiyama, 2021). However, these theories emphasise carnist men as individuals, overlooking broader gendered power relations. They also ignore the ideological underpinnings of behaviour. This analysis suggests that both meat-eating gender performance and conformity are shaped by—and help sustain—an ideologically driven hegemonic gender order that culturally exalts carnist men, subordinates veg*n men, and reinforces the oppression of homosexual men, women and animals. This highlights the ideological entanglement of patriarchy, heteronormativity, and anthropocentrism. This provides an alternative gender-focused framework distinct from the Social Dominance Human-Animal Relations Model (Dhont et al., 2016), which also addresses linked human and animal oppression but through a social dominance lens. By highlighting the interconnectedness of oppression, both models emphasise the need for “intersectional activism”, which fosters collaboration between diverse social justice movements (Aavik, 2018).

3.6. Limitations and Future Research

A key limitation of this study was the exclusion of women's perspectives, which likely obscured additional mechanisms of domination and consent reinforcing the hegemony of carnist masculinity. The analysis also did not fully adopt an intersectional lens to explore how class, race, sexuality, and gender diversity intersect with carnist and veg*n masculinities within the hegemonic order. Future research could examine how these masculinities are shaped by intersecting identities—for example, how transgender veg*n men navigate and are positioned within dominant gender structures. Similarly, while heterosexual and homosexual masculinities were considered, representation of homosexual participants was limited to only one individual. The limited insights into the overlap of carnist masculinity with homophobia were based on accounts provided by a heterosexual vegan man, rather than the lived experiences of homosexual men themselves. As such, the analysis was unable to explore how homosexual men experience and relate with hegemonic forms of carnist masculinity. Future research should prioritise the inclusion of more diverse sexual identities, particularly homosexual and queer men, to better understand how they navigate, internalise, or resist hegemonic carnist masculinity. This study also examined the hegemonic meat-masculinity link in an Australian and British context. Future studies could explore how carnist and veg*n masculinities are constructed and relate in different cultural contexts.

Prior research on meat consumption has largely focused on moral emotions such as empathy and disgust (e.g., Kunst & Hohle, 2016), whereas our findings point to the significance of self-conscious emotions—particularly pride, shame and embarrassment—which are closely tied to masculinity and gender performance through their influence on identity, self-image, and social value (Sznycer, 2019). Future research could investigate whether these emotions contribute to the maintenance of carnist masculinity by examining

gender differences in experiences of self-conscious emotions related to plant-based eating in social contexts.

3.7. Conclusion

Combining hegemonic masculinity, ecofeminist, and critical animal theoretical frameworks, this study extended existing gender performance and masculinity ideology theories of the meat-masculinity link to deepen understanding of how gendered power dynamics contribute to men's resistance to plant-based diets. This study suggests that the link between meat and masculinity is indeed *hegemonic*, because it is upheld by gender relations that reinforce the subordination of women, nonhegemonic masculinities, and animals. Men's meat-eating gender performances and conformity were reinforced by, and helped sustain, a broader ideologically driven hegemonic gender order in which (heterosexual) carnist masculinity is culturally exalted above a subordinated veg*n masculinity. The hegemony of carnist masculinity is maintained by a system of gender relations that reward men's meat-eating gender performances with increased status, sex appeal, and social belonging; through domination mechanisms that feminise, ridicule, and exclude veg*n men; and through consent, maintained via self-policed concealment of veg*nism and "free choice" discourse that prioritises human autonomy over animal rights.

The subordination of veg*n masculinity may serve to suppress and delegitimise veg*n ideology, sustaining the hegemony of carnism, and consequently, the oppression and consumption of animals. Importantly, the feminisation of veg*n men sustains the hegemonic status of "masculine" carnist men, reinforcing a hierarchical masculine/feminine binary that subordinates femininity. These findings suggest that the hegemony of carnist masculinity perpetuates gender inequality and underscores the centrality of women's subordination in sustaining animal oppression, consistent with the ecofeminist linked oppression thesis. Collectively, the analysis elucidated the interconnected processes of a hierarchical gender

system reinforcing the hegemonic status of heterosexual carnist men above “feminised” masculinities (veg*n men, homosexual men), women, and animals. This highlights the intersecting and mutually reinforcing ideologies of patriarchy, heteronormativity, and anthropocentrism in upholding social inequality.

Funding information

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data availability statement

Data is available upon reasonable request to the corresponding author.

Declaration of competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have influenced this work.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used ChatGPT during the final stages of editing to enhance the manuscript’s conciseness and clarity. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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Chapter 10: Integrated Discussion

The overarching aim of this dissertation was to gain a comprehensive understanding of the masculinity dilemma; specifically, how masculinity and other psychosocial factors are associated with men's meat consumption and resistance to meat reduction. This was achieved through a hybrid sequential convergent mixed methods research design comprising one preliminary scale validation study and three key empirical studies: 1) identifying which dimensions of masculinity ideology predict men's meat consumption; 2) exploring within-gender differences among male consumers, and 3) investigating how hegemonic masculinity contributes to men's meat consumption. This discussion begins by briefly returning to the three research questions addressed by the three empirical studies. However, the major focus of this discussion addresses the mixed methods research question to understand how the converged quantitative and qualitative results provide deeper insights into understanding the masculinity dilemma. This chapter also considers how some of the study's key findings contribute to ecofeminist and human-animal relations literature. Implications, study limitations, and directions for future research are also discussed.

10.1. Summary of key findings

The preliminary adjust scale development study developed, psychometrically tested and validated The Meat Consumption Scale, a self-report questionnaire to measure participants meat consumption, for use in the quantitative phase. The scale demonstrated excellent model fit, indicating that the Meat Consumption Scale represents a unidimensional construct measuring Western land-based animal meat-eating patterns. The scale demonstrated convergent validity by correlating in the expected directions with ten meat-related constructs and demographic variables. Internal consistency reliability was acceptable when measured by mean inter-item correlations and corrected item-total correlations, although coefficient H only reached acceptable levels in one sample. Traditional reliability estimates may

underestimate the scale's utility due to its frequency-by-quantity scoring method and the potential suitability of a formative rather than reflective construct model. Further validation using item response theory or alternative reliability frameworks may provide additional insight into the scale's measurement properties. Nevertheless, to the author's knowledge, the Meat Consumption Scale the first brief, psychometrically validated self-report questionnaire of meat consumption that can be administered on a single occasion, representing a more rigorously tested and psychometrically sound alternative to previous unvalidated, ad hoc measures.

The first research question—*which dimensions of masculinity ideology predict men's meat consumption and willingness to reduce their meat intake?*—was addressed in the first empirical study. The link between meat consumption and conformity to masculinity ideology is well established in the literature, with traditional masculinity positively associated, and non-traditional masculinity negatively associated, with men's meat consumption. However, despite current understandings of masculinity as multidimensional (Levant & Wong, 2017), it is unknown which dimensions of masculinity ideology explain this relationship. The first study in this thesis addressed this gap by investigating which traditional and non-traditional masculine norms predicted men's total meat consumption, red and processed meat consumption, and willingness to reduce. A partial least squares structural equation model found that, when controlling for age, education, income, geographic location, sexual orientation, and social dominance orientation (SDO), conformity to the traditional masculine norms “violence” and “importance of sex” positively predicted men's red and processed and total meat consumption. Conformity to the non-traditional masculine norm “sensitivity to male privilege” positively predicted willingness to reduce meat consumption. The results revealed that men's attitudes to violence, sex, and gender equality are the most salient dimensions of masculinity ideology explaining the meat-masculinity relationship.

The second research question—*are there different types of male meat consumers and how do they differ on important meat-related psychosocial factors?*—was addressed in the second empirical study. Researchers have critiqued overemphasis on male versus female differences and the assumption that men comprise a homogenous group of meat consumers (De Backer et al., 2020; Leary et al., 2023; Modlinska et al., 2020; Rosenfeld & Tomiyama, 2021). This overlooks potentially important within-gender differences that may provide a more comprehensive understanding of men's meat consumption. The second study in this thesis investigated whether there are distinct types of male meat consumers that differ on psychological characteristics related to meat consumption. A latent profile analysis identified three groups: Resistant, Ambivalent, and Meat-Averse. Resistant men were heavy meat-eaters with very low willingness to reduce. They had very a positive attitude to eating meat, justified meat consumption with direct MRCDs strategies, lacked moral emotions towards farm animal suffering, perceived the lowest social support for meat reduction, and conformed most of all profiles to traditional masculinity ideology and least to non-traditional masculinity ideology. Ambivalent men ate moderate amounts of meat and were slightly unwilling to reduce. They were ambivalent about meat consumption, showing a positive attitude to eating meat but an emotional response to farm animal suffering. Consequently, they engaged highly in indirect MRCD strategies, intentionally avoiding thinking about what happens to animals in meat production processes. Meat-averse men ate minimal-to-no meat and were highly willing to abstain from meat. They showed strong negative attitudes and feelings of disgust towards meat consumption, strong empathy for farm animals, and high conformity to non-traditional masculinity ideology. While previous studies have identified a diversity of meat consumers segments with distinct characteristics (e.g., Apostolidis & McLeay, 2016; Cornelissen & Piqueras-Fiszman, 2023; Lacroix & Gifford, 2019; Latvala et al., 2012; Malek et al., 2018; Onwezen & van der Weele, 2016; Ritzel & Mann, 2023), this was the first

segmentation study investigating *male* meat consumers, establishing that there are three distinct male meat consumer groups with unique psychological characteristics.

Finally, the third research question—*how does hegemonic masculinity contribute to men's resistance to meat reduction?*—was addressed in the third empirical study. Scholars have applied Connell's (1987) hegemonic masculinity theory to the meat-masculinity link, explaining men's meat consumption as a gender performance of, or conformity to, hegemonic masculinity. However, by focusing on men as individuals rather than power dynamics between masculinities and femininity, these studies have not thoroughly demonstrated the *hegemonic* nature of men's meat consumption. It is also unclear *how* (i.e., the processes and mechanisms), if at all, hegemonic masculinity sustains meat consumption. Taking an ecofeminist and critical animal theoretical approach, the third study explored how hegemonic masculinity contributes to men's meat consumption. A thematic analysis of 19 in-depth interviews of carnist and veg*n men produced three themes that elucidated the hegemonic carnist gender order driving men's meat consumption and the widespread legitimization of animal consumption. In Theme 1, meat-eating gender performances rewarded men with positive emotions, enhanced social status, sex appeal and group belonging—revealing a culturally exalted “carnist masculinity”. Themes 2 and 3 demonstrated the mechanisms of domination and consent reinforcing the hegemonic status of carnist masculinity. In Theme 2, veg*n masculinity was subordinated to carnist masculinity through feminisation, ridicule, and social exclusion. In Theme 3, carnist and veg*n men consented to the hegemonic order through self-policing and anthropocentric free-choice discourse. A fourth theme, *the romanticisation of meat*, which was not discussed at length, highlighted the strong affective connection the carnist participants felt towards meat. The men described feelings of joy, comfort, nostalgia and pleasure associated with meat; fear about losing pleasure and joy at the prospect of giving up meat; the experience of cravings when abstaining from meat; and

the sentiment that meat was irreplaceable. Collectively, the analysis revealed the interconnected processes of a hierarchical gender system—operating through social interactions and discourses—reinforcing a culturally exalted construction of masculinity that positions heterosexual male meat-eaters at the apex of the social hierarchy, above feminised masculinities (veg*n and homosexual men), women, and animals. This elucidates why (heterosexual) men are most resistant to meat reduction: mechanisms of domination and consent collectively maintain the hegemonic status of heterosexual carnist masculinity, and in turn, the hegemony of carnist masculinity reproduces and rewards meat-eating gender performances and deters meat avoidance.

10.2. Understanding the masculinity dilemma

This section addresses the study's overarching aim, exploring how the converged findings provide deeper insights into how masculinity and other psychosocial factors are related to men's resistance to meat reduction. Firstly, this section will discuss how the three consumer groups identified in Study 2 can be interpreted through the hegemonic carnist masculinity framework developed in Study 3, grounded in a critical animal and ecofeminist theoretical framework. The Resistant profile corresponds with hegemonic carnist masculinity; the Meat-averse profile corresponds with veg*n masculinity; and the Ambivalent profile represents what Connell (1995) refers to as a "complicit masculinity". As the qualitative study explicated the relations between carnist and veg*n masculinity and their role in the hegemonic gender order, this discussion will focus on the role of complicit (i.e., ambivalent) masculinity in the gender order and how it contributes to men's resistance to meat reduction. Although men's meat consumption is a complex phenomenon, this parsimonious three-group conceptualisation of male meat consumers may have greater practical utility for understanding and changing men's meat consumption.

In the second part of this discussion, the most salient features of hegemonic carnist masculinity—men’s attitudes to violence, gender equality, and human-animal relations—will be interpreted through this dissertation’s theoretical framework. The converged findings suggest that, in a unified system of dominance, hegemonic carnist masculinity legitimises and sustains violence against both human and animal groups, subordinates nonhegemonic masculinities (veg*n and homosexual men), and contributes to the oppression of women and animals.

10.2.1. Hegemonic carnist masculinity, veg*n masculinity, and complicit ambivalent masculinity

The three latent consumer profiles—Resistant, Ambivalent, and Meat-Averse—can be understood through the model of hegemonic carnist masculinity developed in the qualitative study. As shown in Table 1, the Resistant profile characteristics correspond with hegemonic carnist masculinity, while in Table 2, the Meat-averse profile corresponds with subordinated veg*n masculinity. For instance, the qualitative analysis highlighted that hegemonic masculinity is aligned with carnist ideology; it was suggested that carnist men subordinated veg*n men to suppress veg*n ideology and sustain the legitimacy of animal consumption. Correspondingly, the Resistant profile strongly aligned with carnist ideology (e.g. heavy meat consumption, high direct MRCDs, lack of concern about animal rights), whereas the Meat-Averse profile aligned with veg*n ideology (negligible meat consumption, low direct MRCDs, moral disgust towards meat, concern for animal rights). Moreover, the Resistant profile had the highest proportion of heterosexual men, conformed higher than other profiles to the heterosexual self-presentation norm, and conformed least to non-traditional masculinity (ideology that rejects traditional gender roles and promotes gender equality)—mirroring how hegemonic carnist masculinity reinforced heteronormativity and gender inequality by subordinating homosexuality and women.

Table 1.
Converging Carnist Masculinity with the Resistant Profile

CARNIST MASCULINITY (Study 3)	RESISTANT PROFILE (Study 2)
<i>Meat Consumption</i>	
<ul style="list-style-type: none"> Engages in meat-eating gender performances, heavy meat consumption, takes pleasure in meat consumption. 	<ul style="list-style-type: none"> Highest meat consumption. Strong meat-eating habits. Very positive attitude to meat consumption. Very low disgust towards eating meat. Very unwilling to reduce meat consumption.
<i>Masculinity</i>	
<ul style="list-style-type: none"> Depicted by traditionally masculine traits, especially strength, power, aggression, domination, high status, rationality, and heterosexuality. Meat consumption enhances men's sexual attractiveness. Anti-femininity (men should not embody femininity). Devaluation of women by reinforcing the hierarchical masculine/feminine binary. Dominates and subordinates others, including nonhegemonic men (veg*n and homosexual men), women and animals. 	<ul style="list-style-type: none"> Strongest conformity to traditional masculine norms: <ul style="list-style-type: none"> - Higher than other profiles in conformity to physical violence. - Significantly higher proportion (95%) of heterosexual men; significantly higher conformity to heterosexual self-presentation norm. - Significantly higher conformity to importance of sex norm. Lowest conformity to non-traditional masculinity ideology (i.e., which promotes gender equality by rejecting traditional binary gender roles). Highest endorsement of social dominance orientation (i.e., desire for hierarchical rather than egalitarian social structures).
<i>Human-Animal Ideology</i>	
<ul style="list-style-type: none"> Endorses carnist ideology (i.e., beliefs defending the justness of exploiting, killing and eating animals [Joy, 2009]). Anthropocentric worldview, where humans' perceived superiority justifies their exploitation of animals & nature. 	<ul style="list-style-type: none"> Strong endorsement of direct MRCDs, anthropocentric justifications for eating animals based on carnist ideology. Low empathy and moral disgust for farm animal suffering → meat consumption not viewed as a moral issue. Animal rights considered the most unimportant reason for meat reduction, compared to health & the environment.

Consistent with Aavik's (2023) study of vegan masculinity, Meat-averse men held anti-violent and feminist views, scoring lowest on the violence norm and highest on non-traditional masculinity ideology. Therefore, the latent profile analysis appeared to identify these two ideologically opposing forms of masculinity (carnist versus veg*n). According to the size of the latent profiles, the results suggest that approximately one third of Australian and English participants in this study embody hegemonic carnist masculinity, while only a minority (10%) represent veg*n masculinity. This is consistent with Connell's (1995)

assertion that a masculinity need not be the most widely adopted form of masculinity to be hegemonic.

Table 2.

*Converging Veg*n Masculinity with the Meat-Averse Profile*

VEG*N MASCULINITY (Study 3)	MEAT-AVERSE PROFILE (Study 2)
<i>Meat Consumption</i>	
<ul style="list-style-type: none"> • Opposes and refrains from meat consumption. 	<ul style="list-style-type: none"> • Little-to-no meat consumption. • Weak meat-eating habits. • Very negative attitude to eating meat. • Very high disgust towards eating meat. • Very willing to reduce meat intake even further.
<i>Masculinity</i>	
<ul style="list-style-type: none"> • Placed in binary opposition to traditional hegemonic ideals of masculinity, by being characterised as feminine, weak, irrational, and emotional. 	<p>Low conformity to traditional masculine norms:</p> <ul style="list-style-type: none"> - Significantly lower conformity to traditional masculine norms importance of sex and heterosexual presentation than the Resistant profile. - Significantly lower conformity to physical violence norm than both Resistant and Ambivalent profiles, suggesting less aggressive tendencies. • Highest conformity to non-traditional masculinity (i.e., which promotes gender equality by rejecting traditional binary gender roles; greater openness to traditionally ‘feminine’ gender roles). • Lower endorsement of social dominance orientation (i.e., greater preference for egalitarian rather than hierarchical social structures).
<i>Human-Animal Ideology</i>	
<ul style="list-style-type: none"> • Endorses veg*n ideology, which opposes animal domination, exploitation & consumption. • Acknowledges & supports animal rights. 	<ul style="list-style-type: none"> • Rejection of direct MRCDs (anthropocentric justifications for eating animals based on carnist ideology). • High empathy and moral disgust for farm animal suffering → meat consumption viewed as a moral issue. • Animal rights/welfare seen as the most important reason for meat reduction, compared to health & the environment.

While the Resistant and Meat-averse latent profiles clearly aligned with the qualitative findings by corresponding with carnist and veg*n masculinities, the position of the Ambivalent profile in the hegemonic order is not readily apparent. The Ambivalent profile may represent what Connell (1995) referred to as a “complicit” masculinity, which refers to men who do not embody hegemonic masculinity, but are passively complicit in upholding the hegemonic gender order because they benefit from patriarchal privileges. Connell (1995)

explained, “Masculinities constructed in ways that realise the patriarchal dividend, without the tensions or risks of being the frontline troops of patriarchy, are complicit in this sense.” (p. 79). Interpreted through this dissertation’s critical animal and ecofeminist theoretical framework, a complicit masculinity is one that contributes to the realisation of the patriarchal and *anthropocentric* dividend. That is, they were complicit in upholding the hegemonic hierarchy of masculinities, femininity, and animals. Furthermore, the Ambivalent profile was the largest consumer segment (58% of the sample), consistent with Connell’s contention that most men fall into this complicit category:

The number of men rigorously practising the hegemonic pattern in its entirety may be quite small. Yet *the majority* of men gain from its hegemony, since they benefit from the patriarchal dividend, the advantage men in general gain from the overall subordination of women. (Connell, 1995, p. 79, emphasis added).

Thus, in the same way, most men may be complicit in reinforcing the hegemonic carnist gender order, not only to “gain from the overall subordination of women”, but also to benefit from the subordination, exploitation and consumption of animals. This extends beyond the hedonistic pleasure of consuming animals as food, to the use of animals as entertainment, and the numerous material benefits gained from products or scientific advancements developed through animal testing. In the qualitative study, the Ambivalent men romanticised meat as much as the Resistant men, expressing a strong emotional attachment to eating meat, suggesting that they enjoyed the benefits of animals’ subordinate position.

Supporting the assertion that the Ambivalent profile represents a masculinity complicit in the hegemonic order, the key feature of this profile, ambivalence, is consistent with Gramsci’s understanding of *consent* to hegemony. “Consent, for Gramsci, involves a complex mental state, a ‘contradictory consciousness’ mixing approbation and apathy,

resistance and resignation” (Lears, 1985, p. 570). On the one hand, Ambivalent men enjoyed eating meat, but on the other, felt concerned about the suffering of the animals they were consuming, reflecting Gramsci’s “contradictory consciousness”. According to Gramsci, this ambivalence leads to widespread passivity, and thus, consent to the hegemonic order: “[T]he contradictory state of consciousness does not permit of any action, any decision or any choice, and produces a condition of moral and political passivity.” (Gramsci, 1971, p. 333). Accordingly, as will be discussed below, while the Ambivalent men did not appear to ideologically or morally support the hegemonic gender order, they were complicit through passivity.

The biggest distinction between Ambivalent (complicit) and Resistant (hegemonic) men was their endorsement of carnist ideology and attitude towards animals, indicating that Ambivalent men did not align ideologically with carnist masculinity. Unlike Resistant men, who showed no concern for animal suffering, the Ambivalent men were empathetic towards the plight of farm animals and saw animal rights as a valid reason for meat reduction. They were morally disgusted by the poor treatment of farm animals (though not as strongly as Meat-Averse men), indicating some level of moralisation of animal consumption (Feinberg et al., 2019). Moreover, the Ambivalent men did not strongly endorse direct MRCD strategies, justifications legitimating meat consumption based on carnist ideology. Yet, the Ambivalent men enjoyed and had positive attitudes to eating meat. Notably, unlike other profiles, they relied on indirect MRCD strategies, specifically, avoidance and dissociation. Despite feeling concerned about the poor treatment of animals in the meat industry, they intentionally avoided thinking about or discussing the harmful ways that farm animals are treated by humans and dissociated meat from the living sentient animal it once was. Thus, despite their moral reservations about meat consumption, the Ambivalent men took what Rothgerber (2013) describes as a “look-the-other-way” approach, essentially “turning a blind eye” to

animal suffering. This reflects a form of *strategic ignorance*, a common strategy for alleviating meat-related ambivalence, involving the wilful denial or distortion of information that reveals the negative impacts of one's self-interested decisions (Onwezen & van der Weele, 2016; van der Weele, 2014). Multiple studies have found that large groups of consumers feel ambivalent about eating meat (Berndsen & van der Pligt, 2004; Buttlar & Walther, 2018; Onwezen & van der Weele, 2016; van der Weele, 2014) and utilise strategic ignorance to wilfully deny the brutal realities of meat production (Onwezen & van der Weele, 2016; van der Weele, 2014). This dissertation sheds light on the unique experience of ambivalence for male meat consumers, particularly concerning the intersection between conflicting internal cognitive and emotional states with masculine identity and gender relations.

At a deeper level, Ambivalent men appear to be morally troubled by animal consumption. However, this moral disturbance is stifled by the immediate affective responses and demands of negotiating masculinity in social interactions. Affect and emotion were central to driving "self-policed" consent to the hegemonic order (i.e., conformity to masculine norms). Previous scholars have noted that self-conscious emotions, such as pride and shame, sanction and reinforce masculine conformity and performances (e.g., Waitt & Clifton, 2013, 2015). Pride is experienced as a visceral, embodied expression and affirmation of masculinity, while embarrassment and shame are experienced as a failure to meet masculine standards. In the same way, it was emotionally uncomfortable for men to deviate from hegemonic carnist norms in social contexts, where gender is salient (West & Zimmerman, 1987). Participants experienced (or anticipated experiencing) unpleasant self-conscious emotions when avoiding meat (or at the prospect of not eating meat) at social events (e.g., embarrassment, awkwardness, feelings of disconnection, or alienation). Conversely, men's meat-eating gender performances were accompanied by positive emotions

and affect—including a sense of belonging, connection, joy, and pride—which when expressed through the body, affirm masculinity by signalling ease, confidence, and high status, eliciting higher valuation and respect from others (Sznycer et al., 2017). Thus, aligning with Reeser and Gottzén's (2018) assertion that hegemonic masculinity and gender norms are reified and reinforced through emotion and affect, hegemonic constructions of carnist masculinity manifested in an immediate, visceral experience felt and expressed through the men's bodies, overriding underlying moral emotions and ambivalence.

Of the three distinct masculinities in the gender order, ambivalent complicit masculinity is positioned between the two “extremes”, or, in Connell's (1995) words, “frontline troops” of masculinity (i.e., hegemonic carnist masculinity and subordinated veg*n masculinity). Understanding the relations between, and experiences of, these masculinities reveals that men who feel morally concerned about the treatment of animals are presented with two alternatives. On the one hand, they can concede to their moral reservations and cease participating in animal harm, aligning themselves with veg*n masculinity. However, this would require a personal sacrifice (of their love of meat) and jeopardise their social and emotional security by drawing negative attention, risking ridicule, social exclusion, and having their masculinity diminished (i.e., feminised). Meat-centric social gatherings, particularly in homosocial contexts, which were previously characterised by joy, pleasure, pride, and a sense of connection and belonging, threaten to become awkward, embarrassing, or alienating. On the other hand, Ambivalent men can continue eating meat and remain in the comfort and safety of complicit ambivalence, avoiding these social repercussions, threats to masculinity, and internal moral disturbances by strategically ignoring their moral concerns, quietly adhering to hegemonic carnist masculine norms, and absolving their complicity through deference to neoliberal free choice ideals and the cultural and institutional hegemony of carnist ideology. Requiring nothing but passive and inconspicuous non-action, this option

is easier and more appealing, placing ambivalent men in a safe and relatively comfortable position, protecting their masculinity whilst enabling them to enjoy the hedonistic, social and emotional benefits of carnist masculinity, meat, and other products derived from animal exploitation. Outwardly, they appear to embody hegemonic carnist masculinity, reaping the rewards of carnist gender performances, despite privately harbouring ideological and emotional objections. The cost of this position is minimal, consisting of intermittent states of guilt or ambivalence when reminded of the true origins of meat. In this way, eating meat enables men who do not fully embody hegemonic masculinity to reap its rewards.

