Body Appreciation in Adolescents: A Multi-Study Approach to Understanding a Brief School-Based Program, Protective Factors, and Assessment in School Settings.

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Abstract

Body image concerns commonly emerge during early adolescence and are associated with poorer psychological wellbeing and reduced academic engagement. While prevention programs are widely implemented in schools, evidence for their effectiveness is mixed, and less is known about psychological factors that support body appreciation or how appearance concerns impact classroom participation. This thesis examined body appreciation in early adolescence through three complementary studies drawing on a shared adolescent dataset, with distinct research questions, analytic samples, and methodological approaches.

Study 1 evaluated the effectiveness of Becoming Media Savvy, a single-session body image program developed by the Butterfly Foundation and delivered to Australian secondary school students. Using a randomised controlled design with 269 students aged 12 to 14 years, the study assessed body appreciation alongside self-esteem, media literacy, appearance-ideal internalisation, social comparison, and appearance-related conversations. Contrary to hypotheses, no significant program effects were observed on any outcome following correction for multiple comparisons. Body appreciation did not improve, media literacy declined across both groups, and self-esteem increased similarly in intervention and control participants, suggesting change over time that was independent of program exposure. No sex differences in program effects were observed. Findings highlight the need to reconsider the structure and duration of universal interventions for promoting body appreciation in early adolescence.

Study 2 examined psychological predictors of body appreciation to identify potential alternative prevention targets. Hierarchical regression revealed sex differences in predictive pathways. For girls, self-esteem was the primary predictor of body appreciation, with resilience making a smaller but significant contribution. For boys, a multi-factor model

emerged, with self-esteem, resilience, and positive affect each contributing uniquely. These findings suggest that interventions for girls should primarily strengthen self-esteem while also supporting resilience, whereas interventions for boys may need to target multiple psychological resources concurrently.

Study 3 addressed limitations in existing measurement by developing and validating the Appearance-Related School Interference (ARSI) scale, assessing how appearance concerns disrupt classroom participation. Using split-sample methodology, exploratory and confirmatory factor analyses supported a unidimensional 7-item structure capturing interference in activities including classroom participation, presentations, group work, and physical education. The ARSI demonstrated strong reliability ($\alpha = 0.83–0.88$) and good construct validity, with scores associated with lower body appreciation, lower psychosocial wellbeing, greater appearance-focused cognitions, and higher school anxiety. Correlational patterns differed by sex, suggesting distinct mechanisms through which appearance concerns affect academic engagement.

Despite limitations including self-report measures, a single predominately Angelo-Australian cohort from higher SES metropolitan Melbourne schools, and cross-sectional design for Studies 2 and 3, these studies provide key insights into body appreciation during early adolescence. Brief, single-session programs are unlikely to produce meaningful improvements, highlighting the potential value of longer or more intensive programs. Self-esteem emerged as the central predictor for girls, with resilience also contributing, while boys' body appreciation is influenced by multiple psychological resources, suggesting potential sex-specific prevention targets. The ARSI scale demonstrates that appearance concerns can disrupt classroom participation, emphasising the value of assessing practical outcomes alongside attitudes to guide developmentally appropriate, targeted prevention programs.

Declaration

I, Emily Deborah Keohane, declare that the Doctor of Philosophy thesis entitled 'Body Appreciation in Adolescents: A Multi-Study Approach to Understanding a Brief School-Based Program, Protective Factors, and Assessment in School Settings', 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 previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicates, this thesis is my own work.

I have conducted my research in alignment with the Australian Code of Responsible Conduct of Research and Victoria University's Higher Degree by Research Policy and Procedures.

All research procedures reported in the thesis were approved by the Victoria Human Ethics Committee HRE16 – 286.

This thesis has been edited for clarity of expression, punctuation and grammar using Microsoft Copilot in Word tool. This use complies with VU guidelines on use of editors in HDR theses and overall, VU policy on use of AI in research.

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Chapter 1: Introduction and Literature Review

1.1 Introduction

Body image concerns represent one of the most prevalent psychological challenges facing adolescents today, with researchers consistently documenting high rates of body dissatisfaction, appearance-related anxiety, and associated mental health difficulties across diverse populations (McHale et al., 2024; Rodgers et al., 2023). Traditional approaches to understanding and addressing these concerns have predominantly focused on pathology, dysfunction, and deficit-based models that emphasise what is wrong with adolescents' relationships with their bodies (Tylka & Wood-Barcalow, 2015). While this perspective has yielded valuable insights into risk factors and negative outcomes, it has limited guidance for understating what constitutes healthy, adaptive body image or how to actively promote positive body image attitudes and behaviours. This gap has prompted a shift toward strength-based approaches that examine what enables individuals to thrive.

The emergence of positive psychology has fundamentally challenged the deficit-based approaches across multiple domains of human functioning, advocating instead for strength-based perspectives that examine what enables individuals to thrive rather than merely survive (Seligman & Csikszentmihalyi, 2000). Within body image research, this paradigm shift has led to the development of positive body image constructs, most notably body appreciation, which is a multifaceted construct encompassing acceptance of, favourable opinions toward, and respect for one's body that extends beyond appearance to include appreciation of bodily functionality and engagement in body-protective behaviours (Tylka & Wood-Barcalow, 2015).

The construct of body appreciation represents a fundamentally different way of understanding the body-self relationship, moving beyond the traditional focus on appearance satisfaction to encompass a holistic appreciation of the body as an integrated, functional, and deserving entity (Wood-Barcalow et al., 2010; Tylka & Wood-Barcalow, 2015). This construct has emerged as a central variable in contemporary positive body image research, offering both theoretical insights into adaptive body image processes and practical targets for intervention development (Tylka, 2018).

The adolescent period, particularly early adolescence represents a critical development window for body image formation (McCabe & Ricciardelli, 2004). The convergence of rapid physical changes, cognitive development, and heightened social awareness creates both vulnerabilities and opportunities for shaping lifelong patterns of body-related attitudes and behaviours (Bucchianeri et al., 2013). Understanding how to promote body appreciation during this developmental period and identifying factors that support its development has significant implications for prevention, intervention, and broader public health initiatives.

This thesis examines body appreciation in adolescents through a multi-study approach designed to advance understanding of intervention effectiveness, protective factors, and assessment methods. The research addresses critical gaps in the literature while contributing to both theoretical understanding and practical applications for real-world settings. Specifically, Study 1 evaluates a brief single-session body image program delivered in school settings, examining its effectiveness in promoting body appreciation among early adolescents. Study 2 investigates the psychological pathways through which factors such as self-esteem, resilience, and positive affect predict body appreciation, with particular attention to potential sex differences in these relationships. Study 3 addresses a measurement gap by developing and validating a brief screening tool to assess appearance-related interference

with school participation. Together, these studies provide complementary perspectives on promoting and protecting body appreciation during this critical developmental period.

1.2 Literature Review

Understanding Body Image

Body image, how an individual perceives, thinks, feels, and behaves in relation to their body, is a malleable construct that can be positively and negatively influenced by new information and experiences through attitudes of family, peers, media exposure, and the school environment (Cash & Smolak, 2011; Slade, 1994; Tort-Nasarre et al., 2021). *Positive body image* encompasses valuing and emphasising what makes one's body unique and what it can do, regardless of imperfections or whether it matches societal beauty ideals (Tylka, 2018). It includes self-acceptance, appreciation, and approaches body-related information through a protective lens (Gillen & Markey, 2023). Positive body image is associated with beneficial health and well-being outcomes such as increased self-esteem, decreased depression symptoms, and dieting (Gillen, 2015). *Body dissatisfaction*, represents one of several related constructs assessing negative body image. It is defined as a negative attitude towards one's body stemming from the perceived gap between one's perceptions, thoughts, and feeling about physical appearance and desired appearance (Heider et a., 2018). Related terms include *body esteem*, *body image concerns*, and *negative body image* are also found in the literature, reflecting different researcher's operational definitions and measurement approaches. This thesis retains the specific terminology used in each cited study to maintain fidelity to the original research. These related constructs capture the discrepancy between how individuals perceive their body and their desired appearance, resulting in negative psychological and behavioural consequences (Cash & Szymanski, 1995; Merino et al., 2024).

Body image concerns involve the ongoing preoccupation with negative feelings towards one's physical appearance, encompassing body shape, weight, and other physical features (Rodgers et al., 2023). These concerns are widespread internationally and are seen across people of all ages and genders, primarily driven by significant cultural pressure to achieve appearance standards (Merino et al., 2024). While the specific nature of these concerns differs across cultures, their widespread occurrence and link to reduced mental and physical wellbeing are a universal issue that require intervention (Rodgers et al., 2023). Body image concerns represent a significant mental health challenge facing today's adolescents. In a recent national survey of Australian adolescents, body image was rated as one of the top four personal concerns, with 25.3% of the sample reporting they were extremely or very concerned about body image (McHale et al., 2024). These concerns are important as body dissatisfaction is related to a range of negative mental and physical consequences including lower self-esteem, greater psychological distress, and increased problematic eating behaviours in both males and females (Brechan & Kvalem, 2015; Griffiths et al., 2016; Laporta-Herrero et al., 2018). A recent scoping review of body image research confirms that peer influence, media, and the school environment play significant roles in influencing young people's body image (Zanlorenci et al., 2024). Importantly, body dissatisfaction serves as a primary risk factor for eating disorder development, with longitudinal research demonstrating that adolescents with higher body dissatisfaction show increased risk for subsequent disordered eating behaviours and clinical eating disorders (Stice et al., 2011). The pathway from body dissatisfaction to eating pathology underscores the critical importance of early intervention during adolescence, when body image concerns typically emerge and intensify.