Thus, the converged findings extend the qualitative analysis by identifying three distinct masculinities in the hegemonic carnist gender order (descriptions of each are displayed in Table 3). Carnist and veg*n masculinities embody two salient, ideologically opposing, and *culturally visible* masculinities. As the largest profile, the Ambivalent men represent a widespread, *inconspicuous*, complicit masculinity, which is not a true manifestation of hegemonic carnist masculinity, but nonetheless consents to its hegemony. This is not only because they enjoy patriarchal privileges but also because they derive benefits from animal oppression. Moreover, acquiescing to the hegemonic carnist gender order, rather than acknowledging their moral concerns, offers a safe and comfortable refuge protecting their masculinity.

Table 3.
Masculinities Within the Hegemonic Carnist Gender Order

HEGEMONIC CARNIST MASCULINITY (Resistant profile, 32.7%)	COMPLICIT AMBIVALENT MASCULINITY (Ambivalent profile, 57.7%)	SUBORDINATED VEG*N MASCULINITY (Meat-averse profile, 9.6%)
<i>Meat Consumption</i>		
<ul style="list-style-type: none"> • Heavy meat consumption. • Strong meat-eating habits. • Very positive attitude to eating meat. • Low disgust towards eating meat. • Very unwilling to reduce meat intake. • Benefits socially, emotionally and/or sexually from meat-eating gender performances. 	<ul style="list-style-type: none"> • Moderate meat consumption & meat-eating habits. • Positive attitude to eating meat. • Below-average disgust to eating meat. • Slightly unwilling to reduce meat intake. • Benefits socially, emotionally and/or sexually from meat-eating gender performances. 	<ul style="list-style-type: none"> • Little-to-no meat consumption. • Weak meat-eating habits. • Very negative attitude to eating meat. • Very high disgust towards eating meat. • Very willing to further reduce meat intake.
<i>Masculinity</i>		
<ul style="list-style-type: none"> • Stronger conformity to hegemonic masculinity: <ul style="list-style-type: none"> - More likely to believe physical violence is acceptable. - More likely to be heterosexual and attempt to present themselves as heterosexual. - Place greater importance on sex (i.e. being sexually virile). • Reinforcement of gender inequality: devaluing femininity by reinforcing a masculine/feminine hierarchical binary; lowest conformity to non-traditional masculinity ideology which challenges traditional unequal gender roles & gender-based advantages afforded to men. • Highest social dominance orientation: opposition to egalitarian societies in favour of hierarchical social structures. 	<ul style="list-style-type: none"> • Moderate conformity to hegemonic masculinity: <ul style="list-style-type: none"> - Lower acceptance of violent behaviour than hegemonic carnist men, though higher acceptance compared to veg*n men. - Less importance placed on sex and less need to present as heterosexual compared to hegemonic carnist men. • Moderate conformity to non-traditional masculinity. • Lower social dominance orientation: opposition to hierarchical social structures in favour of egalitarian societies. 	<ul style="list-style-type: none"> • Low conformity to hegemonic masculinity: <ul style="list-style-type: none"> - Lower conformity to traditional masculine norms importance of sex and heterosexual presentation than the Resistant profile. - Significantly lower conformity to physical violence than both Resistant and Ambivalent profiles, suggesting less aggressive tendencies. • Support for gender equality: highest conformity to non-traditional masculinity, which promotes gender equality by rejecting traditional restrictive binary gender roles & recognising gender-based advantages afforded to men. • Lower social dominance orientation: opposition to hierarchical social structures in favour of egalitarian societies.

Table 3 continued.*Masculinities Within the Hegemonic Carnist Gender Order*

HEGEMONIC CARNIST MASCULINITY (Resistant profile, 32.7%)	COMPLICIT AMBIVALENT MASCULINITY (Ambivalent profile, 57.7%)	SUBORDINATED VEG*N MASCULINITY (Meat-averse profile, 9.6%)
<i>Human-Animal Ideology</i>		
<ul style="list-style-type: none"> • Strong endorsement of carnist ideology (i.e., beliefs defending the justness of exploiting, killing and eating animals [Joy, 2010]). • Lack of moral concern for animal suffering (low animal empathy & moral disgust). • Denies animal rights as a legitimate reason for meat reduction. 	<ul style="list-style-type: none"> • Moderate endorsement of carnist ideology. • Moral reservations about meat consumption: moderate empathy and moral disgust for farm animal suffering; views animal rights as most important reason for meat reduction. • Ambivalence about meat consumption: enjoys eating meat but is also concerned about animal suffering. 	<ul style="list-style-type: none"> • Rejection of carnist ideology. • Endorsement of veg*n ideology: meat consumption viewed as an animal rights issue; opposition to animal exploitation & consumption; animal rights viewed as the most important reason for meat reduction. • Meat consumption viewed as a moral issue (high empathy & moral disgust for farm animal suffering).
<i>Mechanisms of Domination & Consent Contributing to the Hegemonic Carnist Gender Order</i>		
<ul style="list-style-type: none"> • Domination via the subordination and social policing of veg*n masculinity through feminisation, ridicule, and social exclusion. • Consent via anthropocentric free-choice discourse: emphasising the neoliberal principle of individual autonomy to justify humans' right to free dietary choice, excluding animals from moral consideration. • Consent via self-policing: self-enforced conformity to hegemonic carnist masculinity to avoid standing out as a "special case" and undermining their masculine image. 	<ul style="list-style-type: none"> • Consent via strategic ignorance of animal suffering through avoidance & dissociation, despite moral reservations about meat consumption. • Consent via anthropocentric free-choice discourse: emphasising the neoliberal principle of individual autonomy to justify humans' right to free dietary choice, excluding animals from moral consideration. • Consent via self-policing: self-enforced conformity to hegemonic carnist masculinity to avoid standing out as a "special case" and undermining their masculine image. 	<ul style="list-style-type: none"> • Consent via anthropocentric free-choice discourse: acknowledging animal rights but prioritising carnist men's dietary preferences based on the neoliberal principle of individual autonomy. • Consent via self-policing: conformity to hegemonic carnist masculinity by hiding, downplaying, or modifying nonhegemonic veg*n practices and beliefs.

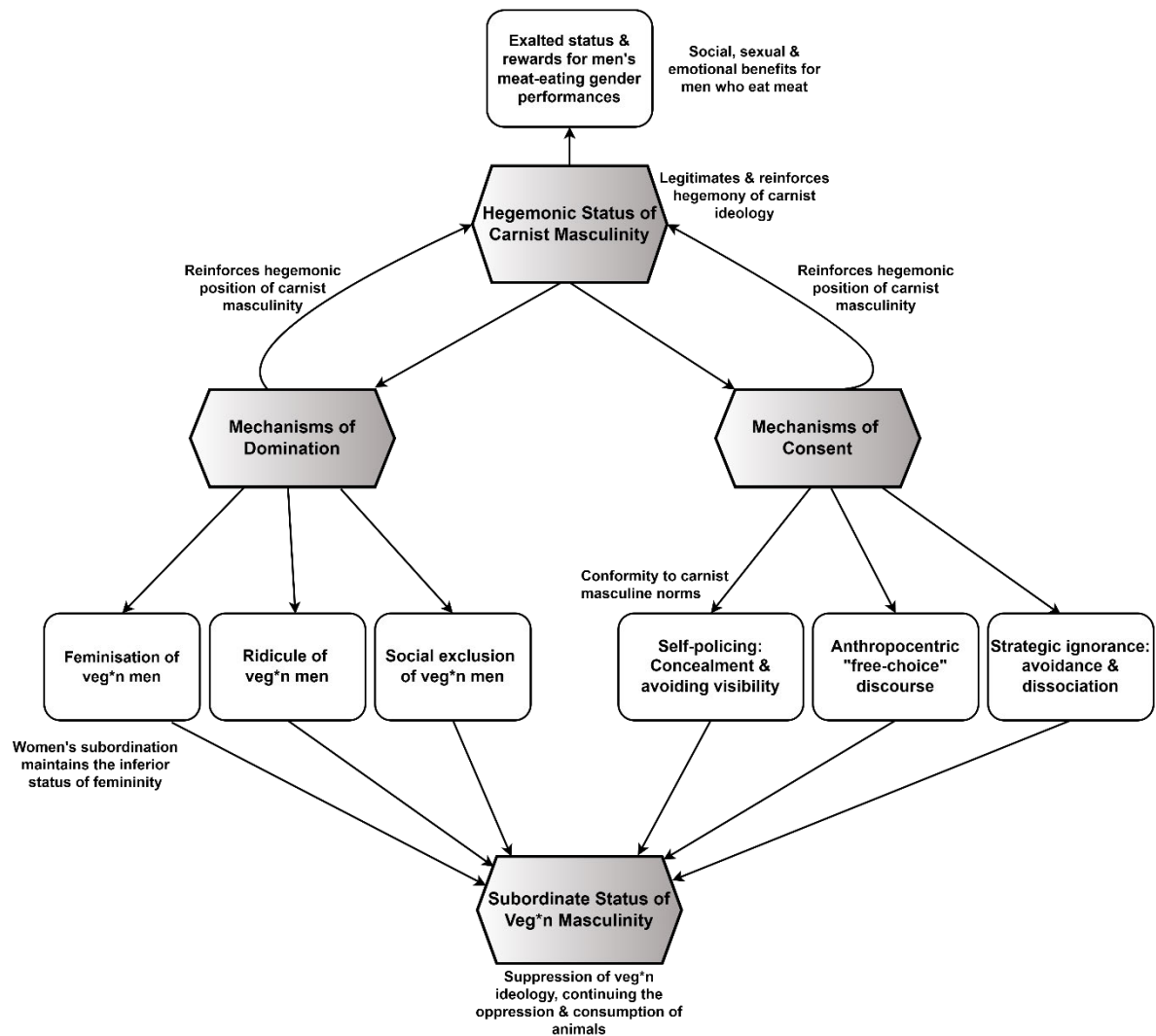
Given the substantial size and characteristics of the complicit Ambivalent profile, the results suggest that strategic ignorance (i.e., avoidance and dissociation) is an important mechanism of consent supporting the hegemonic order, which was not identified in the qualitative study. The final model of hegemonic carnist masculinity, incorporating this additional mechanism of consent is displayed in Figure 1. Aligning with definitions of hegemony that emphasise the role of domination *and consent* (Gramsci, 1971; King et al., 2021; Yang, 2020), this widespread complicity confirms the *hegemonic* status of carnist masculinity—despite *most men* in this study having personal moral reservations about the poor treatment of animals in the meat industry, carnist masculinity maintains an ascendant social position above feminised subordinated masculinities (veg*n, homosexual men), women, and animals.

Overall, the findings address the overarching research question regarding how masculinity and other psychological factors contribute to men’s meat consumption and resistance to meat reduction. It appears that widespread passive consent to the hegemonic gender order presents a major barrier to the widespread adoption of plant-based diets. Consent to the hegemony of carnist masculinity legitimates carnism, enabling men (and people of all genders) to enjoy and benefit from meat consumption. Most men may not personally embody or ideologically internalise hegemonic carnist masculinity. Nevertheless, they passively consent to its hegemony through mechanisms such as self-policed conformity to hegemonic masculine carnist ideology, respecting others “free choice” to eat meat at the expense of their own moral reservations and animals’ rights, and strategically ignoring animal suffering through avoidance and dissociation. Complicity was so pervasive that some veg*n men, who strongly reject carnist ideology and praxis, engaged in these mechanisms—concealing their veg*n diets and framing meat consumption as a personal dietary choice

despite regarding it is a moral issue. This underscores the power of the hegemonic gender order over individual values, beliefs and motivations.

Figure 1.

Final Conceptual Model of Hegemonic Carnist Masculinity



Note. This figure illustrates the hegemonic carnist gender order sustaining men's resistance to plant-based diets and the consumption of animals. Domination mechanisms (feminisation, ridicule, and social exclusion of veg*n men) reinforce the hegemonic position of carnist masculinity above veg*n masculinity, femininity, and animals. Consent mechanisms further reinforce the gender order by self-policing conformity to masculine carnist norms through concealment and avoidance of veg*n dietary practices and beliefs; anthropocentric "free choice" discourse prioritising carnist dietary choices over animal rights; and strategic ignorance of animal suffering. The hegemonic status of carnist

masculinity reproduces and rewards men's meat-eating gender performances with enhanced status, social belonging, pride, and/or sex appeal.

These findings extend theoretical understandings of the masculinity dilemma, elucidating the mechanisms driving men's resistance to meat reduction. Numerous studies have examined carnist and veg*n men's dietary practices with Connell's hegemonic masculinity theory, but have not firmly established that the meat-masculinity link is hegemonic by demonstrating the hierarchal power dynamics between hegemonic and subordinate genders. This dissertation found that the link between meat consumption and masculinity is indeed *hegemonic*—carnist masculinity achieves and sustains ascendant social status through the subordination of nonhegemonic masculinities (veg*n and homosexual men), femininity, and animals, as well as widespread consent. Previous theories of the meat-masculinity link have framed men's meat consumption as a gender performance strategy or conformity to masculinity ideology (e.g., De Backer et al., 2020; Dubisar, 2023; Greenebaum & Dexter, 2018; Nath, 2011). This dissertation was consistent with these theories, finding that men engaged in carnist masculinity performances, and conformed to carnist masculine norms, incentivised with social rewards for eating meat (such as enhanced sex appeal, status, and belonging) and to avoid repercussions such as diminished masculine image, social disconnection, and unpleasant affective states.

Importantly, this dissertation extended these theories, placing these individual-level behaviours in a broader social context. The model of hegemonic carnist masculinity explicates a broader hierarchical gender order that enforces, reinforces, and sustains meat-eating performances and conformity to meat consumption by upholding carnist masculinity as the ideal construction of masculinity. Specifically, a system comprised of mechanisms of domination and consent reinforce the hegemony of carnist masculinity (Figure 1). In turn, the hegemonic status of carnist masculinity reproduces meat-eating gender performances and

conformity to masculine meat-eating norms. Thus, by synthesising hegemonic masculinity theory, doing gender, and conformity to masculinity ideology theories, this dissertation extends theories of the meat-masculinity link, providing a broader perspective on how gender performances and conformity to masculinity ideology are produced by power dynamics and situated within the sociocultural environment.

The power of this system in contributing to men's resistance to meat reduction lies in its synergistic functioning rather than its individual components. The system is a collective force of (1) social incentives and rewards for meat-eating performances and conformity through positive masculinity-affirming emotions (such as pride), enhanced status, social belonging, connection, and sexual appeal; (2) discouragement of meat avoidance through sanctions such as (anticipated) masculinity-diminishing self-conscious emotions (such as embarrassment), compromised social status, and social policing (feminisation, ridicule, exclusion, alienation); (3) widespread consent to the construction of carnist masculinity as the cultural ideal; and (4) the legitimisation of carnist and anthropocentric ideologies through the hegemony of carnist masculinity. These processes and conditions are not only uncondusive to men's meat reduction but actively works against it. When combined with men's romanticisation of meat—heightened hedonist pleasure and affective attachment to eating meat (a.k.a. meat attachment; Graça et al., 2015a)—these elements coalesce into a web of social, emotional, psychological, ideological, and cultural barriers that together impede men's meat reduction. So long as carnist masculinity remains hegemonic, given the salience of gender in social interactions (West & Zimmerman, 1987), these conditions ensure that full abstention from meat in all social situations is unlikely, *even among men who are motivated to reduce or stop eating meat*. With sufficient personal motivation, individual men can overcome these barriers and change their meat-eating habits. This is particularly true for those who hold strong moral convictions about animal rights, as moral convictions tend to be

impervious to social and institutional influence (Skitka et al., 2021). However, this is unlikely to occur on a mass scale until sociocultural conditions become more conducive to men's dietary change. The practical implications of these findings will be discussed in section 10.4.

10.3. Understanding the masculinity dilemma: A unified hegemonic system of oppression

The second part of this discussion will consider some of the study's key findings through critical animal, ecofeminist, and hegemonic masculinity theoretical frameworks. The most salient distinguishing features between carnist and veg*n masculinity was in their attitudes to violence, gender equality, and human-animal relations. Latent profile analysis revealed the largest distinction between carnist (Resistant) and veg*n (Meat-averse) masculinities in conformity to violence (difference = 0.76 SDs), conformity to non-traditional masculinity ideology (difference = 0.82 SDs), and endorsement of carnist ideology, reflecting attitudes to human-animal relationships (direct MRCD strategies; difference = 2.43 SDs). The following section considers how these new insights into carnist and veg*n masculinities contribute to literature on human-animal relations and ecofeminism. Firstly, the results showed that hegemonic masculinity is linked to both human- and animal-directed violence, as men who (explicitly) endorsed violence against humans also (implicitly) endorsed violence against animals. Secondly, results suggested that women's and animals' oppression are linked, supporting the ecofeminist "linked oppression thesis". Literature on the "linked oppression thesis" will be introduced and discussed to explain these findings.

10.3.1. The link between human- and animal-directed violence

The quantitative findings suggested that carnist men tended to endorse violence towards both humans and animals. In Study 1, conformity to the violence norm positively predicted red and processed meat consumption and total meat consumption, over and above SDO. Additionally, in Study 2, the Resistant profile (carnist masculinity) scored significantly

higher on violence than Ambivalent and especially Meat-averse men (veg*n masculinity). In fact, while the Resistant profile scored highest on all traditional masculine norms included in the latent profile analysis, the biggest difference between Resistant and Meat-averse men was their conformity to the use of violence.

Due to the distance of most consumers from the meat production process, there is not an obvious connection between men's meat consumption and their attitudes to perpetrating violence towards others, unless meat consumption itself is recognised as a form of violence, albeit culturally legitimised and institutionalised. Violence is the intentional use of physical force or power resulting in injury, death, psychological harm, or deprivation (World Health Organisation, 2025b). Animals in the meat industry are routinely harmed and *must* be killed to be consumed, making the act of eating meat inherently violent. From this perspective, higher endorsement of violence and meat consumption amongst Resistant men (i.e., hegemonic carnist masculinity) suggests that the more men explicitly condoned the use of violence against humans, the more they (implicitly) condoned the use of violence against animals.

This pattern is consistent with the literature. A qualitative study on meat-eaters' and vegetarians' attitudes towards various forms of violence found that meat-eaters were more accepting than vegetarians of violence against animals (e.g., foxhunting, shooting animals, and angling) and other forms of violence against humans, such as the use of capital punishment and nuclear weapons (Hamilton, 2015). Similarly, in narrative interviews with vegan men, Aavik (2023) found that many held non-violent and pacifist beliefs, though there were no meat-eating participants for comparison. A quantitative analysis also found a link between human-directed violence and meat consumption (i.e., animal violence), such that men's meat consumption was higher than women's due to their higher endorsement of (human-directed) violence (Campos et al., 2020). Moreover, these results align with a broader

pattern showing that human-directed violence (e.g., violent crimes) is associated with animal-directed violence (e.g. pet abuse), particularly amongst men (Flynn, 2011; McPhedran, 2009; Vincent et al., 2019). This is the second quantitative study to empirically establish the link between violence and meat consumption. Although the violence norm measured in this study did not measure actual or past violent *behaviour*, men's attitudes towards violence predict violent behaviour (Nunes et al., 2022), which suggests that men who eat more meat may be more likely to engage in violent behaviour.

This link between meat consumption (animal-directed violence) and violent behaviour (towards humans) can be explained by the “brutalisation effect”, which posits that institutionalised violence (e.g., capital punishment) can legitimise and desensitise individuals to violence, leading to increased violent behaviour in society. Multiple studies have found that incidences of publicised institutionalised violence (i.e., capital punishment) are followed by increased rates of homicide (Bailey, 1998; Bowers & Pierce, 1980; Cochran et al., 1994; Cochran & Chamlin, 2000). The brutalisation effect appears to carry over from institutionalised animal violence to human-directed violence. Communities exposed to institutionalised violence against animals (i.e., high rates of slaughterhouse employment) experience elevated rates of violent sexual crimes and domestic violence, compared to communities without slaughterhouse facilities and those with non-violent male-dominated industries such as vehicle manufacturing or iron and steel forging (Fitzgerald et al., 2009; Jacques, 2015). Prolonged or extreme exposure to violence has a desensitising effect, reducing physiological responses when witnessing violence and reducing empathy for other's suffering (Mrug et al., 2015). Indeed, the current study showed that hegemonic carnist (i.e., Resistant) men, who were more likely to condone violence, felt little empathy for farm animal suffering, whereas veg*n (Meat-averse) men, who expressed anti-violent attitudes, were highly empathetic.

Therefore, it may be that the connection between animal- and human-directed violence reflects a brutalisation effect, whereby the meat industry—institutionalised animal-directed violence—plays a role in normalising, desensitising and legitimising violence towards more broadly to humans. A similar effect has been observed in other systems of institutionalised violence. For example, feminists have argued that the pornography industry, which frequently depicts violence against women, reinforces (sexual) violence towards women in society (McVey et al., 2021). Alternatively, it may be that exposure to human-directed violence desensitises individuals to animal-directed violence, which may appear trivial by comparison. Indeed, individuals who are exposed and desensitised to human-directed violence (e.g., domestic violence) are less likely to find violent behaviour toward animals (e.g., meat consumption) disturbing (McPhedran, 2009).

Thus, this dissertation's findings align with literature on the connection between human- and animal-directed violence, suggesting that the meat-masculinity link is connected to broader cultural attitudes, norms and practices regarding violence. Most research on the link between interpersonal and animal violence focuses either on the cooccurrence of animal abuse and intimate partner violence, or, on the association between childhood animal cruelty and adult violence (Vincent et al., 2019). This dissertation connects the human-animal violence link to social constructions of masculinity, such that the hegemonic construction of masculinity in Australian and British culture legitimises, normalises, and thereby sustains violence towards *both humans and animals*. Veg*n masculinities, which promote more empathetic, non-violent, and egalitarian values and practices, are subordinated to a hegemonic ideal of masculinity that discourages empathy for others and reinforces violence, domination, and inequality. The hegemony of carnist masculinity legitimates and perpetuates animal consumption, a form of institutionalised violence, which in turn may perpetuate violence more broadly, through a brutalisation effect. This supports ecofeminist arguments

that patriarchal systems culturally and institutionally legitimise, manifest and desensitise people to various forms of violence towards humans and animals (Adams, 2015; Birkeland, 1993; Gaard, 1993; Gruen, 1993; Hunnicutt, 2019; Kheel, 2007). The normalisation of violence against one group normalises, desensitises and reinforces violence against the other (Adams, 2015; Hunnicutt, 2019).

10.3.2. The linked oppression of women and animals

Another notable finding that emerged from the converged results suggested that women's and animals' oppression are linked, supporting ecofeminist arguments regarding the interconnected domination, violence, and oppression of humans and animals within patriarchal social structures (Adams, 2015; Birkeland, 1993; Gaard, 1993; Gruen, 1993; Hunnicutt, 2019; Kheel, 2007). When taking a critical animal theoretical perspective, where animal (i.e. "meat") consumption is seen as a form of oppression (Weitzenfeld & Joy, 2014), the quantitative and qualitative results revealed a connection between meat consumption (i.e., animal oppression) and gender inequality (i.e., women's oppression). The qualitative analysis found that hegemonic masculinity subordinated both femininity and animals in the gender order. In particular, women's subordination played a role in reinforcing animal oppression. Veg*n masculinity was subordinated to carnist masculinity by being associated with femininity—a strategy that relies on, and reinforces, the devaluation of femininity in a masculine-feminine hierarchal binary or "dualism" (Plumwood, 1993; Salmen & Dhont, 2023). Thus, maintaining women's subordinate status was crucial for subordinating veg*n men. In turn, the subordination of veg*n men contributed to animal oppression by suppressing and discrediting veg*n ideology. In other words, women's oppression may indirectly contribute to the oppression of animals via the subordination of veg*n masculinity.

The quantitative studies also showed a link between hegemonic carnist masculinity and women's and animals' oppression. One major distinction between carnist and veg*n

masculinity was their conformity to non-traditional (i.e. “new”) masculinity ideology, which aligns with feminist principles and promotes men adopting more traditionally “feminine” gender roles (e.g., childrearing) that have historically oppressed women (Kaplan et al., 2017). The Resistant profile (i.e., carnist masculinity) showed greater support for the domination of animals (e.g., high meat consumption, endorsement of direct MCRDs) and women, given that they were least likely to endorse non-traditional masculinity. Furthermore, sensitivity to male privilege (over and above SDO) was the most important dimension of masculinity ideology predicting willingness to reduce, indicating that men who support unequal *gender* relations specifically (not just unequal intergroup relations generally) have greater resistance to giving up meat. Thus, men who contributed most to animal oppression (eating more meat and showing the greatest resistance to giving up meat) were also most likely to display attitudes that maintain traditional oppressive binary gender roles and privileges over women. This is consistent with previous research finding that US students with more sexist attitudes, and who endorsed more traditional gender roles that subordinate women, were more likely to endorse carnist ideology (direct MEJs) and animal exploitation (Allcorn & Ogletree, 2018). Collectively, these results suggest that hegemonic masculinity in Western cultures such as Australia, the UK, and the US aligns with, endorses, and reinforces patriarchal ideology alongside carnist ideology and praxis (meat consumption).