Longitudinal research has identified distinct developmental patterns that persist from adolescence into adulthood. Recent trajectory research has identified that adolescents who reported low body esteem at age 11 remained relatively stable at 4-year follow-up and was

predicted by factors such as increased appearance-related teasing, reduced self-esteem, lower positive affect, and higher dietary restraint (Lacroix et al., 2022). Body image concerns typically increase during adolescence, with girls generally showing greater increases in body dissatisfaction throughout the adolescent period compared to boys (Dion et al., 2015). Studying body image during the adolescent period is essential as this developmental period creates unique vulnerabilities that can lead to long-lasting negative impacts, and these issues often do not resolve on their own without active support or intervention.

The significance of addressing body image concerns during adolescence cannot be overstated. Eating disorders have among the highest mortality rates of all mental illnesses, with anorexia nervosa specifically showing the highest mortality rate compared to other eating disorders (Arcelus et al., 2011; Auger et al., 2021; van Hoeken et al., 2020). The economic burden is equally substantial, with recent Australian data showing that the total economic and social costs attributed to eating disorders cost the Australian economy $66.9 billion in 2023 (Deloitte Access Economic & Butterfly Foundation, 2024). Additionally, this report also highlights that the number of Australians living with an eating disorder is 4.45% or 1.1 million people, a 21% increase since 2012. This research is particularly relevant in the Australian context, where cross-national research demonstrates that Australia shows some of the largest negative differences in body appreciation compared to other nations (Swami et al., 2023).

Adolescence represents a critical period for body image development due to the convergence of physical, cognitive, and social changes. During puberty, adolescents experience significant physical transformations that interact differently with cultural body ideals for boys and girls. For girls, pubertal changes including increased body fat percentage and hip widening move them further from the cultural thin ideal, potentially causing distress (Voelker et al., 2015). Conversely, boys' pubertal development, including increased muscle

definition and shoulder width, generally moves them closer to the muscular ideal, though body image concerns in boys have historically been underestimated (Labre, 2002; Voelker et al., 2015). Much of the understanding of body image concerns among boys is from studies conducted predominantly among cisgender boys, and systematic reviews exclusively focusing on boys remaining largely missing from the literature (Ahuja et al., 2024).

The timing of puberty provides additional insight into vulnerability. Early maturation in girls and late maturation in boys is associated with increased body dissatisfaction (McCabe & Ricciardelli, 2004; Grower et al., 2019; Tarif et al., 2025). A longitudinal study reported that boys who perceived themselves as late bloomers faced higher risk of sustained body dissatisfaction throughout high school (de Guzman & Nishina, 2014). Cognitive development during adolescence further amplifies appearance concerns. The emergence of metacognition allows adolescents to think about others' thoughts, leading to what Elkind (1967) termed the imaginary audience, the belief that they are the focus of everyone's attention and critique. This developmental phenomenon may intensify self-consciousness about physical appearance during an already vulnerable period of bodily change (Zheng et al., 2019).

Similarly, Fredrickson and Roberts' (1997) objectification theory proposes that repeated exposure to objectifying experiences leads individuals, particularly females, to internalise an observer’s perspective of their bodies. This process of self-objectification shifts attention away from bodily function toward appearance-based evaluation. Empirical support for this framework has been demonstrated in adolescent populations. Tiggemann et al. (2010) found that an objectification theory–based model was supported in both adolescent girls and boys, although girls reported higher levels of body surveillance, appearance anxiety, body shame, and disordered eating behaviours. Extending this work longitudinally, Vangeel et al. (2018) showed that increases in internalisation of sociocultural appearance ideals during adolescence predicted later increases in valuing appearance over competence and body

surveillance into emerging adulthood, highlighting the developmental persistence of self-objectification processes.

Contemporary body ideals differ markedly for boys and girls, reflecting distinct cultural values and expectations. For girls, the thin ideal has dominated for decades, creating a widening gap between cultural ideals and average body size (NCD Risk Factor Collaboration, 2016). Adolescents' endorsement of the thin ideal has been linked to increased body dissatisfaction (Vuong et al., 2021). Both peer and media influences play a key role, with body comparisons, especially with peers, amplifying the effects of thin-ideal internalisation on body image concerns in girls (Carey et al., 2014). Recent appearance trends for girls indicate a shift toward a toned, athletic ideal that combines thinness with muscularity. Although often portrayed as healthier than the traditional thin ideal, this appearance standard remains equally problematic, perpetuating the objectification of female bodies (Benton & Karazsia, 2015; Marashi et al., 2024; Roberts et al., 2022).

For boys, cultural body ideals tend to emphasise lean muscularity and strength, reflecting societal norms that link masculinity with dominance, physical capability, and muscular development (Griffiths et al., 2013; Rodgers et al., 2012). Unlike girls, who primarily focus on thinness, boys may pursue increasing, maintaining, or reducing body size to align with these ideals. The drive for muscularity is associated with negative outcomes, including lower self-esteem, heightened body dissatisfaction, and engagement in muscle-enhancing behaviours such as dietary manipulation and intensive exercise (Gomes et al., 2019; Griffiths et al., 2013; Rodgers et al., 2012, 2020). Awareness of gendered body ideals begins early, with children as young as 8–10 years showing strong preferences for lean, fit bodies, and boys focusing on functional aspects such as strength and athletic performance while girls emphasise appearance (Tatangelo & Ricciardelli, 2013). These patterns

underscore the importance of addressing muscularity-oriented pressures in interventions targeting male adolescents.

The Sociocultural Framework

The dominant theoretical framework for understanding body image development is sociocultural theory, which proposes that cultural beauty ideals are transmitted and reinforced through three primary channels: media, family, and peers (Thompson et al., 1999). The tripartite influence model extends this framework by identifying two key mediating processes, internalisation of appearance ideals and social comparison that translate sociocultural messages into individual body dissatisfaction and potentially disordered eating behaviours (Thompson et al., 1999). *Internalisation of appearance ideals* is the acceptance of the culturally constructed appearance ideals, the thin ideal for females and the muscular ideal for males, and the importance and integration into an individual's self-belief about themselves (Thompson et al., 2012). *Social comparison* in the context of body image, refers to the process of evaluation one's own physical appearance against that of others (Myers & Crowther, 2009). The tripartite influence model has been empirically supported in both female and male populations, including adolescent samples (Karazsia & Crowther, 2009; Keery et al., 2004; Rodgers et al., 2015; Stratton et al., 2015). Cross-sectional and longitudinal research demonstrates that the core mechanisms of internalisation and social comparison consistently mediate the relationships between sociocultural influences and body dissatisfaction across gender and cultural contexts (Girard et al., 2018; Jarman et al., 2021; Rodgers et al., 2015)

Media. Mass media serves as a crucial transmitter of appearance ideals, presenting narrow depictions of attractiveness while emphasising the importance of achieving these ideals (Ricciardelli & Yager, 2016). Within the tripartite influence model, media exposure

contributes to body dissatisfaction primarily through two pathways: increasing internalisation of appearance ideals and facilitating appearance-based social comparison (Thompson et al., 1999). Cultivation theory explains how repeated exposure to specific media messages can alter perceptions, leading individuals to believe media-portrayed ideals reflect reality (Stein et al., 2021). Meta-analytic evidence demonstrates that media exposure to appearance ideals consistently predicts body dissatisfaction across experimental and correlational studies (Grabe et al., 2008; Groesz et al., 2002). However, social media represents a qualitatively different and more concerning development for contemporary adolescents due to its interactive nature, the prevalence of peer-generated content, and the capacity for constant, personalised exposure to appearance-focused material.

The impact of social media on body image is substantial. A comprehensive meta-analysis of 83 studies involving over 55,000 participants demonstrated a moderate-to-strong association between frequency of appearance-based social comparison online and body image concerns (Bonfanti et al., 2025). A meta-analysis revealed a positive relationship between social media use and body image dissatisfaction, with appearance-based usage showing stronger effects than general usage and younger participants being more vulnerable (Saiphoo & Vahedi, 2019). Support for a causal relationship comes from meta-analyses of experimental and longitudinal studies, which found that viewing appearance-ideal social media images negatively impacts body image with a moderate effect size, with appearance-ideal images being significantly more detrimental than other appearance-related social media content (de Valle et al., 2021). Research comparing different contexts of appearance comparison found that upward comparisons (comparing oneself to those perceived as more attractive) made through social media were associated with more negative body image outcomes than comparisons made in person and more negative mood than comparisons in any other context (Fardouly et al., 2017).

While social media affects both boys and girls, the specific content shows some gender differentiation, with girls more vulnerable to thin-ideal content and boys more responsive to muscularity-focused content, though contemporary social media increasingly exposes both genders to multiple appearance ideals simultaneously. This heightened vulnerability during adolescence may reflect the convergence of identity formation processes, increased sensitivity to peer influence, and the imaginary audience phenomenon that intensifies concerns about others' perceptions during this developmental period (Elkind, 1967).

Social media usage among adolescents is extensive, with recent data showing that 92% of teens use YouTube, 68% use TikTok, and 63% use Instagram, with approximately one in five teens reporting they are on YouTube and TikTok almost constantly (Pew Research Center, 2025). The types of social media engagement matter significantly for body image outcomes, with adolescents who edit and upload photos on Instagram demonstrating greater internalisation of beauty stereotypes and higher body image anxiety in both males and females (Verrastro et al., 2020). A comprehensive review of 67 studies provides support for the relationship between Internet and social media use, particularly appearance-focused platforms, and heightened body image and eating concerns, with adolescents identified as particularly vulnerable to these effects (Rodgers & Melioli, 2016).