This intersection of carnism with patriarchy supports the ecofeminist “linked oppression thesis”, which contends that patriarchal social structures oppress women and animals, such that the oppression of women produces and reinforces the oppression of animals, and vice versa (Adams, 2015; Wyckoff, 2014). In patriarchal cultures, women and animals are routinely turned into “pieces of meat” for (heterosexual) men’s consumption, such that both are objectified, and their bodies are fragmented (i.e., butchered), so that they can be consumed (Adams, 2015; Fredrickson & Roberts, 1997; Hunnicut, 2019). A “piece of

meat”, both literally and metaphorically, is an *object* devoid of sentience. Animals in the meat industry are viewed as commodities rather than sentient beings, and thus, *literally* objectified and butchered into pieces of meat. Likewise, women are turned into *metaphorical* “pieces of meat” when their bodies are sexually objectified and “butchered” into parts. As Fredrickson and Roberts (1997) stated,

The common thread running through all forms of sexual objectification is the experience of being treated as a body (or collection of body parts) valued predominantly for its use to (or consumption by) others... Indeed it is not uncommon for magazine photographs to portray dismembered women, eliminating their heads altogether, focusing exclusively on their bodies or body parts. (pp. 174, 176).

Just as the sexual objectification and consumption of women occurs for the gratification of heterosexual men (Gervais & Eagan, 2017), the current study suggests that the objectification and consumption of animals also occurs for the gratification of heterosexual men. Heterosexuality was a key feature of hegemonic carnist masculinity. The qualitative study found that heterosexual carnist men used homophobic slurs to denigrate and subordinate veg*n men by associating them with another subordinated form of masculinity (i.e. homosexuality). Although heterosexual self-presentation was not a significant predictor of meat consumption or willingness to reduce in Study 1, sexual orientation was the strongest predictor of red and processed meat consumption, with heterosexual men eating significantly more than non-heterosexual men. Additionally, in Study 2, the Resistant profile contained a significantly higher proportion of heterosexual men (97%), and this profile scored significantly higher than the other two profiles on conformity to heterosexual self-presentation. Collectively, this highlights the parallel oppression and consumption of

women's and animals' bodies as well as the ideological entanglement of heteronormativity, anthropocentrism and patriarchy.

The current results also support the ecofeminist claim that the subordinate statuses of women and animals are mutually reinforcing. On the one hand, ecofeminists argue that women are sexually objectified and denigrated by being "animalised" (Adams, 2015; Berman, 1994; Hunnicut, 2019). Experiments have shown that sexually objectified women (but not men) were implicitly associated with animal rather than human qualities (Vaes et al., 2011) and that men were more willing to sexually victimise a woman who had been sexually objectified and implicitly "animalised" (Rudman & Mescher, 2012). Associating women with animals, through sexual objectification, has a subordinating effect, leading to women being perceived as less deserving of moral treatment, and thereby justifying sexual violence towards them (Gervais & Eagan, 2017). As Wolfe (2009) explained, "Violence against human others... has often operated by means of a double movement that animalises them for the purpose of domination, oppression, or even genocide—a maneuver that is effective because we take for granted the prior assumption that violence against the animal is ethically permissible" (p. 567). Thus, animals' oppressed status reinforces the oppression of women.

On the other hand, ecofeminists argue that the oppression of women reinforces the oppression of animals (Adams, 2015; Hunnicutt, 2019), though empirical support for this claim is more limited. Rogers (2008) highlighted how sexually objectified women are often exploited to advertise meat products, appealing to heterosexual men's desires. Adams (2015) argued that veg*nism is delegitimised by its association with women's subordinate status. This dissertation provides empirical support for Adams' argument. Veg*n men were subordinated to "masculine" carnist men through their association with the low status of femininity, reinforcing a masculine-feminine hierarchy that devalues femininity (Plumwood, 1993). This, in turn, bolsters the hegemonic status of carnist masculinity its underlying

ideology, delegitimises veg*n ideology, and ultimately sustains animal oppression. Thus, this dissertation strengthens the linked oppression thesis, particularly the argument that women's oppression reinforces animal oppression.

It should be noted, however, that one finding from the current study was inconsistent with the linked oppression thesis. If women's subordination were indeed linked to animal oppression, it would be expected that conformity to the traditional masculine norm "power over women" would have positively predicted men's meat consumption and/or negatively predicted their willingness to reduce their meat intake. In Study 1, however, "power over women" was not a significant predictor of either variable. This may be explained by the wording of the "power over women" items, which captured the participant's belief that women should be obedient and subservient to him. This expresses an overtly sexist attitude which is less acceptable today (Lewis, 2018). Indeed, scoring of this scale in the current sample was strongly positively skewed, indicating that most participants rejected this norm. The sensitivity to male privilege norm, which was a significant predictor of willingness to reduce, is potentially a more appropriate variable because it measures men's support for patriarchal social dynamics in a more subtle way. The non-significance of the power over women norm may also be explained by overlap with the SDO control variable. Both SDO and power over women capture endorsement of dominating relations between groups, the former a generalised endorsement of domination towards all outgroups and the latter specific to male-female relations. Moreover, power over women is similar to SDO in that they both endorse the maintenance of existing status quo power structures, whereas sensitivity to male privilege, while also tied to gender relations, reflects a more progressive attitude supporting the dissolution of traditional binary gender roles. It's possible that SDO (generalised dominance) explains more variance in meat consumption and willingness to reduce than power over women (dominance over one specific group) and that sensitivity to male privilege

better explains men's willingness to reduce because it reflects a more progressive mindset that is open to change.

10.4. Theoretical, practical and methodological implications

10.4.1. Theoretical implications for the meat-masculinity link

This dissertation developed a theoretical model of hegemonic carnist masculinity, which explained how and why men are resistant to meat reduction. This model also elucidated the ways in which meat consumption is sustained and legitimated more broadly through the legitimization of carnist ideology, contributing to widespread resistance to meat reduction regardless of gender.

This was the first study to synthesise three gender theories (i.e., doing gender, conformity to masculinity ideology, and hegemonic masculinity theory), drawing on ecofeminist and critical animal studies theoretical perspectives, to develop a holistic theoretical framework for understanding how masculinity contributes to (men's) meat consumption. Thus, this thesis has extended existing theories of the meat-masculinity link by elucidating a hegemonic gender system that legitimates and sustains carnist masculinity as the cultural ideal, achieved via the subordination of veg*n masculinity, which reinforces meat-eating gender performances and conformity to masculinity ideology.

Previous scholars have identified that men eat meat as a gender performance or impression management strategy, which enables men to boost and reinforce their masculine identity and present a masculine image to others. Men are also pressured to eat meat in conformity to masculine norms. However, these previous theories of the meat-masculinity link focus only on meat-eating men as individuals, and neglect to acknowledge that men's meat-eating gender performances and conformity occur within a broader system of gendered power dynamics between veg*n men, homosexual men, women, and animals. The model of hegemonic carnist masculinity contends that gender performances and pressure to conform

are components contributing to, and reinforced by, a broader ideologically-driven hegemonic gender order. Three pertinent masculinities operate within this gender order. Men who embody heterosexual carnist masculinity are motivated to eat meat to defend their dominant position over nonhegemonic masculinities, women and animals. Complicit masculinities eat meat driven largely through ambivalent consent to the hegemonic order because they benefit from their privileged position over nonhegemonic veg*n men, women and animals. Veg*n masculinities avoid eating meat, seeking more equal relations with women and animals, yet unwittingly consent to the hegemonic order. Collectively, power relations within the hegemonic carnist gender order creates a sociocultural environment impeding men's meat reduction and legitimating carnist ideology. Thus, in addition to interventions targeting individual men's behaviour, it will be important to implement policies and interventions promoting plant-based diets, non-violence (to humans and animals), and gender egalitarianism at the institutional level to shape the sociocultural environment.

Moreover, several studies have investigated hegemonic masculinity from veg*n men's perspectives, finding that veg*n men perform and conform to hegemonic masculine traits such as independence, courage, toughness, and heroism (Greenebaum & Dexter, 2018), rationality and emotional control (Mycek, 2018), or physical strength and virility (Oliver, 2023). However, these studies did not explore *relations* between masculinities and femininity or explicate hegemonic processes of domination and consent. This dissertation went beyond descriptions of how carnist or veg*n men align themselves with hegemonic masculine traits by identifying the domination mechanisms by which carnist men subordinate others in the gender order and the consent mechanisms that reproduce it. Several studies have explored relations between carnist and veg*n masculinities using hegemonic masculinity theory (Aavik, 2023; Bogueva et al., 2020; Nath, 2011), though they did not explicitly identify hegemonic mechanisms of domination and consent. This dissertation went further,

establishing that the connection between men's meat consumption and masculinity is *hegemonic* in nature, such that power relations and consent between masculinities and femininity uphold carnist masculinity as the cultural ideal and legitimate social inequalities that oppress women and animals. Secondly, this dissertation offered a more comprehensive explanation of exactly *how* hegemonic masculinity influences men's meat consumption, through social domination and consent.

This dissertation also contributed to understandings of the masculinity dilemma by demonstrating how the meat-masculinity link represents the intersection of hegemonic masculinity (patriarchal ideology and praxis) with carnist ideology and praxis (human-animal relations). Carnist ideology was strongly endorsed by men belonging to the Resistant profile, which represented hegemonic carnist masculinity. The qualitative study showed that carnist ideology was sustained in a position of social dominance, legitimated, and reproduced through the subordination of veg*n masculinity. Connell (1995) proposed that nonhegemonic masculinities are strategically subordinated to maintain hegemonic men's ascendant social position over women—an expression of patriarchal ideology. Similarly, the current study proposes, through an ecofeminist lens, that hegemonic men subordinated nonhegemonic masculinities to maintain their dominant position over women *and animals*—a manifestation of both patriarchal and carnist ideologies. This suggests that, broadly speaking, men are resistant to plant-based diets, not purely for hedonic or nutritional reasons, but because veg*nism, which promotes greater gender- and animal-egalitarianism, poses an ideological threat which delegitimises men's dominant place over women and animals.

This highlights that carnism is a key feature of hegemonic masculinity that is often overlooked. Connell (1987) argued that heterosexuality is the most important feature of hegemonic masculinity. This is an important feature of hegemonic masculinity to distinguish because of the lived, material consequences for trillions of animals killed annually for human

consumption. If the oppression and exploitation of these animals, their pain and suffering, and their premature deaths are taken seriously, then this constitutes arguably one of the greatest moral atrocities committed by human beings, based on the immense scale of suffering inflicted (Müller, 2024; Singer, 2023).

As carnism is a central feature of hegemonic masculinity, this exposes the anthropocentric bias in existing theories of the meat-masculinity link. Mainstream theories, such as gender performance and conformity to masculine norms, primarily focus on men as individuals. While they acknowledge men's relationships with other humans, emphasising the need for an audience to validate gender performances or the influence of societal expectations, both theories ignore the animal, whose presence (or more accurately, absence) is fundamental to the act of eating meat. Thus, by focusing on men as individuals, previous meat-masculinity theories have failed to consider men's meat consumption as a manifestation of their *relationships* with both human and nonhuman others and the ideologies underlying these interactions. This dissertation offers a broader, non-anthropocentric theory of the meat-masculinity link.

The theory of hegemonic carnist masculinity is compatible with evolutionary perspectives of the meat-masculinity link, which propose that hunting for meat historically established patriarchal social structures by elevating the social power of male hunters, as meat was a highly valued resource (Chan & Zlatevska, 2019b; Hawkes, 1991; Kaplan & Hill, 1985). Anthropological research supports the connection between meat consumption and patriarchal social structures, showing that societies based on plant-based economies tend to be more gender egalitarian than those reliant on meat (Sanday, 1981a, 1981b). Although modern Western industrialised societies no longer rely on hunters to provide meat, the same gender and human-animal hierarchy persists. This dissertation offers a model of hegemonic

carnist masculinity as an explanation for how this hierarchical system has been culturally legitimated and sustained.

10.4.3. Implications for the promotion of plant-based diets in men

The findings of this dissertation have important implications for meat-reduction strategies and the promotion of plant-based diets. Importantly, this thesis initially proposed that, as the biggest meat consumers, men should be targeted in meat-reduction campaigns because they have the potential to make the most dramatic reductions in meat consumption. However, veg*n men and women also consented to the hegemonic gender order—some veg*n men consented to the hegemony of carnist masculinity through anthropocentric free-choice discourse, whilst some women consented through their sexual preferences for carnist men and by participating in the feminisation of veg*n men—perpetuating meat consumption. Thus, considering that everyone, regardless of gender and ideological stance, contributed to the hegemony of carnist masculinity, targeting only male meat consumers—while still important—appears to be an oversimplified approach. Strategies to reduce meat consumption must target people of all demographics, though different approaches will be necessary for different groups.

Male-targeted interventions will need to consider the unique positions and characteristics of the three distinct masculinities. Men are more defensive towards meat reduction than women (Hinrichs et al., 2022) and can display a “boomerang” effect in response to certain interventions, *increasing* their meat attachment when they sense their meat consumption is threatened through animal welfare appeals (Dowsett et al., 2018). As embodiments of hegemonic carnist masculinity, Resistant men are primarily motivated by advancing a carnist ideological agenda and are most likely to exhibit this defensiveness in response to meat-reduction interventions, especially those based on animal welfare. As they were most motivated by health and conformed most to traditional masculine norms, health

appeals may be the most effective strategy, particularly when plant-based diets are framed as providing personal masculine-related health “gains” (e.g., health, strength, energy, muscle, virility), rather than focusing on meat reduction or abstention which frames dietary change as a “loss” (Couture & Loughnan, 2024). Avoiding the topic of animal rights may mitigate defensiveness arising in response to veg*n ideological threat, but this strategy resembles the consent mechanism of “strategic ignorance”, and therefore, reinforces the hegemonic order and fails to challenge the underlying carnist ideology driving meat consumption.

Alternatively, lab-grown meat may be the most appealing option for Resistant consumers. Several Resistant participants expressed interest in lab meat because it would closely replicate the unique taste and texture of meat (to which most carnist participants in this study were emotionally attached) and was seen as “manlier” than plant-based meat alternatives. Moreover, the production of synthetic meat in a laboratory setting aligns with this group’s ideology, as it reflects a hegemonic expression of dominance over nature. While lab-grown meat still reinforces hegemonic anthropocentric ideologies promoting the dominance and exploitation of animals, it remains a pragmatic strategy with the potential to reduce animal suffering and environmental destruction caused by current meat production practices.

While animal welfare appeals may be ineffective for Resistant men, they could be effective for Ambivalent men, who expressed moral concern about animal suffering, did not endorse carnist ideology, and felt ambivalent, which is considered a precursory state to behaviour change (Finkhäuser et al., 2025; Pauer et al., 2022). However, strategic ignorance was a major barrier amongst these men, meaning they would be likely to ignore any “threatening” information. Strategic ignorance could be addressed with strategies that disrupt meat-animal dissociation and the avoidance of information that highlights animal suffering. For example, graphic labels placed on meat products to remind consumers of animal suffering are effective in reducing intentions to eat meat (Kranzbühler & Schifferstein, 2023).

As meat companies would not willingly advertise cruel production practices on their meat products, this strategy would require government intervention, in the same manner, for example, that the Australian government has regulated cigarette marketing and packaging to reduce smoking (Smith et al., 2015).

Although the Meat-averse men abstained from or consumed very little meat, they contributed to meat consumption indirectly through consent. Given their strong concern for animal welfare, this group are most likely unaware of their complicity to animal harm. Raising awareness of how framing animal consumption as a “free choice” upholds carnism may prevent some Meat-averse individuals from reproducing this discourse and giving meat-eaters social permission to eat meat despite its harmful impacts. Ideally, meat consumption should be framed as a public health, environmental and ethical issue. This would shift public understandings of dietary behaviour into a collective responsibility rather than an individual “personal choice”.

Most men who participated in this study, including Ambivalent and Meat-averse, consented to the hegemonic system despite personally expressing moral reservations about meat consumption. Meat-averse men self-policed by hiding, downplaying, and at times even eating meat in certain social situations, despite their personal beliefs and motivations to abstain. This was because many participants, regardless of diet, conformed to hegemonic carnist masculinity for fear of feeling embarrassed and awkward standing out as “the special case”, to avoid ridicule and negative social attention, which increased feelings of self-consciousness, and to avoid social exclusion and feelings of alienation. Treating the individual as an independent and rational agent fails to recognise the overriding impact of emotional experiences within social interactions, and the broader sociocultural environment, on behaviour and gender performances. Previous studies have identified lack of cooking skills, recipes and nutritional knowledge as major barriers to meat reduction (Kemper, 2020;

Stoll-Kleemann & Schmidt, 2017). However, given the salience of gender in social interactions (West & Zimmerman, 1987), so long as carnist masculinity remains the hegemonic masculine ideal, the reification of hegemonic carnist masculinity will be manifested through affective discomfort in social contexts for men who abstain from eating meat. This means that increasing an individual's motivation to reduce their meat intake will be relatively ineffective within a sociocultural environment that deters men's consumption of plant-based food.

Thus, in addition to individually targeted interventions, the promotion of plant-based diets will be supported by action at the institutional level, to change sociocultural norms and public discourses. For example, as the hegemonic system is sustained by widespread consent through anthropocentric free choice rhetoric, it is imperative to challenge the widespread anthropocentric illusion of human separation from, and superiority over, animals and nature. Moreover, meat consumption should be framed by governments, institutions and the media as a public issue (with ethical, health, and environmental impacts) rather than being shielded from government regulation within the private sphere as a "personal choice" (Adams, 1993; Jenkins & Twine, 2014). Mass strategic ignorance should also be challenged at the institutional level. For example, "Ag Gag" laws prohibit taking or possessing video, images, or audio recordings without farm owner's consent, ultimately deterring and silencing undercover investigators and whistle blowers aiming to expose animal cruelty in animal agricultural systems (Robbins et al., 2016). These laws, strategically implemented by corporations that profit from animal oppression, sustain mass consent to the hegemonic order by ensuring that the public remain ignorant of animal suffering.

Cultural shifts in social constructions of masculinity will also be needed to facilitate individual-level change. Veg*n masculinity was associated with non-violence, empathy, and gender egalitarianism, whilst carnist masculinity was associated with violence, lack of

empathy, and gender inequality. Aavik (2023) found that most male vegan participants held pacifist, non-violent, (gender) egalitarian attitudes *before* they transitioned to veganism, suggesting that they were open to adopting a plant-based diet, particularly for animal welfare and environmental reasons, because these issues resonated with pre-existing values. This is known as “moral piggybacking”, key to the process of moralisation (Feinberg et al., 2019). Hence, fostering masculinities that embrace non-violence and (gender) egalitarianism, as general principles, may make men more open to meat reduction at a later stage, particularly on animal rights grounds. Ecological (Hultman & Pulé, 2018) or care masculinities (Elliot, 2016) reject domination and violence and instead emphasise care, relationality, interdependence, equality, and emotional sensitivity.

Positive human-animal connections may be one way to foster caring masculinities and increase openness to meat reduction in men. It is believed that the cultivation of empathy and care in human-animal relations can then extend to human interactions and relationships (Cloutier & Peetz, 2016; Prato-Previde et al., 2022). Many veg*ns experience “a deeply felt connection to a nonhuman animal” prior to their transition to veg*nism (Aavik, 2023, p. 62; Rothgerber & Mican, 2014). A close emotional connection with a nonhuman animal enables people to comprehend their sentience and cultivate empathy towards them, leading to greater openness to meat-avoidance (Rothgerber & Mican, 2014). Promoting positive human-animal relationships may be especially impactful for men in the development of non-violent masculinities, as witnessing animal abuse in childhood leads to higher incidences of perpetrating violent behaviour towards humans and animals, compared to females, later in life (Flynn, 2011; Schaefer, 2007). This underscores the importance of promoting caring, non-violent human-animal interactions for fostering masculinities that encourage men to relate to others with empathy, equality, and respect. This can challenge dominance-based relations foundational to the hegemonic carnist gender order.

Furthermore, given the significance of the linked oppression of women and animals identified in this dissertation, broader education of feminist issues may indirectly promote the adoption of plant-based diets. Aavik (2023) found that many vegan men who had previously been educated about feminism recognised the parallel oppression of women and animals in patriarchal societies, which contributed to their transition to veganism. This reflects what Gramsci (1971) referred to as the cultivation of “critical consciousness” as a means of challenging hegemonic systems. Becoming aware of hegemonic social structures, and one’s role within them, is imperative to overcoming hegemonic ideological indoctrination. Moreover, by highlighting the interconnection between animal rights, feminist, and LGBTQI social justice issues, this dissertation underscores the need for “intersectional activism”, which fosters collaboration between diverse social justice organisations (Aavik, 2018).

Although not examined in this chapter, Study 1 found that men’s sexuality was also a salient component of the meat-masculinity link. In a culture where meat-eating men represent the hegemonic form of masculinity, some men may feel compelled to eat meat to enhance their sexual appeal. For example, a vegan participant in the current study experienced multiple rejections when dating heterosexual women because of their romantic preferences for more “masculine” meat-eating men. However, inconsistent with this hypothesis, a recent hypothetical scenario experiment in the U.S. found that heterosexual meat-eating men preferred masculine meat-based dishes when dining with male companions, but not when dining with an attractive female date (Gasiorowska et al., 2023). It’s possible that heterosexual meat-eating women’s preference for meat-eating men may simply reflect people’s general preference for a sexual partner similar to themselves, as studies show that veg*ns prefer veg*n sexual partners (Nezlek et al., 2021; Potts & Parry, 2010). Notably, at times, heterosexual meat-eating men will *refrain* from eating meat, and eat plant-based food, to please their romantic partners (Bogueva et al., 2022). An implication of this is that men

may be more willing to adopt a plant-based diet if they believe that a potential sexual partner would find it attractive. One experiment found that men were more open to meat reduction when plant-based diets were promoted by (young and attractive) women compared to men (Rosenfeld, 2024). Therefore, to make plant-based diets more appealing to the biggest meat consumers—heterosexual men—strategies could aim to make veg*n masculinity more sexually attractive to heterosexual women.

Alternatively, meat consumption may be linked to men's sex drives and desires. The current results showed that men who placed greater importance on sex (potentially reflecting a greater “appetite” for sex) also ate more meat (i.e., reflecting a greater appetite for meat). The link between meat and men's sex drive dates back to the Victorian era. The influential U.S. minister and health reformer Sylvester Graham advocated for vegetarian diets to temper sexual desire, especially amongst men (Pivar, 1984). Western cultural representations of masculinity implicitly communicate this message that men's desire for meat and sex are linked. Buerkle (2009) noted how U.S. burger advertisements commonly depicted heterosexual men's meat consumption as driven by the same “natural”, “primal” and “insatiable” male appetite that drives their sexual pursuits of women. “[W]ithin the retrograde masculinity depicted, women and meat are one in the same. They are both prizes: they both represent dominant masculinity's goals, and they both emphasise men's consumptive impulses (both sexual and dietetic) as essential to their maleness” (Buerkle, 2009, p. 86). This links back to ecofeminist arguments that in patriarchal societies women and animals are consumed for heterosexual men's pleasure. The implication of these cultural messages is that (heterosexual) men are framed as powerless over their “primal” and “natural instinct” to eat meat, which reinforces the “natural” and “necessary” components of carnist ideology. Thus, interventions will need to challenge the notion that meat consumption is a “natural” and “primal” instinct.

10.4.4. Methodological implications

Finally, this thesis has important methodological implications. The Meat Consumption Scale developed as an adjunct study has the potential to improve the methodological quality of meat consumer research across multiple disciplines. Previously, meat consumer studies have used unvalidated ad-hoc survey instruments to measure participants' self-reported meat consumption. The Meat Consumption Scale offers a psychometrically validated, fast, and affordable assessment tool for researchers, ideal for cross-sectional and experimental studies. As a multi-item scale, the Meat Consumption Scale has stronger predictive validity than single-item scales and can be used in structural equation modeling. Thus, the Meat Consumption Scale will enable researchers to more accurately measure, predict, compare, and understand meat consumer behaviour.

Additionally, results have methodological implications for researchers investigating meat consumers and the meat-masculinity link. Firstly, Study 1 identified that only certain dimensions of masculinity ideology predicted men's meat consumption and willingness to reduce, suggesting that previous studies have oversimplified the relationship between meat consumption and masculinity by measuring global conformity to masculinity ideology rather than its subdimensions. Thus, researchers investigating the meat-masculinity link should avoid measuring conformity to masculinity ideology as a global construct. This supports Wong et al.'s (2017) assertion that researchers should "disaggregate the generic construct of conformity to masculine norms and... focus instead on specific dimensions of masculine norms and their differential associations with other outcomes" (p. 80). This methodological approach offers several advantages: it enables a theoretically grounded understanding of the meat-masculinity link consistent with contemporary conceptualisations of masculinity as multidimensional (Levant & Wong, 2017); a more nuanced understanding of which aspects of masculinity ideology may be inhibiting men's meat reduction; and specific information to

guide targeted meat reduction interventions and directions for future research on the meat-masculinity link. Additionally, Study 2 identified three latent psychological profiles of male meat consumers, confirming that men are not a homogenous population of meat consumers. Therefore, it is important that researchers aiming to reduce men's meat consumption continue focusing on within-gender heterogeneity, as treating male consumers as a homogenous group can miss the complexities of the meat-masculinity link.