Choukas-Bradley et al. (2022) proposed the Perfect Storm Model to explain why adolescents are disproportionately vulnerable to the negative effects of social media on body image. The model identifies three converging factors that create conditions of heightened susceptibility: adolescent development processes including pubertal changes, heightened importance of peer feedback, and increased self-consciousness (Elkind, 1967); gender-related sociocultural pressures emphasising girls' physical appearance and promoting self-objectification; and constantly available nature, that amplify appearance-focused social

comparison. Together these factors create a ‘perfect storm’ in which adolescent girls face simultaneous pressures including strong motivation for social validation, increased sensitivity to peer-feedback, and ongoing exposure to appearance-focused content. While developed specifically in relation to girls, the developmental and sociocultural processes the model identifies have broader relevance for understanding adolescent vulnerability to social media’s appearance -related effects. Building critical awareness of social media’s influence during this period of increased vulnerability may provide meaningful protection against its negative effects on body image (McLean et al., 2016). This supports the importance of media literacy initiatives during early adolescence, the developmental period during which these converging vulnerabilities are predicted to be at their peak.

Family. Families transmit appearance ideals through both explicit comments and indirect modelling, with social learning theory explaining how children adopt parental values and behaviours. Research demonstrates that maternal body dissatisfaction significantly predicts daughters' body dissatisfaction from early childhood (Perez et al., 2018), with perceived maternal concerns about weight predicting weight concerns in adolescent girls (Thøgersen-Ntoumani et al., 2016). When mothers make negative comments about their own appearance, daughters immediately report decreased body esteem and show dietary restraint behaviours (Handford et al., 2018). Research examining parental predictors of children's body dissatisfaction found that maternal variables (body dissatisfaction, drive for thinness, approach to change) significantly predicted body dissatisfaction in boys, while father variables showed no significant relationships, highlighting the need for further investigation of paternal influence (Solano-Pinto et al., 2021).

Parental encouragement of dieting shows particularly strong effects: when both parents encouraged dieting, daughters were eight times more likely to report early dieting behaviours (Balantekin et al., 2014). Family conversations about weight relate to increased

disordered eating in both boys and girls, while healthy eating conversations show protective effects (Berge et al., 2013). Siblings also contribute significantly, with appearance-based teasing and pressure relating to increased body dissatisfaction in girls (Johnson & Blodgett Salafia, 2022) and stronger drive for muscularity in boys (Schaefer & Blodgett Salafia, 2014).

Peers. Peers represent the third crucial transmitter of appearance ideals in the tripartite model, with adolescence marking a period when peer influence intensifies significantly. Peers transmit appearance pressures through direct commentary, modelling behaviours, and facilitating social comparison processes (Jones et al., 2004), with a comprehensive review confirming that appearance teasing and perceived pressure to be thin are most consistently linked to body dissatisfaction both concurrently and longitudinally (Webb & Zimmer-Gembeck, 2014). Adolescents experiencing appearance-related victimization from peers perceive themselves as less attractive and report being teased more about their appearance (Zimmer-Gembeck & Webb, 2017). Peers also establish group norms around appearance-focused behaviours and provide readily available comparison targets in daily social contexts (Hutchinson & Rapee, 2007).

Contemporary digital contexts have expanded peer influence beyond face-to-face interactions. Cyberbullying is associated with increased body dissatisfaction, with adolescents who are cyberbullied almost twice as likely to consider themselves too fat, though stronger friendship dynamics can partially mediate these effects (Kenny et al., 2018). Appearance-related cyberbullying specifically is associated with body shame, lower body appreciation, and eating disorder symptomology among adolescent females (Prince et al., 2024). Longitudinal research demonstrates that early physical maturation combined with appearance teasing from parents and peers is associated with elevated and increasing appearance anxiety symptoms in both boys and girls, with earlier maturing adolescents who

experience high levels of teasing at greatest risk for appearance anxiety over time (Zimmer-Gembeck et al., 2017).

Social Comparison. Social comparison serves as one of the two key mediating processes in the tripartite influence model, explaining how sociocultural pressures translate into individual body dissatisfaction. Social comparison theory (Festinger, 1954) proposes that individuals evaluate themselves by comparing to others when objective measures are unavailable. Applied to appearance, this process significantly impacts body satisfaction. A comprehensive meta-analysis found a medium effect size for the relationship between appearance-related social comparison and body dissatisfaction, with stronger effects for females and greater impact on younger participants (Myers & Crowther, 2009). These comparison processes are particularly relevant in school settings where adolescents are continuously exposed to same-age peers as readily available comparison targets. Appearance comparison functions as an important mediating mechanism between internalisation of appearance ideals and body dissatisfaction in both boys and girls, with greater internalisation leading to increased comparison and subsequently higher body dissatisfaction (Barbierik et al., 2023).

Upward social comparisons, where individuals compare themselves to those perceived as more attractive, are particularly problematic. Individuals with high body dissatisfaction are more likely to engage in upward comparisons, with both trait and state negative body image predicting upward appearance comparison behaviours in daily life (Rogers et al., 2017). Meta-analytic evidence confirms that upward social comparisons have significant negative effects on body image, self-esteem, subjective well-being, and mental health (McComb et al., 2023).