Finally, this dissertation emphasised the importance of gender relations and masculinity in men's meat consumption. Therefore, in support of previous scholars' recommendations (Bogueva & Marinova, 2018; Graça et al., 2019; Rosenfeld, 2023), researchers investigating meat consumer behaviour must consider or control for gender. The heteronormative aspect of the meat-masculinity link highlights the need for researchers to include sexual orientation in future analyses of meat consumer behaviour. Heteronormativity related to men's meat consumption is sometimes acknowledged in qualitative research (e.g., Bogueva et al., 2020; Buerkle, 2009; Nath, 2011), but is largely neglected in quantitative analyses. As heterosexual men in this study were the most attached to meat and resistant to meat reduction, future studies into men's meat consumption should consider the role of sexual orientation.

10.5. Limitations and future research

Given that only 3.6% of meat consumption studies published between 1989 and 2018 employed a mixed methods design (Graça et al., 2019), a strength of this thesis lies in its use of such a design. This approach leverages the strengths of both qualitative and quantitative methods, allowing for data collection that provides both breadth and depth, and enabling a more comprehensive exploration of men's meat consumption. The quality of mixed methods research is dependent on the methodological rigour of both the quantitative and qualitative phases (Creswell, 2018).

In the quantitative phase, key dimensions of masculinity related to men's meat consumption were identified. However, one limitation pertains to the lack of depth of self-report masculinity questionnaires. This study found that men who conformed to violence norms ate more meat. However, the violence scale did not discern between different types of violence, to whom violence is directed towards, and in what contexts. Moreover, it was suggested that men's acceptance of physical violence towards humans was positively associated with acceptance of violence towards animals. However, this interpretation relied on a measure that did not capture *explicit* attitudes about animal-directed violence, but instead relied on participants' implicit knowledge and attitudes—although many people do not consciously think about animal slaughter when eating meat, it is common knowledge that animals must be slaughtered for their meat. From a carnist perspective animal slaughter is not viewed as “violent”, particularly with common discourses such as “humane slaughter” (Browning & Veit, 2020). Additionally, in Study 1, sensitivity to male privilege was a significant predictor of willingness to reduce meat consumption, which suggested that men with more gender egalitarian views are more open to meat reduction. However, it is unclear whether this reflects gender egalitarianism *in practice*. Some men verbally endorse gender egalitarianism to distance themselves from hegemonic masculinity but continue to reinforce gender inequality in their relationships (Lamont, 2015). Therefore, future research could use more specific and explicit measures to capture the nuances of how violent and gendered attitudes and behaviours relate to animal consumption.

This thesis identified a link between human- and animal-directed violence, suggesting that institutionalised animal violence may reinforce broader acceptance and/or perpetration of violence in society towards humans. However, as a correlational study this explanation is somewhat speculative. Experimental research would be needed to test this hypothesis. Nevertheless, there is a paucity of quantitative and mixed methods research on the links

between violence, gender (in)equality, and meat consumption, highlighting the contribution of this thesis to the literature on meat consumption, masculinity, and human-animal relations.

In the qualitative phase, one limitation was a lack of consistency in the interviewing approach taken. In discussions of the meat-masculinity link in the first four interviews, the researcher focused specifically on the dimensions of masculinity ideology that were predictors of men's meat consumption in Study 1. This interviewing approach was found to be somewhat restrictive, limiting the breadth and depth of shared information. It was decided to proceed with the remaining interviews using a more traditional inductive qualitative interviewing approach, where participants were enabled to bring up aspects of masculinity they believed were relevant, including and beyond specific dimensions of masculinity. This also ensured that the quantitative and qualitative phases of the research were independent, in accordance with a convergent mixed methods design approach. Moreover, as the researcher's first qualitative study, the richness and depth of qualitative data improved as the interviews progressed and the researcher improved her skills in eliciting greater openness, depth and detail from the participants. This meant that the participants in earlier interviews (two Meat-averse and two Resistant) did not have the opportunity to discuss their views on the connection between meat and masculinity in as much depth as participants who were interviewed at later stages.

Sample limitations from both the quantitative and qualitative phases should also be acknowledged. The findings of this dissertation were based on responses collected from a non-representative Australian and English sample with predominantly white, well-educated, middle-class, left-wing, heterosexual men. As a non-representative (convenience) sample, the findings may not represent the broader Australian and English population or apply to other cultural contexts. However, the findings offer insights into the workings of (hegemonic) masculinity amongst carnist and veg*n men in a position of privilege. Future research could

extend understandings of the meat-masculinity link by exploring relations between carnist and veg*n masculinities across intersectional identities (e.g., race, class, sexual orientation, gender diversity). For example, this study did not ascertain whether the participants were cisgender or transgender men and did not include transgender masculinities when applying Connell's hegemonic masculinity theory. As a marginalised masculinity, carnist and veg*n transgender men may face additional complexities in navigating and positioning themselves within the hegemonic order. On the one hand, transgender men may be more critical than cisgender men of restrictive hegemonic gender role prescriptions (Parent & Bradstreet, 2017), but on the other, may feel more pressure than cisgender men to conform to hegemonic masculine norms (Cooper et al. 2023). Given that there is no research on the relationship between masculinity and meat consumption in transgender men (to the authors knowledge), this offers an important avenue for future research.

Another limitation was that this dissertation's theory of hegemonic carnist masculinity did not explore or explain how non-binary and genderqueer genders relate to the meat-masculinity link or fit within the hegemonic gender order. This may be difficult to determine given the diversity of gender identities within the non-binary umbrella. Nevertheless, this reflects a broader limitation in the meat-masculinity literature. Some non-binary people incorporate, or move between, both masculine and feminine identities, at times identifying predominantly more with one gender identity, though sometimes as neither (Richards et al., 2016). Examining whether dietary preferences change alongside shifts in subjective gender identity amongst non-binary people may provide deeper insights into the relationship between meat consumption and masculinity.

Overall, the findings and conclusions must be understood within the context of the researcher's positionality. As a female vegan the researcher was placed as an "outsider" in the study's exploration of men, masculinities, and meat consumption. Her vegan identity was

withheld from participants so as not to influence their ability to be forthcoming in their opinions. But this ideological stance nevertheless influenced the interpretation of results, as meat consumption is viewed from a vegan standpoint as a form of animal oppression. While this introduces a biased interpretation of the study's findings, it is important to recognise that all individuals, consciously or otherwise, hold some ideological stance on animal consumption, rendering true neutrality unattainable. While the positivist paradigm seeks and claims research(er) objectivity, all research is embedded in and influenced by its social, cultural, political and historical context and its dominant ideologies (Keller, 1982). These contextual factors determine what is considered worthy of study, how it should be studied, and whom is undertaking the study. For example, feminists argue that scientific inquiry is built on hegemonic masculine ideals and assumptions regarding human rationality, autonomy, and emotional detachment (Bordo, 1987; Keller, 1982). Hence, the pursuit of "objective" or "neutral" researcher is an illusion. Instead, the researcher's subjectivity can be considered a strength, rather than limitation, of scientific inquiry (Olmos-Vega et al., 2023), providing critical insights into taken-for-granted beliefs, norms and practices surrounding animal consumption. Nonetheless, to maintain methodological rigour, reflexive practices were employed throughout the research process, such as maintaining a reflexive journal and critically questioning assumptions and interpretations to consider alternative perspectives in the analysis.

The social processes sustaining the hegemony of carnist masculinity identified in this dissertation are by no means exhaustive. Future research could build on the model of hegemonic carnist masculinity by uncovering additional mechanisms of domination and consent. Given that gender relations played a central role in the current study's analysis and findings, one limitation was that *women's* experiences and perspectives did not inform the study's results or conclusions. The qualitative analysis identified that women contributed to

(men's) meat consumption by consenting to the hegemonic gender order. However, women may engage in different mechanisms of consent. As hegemonic masculinity is sustained by gender relations, a more comprehensive understanding of the masculinity dilemma could be formed by exploring how women's interactions, perspectives, and experiences with carnist/veg*n men contribute to hegemonic carnist masculinity.

Finally, it should be noted that Study 1 found that masculine norms explained only a relatively modest proportion of variance in men's meat consumption and willingness to reduce. This suggests that masculinity may be an essential though ancillary factor related to the masculinity dilemma. Accordingly, the practical implications discussed in this chapter—particularly those related to the domains of sex and violence—may have a very minimal impact on men's dietary behaviour. Nevertheless, masculine norms are only one way in which masculinity relates to men's meat consumption. As was illustrated in Study 3, broader patriarchal social structures, gendered social dynamics, and cultural gender ideologies relate to the masculinity dilemma, which are not easily quantified in statistical models. These underlying structures and dynamics likely exert a stronger influence on men's eating behaviour than can be directly observed through survey-based measures. Hence, while masculinities and gender dynamics only partially account for men's resistance to meat reduction, this dissertation underscores their importance and provides an in-depth explanation of psychosocial and structural processes through which the masculinity dilemma is sustained. As highlighted earlier in this chapter, institutional and cultural reforms will be necessary to drive widespread cultural change and dietary shifts.

10.6. Conclusion

This dissertation sought to understand the masculinity dilemma—*why are most men resistant to meat reduction?* This theoretical framework of hegemonic carnist masculinity developed in this thesis illuminated the psychosocial processes contributing to this dilemma,

and meat consumption more broadly, as well as contributing to the literature on human-animal relations and the ecofeminist linked oppression thesis. The results suggested that, in a unified hierarchical gender system, hegemonic processes of domination and consent reinforce a hegemonic construction of heterosexual carnist masculinity in Western cultures like Australian and the UK, which condones, normalises, and sustains violence against human and animal groups, subordinates nonhegemonic masculinities (veg*n and homosexual men), and contributes to the oppression of women and animals.

This thesis synthesised three gender theories, and drew on ecofeminist and critical animal theoretical perspectives, to develop a non-anthropocentric theory of “hegemonic carnist masculinity” to understand the meat-masculinity link. Men’s meat consumption was previously understood as a gender performance or “masculinity management” strategy to enhance men’s masculine identity, or alternatively, as conformity to masculine norms. The theoretical model of hegemonic carnist masculinity proposed in this dissertation places meat-eating gender performances and conformity in a broader social context. Conformity to (carnist) masculinity ideology is one “self-policed” mechanism of consent, amongst others, reinforcing the hegemonic status of carnist masculinity. Collectively, mechanisms of domination and consent maintain the hegemonic, culturally idealised status of carnist masculinity. In turn, the hegemonic status of carnist masculinity reproduces and rewards men’s meat-eating gender performances and deters meat avoidance. Moreover, the hegemony of carnist masculinity above veg*n masculinity legitimates carnist ideology whilst suppressing veg*n ideology, sustaining widespread social acceptance of animal consumption.

This dissertation highlights that one major barrier to men’s meat reduction is that the majority of men—both veg*n and complicit masculinities—passively, and at times unconsciously or unintentionally, consent to and reinforce the hegemony of carnist masculinity, *despite personal moral reservations about the treatment of animals within this*

system. In short, there is widespread complicity in the construction of carnist masculinity as the cultural ideal. This underscores the power of hegemonic social dynamics to override individual values, morals, motivations, and intentions. As carnist men, veg*n men, and women consented to the hegemonic system, targeting only male meat-eaters will be an insufficient approach to challenging hegemonic carnist masculinity. Importantly, efforts to reduce meat consumption must change sociocultural conditions, in particular, fostering non-violent and gender egalitarian masculinities, rather than focusing solely on individual-level factors.

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Appendix A

Quantitative Phase Questionnaire

Demographic Questions

Age: _____

Gender: Male / Female / Other

Do you live in a suburban/metropolitan or regional/country area?

- Suburban/metropolitan
- Regional/rural

Marital status

- Single
- De facto/married
- Separated
- Divorced
- Widowed

Living situation

- Living with parents
- Living alone
- Living with partner
- Living with housemates
- Single/couple living with children
- Single/couple with children who have left home

What is the highest level of education you have completed?

- Primary school
- High school years 7 to 11
- Year 12/high school certificate
- Trade/technical/vocational training
- TAFE/certificate/diploma
- Bachelor degree / Honours degree
- Postgraduate degree (Masters/Phd)

What is your employment status?

- Student

- Part-time
- Full-time
- Casual
- Retired
- Unemployed

What industry do you work? (If retired, in what industry did you work?) [ANZSIC classification system]

- A. Agriculture, Forestry and Fishing
- B. Mining
- C. Manufacturing
- D. Electricity, Gas, Water and Waste Services
- E. Construction
- F. Wholesale Trade
- G. Retail Trade
- H. Accommodation and Food Services
- I. Transport, Postal and Warehousing
- J. Information Media and Telecommunications
- K. Financial and Insurance Services
- L. Rental, Hiring and Real Estate Services
- M. Professional, Scientific and Technical Services
- N. Administrative and Support Services
- O. Public Administration and Safety
- P. Education and Training
- Q. Health Care and Social Assistance
- R. Arts and Recreation Services
- S. Other Services

What is your approximate total annual income before tax?

- \$0 – 29,999
- \$30,000 – 39,999
- \$40,000 – 49,000
- \$50,000 – 59,000
- \$60,000 – 69,999
- \$70,000 – 79,000
- \$80,000 – 89,999
- \$90,000 – 99,000
- \$100,000 – 120,000
- \$120,000 - \$150,000
- \$150,000 - \$199,999
- \$200,000 and above

Which of the following best describes your sexual orientation?

- Heterosexual
- Homosexual

- Bisexual

What is your religion?

- Buddhism
- Christianity
- Judaism
- Islam
- Hindu
- No religion
- Spiritual
- Other

What is your country of residence?

- Australia
- Other (please specify)

Dietarian Identity

Please indicate which of the following most applies to you:

1. Unrestricted meat-eater (I eat as much meat as I like)
2. Meat-reducer (I try to limit the amount of meat I eat)
3. Pescatarian (I don't eat meat, but I eat seafood and fish)
4. Vegetarian (I don't eat meat, seafood or fish, but I eat dairy and eggs)
5. Vegan (I don't consume any animal products)

What is the main reason for your dietary preference?

1. Price
2. Animal welfare/rights
3. Environment
4. Taste
5. Habit
6. Ease/convenience
7. Health/nutrition
8. Someone else cooks for me or does the shopping
9. Everyone I know eats what I eat
10. Religious/Spiritual beliefs
11. Other (please specify)

Willingness to reduce meat consumption (Graça et al., 2015b)

In recent times, meat consumption is being increasingly debated on the grounds of environmental sustainability, health and safety concerns, and animal rights/welfare concerns. Please tell us your willingness to:

1. Slightly reduce your meat consumption (1 = very unwilling, 5 = very willing)
2. Drastically reduce your meat consumption.
3. Stop eating meat altogether.

Animal Flesh Disgust Subscale (Food Disgust Scale) (Hartmann & Siegrist, 2018)

Please indicate how disgusting you perceive the following products or situations to be:

Not disgusting at all 1 2 3 4 5 6 Extremely disgusting

1. To put animal cartilage into my mouth.
2. To see raw meat.
3. To eat a steak that is still bloody inside.
4. To see a whole pig en brochette (on a spit roast).

Animal empathy and moral disgust (adapted from Anderson et al., 2019)

When you look at the following images, to what extent do you feel the following emotions on a scale where 0 = not at all and 100 = very much:

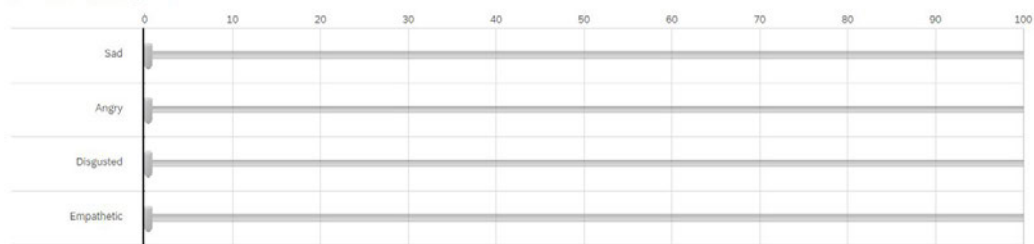


When I see this image I feel...

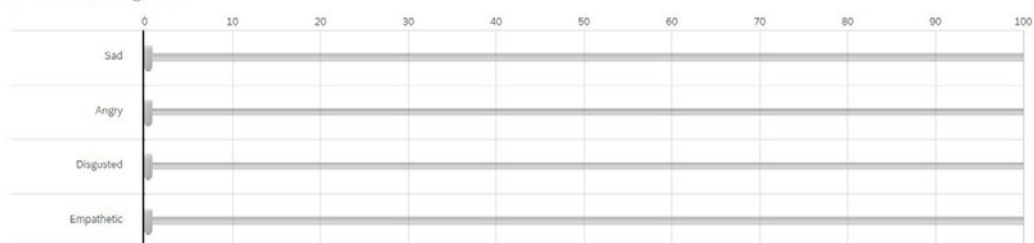
Emotion	Percentage
Sad	1%
Angry	1%
Disgusted	1%
Empathetic	2%



When I see this image I feel...



When I see this image I feel...



When you think about the fact that animals are killed so that humans can eat them, I feel...



Meat-eating Justifications (Rothgerber, 2013)

1. I enjoy eating meat too much to ever give it up. (direct)
2. Animals don't really suffer when being raised and killed for meat. (direct)
3. It's acceptable to eat certain animals because they're bred for that purpose. (direct)
4. To me, there is a real difference between animals we keep as pets and animals we eat as food. (direct)
5. When I look at meat, I try hard not to connect it with an animal. (indirect)
6. God intended for us to eat animals. (direct)
7. I try not to think about what goes on in slaughterhouses. (indirect)
8. Meat is essential for strong muscles. (direct)
9. It wouldn't surprise me to learn that scientists believe the human body (e.g. our teeth) has evolved to eat meat. (direct)
10. Meat tastes too good to worry about what all the critics say. (direct)
11. Animals do not feel pain the same way humans do. (direct)
12. Humans are at the top of the food chain and meant to eat animals. (direct)
13. It seems wrong that people in some cultures eat dogs and cats. (direct)
14. I do not like to think about where the meat I eat comes from. (indirect)
15. God gave us dominion over animals. (direct)
16. I would have problems touring a slaughterhouse. (indirect)
17. We need the protein we can only get in meat for healthy development. (direct)
18. It violates human destiny and evolution to give up eating meat. (direct)
19. There is no food that satisfies me as much as a delicious piece of meat. (direct)
20. Meat is processed so that animal pain and discomfort is minimised and avoided. (direct)
21. Ultimately, animals are here to serve our needs. (direct)
22. I am more sensitive to the suffering of house pets like cats and dogs than other wild animals. (direct)
23. When I eat meat, I try not to think about the life of the animal I am eating. (indirect)
24. It is God's will that humans eat animals. (direct)
25. I try to stay away when people start talking to me in graphic terms about how the animals we eat suffer. (indirect)
26. We need meat for a healthy diet. (direct)
27. Our early ancestors ate meat, and we are supposed to also. (direct)

Vegetarian Eating Motives Inventory (Hopwood et al., 2020)

Meat consumption is being increasingly debated on the grounds of environmental sustainability, health and safety concerns, and animals rights/welfare concerns. The following questions are about the potential reasons that may motivate you to reduce your meat consumption. Please rate the importance of each of the following reasons for you to eat less meat or animal products. The questions are hypothetical, so please rate the items even if you don't intend to change your diet.

1 = Not important reason to reduce my meat intake, 7 = Very important reason to reduce meat intake

Environmental Motives Subscale of VEMI

1. Plant-based diets are better for the environment than meat-based diets.
2. Plant-based diets are more sustainable than meat-based diets.
3. Eating meat is bad for the planet.
4. Plant-based diets are environmentally friendly.
5. Plants have less of an impact on the environment than animal products.

Animal Motives Subscale of VEMI

1. Animals do not have to suffer.
2. Animals' rights are respected.
3. Animal rights are important to me.
4. It does not seem right to exploit animals.
5. I am concerned about animal rights.
6. I don't want animals to suffer.

Health Motive Subscale of VEMI

1. I want to be healthy.
2. I want to live a long time.
3. I care about my body.
4. My health is important to me.

Attitude to eating meat (Graca et al., 2015; Lentz et al., 2018)

On the scale provided, please choose what most closely aligns with your thoughts and attitudes towards **the act of eating meat**. Scores closer to 1 mean you agree more with the attribute on the left, and score closer to 7 mean you agree more with the attribute on the right.

1. Bad Good
2. Unpleasant Pleasant
3. Favourable Unfavourable

Subjective Norm (Cheah et al., 2020; Bogueva et al., 2020; Lai et al., 2020; Povey et al., 2001; Schenk et al., 2018)

Please indicate the extent to which you agree or disagree with the following statement, on a scale where 1 = strongly disagree and 5 = strongly agree:

1. My female friends would approve (or do approve) of me reducing my meat consumption.
2. My male friends would approve (or do approve) of me reducing my meat consumption.
3. Female family members would approve (or do approve) of me reducing my meat consumption.
4. Male family members would approve (or do approve) of me reducing my meat consumption.
5. Female work colleagues would approve (or do approve) of me reducing my meat consumption.
6. Male work colleagues would approve (or do approve) of me reducing my meat consumption.
7. My partner would approve (or does approve) of me reducing my meat consumption.
8. Health professionals would approve (or do approve) of me reducing my meat consumption.

Perceived Behavioural Control (Graca et al., 2015; Lentz et al., 2018)

In regards to your meat consumption habits...

(where 1 = Strongly disagree and 5 = strongly agree)

1. I am confident that I could change my meat consumption habits if I wanted to.
2. Whether I change my meat consumption habits or not is entirely up to me.
3. Changing my meat consumption habits or not is something that is under my control.

4. Changing my meat consumption habits would be difficult.

Short Social Dominance Orientation Scale (Pratto et al., 2013)

There are many kinds of groups in the world: men and women, ethnic and religious groups, nationalities, political factions. How much do you support or oppose the ideas about groups in general? Next to each of the following statements, select a number from 1 to 10 to show your opinion.

Extremely Oppose 1 2 3 4 5 6 7 8 9 10 Extremely Favour

I changed to 1=extremely oppose – 5 = extremely favour

1. In setting priorities, we must consider all groups (R)
2. We should not push for group equality.
3. Group equality should be our ideal. (R)
4. Superior groups should dominate inferior groups.

Habit Strength (Rees et al., 2018)

Please indicate to what extent you agree or disagree with the following statements, where 1 = strongly disagree, and 5 = strongly agree.

Eating meat is something...

1. I do automatically
2. I do without having to consciously remember
3. I do without thinking
4. I have no need to think about doing.
5. That is typically me.

Convenience (Malek, Umberger & Goddard, 2019)

Please indicate to what extent you agree or disagree with the following statements, where 1 = strongly disagree, and 5 = strongly agree.

1. Meat-free meals are easy to prepare.
2. Meat-free meal options are convenient.
3. Meat-free meal options can be cooked very simply.
4. Meat-free meal options are easily available in shops, restaurants and supermarkets.
5. Meat-free meals are quick to prepare.

Price (Food Choice Questionnaire Subscale Steptoe, 1995)

Please indicate to what extent you agree or disagree with the following statements, where 1 = strongly disagree, and 5 = strongly agree.

1. Meat is cheap.
2. Meat is good value for money.
3. Meat is cheaper than plant-based foods.
4. A meat-based diet is more affordable than a plant-based diet.
5. Meat is expensive. (R)

National identity (Nguyen & Platow, 2021)

Your thoughts on Australia/England and other Australians/Britons:

1 = strongly disagree, 7 = strongly agree

1. I feel a bond with other Australians/Britons.
2. I feel solidarity with other Australians/Britons.
3. I feel committed to Australia/Britain.
4. I think that Australians/Britons have a lot to be proud of.
5. It is pleasant to be an Australian/Britons.
6. I often think about the fact that I am Australian/British.
7. The fact that I am Australian/British is an important part of my identity.
8. Being Australian/British is an important part of how I see myself.
9. I have a lot in common with the average Australian/Briton.
10. When someone criticizes Australia/Briton, it feels like a personal insult.
11. When I talk about Australians/Britons, I usually say 'we' rather than 'they'.
12. When someone praises Australians/Britons, it feels like a personal compliment.
13. I identify with being a(n) Australian/Briton.*

*This item was accidentally excluded from the questionnaire.

Conformity to Masculine Norms Inventory (CMNI-30) Short Form (Levant et al., 2020)

On a scale from 1 – 6, where 1 is strongly disagree, and 6 is strongly agree, please indicate to what extent you agree or disagree that the following statements apply to you:

1. I tend to share my feelings (R) EMOTIONAL CONTROL
2. I like to talk about my feelings (R) EMOTIONAL CONTROL

3. I bring up my feelings when talking to others (R) EMOTIONAL CONTROL
4. For me, the best feeling in the world comes from winning WINNING
5. I will do anything to win WINNING
6. In general I must get my way WINNING
7. I would feel good if I had many sexual partners PLAYBOY
8. I would change sexual partners often if I could PLAYBOY
9. I would find it enjoyable to date more than one person at a time PLAYBOY
10. It's never ok for me to be violent (R) VIOLENCE
11. I think that violence is sometimes necessary VIOLENCE
12. I dislike any kind of violence (R) VIOLENCE
13. It would be awful if people thought I was gay HTROSEXUAL SELF-PRESENT
14. I would get angry if people thought I was gay HTROSEXUAL SELF-PRESENT
15. I would be furious if someone thought I was gay HTROSEXUAL SELF-PRESENT
16. Having status is not important to me (R) PURSUIT OF STATUS
17. I think that trying to be important is a waste of time (R) PURSUIT OF STATUS
18. I would hate to be important (R) PURSUIT OF STATUS
19. Work comes first for me PRIMACY OF WORK
20. I feel good when work is my first priority PRIMACY OF WORK
21. I need to prioritize my work over other things PRIMACY OF WORK
22. I love it when men are in charge of women POWER OVER WOMEN
23. The women in my life should obey me POWER OVER WOMEN
24. Things tend to be better when men are in charge POWER OVER WOMEN
25. It bothers me when I have to ask for help SELF-RELIANCE
26. I am not ashamed to ask for help (R) SELF-RELIANCE
27. I never ask for help SELF-RELIANCE
28. I enjoy taking risks RISK-TAKING
29. I take risks RISK-TAKING
30. I put myself in risky situations RISK-TAKING

Toughness Subscale Male Role Norms Inventory Short Form (Levant et al., 2013)

On a scale from 1 – 6, where 1 is strongly disagree, and 6 is strongly agree, please indicate to what extent you agree or disagree that the following statements apply to you:

1. It's important for a man to take risks, even if he might get hurt.
2. When the going gets tough, men should get tough.