Internalisation of Appearance Ideals. Internalisation of appearance ideals serves as the second key mediating process in the tripartite model, explaining how sociocultural influences translate into body dissatisfaction. Internalisation refers to the acceptance and integration of culturally constructed appearance ideals into an individual's personal belief system about how they should look (Thompson et al., 2012). Rather than simply being aware of cultural beauty standards, individuals who have internalised these ideals actively endorse them as personally important and use them as benchmarks for self-evaluation. Meta-analytic evidence demonstrates that internalisation serves as a stronger predictor of body dissatisfaction than mere awareness of cultural ideals, with endorsement of appearance ideals showing very large associations with body dissatisfaction ($r = .43$-$.45$) compared to simple awareness (Paterna et al., 2021). Longitudinal research confirms that internalisation predicts increases in body dissatisfaction over time, with baseline internalisation predicting both social comparison tendencies and body dissatisfaction at eight-month follow-up (Rodgers et al., 2015).

For females, internalisation of the thin ideal has consistently emerged as a robust predictor of body dissatisfaction and disordered eating behaviours, with meta-analytic evidence showing a very large effect size ($r = .45$) for the relationship between thin-ideal internalisation and body dissatisfaction (Paterna et al., 2021). The evolution from the traditional thin ideal toward a toned athletic ideal that maintains thinness while adding muscularity represents a contemporary challenge, as this new standard may be even more difficult to achieve while being marketed as "healthier" than pure thinness (Slater et al., 2017).

Males face the complex challenge of potentially internalising both muscular and thin ideals simultaneously. Research demonstrates that internalisation of muscular appearance ideals and social comparison mediate the relationship between sociocultural influences and

muscularity-related body dissatisfaction (Karazsia & Crowther, 2009). More recent findings indicate that symptoms of muscle dysmorphia and disordered eating in young men are independently and positively related to internalisation of both muscularity and thinness ideals, highlighting the multifaceted nature of contemporary male appearance pressures (Klimek et al., 2018). These findings suggest that interventions targeting male body image concerns must address both appearance ideals rather than focusing exclusively on muscularity.

Evolution of Body Image Intervention Approaches

Early body image interventions focused on psychoeducation about eating disorders' harmful effects, assuming that information about negative consequences would discourage unhealthy behaviours. However, research revealed that providing direct information about eating disorders could cause harm by normalising dieting or glorifying eating disorders (Warschburger et al., 2011). A meta-analysis of 51 eating disorder prevention programmes found that approximately half (51%) achieved significant reductions in eating disorder risk factors, with small average effect sizes, though some programmes produced medium-sized effects (Stice et al., 2007). Key patterns emerged: interactive programs outperformed didactic ones; effects were stronger for participants over 15 years and for multi-session programmes; and notably, programmes with body acceptance content and without psychoeducational content produced larger effects. This finding provides preliminary evidence suggesting that positive health promotion approaches emphasising strength-building and body acceptance may outperform traditional harm reduction models focused solely on preventing negative outcomes. Recognising these limitations of traditional psychoeducational approaches, prevention programs increasingly focus on building protective factors and life skills rather than direct information about eating disorders (Warschburger et al., 2011).

Understanding that sociocultural pressures, particularly media exposure, are primary risk factors in the tripartite influence model, contemporary prevention efforts have increasingly focused on media literacy interventions that build critical thinking skills to resist these pressures. While the tripartite model identifies media, peers, and family as sources of appearance pressures, media literacy interventions primarily target critical evaluation of media messages, though some programs also incorporate strategies to address peer and family influences. Media literacy refers to the ability to identify and analyse media messages' construction and purpose (McLean et al., 2016; Potter, 2004). These programs teach critical evaluation of media representations, recognition of digital manipulation, and questioning of why diverse appearances aren't promoted. The goal is reducing internalisation of appearance ideals and decreasing comparisons with unrealistic images, thereby reducing body dissatisfaction (McLean et al., 2016).

Media literacy interventions show promise, though with modest effect sizes overall. A comprehensive meta-analysis of school-based media literacy programs found small but significant effects for improving positive body image and media literacy on average, though individual programs varied widely in their effectiveness (Kurz & Rosendahl, 2022). However, individual well-designed trials demonstrate more substantial improvements, with adolescent girls participating in social media literacy interventions showing significant improvements in body image, media literacy, and disordered eating (McLean et al., 2017). Longitudinal research demonstrated that media literacy interventions reduced weight and shape concerns, dieting, and body dissatisfaction over 30-month follow-up (Wilksch & Wade, 2009). While these mixed findings suggest that program quality, implementation fidelity, and participant characteristics may moderate effectiveness, the evidence overall supports media literacy as a viable approach for school-based body image intervention. However, the modest

effect sizes and variable outcomes suggest that additional approaches targeting positive body image development may complement traditional risk-reduction strategies.