3. I think a young man should try to be physically strong, even if he's not big.

Importance of Sex Subscale Male Role Norms Inventory Short Form (Levant et al., 2013)

On a scale from 1 – 6, where 1 is strongly disagree, and 6 is strongly agree, please indicate to what extent you agree or disagree that the following statements apply to you:

1. Men should always like to have sex.
2. A man should not turn down sex.
3. A man should always be ready for sex.

New Masculinity Inventory (Kaplan et al., 2017)

1. Men should make an effort to eat nutritious foods because they are paying attention to their bodies, and not only for health reasons. [HOLISTIC ATTENTIVENESS]
2. Men should try to achieve full harmony between mind and body. [HOLISTIC ATTENTIVENESS]
3. A man should come to know himself through paying attention to his body and its needs. [HOLISTIC ATTENTIVENESS]
4. Men should emphasize dialogue and listening to others as a way of life. [HOLISTIC ATTENTIVENESS]
5. Society's definition of masculinity is partial and too restrictive. [QUESTIONING DEFINITIONS OF MASCULINITY]
6. Men should follow their hearts and inclinations, even in ways that society deems "unmanly". [QUESTIONING DEFINITIONS OF MASCULINITY]
7. I appreciate men who are willing to take up "feminine " or less profitable jobs in order to increase their personal satisfaction. [QUESTIONING DEFINITIONS OF MASCULINITY]
8. Men should enjoy their sexual experiences, regardless of how they "perform " sexually. [QUESTIONING DEFINITIONS OF MASCULINITY]
9. The distinction between masculine and feminine characteristics and roles is damaging for both men and women. [SENSITIVITY TO MALE PRIVILEGE]
10. Men should be able to express their feelings at work the same way they do at home or with friends. [AUTHENTICITY]
11. Men should let themselves express the various aspects of their personality with equal ease at work, at home, and with friends. [AUTHENTICITY]

12. Men should be encouraged to share their feelings and concerns more often and more openly with others. [AUTHENTICITY]
13. Men should constantly search for meaning and strive for personal development and growth. [AUTHENTICITY]
14. Involvement in hands-on childcare should play a significant role in men's self-realisation as fathers. [DOMESTICITY & NURTURING]
15. Helping one's children develop their true selves is a more important part of fatherhood than focusing on their financial well-being. [DOMESTICITY & NURTURING]
16. A man's career should not come at the expense of his family, friends, and hobbies. [DOMESTICITY & NURTURING]
17. A man should be able to give priority to the career of his spouse, even if his own career slows down as a result. [SENSITIVITY TO MEN'S PRIVILEGE]

Appendix B

Qualitative Phase Semi-structured Interview Schedule

SECTION 1: MEAT CONSUMPTION

Free association:

- When I say the following, what do you think of? What images/words come to mind?
 - Meat. Vegetables. Meat-eater. Vegetarian/vegan.

Historical narrative of meat consumption

- How would you describe your diet?
- Tell me about your history with eating meat. How has this changed over your lifetime?

Experiences of eating meat

- Tell me about your favourite food/meat?
 - Probe for detail of experience, feelings, thoughts, history, social contexts (e.g., how do you feel before/during/after?)
- What's important to you in a meal?
- What are the most important reasons for you to eat meat & why?

Willingness to reduce meat consumption

- Have you ever gone without meat before? Probe for detail of experience.
- What advantages/disadvantages would there be if you were to reduce your meat consumption?
- Can you imagine a situation in which you might consider reducing your meat consumption? What would motivate you? What would need to happen/change for you to be willing to reduce your meat consumption?
- What would be/was the hardest part of eating less meat for you? What sorts of situations? What would make it easier?
- In what social situations would it be most difficult to not eat meat? Why?

Alternative questions for meat-avoiders:

- What happened/changed that made you willing to stop eating meat? What motivated you? Have your motives changed? Probe for history/experience.
- What was difficult about reducing or giving up meat?
- What helped you or made it easier?
- What have been the advantages/disadvantages for you not eating meat?

Lab grown meat [introduced in later stages of interviews]

- What are your thoughts on/impressions of lab grown meat?
- What concerns do you have with lab grown meat?

Meat alternatives [introduced in later stages of interviews]

- What are your thoughts on and experiences with plant-based meat alternatives? (e.g., mock meats).

SECTION 2: MASCULINITY

How participant views themselves

- How would you describe yourself?

- What has been the proudest moment of your life?
- What is most important to you in life? How has this changed?

Views on masculinity

- Think of someone in your life who you feel best embodies the qualities of manhood/masculinity. Can you describe them? How do they behave? What about someone who you don't believe is masculine?
- What is the role of a man in his life? (e.g., society, work, family, relationships, personal life)? [adapted from Fazli Khalaf et al., 2013].
- In society today, what advantages/disadvantages do you think there are to being a man?
- What masculine & feminine gender roles do you think are relevant today? Which are outdated?

SECTION 3: MASCULINITY & MEAT CONSUMPTION

Perceptions of other men not eating meat

- How does society/media portray people/men who do/don't eat meat? From what you've observed of meat-eating men and veg*n men, is there any truth to these portrayals?
- In reality what do you think are the differences between veg*n and meat-eating men?
- Have you ever been in a social situation (e.g., BBQ, dinner, party) with a veg*n man? What thoughts did you have when you've seen a vegetarian man at a BBQ or at a social occasion. Feelings? What did you do – talk to him? Did you comment on it?
- One stereotypical gender role is that men eat meat, and women eat vegetables/salads. How relevant do you think this is today?
- Are there legitimate/illegitimate reasons for men to stop eating meat?

Perceptions of self not eating meat

- If you were to stop eating meat, how would this impact the way you feel about yourself as a man?
 - What if you took someone on a date out to dinner? What if you were at a BBQ with your mates?
- If you stopped eating meat, how would others [friends/family/colleagues] react?
 - How would this impact the way others see you as a man?

Alternative questions for meat-avoiders:

- How has abstaining from meat impacted the way you feel about yourself as a man?
- Can you describe any experiences where you felt your masculinity was questioned for not eating meat.

Appendix C

Attitude to Lab-Grown Meat Questionnaire Information to Participants & Survey Questions

INFORMATION TO PARTICIPANTS

We are inviting men aged 18 years and over to participate in a research project entitled ‘The psychosocial mechanisms driving meat consumption in men’ being conducted by a student researcher, Lauren Camilleri, as part of a Psychology PhD at Victoria University. The research is being supervised by Dr Peter Gill and Dr Melissa Kirkovski from the College of Health and Biomedicine, Victoria University, Australia.

What does participation involve?

If you agree to participate you will fill out an anonymous online 15-20 minute questionnaire. You will be asked **5 open-ended questions** about your attitudes to lab grown meat. We have kept the survey short so that you can provide as much detail in your answers as possible, there is no word limit.

You don't need to have any knowledge or understanding of lab grown meat to participate, we will provide a description of what lab grown meat is, and are interested in hearing your first impressions.

This is a short-answer survey where you will write down your answers in a text box, so we recommend using a keyboard rather than completing the survey on a smart phone.

To ensure the research is of significant value it is important that you answer each question as honestly as possible.

Your answers to the questionnaire will remain anonymous and confidential. Furthermore, your participation is completely voluntary, and you may stop answering the questions and withdraw your participation from the study, without explanation, at any time.

Once the completed questionnaire has been submitted, withdrawal from the study will not be possible, as we will be unable to identify your anonymous questionnaire amongst the larger participant pool. Your questionnaire will form part of a larger database from which only group data will be reported, and which only the researchers listed above will have access to.

Completing and submitting the questionnaire indicates that you understand the nature of the research and consent to participate in this research.

What will I gain from participating?

While we do not anticipate that you will receive any direct personal benefits, by participating in this study you will have the opportunity to contribute to knowledge of the psychological and social mechanisms underlying human behaviour, and assist a student researcher.

How will the information I give be used?

The information you provide is anonymous, and will remain completely confidential. Your questionnaire will form part of a larger database from which only group data will be reported, and only the researchers listed above will have access to the data. Statistical analysis will be performed on the data, and the results will be written up and reported as a thesis, and

published in an academic journal.

What are the potential risks of participating in this project?

The researchers understand some of the questions may be of a sensitive nature. Therefore, you can stop answering the questions and withdraw your participation without explanation at any time. Withdrawal from the study will have no negative consequences.

There is a small risk that reflecting on your eating behaviours may disrupt your regular eating patterns. If you find that your eating behaviours or thoughts regarding food become disrupted or disturbed, UK participants can contact Beat on 0808 801 0677, Australian participants can contact The Butterfly Foundation on 1800 334 673. Should you experience any distress or discomfort as a result of participating in this study UK participants can contact SupportLine on 01708 765200, Australian participants can contact Lifeline on 13 11 14.

How will this project be conducted?

The data will be collected, pooled, and thematically analysed for group differences and similarities.

Who is conducting the study?

This study is being conducted at Victoria University for a PhD project. If you have any queries regarding your participation in this study, please feel free to contact the Principle or Student Researchers:

The Chief Investigator for the project is Dr Peter Gill from the College of Health and Biomedicine at Victoria University, PO Box 14428, Melbourne Vic 3001. He can be contacted by email at peter.gill@vu.edu.au or by phone on +613 9919 5641 or mobile: +61 403 107 369

The student researcher Lauren Camilleri can be contacted by email at lauren.camilleri6@live.vu.edu.au or on +61 434 870 912. Any queries about your participation in this project may be directed to the Chief Investigator listed above.

If you have any queries or complaints about the way you have been treated, you may contact the Victoria University Human Research Ethics Committee, Office for Research, Victoria University, PO Box 14428, Melbourne, VIC, 8001, by emailing researchethics@vu.edu.au or phoning +613 9919 4781 or +613 9919 4461.

LAB MEAT SURVEY QUESTIONS

Q1. Please explain the potential reasons why you might be willing to eat lab grown meat. For example, what do you find appealing about it? What potential benefits do you see? Under what circumstances would you eat it? Please provide as much detail as possible.

Q2. Please explain the reasons why you would not be willing to eat lab grown meat. For example, do you have any concerns? What do you find unappealing? Please provide as much detail as possible.

Q3. Meat is sometimes associated with masculinity - some people view men who eat meat as more manly than men who don't eat meat. Even if you personally disagree that men who eat meat are more masculine than men who don't eat meat, how (or where) have you seen this stereotype perpetuated in society today? Please describe what you've seen and what message or attitude was expressed. E.g., by social media influencers; attitudes or comments expressed by friends, family, work colleagues, public figures etc., news articles or things in the media etc.

Q4. Considering the meat-masculinity stereotype... How do you think people might perceive the manliness of a man who eats lab grown meat? How would this compare to the perceived manliness of a man who doesn't eat meat? Please provide reasons for your answer.

Q5. Finally, what is your overall impression of lab grown meat? E.g., How would you feel about eating it? How likely would you be to eat it (e.g., try it once, eat it regularly). Do you support/oppose it?

Appendix D

Victoria University Human Research Ethics Committee Approval

Original Ethics Approval

From: quest.noreply@vu.edu.au
To: [Peter Gill](#)
Cc: andrew.jago@vu.edu.au; [Jessica Scarfo](#); [Lauren Camilleri](#)
Subject: Quest Ethics Notification - Amendment Request Process Finalised - Application Approved
Date: Monday, 9 May 2022 11:52:31 PM

Dear DR PETER GILL,

Your amendment request for the following ethics application has been formally reviewed and finalised.

- » Application ID: HRE21-162
- » Chief Investigator: DR PETER GILL
- » Other Investigators: DR JESSICA SCARFO, MR ANDREW JAGO, Ms Lauren CAMILLERI
- » Application Title: The psychosocial mechanisms driving meat consumption in men: developing a theoretical model to explain men's meat consumption
- » Form Version: 13-07

The amendment request for this ethics application has been accepted and deemed to meet the requirements of the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007)' by the Victoria University Human Research Ethics Committee. Approval has been granted for two (2) years from the original approval date; 14/03/2022.

Continued approval of this research project by the Victoria University Human Research Ethics Committee (VUHREC) is conditional upon the provision of a report within 12 months of the above approval date or upon the completion of the project (if earlier). A report proforma may be downloaded from the Office for Research website at: <http://research.vu.edu.au/hrec.php>.

Please note that the Human Research Ethics Committee must be informed of the following: any changes to the approved research protocol, project timelines, any serious events or adverse and/or unforeseen events that may affect continued ethical acceptability of the project. In these unlikely events, researchers must immediately cease all data collection until the Committee has approved the changes. Researchers are also reminded of the need to notify the approving HREC of changes to personnel in research projects via a request for a minor amendment. It should also be noted that it is the Chief Investigators' responsibility to ensure the research project is conducted in line with the recommendations outlined in the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007)'.

On behalf of the Committee, I wish you all the best for the conduct of the project.

Secretary, Human Research Ethics Committee
 Phone: 9919 4781 or 9919 4461
 Email: researchethics@vu.edu.au

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Amended Ethics Approval 2022

From: quest.noreply@vu.edu.au
To: [Peter Gill](#)
Cc: andrew.jago@vu.edu.au; [Jessica Scarfo](#); [Lauren Camilleri](#)
Subject: Quest Ethics Notification - Amendment Request Process Finalised - Application Approved
Date: Wednesday, 22 June 2022 7:22:52 PM

Dear DR PETER GILL,

Your amendment request for the following ethics application has been formally reviewed and finalised.

- » Application ID: HRE21-162
- » Chief Investigator: DR PETER GILL
- » Other Investigators: DR JESSICA SCARFO, MR ANDREW JAGO, Ms Lauren CAMILLERI
- » Application Title: The psychosocial mechanisms driving meat consumption in men: developing a theoretical model to explain men's meat consumption
- » Form Version: 13-07

The amendment request for this ethics application has been accepted and deemed to meet the requirements of the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007)' by the Victoria University Human Research Ethics Committee. Approval has been granted for two (2) years from the original approval date; 14/03/2022.

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On behalf of the Committee, I wish you all the best for the conduct of the project.

Secretary, Human Research Ethics Committee
 Phone: 9919 4781 or 9919 4461
 Email: researchethics@vu.edu.au

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Amended Ethics Approval 2023

From: quest.noreply@vu.edu.au
To: [Peter Gill](#)
Cc: andrew.jago@vu.edu.au; [Jessica Scarfo](mailto:Jessica.Scarfo@vu.edu.au); [Melissa Kirkovski](mailto:Melissa.Kirkovski@vu.edu.au); [Lauren Camilleri](mailto:Lauren.Camilleri@vu.edu.au); samual.maraldo@students.vu.edu.au
Subject: Quest Ethics Notification - Amendment Request Process Finalised - Application Approved
Date: Wednesday, 19 April 2023 6:21:32 PM

Dear DR PETER GILL,

Your amendment request for the following ethics application has been formally reviewed and finalised.

- » Application ID: HRE21-162
- » Chief Investigator: DR PETER GILL
- » Other Investigators: DR JESSICA SCARFO, MR ANDREW JAGO, Ms Lauren CAMILLERI, Mr SAMUAL MARALDO, Dr Melissa Kirkovski
- » Application Title: The psychosocial mechanisms driving meat consumption in men: developing a theoretical model to explain men's meat consumption
- » Form Version: 13-07

The amendment request for this ethics application has been accepted and deemed to meet the requirements of the National Health and Medical Research Council (NHMRC) 'National Statement on Ethical Conduct in Human Research (2007)' by the Victoria University Human Research Ethics Committee. Approval has been granted for two (2) years from the original approval date; 14/03/2022.

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Secretary, Human Research Ethics Committee
 Phone: 9919 4781 or 9919 4461
 Email: researchethics@vu.edu.au

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Appendix E

INFORMATION TO PARTICIPANTS INVOLVED IN RESEARCH

We are inviting individuals aged 18 years and over to participate in a research project entitled 'The psychosocial mechanisms driving meat consumption in men' being conducted by a student researcher, Lauren Camilleri, as part of a Psychology PhD at Victoria University. The research is being supervised by Dr Peter Gill and Dr Jessica Scarfo from the College of Health and Biomedicine, Victoria University.

The aim of this research is to understand the psychological factors that influence people's consumption of meat products. We are looking for people with a range of different consumption habits, so people of all levels of consumption habits (including people who do not eat meat) are encouraged to participate.

What does participation involve?

If you agree to participate you will be required to fill out an anonymous online questionnaire, which will take approximately 40 minutes to complete. You will be asked to answer multiple choice questions about:

- The frequency of your meat consumption
- Attitudes and beliefs about meat consumption and various other topics (e.g. moral & ethical beliefs)
- Emotional traits
- Personality traits
- Values
- Basic demographic information

The survey will also involve you viewing a short series of images. Some participants may find the nature of these images uncomfortable or distressing.

To ensure the research is of significant value it is important that you answer each question as honestly as possible.

Your answers to the questionnaire will remain anonymous and confidential. Furthermore, your participation is completely voluntary, and you may stop answering the questions and withdraw your participation from the study, without explanation, at any time.

Please understand that once the completed questionnaire has been submitted, withdrawal from the study will not be possible, as we will be unable to identify your anonymous questionnaire amongst the larger participant pool. Your questionnaire will form part of a larger database from which only group data will be reported, and which only the researchers listed above will have access to.

Completing and submitting the questionnaire indicates that you understand the nature of the research and consent to participate in this research.

What will I gain from participating?

While we do not anticipate that you will receive any direct personal benefits, by participating in this study you will have the opportunity to contribute to knowledge of the psychological and social mechanisms underlying human behaviour, and assist a student researcher.

How will the information I give be used?

The information you provide is anonymous, and will remain completely confidential. Your questionnaire will form part of a larger database from which only group data will be reported, and only the researchers listed above will have access to the data. Statistical analysis will be performed on the data, and the results will be written up and reported as a thesis, and published in an academic journal.

What are the potential risks of participating in this project?

The researchers understand some of the questions may be of a sensitive nature. Therefore, you can stop answering the questions and withdraw your participation without explanation at any time. Withdrawal from the study will have no negative consequences.

There is a small risk that reflecting on your eating behaviours may disrupt your regular eating patterns. If you find that your eating behaviours or thoughts regarding food become disrupted or disturbed, Australian participants please contact the Butterfly Foundation on 1800 334 673 and participants in the UK please contact Beat on 0808 801 0677.

Should you experience any distress or discomfort as a result of participating in this study, Australian participants please contact Lifeline on 13 11 14 and participants in the UK please contact SupportLine on 01708 765200.

How will this project be conducted?

The data will be collected, pooled, and statistically analysed for group differences and similarities.

Who is conducting the study?

This study is being conducted at Victoria University for a PhD project. If you have any queries regarding your participation in this study, please feel free to contact the Principle or Student Researchers:

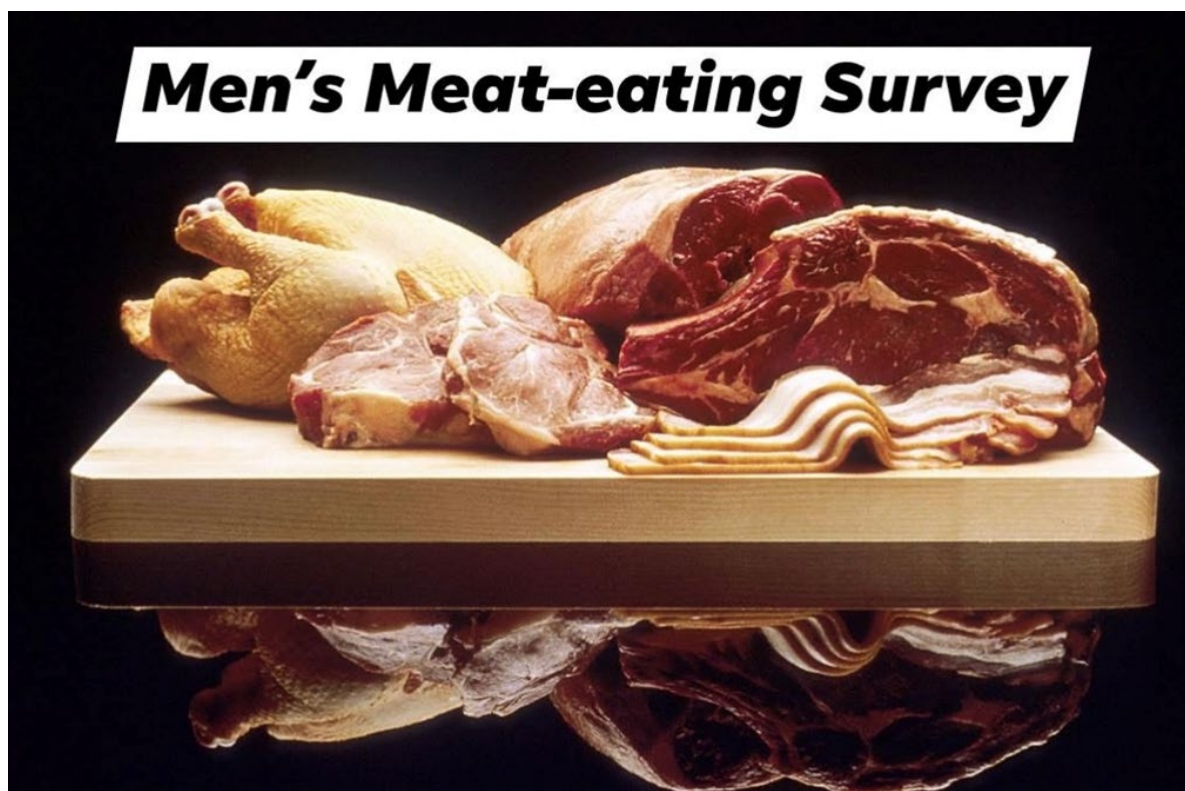
The Chief Investigator for the project is Dr Peter Gill from the College of Health and Biomedicine at Victoria University, PO Box 14428, Melbourne Vic 8001. He can be contacted by email at peter.gill@vu.edu.au or by phone on +613 9919 5641 or mobile: 0403 107 369

The student researcher Lauren Camilleri can be contacted by email at lauren.camilleri6@live.vu.edu.au or on 0434 870 912.

Any queries about your participation in this project may be directed to the Chief Investigator listed above.

If you have any queries or complaints about the way you have been treated, you may contact the Victoria University Human Research Ethics Committee, Office for Research, Victoria University, PO Box 14428, Melbourne, VIC, 8001, by emailing researchethics@vu.edu.au or phoning (03) 9919 4781 or 9919 4461.

Appendix F
Social Media Survey Invitation



Calling all Australian men!

You are invited to participate in an online survey being conducted for a Psychology PhD project at Victoria University, Australia. The aim of this research is to understand the psychological factors that influence Australian men's meat consumption.

Any males aged 18 or over are invited to participate. We are looking for people with a range of different eating habits, so men who don't eat meat (e.g., vegetarians) are welcome to participate as well as meat-eaters.

The survey takes about 30 minutes and involves questions about your diet, personal beliefs, personality traits, and emotional responses to certain images. All information you provide will remain anonymous and confidential. Results will be published in a scientific journal.

If you are interested in participating please use the link below:

For more information please contact the student researcher Lauren Camilleri on 0434 870 912 or email lauren.camilleri6@live.vu.edu.au

Appendix G

Qualitative Phase Information to Participants

INFORMATION TO PARTICIPANTS INVOLVED IN RESEARCH

We are inviting males aged 18 years and over to participate in a research project aiming to understand the psychosocial factors influencing men's consumption of meat. We are looking for men with a range of different attitudes to eating meat and consumption habits, so people who limit or avoid eating meat are also invited to participate, as well as meat-eaters.

The study is being conducted by a student researcher, Lauren Camilleri, as part of a Psychology PhD at Victoria University, Melbourne, Australia. The research is being supervised by Dr Peter Gill and Dr Melissa Kirkovski from the College of Health and Biomedicine, Victoria University.

What does participation involve?

The research involves participating in an online Zoom interview (approximately 60-90 minutes depending on your answers). We will be discussing topics such as your emotions, attitudes and beliefs related to eating meat, animals, and reducing your meat intake (if applicable). There will also be a discussion of your beliefs about masculinity, gender roles, and your sociocultural context.

What will I gain from participating?

As a thank you for participating, you will be reimbursed £41 (approx \$78 AUD depending on the exchange rate) for your time. While we do not anticipate that you will receive any direct personal benefits, by participating in this study you will have the opportunity to contribute to knowledge of the psychological and social mechanisms underlying human behaviour, and assist a student researcher. However, there are indirect benefits to participating. Your insights will help to guide future research, social marketing campaigns, and social and health policy.

How will the information I give be used?

The information you provide will remain anonymous and confidential. Your personal identity will not be revealed in the reporting of results. The data collected will be collated with other survey responses and analysed for broad themes. Only the researchers listed above will have access to your responses. Results of the study will be written up and reported as a thesis, and published in an academic journal. Your participation is completely voluntary, and you may stop answering the questions and withdraw your participation from the study, without explanation, at any time. You may request to withdraw and have your information destroyed after taking part in the interview if you wish. However, please understand that once the data has been thematically analysed, withdrawal from the study will not be possible.

What are the potential risks of participating in this project?

The researchers understand some of the questions may be of a sensitive nature and make you feel uncomfortable during the interview. When deciding whether to participate please consider whether you would be comfortable discussing topics such as masculinity and gender roles with a female interviewer. If it would make you feel more comfortable you do not have to turn your camera on during the Zoom interview (only audio will be recorded). Please note that you can stop answering the questions and withdraw your participation without explanation at any time. Withdrawal from the study will have no negative consequences.

Should you experience any distress or discomfort as a result of participating in this study please, Australian participants can contact Lifeline on 13 11 14, and UK participants can contact Samaritans on 116 123 for free.

There is a small risk that reflecting on your eating behaviours may disrupt your regular eating patterns. If you find that your eating behaviours or thoughts regarding food become disrupted or disturbed, Australian participants can contact the Butterfly Foundation on 1800 334 673; UK participants can contact Beat on 0808 801 0677 for free.

How will this project be conducted?

The project will involve a semi-structured interview lasting approximately 60-90 minutes. The data will be collected, collated with other participants' responses, and thematically analysed for similarities.

Who is conducting the study?

This study is being conducted at Victoria University for a PhD project. If you have any queries regarding your participation in this study, please feel free to contact the Principle or Student Researchers: The Chief Investigator for the project is Dr Peter Gill from the College of Health and Biomedicine at Victoria University, PO Box 14428, Melbourne Vic 8001. He can be contacted by email at peter.gill@vu.edu.au or by phone on +613 9919 5641 or mobile: +61 403 107 369

The student researcher Lauren Camilleri can be contacted by email at lauren.camilleri6@live.vu.edu.au or on +61 434 870 912.

Any queries about your participation in this project may be directed to the Chief Investigator listed above. If you have any queries or complaints about the way you have been treated, you may contact the Victoria University Human Research Ethics Committee, Office for Research, Victoria University, PO Box 14428, Melbourne, VIC, 8001, by emailing researchethics@vu.edu.au or phoning +61 39919 4781 or +61 39919 4461.

Appendix H

Qualitative reflexive thematic analysis critical reflection questions

“Useful things to ask about the data set to facilitate this critical engagement include:

- *How* does the person make sense of whatever it is they're discussing?
- Why might they be making sense of things in this way (and not in another way)?
- In what different ways do they make sense of this topic?
- How ‘common sense’ or socially normative is this depiction or story?
- How would I feel if I was in that situation? (Is this different from or similar to how the person feels, and why might that be?)
- What assumptions do they make in describing the world?
- What kind of world is “revealed” through their account?” (Braun & Clarke, 2022, p. 44)

“It's important to recognise that such questions are the starting point, not the limit, for the things we might want to ask as we start to engage with our data. There are many other questions you can ask to facilitate critical engagement, depending on the topic. These include questions you ask of yourself, such as:

- Why might I be reacting to the data in this way?
- What does my interpretation rely on?
- What different ways could I make sense of the data?

Some other potential questions to ask it's a critical engagement:

- What sort of assumptions about men, meat, masculinity, animals, meat-eaters, or vegetarians are being made here?
- How are animals/men/meat/meat eaters/vegetarians characterized?
- What purpose does [not] eating meat serve?
- What ideas about masculinity are being drawn on?
- Why might a participant understand something as positive? Or as negative?
- What makes a particular claimed experience possible?
- What moral frameworks do participants rely on?
- What sorts of assumptions are made about how the world is - or should be - organised?” (Braun & Clarke, 2022, p. 45).

Appendix I

The Meat Consumption Scale (MCS)

For any use of the Meat Consumption Scale, please cite:

Camilleri, L., Jago, A., Rehman, A., & Gill, P. R. (2025). Development and preliminary validation of the Meat Consumption Scale. *BMC Psychology*, <https://doi.org/10.1186/s40359-025-03270-2>.

Instructions for participants:

The following questions relate to your consumption of meat in the **past two weeks**, including *all* meals (main meals and snacks). Please ensure you read the definition of each meat category, as some meat products may be excluded.

You will be asked to estimate how many times you have consumed different types of meat in the past 2 weeks – please answer numerically (e.g., 5) rather than in words (e.g., “most days”). Please give an *exact* numerical value (e.g., 7) rather than a range (e.g., 6-7).

As this survey relies on memory, please give your *best estimation* of what you have eaten.

A: Beef (including steak, minced/ground beef, and beef burgers. Please exclude processed beef like jerky or corned beef)

1. Beef Frequency

Please indicate approximately how many times you have eaten **beef** in the past 2 weeks:

2. Beef Quantity

On these occasions you have eaten **beef** how would you describe your typical portion size?

- 1= Very Small (less than 10% of a typical meal)
- 2= Small (10- 20% of a typical meal)
- 3= Medium (21-30% of a typical meal)
- 4= Large (31-40% of a typical meal)
- 5= Very Large (more than 40% of a typical meal)

B: Lamb (including lamb and mutton)

3. Lamb Frequency

Please indicate approximately how many times you have eaten **lamb** in the past 2 weeks:

4. Lamb Quantity

On these occasions you have eaten **lamb** how would you describe your typical portion size?

- 1= Very Small (less than 10% of a typical meal)
- 2= Small (10- 20% of a typical meal)
- 3= Medium (20-30% of a typical meal)
- 4= Large (30-40% of a typical meal)
- 5= Very Large (more than 40% of a typical meal)

C: Poultry (chicken, turkey, duck, and other game birds such as quail or pheasants etc. Please exclude processed poultry meats such as chicken loaf or turkey slices)

5. Poultry Frequency

Please indicate approximately how many times you have eaten **poultry** (such as turkey or duck) in the past 2 weeks: _____

6. Poultry Quantity

On these occasions you have eaten **poultry** how would you describe your typical portion size?

- 1= Very Small (less than 10% of a typical meal)
- 2= Small (10- 20% of a typical meal)
- 3= Medium (20-30% of a typical meal)
- 4= Large (30-40% of a typical meal)
- 5= Very Large (more than 40% of a typical meal)

D: Pork (please exclude processed pork such as bacon or ham)

7. Pork Frequency

Please indicate approximately how many times you have eaten **pork** in the past 2 weeks:

8. Pork Quantity

On these occasions you have eaten **pork** how would you describe your typical portion size?

- 1= Very Small (less than 10% of a typical meal)
- 2= Small (10- 20% of a typical meal)
- 3= Medium (20-30% of a typical meal)
- 4= Large (30-40% of a typical meal)
- 5= Very Large (more than 40% of a typical meal)

E: Bacon or Ham

9. Bacon/ham Frequency

Please indicate approximately how many times you have eaten **bacon or ham** in the past 2 weeks: _____

10. Bacon/ham Quantity

On these occasions you have eaten **bacon or ham** how would you describe your typical portion size?

- 1= Very Small (less than 10% of a typical meal)
- 2= Small (10- 20% of a typical meal)
- 3= Medium (20-30% of a typical meal)
- 4= Large (30-40% of a typical meal)
- 5= Very Large (more than 40% of a typical meal)

F: Other Processed Meats (including preserved, cured, salted, or smoked meats such as salami, chicken loaf, corned beef, canned meat, sausages, beef jerky and other meats such as hot dogs, meat pies and dim sims. Exclude bacon and ham)

11. Other Processed Meat Frequency

Please indicate approximately how many times you have eaten other **processed meats** in the past 2 weeks: _____

12. Other Processed Meat Quantity

On these occasions you have eaten **processed meats** how would you describe your typical portion size?

- 1= Very Small (less than 10% of a typical meal)
- 2= Small (10- 20% of a typical meal)
- 3= Medium (20-30% of a typical meal)
- 4= Large (30-40% of a typical meal)
- 5= Very Large (more than 40% of a typical meal)

Scoring Instructions for the Meat Consumption Scale

Step 1:

For each of the six meat categories—

- A (beef)
- B (lamb)
- C (poultry)
- D (pork)
- E (bacon & ham)
- F (other processed meats)

—multiply the frequency score (number of times consumed in the past 2 weeks) by the quantity score (typical portion size) to create a total score for each meat category.

Step 2:

Sum the total beef score with the total lamb score to create a total “red meat” score.

Step 3:

Sum the total pork score with the total bacon & ham score to create a total “pork products” score.

Step 4:

Sum these total scores together (red meat + poultry + pork products + other processed meats) to calculate a total *Meat Consumption* score.

Appendix J

THE NEW WAY TO DO UNI

OFFICE FOR RESEARCH TRAINING, QUALITY AND INTEGRITY

DECLARATION OF CO-AUTHORSHIP AND CO-CONTRIBUTION: PAPERS INCORPORATED IN THESIS

This declaration is to be completed for each conjointly authored publication and placed at the beginning of the thesis chapter in which the publication appears.

1. PUBLICATION DETAILS (to be completed by the candidate)

Title of
Paper/Journal/Book:

Introducing the Meat Consumption Scale: Psychometric Properties and Convergent Validity submitted to BMC Psychology on 30/10/24.

Surname: Camilleri

First name: Lauren

Institute: Institute for Health and Sport

Candidate's Contribution (%): 55%

Status:

Accepted and in press:

☐

Date:

Published:

☐

Date:

2. CANDIDATE DECLARATION

I declare that the publication above meets the requirements to be included in the thesis as outlined in the HDR Policy and related Procedures – policy.vu.edu.au.

Camilleri

Signature

13/05/25

Date

3. CO-AUTHOR(S) DECLARATION

In the case of the above publication, the following authors contributed to the work as follows:

The undersigned certify that:

1. They meet criteria for authorship in that they have participated in the conception, execution or interpretation of at least that part of the publication in their field of expertise;
2. They take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;


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3. There are no other authors of the publication according to these criteria;
4. Potential conflicts of interest have been disclosed to a) granting bodies, b) the editor or publisher of journals or other publications, and c) the head of the responsible academic unit; and
5. The original data will be held for at least five years from the date indicated below and is stored at the following **location(s)**:

DANS Data Station <https://doi.org/10.17026/dans-z9x-8cpw>

Victoria University R: Drive

Name(s) of Co-Author(s)	Contribution (%)	Nature of Contribution	Signature	Date
Andrew Jago	20%	conceptualisation, methodology, supervision, writing – review and editing.	<i>Andrew Jago</i>	12/5/25
Abdul Rehman	5%	conceptualisation, data collection		
Peter Gill	20%	conceptualisation, methodology, supervision, writing – review and editing.	<i>Peter Gill</i>	6/5/25

Updated: September 2019

PO Box 14428, Melbourne,
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CRICOS Provider No. 00124K (Melbourne),
02475D (Sydney), RTO 3113

Appendix K

THE NEW WAY TO DO UNIOFFICE FOR RESEARCH TRAINING, QUALITY
AND INTEGRITYDECLARATION OF CO-AUTHORSHIP AND CO-CONTRIBUTION:
PAPERS INCORPORATED IN THESIS

This declaration is to be completed for each conjointly authored publication and placed at the beginning of the thesis chapter in which the publication appears.

1. PUBLICATION DETAILS (to be completed by the candidate)

Title of
Paper/Journal/Book:

Camilleri, L., Kirkovski, M., Scarfo, J., Jago, A., & Gill, P. R. (2024).
Understanding the meat-masculinity link: Traditional and non-traditional
masculine norms predicting men's meat consumption. Ecology of Food and
Nutrition, 63(4), 1-32. <https://doi.org/10.1080/03670244.2024.2361818>

Surname: Camilleri

First name: Lauren

Institute: Institute for Health and Sport

Candidate's Contribution (%): 60

Status:

Accepted and in press:

☐

Date:

Published:

☒

Date:

19/06/2024

2. CANDIDATE DECLARATION

I declare that the publication above meets the requirements to be included in the thesis as outlined
in the HDR Policy and related Procedures – policy.vu.edu.au.

 20/5/25

Signature

Date

3. CO-AUTHOR(S) DECLARATION

In the case of the above publication, the following authors contributed to the work as follows:

The undersigned certify that:




1. They meet criteria for authorship in that they have participated in the conception, execution or interpretation of at least that part of the publication in their field of expertise;
2. They take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;


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3. There are no other authors of the publication according to these criteria;
4. Potential conflicts of interest have been disclosed to a) granting bodies, b) the editor or publisher of journals or other publications, and c) the head of the responsible academic unit; and
5. The original data will be held for at least five years from the date indicated below and is stored at the following location(s):

DANS Data Station <https://doi.org/10.17026/dans-zbe-dzn4>.

Victoria University R: Drive

Name(s) of Co-Author(s)	Contribution (%)	Nature of Contribution	Signature	Date
Melissa Kirkovski	10%	supervision, writing - review & editing		20/05/2025
Jessica Scarfo	10%	conceptualisation, methodology, supervision, writing - review & editing		
Andrew Jago	10%	conceptualisation, methodology, supervision, writing - review & editing		12/5/25
Peter Gill	10%	conceptualisation, methodology, supervision, writing - review & editing		6/5/25

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Appendix L

THE NEW WAY TO DO UNI

OFFICE FOR RESEARCH TRAINING, QUALITY AND INTEGRITY

DECLARATION OF CO-AUTHORSHIP AND CO-CONTRIBUTION: PAPERS INCORPORATED IN THESIS

This declaration is to be completed for each conjointly authored publication and placed at the beginning of the thesis chapter in which the publication appears.

1. PUBLICATION DETAILS (to be completed by the candidate)

Title of Paper/Journal/Book: Camilleri, L., Gill, P. R., Scarfo, J., & Jago, A. (2023). Resolving the masculinity dilemma: Identifying subtypes of male meat consumers with latent profile analysis. *Food Quality and Preference*, 108, 104890. <https://doi.org/https://doi.org/10.1016/j.foodqual.2023.104890>

Surname: Camilleri First name: Lauren

Institute: Institute for Health and Sport Candidate's Contribution (%): 55%

Status:

Accepted and in press:

☐

Date:


Published:

☒

Date:

2. CANDIDATE DECLARATION

I declare that the publication above meets the requirements to be included in the thesis as outlined in the HDR Policy and related Procedures – policy.vu.edu.au.

 13.05.25

Signature

Date

3. CO-AUTHOR(S) DECLARATION

In the case of the above publication, the following authors contributed to the work as follows:

The undersigned certify that:

1. They meet criteria for authorship in that they have participated in the conception, execution or interpretation of at least that part of the publication in their field of expertise;
2. They take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;


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3. There are no other authors of the publication according to these criteria;
4. Potential conflicts of interest have been disclosed to a) granting bodies, b) the editor or publisher of journals or other publications, and c) the head of the responsible academic unit; and
5. The original data will be held for at least five years from the date indicated below and is stored at the following **location(s)**:

DANS Data Station <https://doi.org/10.17026/dans-zbe-dzn4>

Victoria University R: Drive

Name(s) of Co-Author(s)	Contribution (%)	Nature of Contribution	Signature	Date
Peter Gill	15%	conceptualisation, methodology, data curation, formal analysis, supervision,	<i>Peter Gill</i>	6/5/25
Jessica Scarfo	15%	conceptualisation, methodology, data curation, formal analysis, supervision,		
Andrew Jago	15%	conceptualisation, methodology, formal analysis, supervision, writing - review & editing	<i>Andrew Jago</i>	12/5/25

Updated: September 2019

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Appendix M

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DECLARATION OF CO-AUTHORSHIP AND CO-CONTRIBUTION: PAPERS INCORPORATED IN THESIS

This declaration is to be completed for each conjointly authored publication and placed at the beginning of the thesis chapter in which the publication appears.

1. PUBLICATION DETAILS (to be completed by the candidate)

Title of Paper/Journal/Book:	Hegemonic Carnist Masculinity: Mechanisms of Domination and Consent Sustaining the Consumption of Animals		
Surname:	Camilleri	First name:	Lauren
Institute:	Institute for Health and Sport	Candidate's Contribution (%):	55
Status:			
Accepted and in press:	<input type="checkbox"/>	Date:	<input type="text"/>
Published:	<input type="checkbox"/>	Date:	<input type="text"/>

2. CANDIDATE DECLARATION

I declare that the publication above meets the requirements to be included in the thesis as outlined in the HDR Policy and related Procedures – policy.vu.edu.au.

	29/5/25
Signature	Date

3. CO-AUTHOR(S) DECLARATION

In the case of the above publication, the following authors contributed to the work as follows:




The undersigned certify that:

1. They meet criteria for authorship in that they have participated in the conception, execution or interpretation of at least that part of the publication in their field of expertise;
2. They take public responsibility for their part of the publication, except for the responsible author who accepts overall responsibility for the publication;


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3. There are no other authors of the publication according to these criteria;
4. Potential conflicts of interest have been disclosed to a) granting bodies, b) the editor or publisher of journals or other publications, and c) the head of the responsible academic unit; and
5. The original data will be held for at least five years from the date indicated below and is stored at the following **location(s)**:

Victoria University R Drive.

Name(s) of Co-Author(s)	Contribution (%)	Nature of Contribution	Signature	Date
Lutfiye Ali	20%	Conceptualisation, methodology, formal analysis, writing – review & editing,		29/5/25
Andrew Jago	5%	writing – review & editing, supervision.		27/5/25
Peter Gill	20%	Conceptualisation, methodology, formal analysis, writing – review & editing,		26.5.25

Updated: September 2019

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Supplementary A
Chapter 6: Previous Measures of Meat Consumption & Intention

MEAT CONSUMPTION MEASURES

De Backer, C., Erreygers, S., De Cort, C., Vandermoere, F., Dhoest, A., Vrinten, J., & Van Bauwel, S. (2020). Meat and masculinities. Can differences in masculinity predict meat consumption, intentions to reduce meat and attitudes towards vegetarians? *Appetite*, 147. <https://doi.org/10.1016/j.appet.2019.104559>

Respondents meat intake was measured by asking them how many days a week they ate meat for breakfast, lunch, dinner and in between as snack on a 0 (never) to 7 (every day) scale. Questions were asked separately for each meal and snack to ensure respondents considered all food intake options, and not only their main meals.

WESTERN MEN [DOESN'T SPECIFY COUNTRY OF SAMPLE]

Kunst, J. R., & Hohle, S. M. (2016). Meat eaters by dissociation: How we present, prepare and talk about meat increases willingness to eat meat by reducing empathy and disgust. *Appetite*, 105, 758-774. <https://doi.org/10.1016/j.appet.2016.07.009>

On a scale of 0 – 7, where 0 = never and 7 = daily, how often do you eat meat?

On a scale of 0 – 7, where 0 = never and 7 = daily, how often do you eat _____? (chicken, pork, lamb, fish etc.)

NORWAY, USA

Lea, E., & Worsley, A. (2001). Influences on meat consumption in Australia. *Appetite*, 36(2), 127-136. <https://doi.org/10.1006/appe.2000.0386>

Participants were asked to indicate how often they consumed red meat, white meat, fish and seafood, eggs and dairy:

- never
- rarely
- one to three times a month
- one to four times a week
- almost daily/daily

AUSTRALIA

Lentz, G., Connelly, S., Miroso, M., & Jowett, T. (2018). Gauging attitudes and behaviours: Meat consumption and potential reduction. *Appetite*, 127, 230-241. <https://doi.org/10.1016/j.appet.2018.04.015>

Before being asked any questions about meat related habits, participants were given a definition of meat, as defined by the researchers:

“Please keep in mind when answering questions, that the word “meat” refers to red and white meats (e.g. beef, lamb, pork, chicken, turkey, fish, seafood etc.) that are either unprocessed (e.g. chicken breast, steak, fish filet) or processed (e.g. sausage, salami, meat mince, chicken nuggets, crab cakes).”

After reading this short definition, participants were asked, “On average how often do you consume meat or products that include meat?”

- never
- rarely
- several times a week
- daily
- several times a day

NEW ZEALAND

Malek, L., Umberger, W., & Goddard, E. (2019). Is anti-consumption driving meat consumption changes in Australia? *British Food Journal*, 121(1), 123-138.
<https://doi.org/10.1108/BFJ-03-2018-0183>

For meat consumers, consumption frequencies of beef, chicken, pork and lamb were measured using a matrix-style question with the following response options: “never”, “less than once per month”, “one to three times per month” and seven options ranging from “1 day per week” to “everyday”.

AUSTRALIA

Malek, L., Umberger, W. J., & Rolfe, J. (2018). Segmentation of Australian meat consumers on the basis of attitudes regarding farm animal welfare and the environmental impact of meat production. *Animal Production Science*, 58(3).
<https://doi.org/10.1071/an17058>

‘Considering main meals in a typical week, how often are beef, chicken, pork and lamb products prepared by you and/or members of your household?’

This matrix style question included nine response options (number of days per week scored: ‘1–7’, ‘less than one’ or ‘never’) for each of the four meat types.

Responses were recoded into three categories for analysis (‘less than once per week’, ‘1–2 days per week’, and ‘≥3 days per week’).

AUSTRALIA

Pfeiler, T. M., & Egloff, B. (2018). Personality and meat consumption: The importance of differentiating between type of meat. *Appetite*, 130, 11-19.
<https://doi.org/10.1016/j.appet.2018.07.007>

Consumption of three different types of meat (meat, poultry, and fish) was measured by asking participants to indicate the frequency with which they had consumed each of these types of meat during the past month (“How often do you eat meat, fish, or poultry?”).

(1=never, 2=once a month or less frequently, 3=two to four days a month, 4=two to three days a week, 5=four to six days a week, or 6= every day).

We also computed a variable overall meat consumption by averaging the three different types of MC ($\alpha=.52$).

GERMANY, AUSTRALIA

Rees, J. H., Bamberg, S., Jäger, A., Victor, L., Bergmeyer, M., & Friese, M. (2018). Breaking the habit: On the highly habitualized nature of meat consumption and implementation intentions as one effective way of reducing it. *Basic and Applied Social Psychology, 40*(3), 136-147. <https://doi.org/10.1080/01973533.2018.1449111>

Meat consumption was assessed in three ways:

- (1) four step rating scales asking how frequently during the last week that participants had eaten sausage for breakfast, as a snack in between, for lunch, and for dinner (with response options never, seldom, occasionally, and always);
- (2) five-step rating scales asking the same questions for last week’s meat consumption; and
- (3) participants completing a diary asking them to remember all the meals they had eaten “yesterday” and “today.” For each meal they were asked to tick whether they had eaten sausage (one, two, three to four slices) or meat (small piece, large piece, two to three pieces). These items formed a reliable scale and were averaged to yield an index of self-reported meat consumption.

GERMANY

Rothgerber, H. (2013). Real men don’t eat (vegetable) quiche: Masculinity and the justification of meat consumption. *Psychology of Men & Masculinity, 14*(4), 363-375. <https://doi.org/10.1037/a0030379>

Eating behaviour was assessed for a variety of meals, specifically those involving beef, chicken, pork, fish, or those completely vegetarian. For each, respondents were asked two items:

1. “How often do you eat ____?” with response options ranging from 1 (very infrequently) to 9 (very frequently);
2. “Estimate how many times in an average week you eat _____” with options ranging from 0 to 20.

Responses on each two-item scale were positively correlated. Thus, the two items were summed to create an overall index of beef consumed, chicken consumed, pork consumed, fish consumed, and vegetarian meals consumed. The average of these items was taken as a measure of overall consumption.

USA

Schosler, H., de Boer, J., Boersema, J. J., & Aiking, H. (2015). Meat and masculinity among young chinese, turkish and dutch adults in the netherlands. *Appetite*, 89, 152-159. <https://doi.org/10.1016/j.appet.2015.02.013>

Because meat consumption in the Netherlands is largely associated with the main meal of the day, its frequency is usually measured by a single question (Schösler et al., 2012): “How many days per week do you eat meat with your main meal (including chicken)?” Taking into account that migrants may eat more than one warm meal per day, an additional item asked for the number of warm meals per day (answer categories: 0, 1, 2 and 3).

NETHERLANDS

Tobler, C., Visschers, V. H., & Siegrist, M. (2011). Eating green. Consumers' willingness to adopt ecological food consumption behaviors. *Appetite*, 57(3), 674-682. <https://doi.org/10.1016/j.appet.2011.08.010>

Four items asked participants how often they consumed beef or veal, pork, poultry, and sausages or other processed meat products → several times a day (5), daily (4), several times a week (3), several times a month (2), several times a year (1), and rarely or never (0).

SWITZERLAND

Trethewey, E., & Jackson, M. (2019). Values and cognitive mechanisms: Comparing the predictive factors of australian meat intake. *Appetite*, 142, 104386. <https://doi.org/https://doi.org/10.1016/j.appet.2019.104386>

Item 1: ‘In the past two weeks, how many days did you consume meat?’ → four options of “never” to “everyday”.

Item 2: ‘In the past two weeks, how many meals in a day would typically contain meat?’ with the options of breakfast, lunch and dinner.

For the final analysis, the number of breakfasts that contained meat was excluded from the behavioural meat consumption score, due to the reliability of the measure increasing (from $\alpha = .76$ to $\alpha = .83$) without this item. The number of days, lunches, and dinners that contained meat in the past two weeks made up a total meat consumption score, whereby a higher score indicates greater behavioural meat consumption. The scale had a possible range of 0–6.