Individual Protective Factors: A Positive Psychology Approach

While sociocultural theory identifies environmental risk factors that contribute to body dissatisfaction (media, family, peer influences), positive psychology provides an additional perspective by focusing on building individual resilience against these pervasive cultural pressures. The tripartite influence model explains how appearance ideals are transmitted and internalisation yet offers few insights into why some adolescents maintain positive body image despite identical sociocultural exposures. Positive psychology offers a complementary theoretical framework that addresses this gap by focusing on identifying and cultivating human strengths, virtues, and optimal functioning rather than solely addressing pathology and dysfunction (Seligman & Csikszentmihalyi, 2000). The foundational premise of positive psychology is that mental health is not merely the absence of mental illness, but represents a distinct state characterized by flourishing, wellbeing, and the presence of positive characteristics (Keyes, 2002). Rather than focusing exclusively on reducing risk factors, positive psychology directs attention toward building protective resources that enable adolescents to thrive despite sociocultural pressures. Meta-analytic evidence supports the effectiveness of strength-based approaches for building adolescent resilience and mental health (Fu et al., 2025), suggesting that interventions focusing on cultivating positive characteristics may offer sustainable pathways to wellbeing.

Two complementary theoretical frameworks support the examination of individual protective factors for body appreciation. Fredrickson's (2001) *broaden-and-build theory* proposes that positive psychological states broaden individuals' thought-action repertoires and build enduring personal resources, including resilience and adaptive coping strategies.

Applied to body appreciation, this suggests that positive psychological characteristics may help adolescents develop flexible, adaptive responses to appearance-related challenges while building lasting resources that protect against future threats. Additionally, r*esilience theory* highlights adolescents' capacity to develop protective resources that enable positive outcomes despite adversity (Masten, 2001; Zimmerman, 2013). Rather than viewing adolescents as passive recipients of sociocultural pressures, this perspective recognises their inherent capacity to develop protective resources that buffer against appearance-related risks.

Body appreciation demonstrates the application of positive psychology principles to body image. Rather than representing the mere absence of body dissatisfaction, *body appreciation* embodies a distinct set of positive characteristics: respect for the body, acceptance of its appearance, appreciation of its functionality, and protective attitudes that filter appearance-related information (Tylka & Wood-Barcalow, 2015). This conceptualisation suggests that promoting positive body image requires more than reducing exposure to sociocultural pressures or challenging internalisation appearance ideals. It requires actively cultivating protective psychological resources such as self-esteem, resilience, and positive affect that enable adolescents to maintain body appreciation despite ongoing exposure to appearance-focused environments.

Body Appreciation

The field has increasingly recognised that positive body image represents more than simply the absence of negative body image, highlighting the need for alternative approaches that build resilience rather than solely reduce pathology. Positive body image is a distinct, multifaceted construct that must be deliberately cultivated (Tylka & Wood-Barcalow, 2015; Wood-Barcalow et al., 2010). Historically, positive body image was conceptualized as one end of a bipolar continuum with negative body image at the opposite end, assuming that low

negative body image automatically indicated positive body image. Research has shown this to be inaccurate, with positive body image instead representing a distinct construct with unique predictors and outcomes (Tylka & Wood-Barcalow, 2015).

Conceptual Development of Body Appreciation. Body appreciation emerged from qualitative investigations with adult women and, subsequently, adolescents, revealing that positive body image involves holding favourable opinions regardless of imperfections, respecting one's body through health-promoting behaviours, and actively protecting body image by rejecting unrealistic standards (Avalos & Tylka, 2006; Frisén & Holmqvist, 2010; Wood-Barcalow et al., 2010). Importantly, this work established that body appreciation requires deliberate and ongoing effort to maintain. Researchers identified what they term fluidity, recognising that body image experiences natural ups and downs, yet individuals can work through transient negative feelings while sustaining an overall sense of body respect (Wood-Barcalow et al., 2010). This conceptualisation suggests that positive body image does not require loving one's body all the time, but rather involves developing resilience and adaptive coping strategies that maintain overall body respect and appreciation despite temporary setbacks.

The seminal work by Tylka and Wood-Barcalow (2015) provided the definitive framework for positive body image as a distinct, multifaceted construct encompassing five core facets: body appreciation, broad conceptualisation of beauty, adaptive appearance investment, inner positivity, and body-protective information processing. The construct is holistic, both stable and malleable through intervention, protective against appearance pressures, and shaped by social identities and perceived acceptance by others (Tylka & Wood-Barcalow, 2015). Importantly, body appreciation does not demand total satisfaction with one's appearance and should not be confused with self-absorption, excessive pride, or neglecting bodily health. Rather, it involves a balanced, functional relationship with one's

body that acknowledges imperfections while maintaining overall respect and appreciation. Unlike body dissatisfaction research which uses numerous measures, positive body image benefits from standardised measurement through the Body Appreciation Scale-2 (BAS-2), which shows robust validity across 65 nations and diverse populations (Swami et al., 2023; Tylka & Wood-Barcalow, 2015).