AUSTRALIA

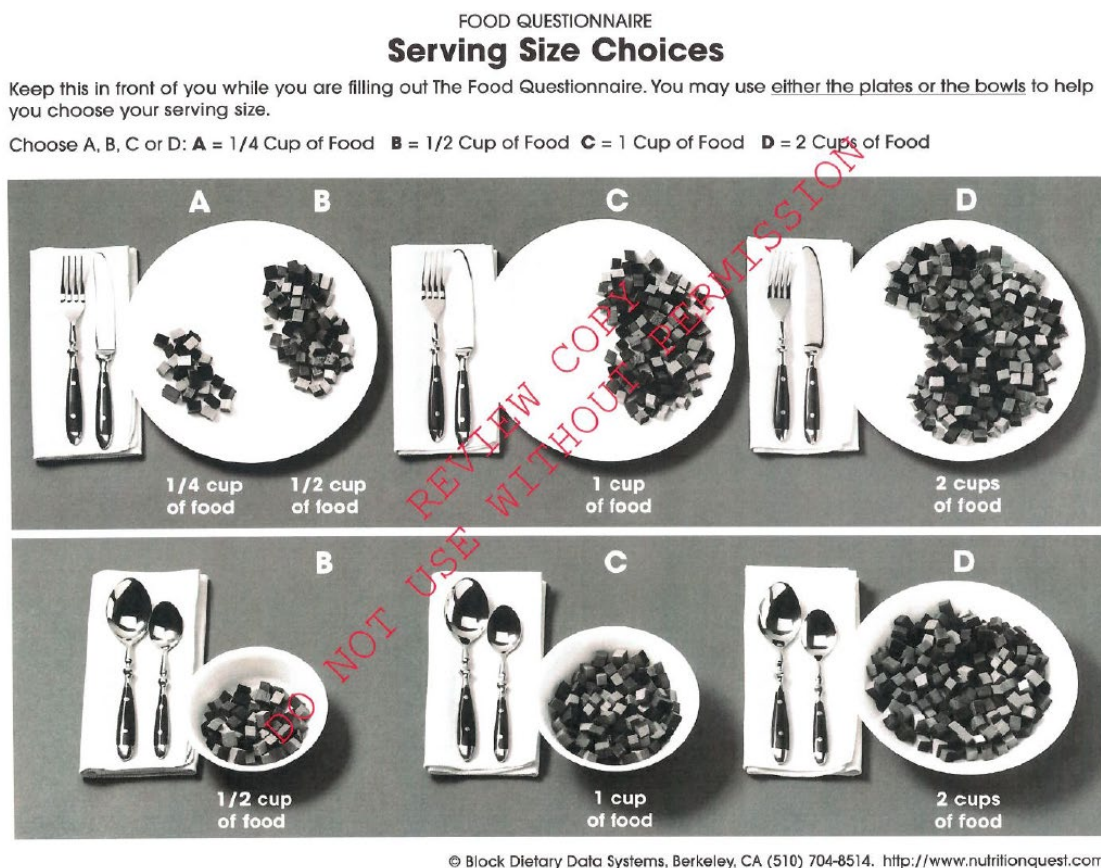
Zur, I., & A. Klöckner, C. (2014). Individual motivations for limiting meat consumption. *British Food Journal*, 116(4), 629-642. <https://doi.org/10.1108/bfj-08-2012-0193>

Meat eating behaviour was measured on a frequency scale, using an ordinal scale (0=never, 1=rarely, 2=on special occasions only, 3=sometimes, 4=one or more times a week, 5=daily).

NORWAY

PORTION SIZE MEASURES

Block (2000). <https://eprovide.mapi-trust.org/instruments/block-brief-2000-food-frequency-questionnaire>



Klockner, C. A. (2017). A stage model as an analysis framework for studying voluntary change in food choices - the case of beef consumption reduction in Norway. *Appetite*, 108, 434-449. <https://doi.org/10.1016/j.appet.2016.11.002>

The questionnaire started with an elaborate tracking of the amount of beef consumption and consumption of other meat and fish in the previous week.

The participants were asked, how many meals including beef and other meat/fish they had and how big the portion size was (with a picture showing a typical piece of beef/ other meat/fish as a portion size reference). Unprocessed and processed forms of meat, and sausages, patties, burgers, stews, convenience food, etc. including beef/other meat/fish were asked for in the same way. Cold-cut was excluded from the study.

Based on this information, the amount of beef and other meat/fish eaten in the previous week was estimated in grams by multiplying the frequency with the grams per portion corresponding to the portion size reported. A similar type of instrument is used by the National Institute for Consumer Research (SIFO) in Norway to assess food consumption patterns.

NORWAY

Schösler, H., Boer, J. d., & Boersema, J. J. (2012). Can we cut out the meat of the dish? Constructing consumer-oriented pathways towards meat substitution. *Appetite*, 58(1), 39-47. <https://doi.org/https://doi.org/10.1016/j.appet.2011.09.009>

The participants were shown three photos of a plate with a piece of meat that was 50, 100 or 150 g. These weights were also given in the descriptions of the photos. Each photo was accompanied by the question whether the portion size was too small, enough or too large (i.e. creating non-monotonic item response functions). After dichotomizing the responses to the 50 and the 150 g items, the three items yielded a reliable score (Guttman's Lambda 5 = .63).

NETHERLANDS

Schosler, H., de Boer, J., Boersema, J. J., & Aiking, H. (2015). Meat and masculinity among young chinese, turkish and dutch adults in the netherlands. *Appetite*, 89, 152-159. <https://doi.org/10.1016/j.appet.2015.02.013>

What portion size of a piece of meat would you be most inclined to choose? 50, 100, 150 or 200 grams.

NETHERLANDS

Sparkman, G., Macdonald, B. N. J., Caldwell, K. D., Kateman, B., & Boese, G. D. (2021). Cut back or give it up? The effectiveness of reduce and eliminate appeals and dynamic norm messaging to curb meat consumption. *Journal of Environmental Psychology*, 101592. <https://doi.org/https://doi.org/10.1016/j.jenvp.2021.101592>

The image below shows the approximate size of a single serving for different categories of food.



Thinking about your diet **over the past 30 days**, please select the responses that best describe how often you eat a serving of each of the following types of food.

[participants view a matrix style question assessing the following]

Dairy (cheese, milk, yogurt, etc.)

Chicken (fried chicken, in soup, grilled chicken, etc.)

Turkey (turkey dinner, turkey sandwich, in soup, etc.)

Fish and seafood (tuna, shrimp, crab, etc.)

Pork (ham, pork chops, ribs, etc.)

Beef (steak, meatballs, in tacos, etc.)

Other meat (duck, lamb, venison, etc.)

Eggs (omelet, in salad, in baked goods, etc.)

Fruit (apples, bananas, oranges, etc.)

Vegetables (carrots, mushrooms, potatoes, etc.)

Nuts (almonds, cashews, walnuts, peanuts, etc.)

Beans (soy, chickpeas, chili, etc.)

Veggie meats (tofu, veggie dogs, veggie burgers, tempeh, etc.)

Grains (breads, pasta, rice, etc.)

[Responses: *Never, Less than 1 time per week, 1-6 times per week, 1-3 times per day, 4 or more times per day*]

UNITED STATES

INTENTION MEASURES

Bertolotti, M., Chirchiglia, G., & Catellani, P. (2016). Promoting change in meat consumption among the elderly: Factual and prefactual framing of health and well-being. *Appetite*, 106, 37–47. [STUDY 2]

“Behavioural intentions. Participants' intention to change their consumption of red and cured meat, and fresh and cooked vegetables in the following month were measured using of a 7point scale, ranging from 1 (“much less than before”)to7(“much more than before”)” [p. 43].

ITALY

Cordts, A., Nitzko, S., & Spiller, A. (2014). Consumer response to negative information on meat consumption in Germany. *International Food and Agribusiness Management Review*, 17(A), 83-106. <https://doi.org/10.22004/AG.ECON.164599>

1 item, 3-point scale

“Do you believe that you will in the future eat more, less or approximately the same among of meat?”

GERMANY

Graca, J., Calheiros, M. M., & Oliveira, A. (2015). Attached to meat? (un)willingness and intentions to adopt a more plant-based diet. *Appetite*, 95, 113-125. <https://doi.org/10.1016/j.appet.2015.06.024>

Preface: "In recent times, MC is being increasingly debated on the grounds of environmental sustainability, health and safety concerns, and animal rights/welfare arguments."

Specifically, in the next six months, do you intend to...

- 1) Reduce meat consumption
 - 2) Avoid eating meat
 - 3) Follow a plant-based diet.
- 1 = Surely not to 5 = surely yes

Responses averaged to form a general measure of willingness, and general measure of intentions to reduce.

PORTUGAL, USA

Graham, T., & Abrahamse, W. (2017). Communicating the climate impacts of meat consumption: The effect of values and message framing. *Global Environmental Change*, 44, 98-108. <https://doi.org/10.1016/j.gloenvcha.2017.03.004>

Intention to reduce meat consumption was measured via a series of questions on a 7-point Likert scale, asking participants the extent to which they agreed or disagreed with: “I intend to eat meat most days of the forthcoming month”, “I plan to use more alternative protein sources than that of meat (such as beans, lentils, peas and nuts) in the forthcoming month”, and “In the forthcoming month, I am likely to eat meat on relatively few or no occasions”. Items were recoded so that a higher score reflected a stronger intention to eat meat (Cronbach's $\alpha = 0.88$) [102].

NEW ZEALAND

Krispenz, A., & Bertrams, A. (2020). Correlates of the intention to reduce meat consumption. *Sustainability*, 12(11). <https://doi.org/10.3390/su12114774>

“The intention to eat less meat was assessed with three items: (1) “In the future, I intend to eat meat at least one day less per week” (−3 (extremely unlikely) to +3 (extremely likely)); (2) “In the future, I will try to eat meat at least one day less per week” (−3 (definitely true) to +3 (definitely untrue)); and (3) “In the future, I plan to eat meat at least one day less per week” (−3 (strongly disagree) to +3 (strongly agree)). A mean intention score was calculated with high scores indicating a high intention to eat less meat. The items showed good internal consistencies (Cronbach's α Study 1 = 0.86, Study 2 = 0.85).” [p4].

GERMANY, SWITZERLAND

Nguyen, A., & Platow, M. J. (2021). "I'll eat meat because that's what we do": The role of national norms and national social identification on meat eating. *Appetite*, 164, 105287. <https://doi.org/10.1016/j.appet.2021.105287>

The meat-eating intentions items were (see also Sparks & Shepherd, 1992, for similar items): (1) “In the next week, I intend to eat meat, ” (2) “I am willing to eat meat in the next week,” (3) “The probability that I will eat meat in the next week is ...,” and (4) “The likelihood that I would serve meat to a friend/family in the next week is ” Responses on the third and fourth items of this latter inventory were measured on seven-point scales anchored with 1 =

“very low” and 7 = “very high.” Finally, we included a single item to measure intent to eat a vegetarian meal, “I am planning to eat a vegetarian meal in the next week.” [p. 4]

US, AUSTRALIA, UK

Pabian, S., Hudders, L., Poels, K., Stoffelen, F., & De Backer, C. J. S. (2020). Ninety minutes to reduce one's intention to eat meat: A preliminary experimental investigation on the effect of watching the Cowspiracy documentary on intention to reduce meat consumption. *Frontiers in Communication*, 5, 1-7. <https://doi.org/10.3389/fcomm.2020.00069>

3 items measure “intention to reduce meat consumption”:

(1) “I intent to eat less white meat”; (2) “I intend to eat less red meat”; (3) “I intend to eat less processed meat”. 7-point Likert scale from 0 (totally disagree) to 6 (totally agree).

SAMPLE NOT REPORTED

Povey, R., Wellens, B., & Conner, M. (2001). Attitudes towards following meat, vegetarian and vegan diets: an examination of the role of ambivalence. *Appetite*, 37(1), 15-26. <https://doi.org/10.1006/appe.2001.0406>

“Behavioural intentions. These were measured by recording participants' responses to a single statement regarding each diet, (e.g. “I intend to eat a vegetarian diet in the future”). Responses were measured on a 7-point scale that was weighted on both ends (“strongly agree” to “strongly disagree”)” (p. 18-19).

UK

Schenk, P., Rössel, J., & Scholz, M. (2018). Motivations and constraints of meat avoidance. *Sustainability*, 10(11). <https://doi.org/10.3390/su10113858>

“Therefore, our dependent variable was an index of two questions which measure the reported intention to consume meat (question 1) and fish (question 2) in the future, with seven-point scales, ranging from “everyday”(=1) to “never” (=7). Strict vegetarians represent the upper end of this continuum. Heavy meat-eaters represent the lower end. Plant-based diets are situated in between (cf. [1]). The higher is the score on this index, the stronger is the propensity to avoid meat consumption” [p. 7].

SWITZERLAND

Sparkman, G., & Walton, G. M. (2017). Dynamic norms promote sustainable behavior, even if it is counternormative. *Psychological Science*, 28(11), 1663–1674. <http://doi.org/10.1177/0956797617719950>. [STUDY 2]

1 item: [Single Choice Question]

Do you intend to change your meat consumption over the next month (30 days)? Meat includes chicken, beef, pork, duck, fish, seafood, etc.

"I intend to _____ my meat consumption over the next month."

[Options: Greatly decrease, Decrease, Somewhat decrease, Maintain current level, Somewhat increase, Increase, Greatly Increase]

USA

Sparkman, G., Macdonald, B. N. J., Caldwell, K. D., Kateman, B., & Boese, G. D. (2021). Cut back or give it up? The effectiveness of reduce and eliminate appeals and dynamic norm messaging to curb meat consumption. *Journal of Environmental Psychology*, 101592. <https://doi.org/https://doi.org/10.1016/j.jenvp.2021.101592>

Do you intend to change your meat consumption over the next month (30 days)? Meat includes chicken, beef, pork, duck, fish, seafood, etc.

"I intend to _____ my meat consumption over the next month."

[Options: Greatly decrease, Decrease, Somewhat decrease, Maintain current level, Somewhat increase, Increase, Greatly Increase]

USA

Stea, S., & Pickering, G. J. (2018). Optimizing messaging to reduce red meat consumption. *Environmental Communication*, 13(5), 633-648. <https://doi.org/10.1080/17524032.2017.1412994>

3 items, 7-point scale.

Participants were asked three questions to determine if they intended to alter their red meat consumption. First, participants were asked directly if they intended to reduce their frequency of red meat consumption, consume the same amount, or increase their consumption

(Berndsen & van der Pligt, 2004). Second, they indicated their level of agreement with the statement “I intend to reduce the amount of red meat I consume in the future” on a seven-point Likert scale, with scale anchors of “Extremely unlikely” to “Extremely likely.” Finally, participants were asked to indicate how often per week they intended to eat specific types of red meat in the future, using categorical frequency responses. For this last measure, participants were only asked about meats they had previously reported eating on at least 1–2 occasions per week.” [637-638].

CANADA

Tian, Q., Hilton, D., & Becker, M. (2016). Confronting the meat paradox in different cultural contexts: Reactions among Chinese and French participants. *Appetite*, 96, 187-194. <https://doi.org/10.1016/j.appet.2015.09.009>

[INTENTION COMBINED WITH WILLINGNESS TO EAT MEAT]

“Willingness to eat meat, including beef, pork and lamb, was measured by two items for each type of meat: desire to eat meat in the following days (to what extent do you want to eat beef [pork, lamb] within the next days [1 not at all, 4 neutral, 7 very much]) and the intended amount of meat consumption in the coming year (regarding your consumption of beef [pork, lamb] products, during the coming year you think you will... [1 decrease, 4 stay constant, 7 increase]). [P189].

CHINA, FRANCE

Vainio, A., Irz, X., & Hartikainen, H. (2018). How effective are messages and their characteristics in changing behavioural intentions to substitute plant-based foods for red meat? The mediating role of prior beliefs. *Appetite*, 125, 217–224. <http://doi/10.1016/j.appet.2018.02.002>.

“After having communicated the messages, the participants' intentions to change their consumption of red meat and plant-based alternatives were measured with questions asking how their consumption of six food items was going to change during the following 12 months. The food items were: the meat of ruminants (beef or lamb), pork, processed meat, vegetables, legumes (a plant-based source of proteins often promoted as a meat substitute), and plant-based dairy substitutes. There were six response categories: 1 (I don't consume now and will not consume in future), 2 (I intend to stop consumption), 3 (my consumption will decrease), 4 (my consumption will not change), 5 (my consumption will increase), and 6 (I will start consuming). The responses were combined into two dichotomous variables. The first variable was intentions to reduce or discontinue consumption of red meat products (original response categories 2 and 3) and the reference group were those who did not intend to reduce or discontinue (original response categories 1, and 4e6). The second variable was

intentions to start or increase consumption of plant-based products (original response categories 5e6), and the reference group were those who did not intend to start or increase (original response categories 1e4). About 40.90% per cent of the respondents (N ¼ 523) intended to reduce or discontinue their consumption of red meat and about 31.20% per cent of the respondents (N ¼ 399) intended to start or increase their consumption of plant-based alternatives” [p. 220].

FINLAND

Verain, M. C. D., Sijtsema, S. J., Dagevos, H., & Antonides, G. (2017). Attribute segmentation and communication effects on healthy and sustainable consumer diet intentions. *Sustainability*, 9, 734. <http://doi.org/10.3390/su9050743>.

The dependent variables included a range of sustainable and unsustainable food choice intentions related to dinner options. Respondents were asked to indicate, for each of 26 dinner components, the number of days (0–7) in the following week they intended to choose that component for their dinner. The options differed in quantities of unsustainable food (meat and dairy) as well as in sustainability of the production method (e.g., organic and animal friendly) and components were related to one of four product categories: vegetables, dairy, meat and “other”.

NETHERLANDS

Wyker, B. A., & Davison, K. K. (2010). Behavioral change theories can inform the prediction of young adults' adoption of a plant-based diet. *Journal of Nutrition Education Behavior*, 42(3), 168-177. <https://doi.org/10.1016/j.jneb.2009.03.124>

How much do you agree/disagree with the following statements:

“I intend to follow a plant-based diet in the next year”

“How likely is it that you will follow a plant-based diet in the next year?”

(1=not at all likely to 7= extremely likely)

USA

Zur, I., & A. Klöckner, C. (2014). Individual motivations for limiting meat consumption. *British Food Journal*, 116(4), 629-642. <https://doi.org/10.1108/bfj-08-2012-0193>

Reduce intentions were measured on an ordinal scale:

- 0 = no intention to reduce
- 1 = intention to reduce MC to special occasions only
- 2 = intention to avoid consumption of specific types of meat
- 3 = intention to become vegetarian
- 4 = intention to become vegan

NORWAY

STAGES OF CHANGE [RELATED TO INTENTION]

Weibel, C., Ohnmacht, T., Schaffner, D., & Kossmann, K. (2019). Reducing individual meat consumption: An integrated phase model approach. *Food Quality and Preference*, 73, 8-18. <https://doi.org/https://doi.org/10.1016/j.foodqual.2018.11.011>

Participants were asked what phase of the behavioural change process they would place themselves:

1. I have never considered reducing my meat consumption.
2. I've considered reducing my meat consumption, but I haven't yet put this plan into practice.
3. I make sure I consume less meat occasionally. In the future it is my firm intention to do this on a regular basis.
4. I take consuming little or no meat for granted.

(Based on Bamberg's (2013) 'Self-Regulation Model')

SWITZERLAND

Wyker, B. A., & Davison, K. K. (2010). Behavioral change theories can inform the prediction of young adults' adoption of a plant-based diet. *Journal of Nutrition Education Behavior*, 42(3), 168-177. <https://doi.org/10.1016/j.jneb.2009.03.124>

Which of the following five responses best describes your diet:

1. I do not follow a plant-based diet and do not plan to do so in the next 6 months. [Precontemplation]
2. I do not follow a plant-based diet, but have been thinking about doing so within the next 6 months. [Contemplation]
3. I presently follow a PBD, but not on a regular basis. [Preparation]

4. I presently follow a PBD, but have only begun doing so within the past 6 months.
[Action]
5. I presently follow a PBD and have been doing so for longer than 6 months.
[Maintenance]

(Based on the Transtheoretical Model)

USA

PREVIOUS CHANGES IN MEAT CONSUMPTION

Malek, L., Umberger, W. J., & Goddard, E. (2019). Committed vs. Uncommitted meat eaters: Understanding willingness to change protein consumption. *Appetite*, 138, 115-126. <https://doi.org/https://doi.org/10.1016/j.appet.2019.03.024>

Participants were asked to indicate how frequently they consume beef, chicken, pork, lamb, fish/seafood, dairy products and meat-free main meals during a typical month:

e.g., ‘During a typical month, how frequently do you eat a meat-free dish as your main meal (e.g., vegetable-based pasta dishes, vegetable stir-fries or risottos, vegetable frittatas or fritters, lentil curry etc.)?’

Responses were recoded into five categories for analysis: ‘most days (5–7 days)’, ‘2–4 days per week’, ‘1 day per week’, ‘1–3 times per month’, ‘less than once per month or never’.

For each type of meat, respondents were also asked whether they have changed the frequency of their consumption within the previous 12 months, with response options: no change, reduced, increased, started eating, and stopped eating altogether.

AUSTRALIA

MEAT CONSUMPTION FREQUENCY + CHANGES + INTENTION

Latvala, T., Niva, M., Mäkelä, J., Pouta, E., Heikkilä, J., Kotro, J., & Forsman-Hugg, S. (2012). Diversifying meat consumption patterns: Consumers' self-reported past behaviour and intentions for change. *Meat Science*, 92(1), 71-77. <https://doi.org/https://doi.org/10.1016/j.meatsci.2012.04.014>

In the survey a set of questions dealt with past changes in the consumption of beef, pork, chicken and vegetables. With a three-level scale the respondents expressed their perception of whether their own consumption had decreased, remained stable or increased in the previous 2–3 years. The same three-level scale was used to measure the respondents' future consumption intentions regarding the same meat types and vegetables.

The frequency of meat consumption was recorded using meat type-specific measures. The meat types included beef, pork and chicken. Table 2 provides the distribution of past and

future changes in consumption and the current frequency of different food types as main courses.

Table 2

The stated past changes and intended future changes in meat and vegetable consumption and the current consumption level.

	Proportion of consumers %				Currently consume more than once a week as a main course
	Have increased consumption during the past 2–3 years	Have decreased consumption during the past 2–3 years	Intend to increase consumption in the next 2–3 years	Intend to decrease consumption in the next 2–3 years	
Beef	6	31	3	17	55
Pork	4	27	2	17	53
Chicken	31	8	12	6	66
Vegetables	44	2	42	1	31

FINLAND

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- De Backer, C., Erreygers, S., De Cort, C., Vandermoere, F., Dhoest, A., Vrinten, J., & Van Bauwel, S. (2020). Meat and masculinities. Can differences in masculinity predict meat consumption, intentions to reduce meat and attitudes towards vegetarians? *Appetite*, 147, 104559. <https://doi.org/10.1016/j.appet.2019.104559>
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- Graham, T., & Abrahamse, W. (2017). Communicating the climate impacts of meat consumption: The effect of values and message framing. *Global Environmental Change*, 44, 98-108. <https://doi.org/https://doi.org/10.1016/j.gloenvcha.2017.03.004>
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- Kunst, J. R., & Hohle, S. M. (2016). Meat eaters by dissociation: How we present, prepare and talk about meat increases willingness to eat meat by reducing empathy and disgust. *Appetite*, 105, 758-774. <https://doi.org/10.1016/j.appet.2016.07.009>
- Latvala, T., Niva, M., Mäkelä, J., Pouta, E., Heikkilä, J., Kotro, J., & Forsman-Hugg, S. (2012). Diversifying meat consumption patterns: Consumers' self-reported past behaviour and intentions for change. *Meat Science*, 92(1), 71-77. <https://doi.org/https://doi.org/10.1016/j.meatsci.2012.04.014>
- Lea, E., & Worsley, A. (2001). Influences on meat consumption in Australia. *Appetite*, 36(2), 127-136. <https://doi.org/10.1006/appe.2000.0386>
- Lentz, G., Connelly, S., Miroso, M., & Jowett, T. (2018). Gauging attitudes and behaviours: Meat consumption and potential reduction. *Appetite*, 127, 230-241. <https://doi.org/10.1016/j.appet.2018.04.015>
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Supplementary B

Chapter 6: Measures of Convergent Validity

1. Attitude to eating meat (Graca et al., 2015; Lentz et al., 2018)

On the scale provided, please choose what most closely aligns with your thoughts and attitudes towards the act of eating meat. Scores closer to 1 mean you agree more with the attribute on the left, and score closer to 7 mean you agree more with the attribute on the right.

- 4. Bad Good
- 5. Unpleasant Pleasant
- 6. Against For
- 7. Favourable Unfavourable

2. Subjective Norm (Cheah et al., 2020; Povey et al., 2001)

Please indicate the extent to which you agree or disagree with the following statement, on a scale where 1 = strongly disagree and 5 = strongly agree:

- 9. My female friends would approve (or do approve) of me reducing my meat consumption.
- 10. My male friends would approve (or do approve) of me reducing my meat consumption.
- 11. Female family members would approve (or do approve) of me reducing my meat consumption.
- 12. Male family members would approve (or do approve) of me reducing my meat consumption.
- 13. Female work colleagues would approve (or do approve) of me reducing my meat consumption.
- 14. Male work colleagues would approve (or do approve) of me reducing my meat consumption.
- 15. My partner would approve (or does approve) of me reducing my meat consumption.
- 16. Health professionals would approve (or do approve) of me reducing my meat consumption.

[Unapplicable items (i.e., partner) were given a score of 0.]

3. Perceived Behavioural Control (Ajzen, 2002; Graca et al., 2015; Lentz et al., 2018)

In regards to your meat consumption habits...

(where 1 = Strongly disagree and 5 = strongly agree)

5. I am confident that I could change my meat consumption habits if I wanted to.
6. Whether I change my meat consumption habits or not is entirely up to me.
7. Changing my meat consumption habits or not is something that is under my control.
8. Changing my meat consumption habits would be difficult.*

*Note: the fourth item captures the self-efficacy component of PBC based on Ajzen's (2002) theory, which was not covered in the scales by Graca et al. (2015) or Lentz et al. (2018).

4. Willingness to reduce meat consumption (adapted from Graca et al., 2015)

In recent times, MC is being increasingly debated on the grounds of environmental sustainability, health and safety concerns, and animal rights/welfare argument.

Please tell us your willingness to (1 = very unwilling, 5 = very willing):

4. Slightly reduce your meat consumption
5. Drastically reduce your meat consumption.
6. Stop eating meat altogether.

5. Meat-eating Justifications (Rothgerber, 2013)

On a scale of 1 = strongly disagree to 5 = strongly agree, to what extent do you agree with the following statements:

28. I enjoy eating meat too much to ever give it up.
29. Animals don't really suffer when being raised and killed for meat.
30. It's acceptable to eat certain animals because they're bred for that purpose.
31. To me, there is a real difference between animals we keep as pets and animals we eat as food.
32. When I look at meat, I try hard not to connect it with an animal.
33. God intended for us to eat animals.
34. I try not to think about what goes on in slaughterhouses.

35. Meat is essential for strong muscles.
36. It wouldn't surprise me to learn that scientists believe the human body (e.g. our teeth) has evolved to eat meat.
37. Meat tastes too good to worry about what all the critics say.
38. Animals do not feel pain the same way humans do.
39. Humans are at the top of the food chain and meant to eat animals.
40. It seems wrong that people in some cultures eat dogs and cats.
41. I do not like to think about where the meat I eat comes from.
42. God gave us dominion over animals.
43. I would have problems touring a slaughterhouse.
44. We need the protein we can only get in meat for healthy development.
45. It violates human destiny and evolution to give up eating meat.
46. There is no food that satisfies me as much as a delicious piece of meat.
47. Meat is processed so that animal pain and discomfort is minimised and avoided.
48. Ultimately, animals are here to serve our needs.
49. I am more sensitive to the suffering of house pets like cats and dogs than other wild animals.
50. When I eat meat, I try not to think about the life of the animal I am eating.
51. It is God's will that humans eat animals.
52. I try to stay away when people start talking to me in graphic terms about how the animals we eat suffer.
53. We need meat for a healthy diet.
54. Our early ancestors ate meat, and we are supposed to also.

6. Animal Flesh Disgust Subscale (Hartmann & Siegrist, 2018)

Please indicate how disgusting you perceive the following products or situations to be:

Not disgusting at all 1 2 3 4 5 6 Extremely disgusting

5. To put animal cartilage into my mouth.
6. To see raw meat.
7. To eat a steak that is still bloody inside.
8. To see a whole pig en brochette (on a spit roast).

7. Conformity to Masculine Norms Inventory Short Form (Levant et al., 2020)

On a scale from 1 – 6, where 1 is strongly disagree, and 6 is strongly agree, please indicate to what extent you agree or disagree that the following statements apply to you:

31. I tend to share my feelings (R)
32. I like to talk about my feelings (R)
33. I bring up my feelings when talking to others (R)
34. For me, the best feeling in the world comes from winning
35. I will do anything to win
36. In general I must get my way
37. I would feel good if I had many sexual partners
38. I would change sexual partners often if I could
39. I would find it enjoyable to date more than one person at a time
40. It's never ok for me to be violent (R)
41. I think that violence is sometimes necessary
42. I dislike any kind of violence (R)
43. It would be awful if people thought I was gay
44. I would get angry if people thought I was gay
45. I would be furious if someone thought I was gay
46. Having status is not important to me (R)
47. I think that trying to be important is a waste of time (R)
48. I would hate to be important (R)
49. Work comes first for me
50. I feel good when work is my first priority
51. I need to prioritize my work over other things
52. I love it when men are in charge of women
53. The women in my life should obey me
54. Things tend to be better when men are in charge
55. It bothers me when I have to ask for help
56. I am not ashamed to ask for help (R)
57. I never ask for help
58. I enjoy taking risks
59. I take risks
60. I put myself in risky situations

8. Short Social Dominance Orientation Scale (Pratto et al., 2013)

There are many kinds of groups in the world: men and women, ethnic and religious groups, nationalities, political factions. How much do you support or oppose the ideas about groups in general? Next to each of the following statements, select a number from 1 to 10 to show your opinion.

Extremely Oppose 1 2 3 4 5 6 7 8 9 10 Extremely Favour

[Note: We changed the scoring to 1=extremely oppose to 5=extremely favour]

5. In setting priorities, we must consider all groups (R)
6. We should not push for group equality.
7. Group equality should be our ideal. (R)
8. Superior groups should dominate inferior groups.

9. Meat-eating habit strength (Rees et al., 2018)

Please indicate to what extent you agree or disagree with the following statements, where 1 = strongly disagree, and 5 = strongly agree.

Eating meat is something...

6. I do automatically
7. I do without having to consciously remember
8. I do without thinking
9. I have no need to think about doing.
10. That is typically me.

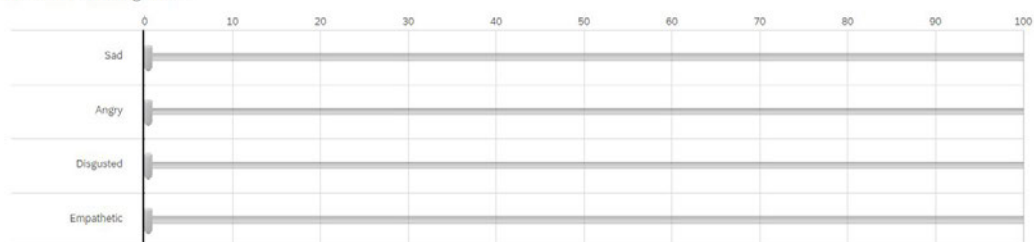
10. Animal empathy (adapted from Anderson et al., 2019)

When you look at the following images, to what extent do you feel the following emotions on a scale where 0 = not at all and 100 = very much:

a)



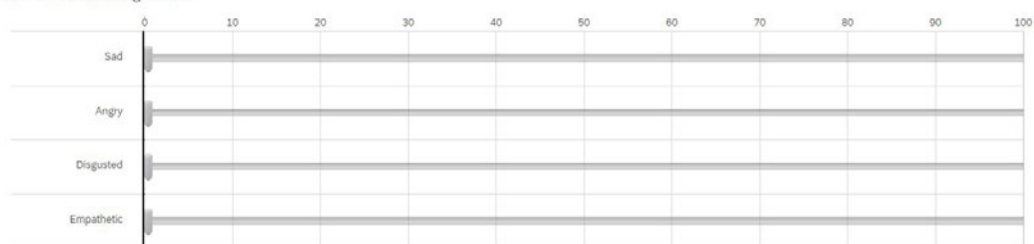
When I see this image I feel...



b)



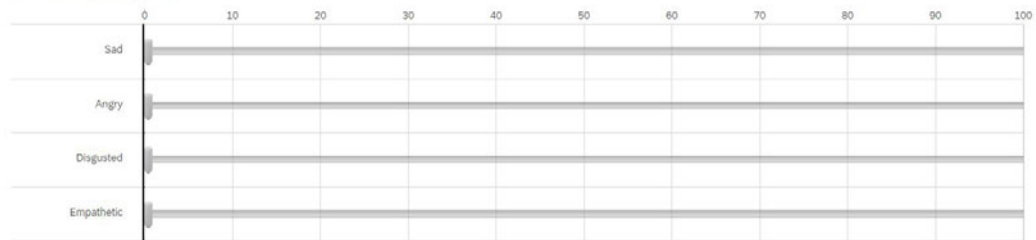
When I see this image I feel...



c)



When I see this image I feel...



d)

When you think about the fact that animals are killed so that humans can eat them, I feel...



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Supplementary C

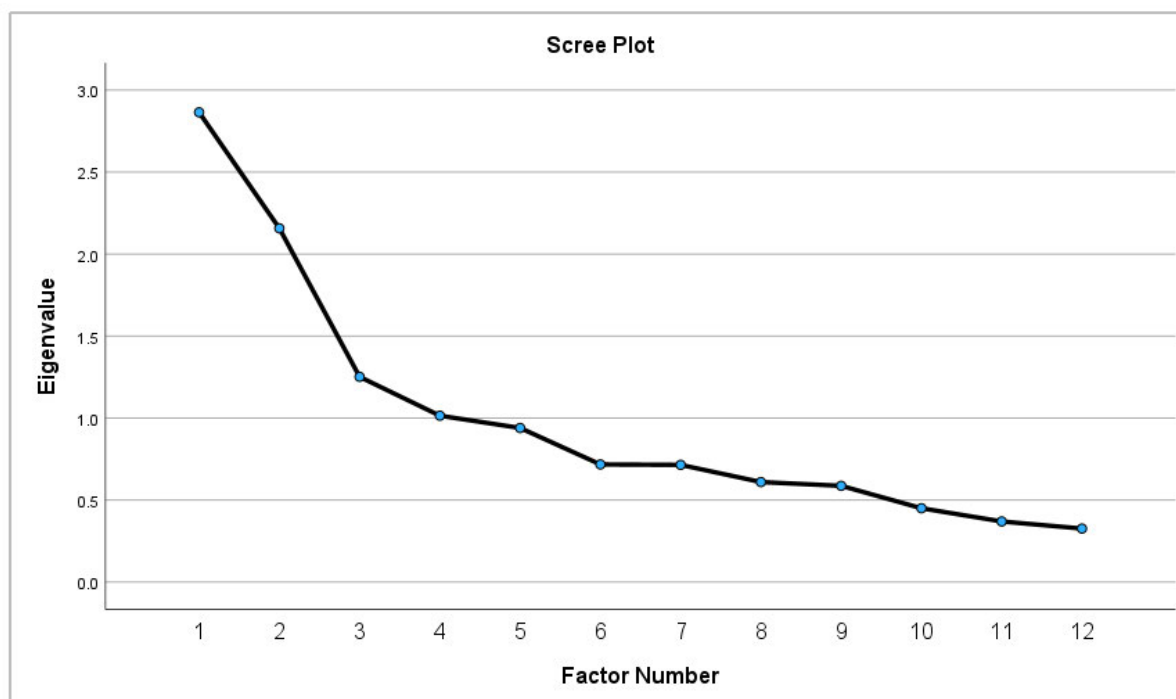
Chapter 6: EFA & CFA of two-factor structure

Exploratory Factor Analysis

Using sample 1, exploratory factor analysis was run on the questionnaire items when all meat consumption and intention items were entered into the model simultaneously.

EFA Model 1

According to Velicer's Revised MAP test (Velicer, Eaton, and Fava 2000), the smallest average 4th power partial correlation = .0027, indicating the presence of two latent factors. A principal axis factoring analysis specifying two fixed factors was run, converging in 7 iterations. Bartlett's test of sphericity was significant, and Kaiser-Meyer-Olkin's test of sampling adequacy value of .674 indicated the data were suitable for factor analysis. The determinant value (.073) was greater than .00001, indicating no multicollinearity. A scree plot also suggested the presence of two factors (Figure 1). Additionally, a two-factor solution made theoretical sense, as items fell into the two distinct constructs we intended to measure (meat consumption and intentions to eat meat). The two factors explained 41.85% of the variability in the questionnaire data. However, factor loadings did not make theoretical sense as they did not reflect the expected two-factor solution with clear distinctions between the meat-related and intention related items (Table 1). Moreover, numerous items had cross loadings and therefore did not load distinctly onto one factor.

Figure 1 Scree plot of EFA Model 1 using principal axis factoring extraction**Table 1**

EFA Model 1 Factor Loadings

Scale Item	Factor 1	Factor 2
Beef	.634	-.363
Lamb	.407	-.097
Poultry	.484	-.153
Pork/Bacon/Ham	.422	-.312
OPM	<u>.519</u>	<u>-.505</u>
Fish/Seafood	.274	-.049
Beef Intention	<u>.464</u>	<u>.479</u>
Lamb Intention	.451	.264
Poultry Intention	.522	.140
Pork/Bacon/Ham Intention	<u>.357</u>	<u>.491</u>
OPM Intention	.176	.676
Fish/Seafood Intention	<u>.200</u>	<u>.210</u>

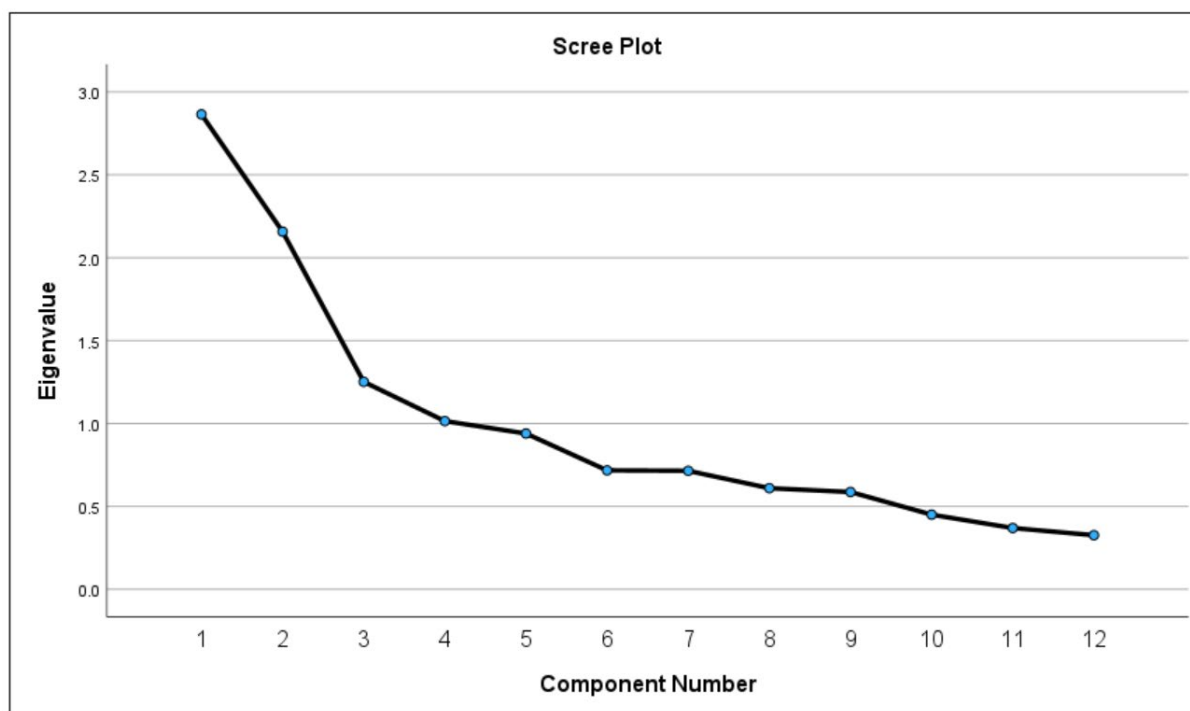
Note. Exploratory factor analysis conducted on all meat and intention items using principal axis factoring. Bold values indicate which factor the scale item loads onto. Underlined values indicate item cross loadings. OPM = other processed meats.

EFA Model 2

The EFA was rerun with a principal components extraction method, and as factors were expected to correlate, an oblique rotation method (promax, Kappa = 4) was selected (Allen, Bennett, and Heritage 2014). The model converged in 3 iterations. Again, VSP suggested the presence of two factors (Figure 2).

This time the items loaded distinctly onto two factors, one representing meat consumption, the other representing intention to eat meat (Table 2). The two factors explained 41.85% variance in the questionnaire data. Factor 1, *Meat Consumption*, included all meat categories (beef, lamb, poultry, pork/bacon/ham, other processed meats, and fish/seafood), explaining 23.87% of the variability in the questionnaire items. Factor 2, *Intention to Eat Meat*, included all intention items, explaining 17.98% variance.

All factor loadings were above the recommended minimum of 0.40 (Howard 2016), except for fish/seafood consumption (.345). Both the Meat Consumption factor (coefficient $H = .83$) and the Intention to Eat Meat factor (coefficient $H = .81$) had acceptable internal consistency reliability. However, the fish/seafood consumption and intention items did not meet the minimum 0.30 threshold and therefore did not demonstrate acceptable reliability (corrected item-total correlation = .232). This indicated that the fish/seafood consumption and intention items should be removed.

Figure 2 Scree plot of EFA Model 2 using principal components extraction**Table 2**

EFA Model 2 Factor Loadings and Item Reliability

Scale Item	Factor 1	Factor 2	Corrected item-total correlation
Beef	.783	.000	.574
Lamb	.495	.136	.412
Poultry	.581	.128	.356
Pork/Bacon/Ham	.638	-.089	.397
OPM	.777	-.191	.547
Fish/Seafood	.345	.103	.232*
Beef Intention	.086	.730	.496
Lamb Intention	.216	.569	.425
Poultry Intention	.383	.470	.365
Pork/Bacon/Ham Intention	-.032	.713	.507
OPM Intention	-.299	.739	.469
Fish/Seafood Intention	.018	.406	.258*

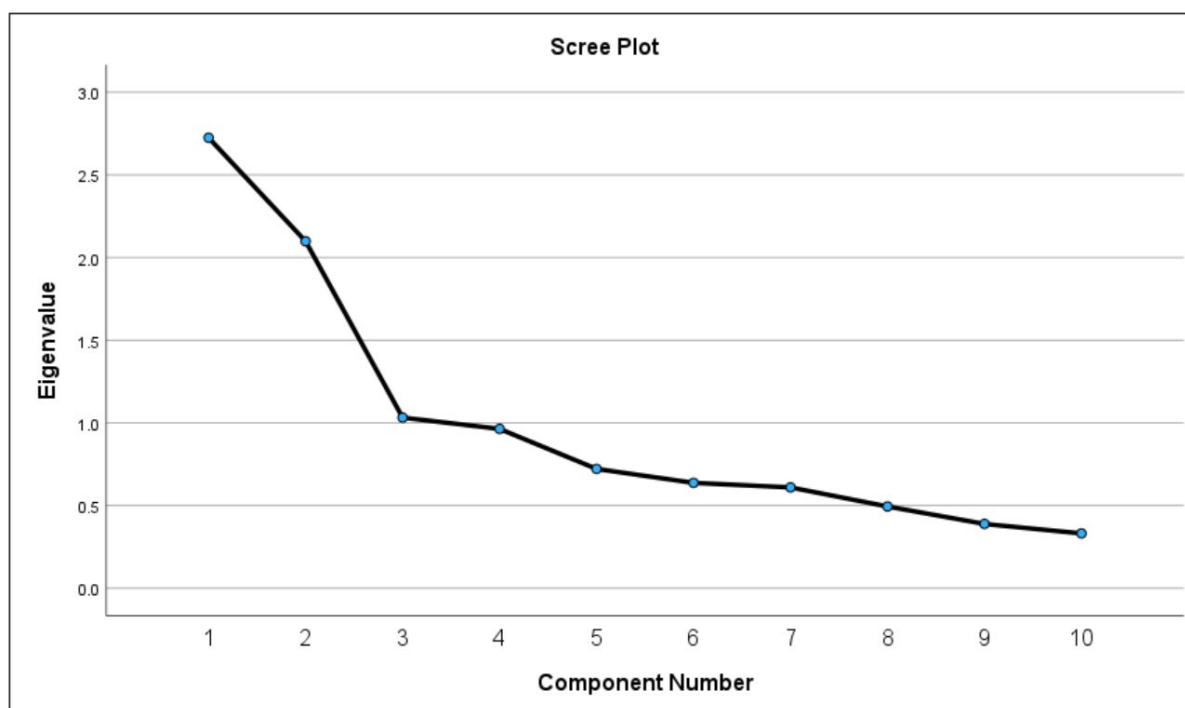
Note. Exploratory factor analysis conducted on all meat and intention items using principal components analysis extraction. Bold values indicate which factor the scale item loads onto. * indicates corrected item-total correlations that

do not meet recommended thresholds for internal consistency reliability. OPM = other processed meats.

EFA Model 3

The EFA was rerun, excluding the fish/seafood consumption and intention items. Velicer's Revised MAP test indicated the presence of two factors, with the smallest average 4th power partial correlation = .0049. An EFA with two fixed factors was run using a principal components extraction method and an oblique rotation method (promax, Kappa = 4). The model converged in 3 iterations. Again, VSP suggested the presence of two factors (Figure 3). The two factors explained 48.23% variance in the questionnaire data. Factor 1, *Meat Consumption*, included all meat categories (beef, lamb, poultry, pork/bacon/ham, other processed meats), explaining 27.25% of the variability in the questionnaire items. Factor 2, *Intention to Eat Meat*, included all intention items, explaining 20.98% variance.

The pattern matrix indicated that the items loaded onto two factors, one representing meat consumption, the other representing intention to eat meat (Table 3). However, while all factor loadings met the minimum 0.40 threshold, there was cross loading on the poultry intention item. We did not believe it made theoretical sense to remove only the poultry intention item and not the poultry consumption item. Therefore, the EFA did not provide a clean interpretable solution.

Figure 3 Scree plot of EFA Model 3 (excluding fish/seafood items)**Table 2**

EFA Model 3 Factor Loadings and Item Reliability

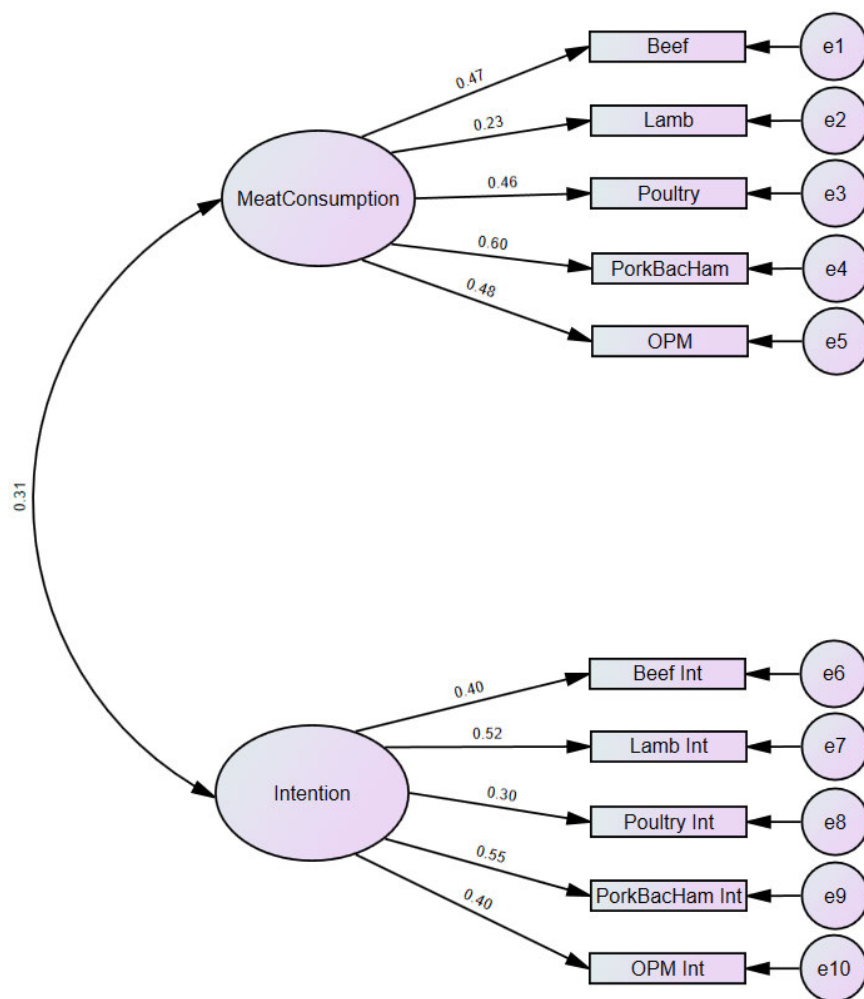
Scale Item	Factor 1	Factor 2	Corrected item-total correlation
Beef	.784	.028	.596
Lamb	.453	.117	.339
Poultry	.597	.146	.382
Pork/Bacon/Ham	.646	-.064	.413
OPM	.784	-.185	.563
Beef Intention	.076	.746	.502
Lamb Intention	.231	.582	.420
Poultry Intention	.399	.468	.339
Pork/Bacon/Ham Intention	-.039	.722	.509
OPM Intention	-.322	.754	.489

Note. Exploratory factor analysis conducted on all meat and intention items using principal components analysis extraction. Bold values indicate which factor the scale item loads onto. Underlined values indicate item cross loading. OPM = other processed meats.

Confirmatory factor analysis

Although the two-factor latent structure identified in the EFA did not demonstrate construct validity, for thoroughness we further tested the validity of this two-factor latent structure in sample 2, using confirmatory factory analysis with 5000 bootstrap samples to correct for multivariate non-normality (Mardia's kurtosis = 42.86). The two-factor CFA model is displayed in Figure 4.

Standardised path coefficients were all significant ($p < .01$) and of moderate strength, except for lamb consumption and poultry intention which were weak. The correlation between the Meat Consumption factor and the Intention to Eat Meat latent factors was weak-to-moderate and significant ($p < .001$). All errors and squared multiple correlations were significant ($p < .001$). The Bollen-Stine chi-square fit index was significant ($p < .001$), indicating poor model fit. The SRMR (.0512) met acceptable thresholds, indicating good model fit. However, the remaining fit indices indicated poor model fit (CMIN/DF=2.827, NFI=.764, TLI=.773, CFI=.828, RMSEA=.063). Therefore, the CFA did not provide evidence of construct validity for the two-factor model.

Figure 4 Two-factor model tested with confirmatory factor analysis

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