Body Appreciation as a Protective Factor. Research consistently demonstrates that body appreciation serves multiple protective functions beyond the absence of body dissatisfaction. The most comprehensive evidence comes from large-scale cross-national research showing that body appreciation correlates with numerous positive outcomes. In the 65-nation study by Swami et al. (2023), greater body appreciation was significantly associated with higher life satisfaction across diverse cultural contexts.

Experimental evidence demonstrates body appreciation's protective role against media-induced body dissatisfaction. Foundational work by Halliwell (2013) found that women with high body appreciation did not increase the importance placed on their appearance discrepancies after viewing thin female models, while women with low body appreciation showed increased focus on appearance discrepancies. Importantly, this protective effect extended even to women who had internalisation the thin ideal, demonstrating body appreciation's robust buffering capacity. Similarly, Andrew et al. (2015) found that university women with higher body appreciation showed no increase in body dissatisfaction following exposure to thin-ideal advertisements, while those with lower body appreciation experienced significant increases. The protective effect remained even after accounting for self-objectification and appearance comparison, suggesting that body appreciation operates through mechanisms requiring further investigation.

Body appreciation promotes adaptive information processing, with individuals filtering appearance-related information in body-protective ways and being less likely to engage in appearance-focused social comparisons (Andrew et al., 2016; Tylka & Wood-Barcalow, 2015; Wood-Barcalow et al., 2010). Body appreciation correlates with healthier behavioural choices, including sun protection, cancer screening behaviours, and reduced weight-loss behaviour (Andrew et al., 2016). Higher body appreciation is associated with more intuitive eating patterns (Linardon, 2022; Behrend et al., 2024) and physical activity motivated by intrinsic and pro-health reasons rather than appearance-focused concerns (Czepczor-Bernat et al., 2025).

Body appreciation is consistently associated with lower depression and anxiety and higher life satisfaction and positive affect. Meta-analytic evidence reveals that body appreciation is negatively associated with depression and anxiety symptoms, and positively associated with self-esteem, self-compassion, and other adaptive wellbeing constructs across diverse populations (Linardon et al., 2022). These protective effects appear universal, with the 65-nation study finding that body appreciation was significantly associated with life satisfaction across all cultural contexts examined (Swami et al., 2023). Prospective research demonstrates that body appreciation predicts better wellbeing over time, with baseline body appreciation significantly predicting decreased depressive symptoms and increased self-esteem, flourishing, and wellbeing at three-month follow-up (Linardon et al., 2023).

Body appreciation shows theoretically consistent relationships with established risk and protective factors. Meta-analytic evidence demonstrates that higher body appreciation correlates negatively with internalisation of appearance ideals, body surveillance, and sociocultural pressures, key risk factors identified in the Tripartite Influence Model, while showing positive associations with self-esteem, self-compassion, and adaptive wellbeing (Linardon et al., 2022). These associations remain significant even after controlling for

negative body image, suggesting that body appreciation provides unique protective benefits beyond the absence of body dissatisfaction. While this evidence establishes body appreciation as a robust protective factor, the research base has been developed primarily with adult populations, with limited evidence examining these relationships in younger age groups.

Emerging research with adolescent samples supports similar protective relationships. Cross-sectional research with Hungarian female adolescents demonstrated that body appreciation was positively associated with self-esteem, life satisfaction, health perceptions, physical activity involvement, and dietary control, while showing negative associations with excessive alcohol consumption, weight-loss attempts, and familial patterns of eating pathology (Piko et al., 2020). Research with Lithuanian adolescents aged 15-18 years found that body appreciation served a protective function against body-related concerns and problematic eating patterns in both male and female participants, while also relating to enhanced self-regard, appreciation of bodily capabilities, and athletic involvement (Baceviciene & Jankauskiene, 2020). When this same cohort was assessed at ages 16-17 years, these findings extended to encompass broader indicators of adolescent wellbeing, including overall satisfaction with life, subjective fitness levels, more adaptive nutritional behaviours, realistic body size perceptions, and favourable health evaluations, with these relationships demonstrating particular strength among female participants (Baceviciene et al., 2025).

Beyond cross-sectional associations, longitudinal evidence from Norwegian adolescents aged 16-17 years showed that initial levels of both positive developmental characteristics and body appreciation predicted enhanced psychological wellbeing one year subsequently, with this predictive relationship remaining significant after accounting for initial wellbeing levels (Urke et al., 2021). While this adolescent research provides important preliminary evidence, studies have predominantly examined older adolescents (or focused

exclusively on girls, leaving questions about whether these protective relationships operate similarly in both male and female early adolescents when body image attitudes are first forming and intervention may be most impactful.

Body Appreciation as an Intervention Target. The theoretical conceptualisation of body appreciation as stable yet malleable (Tylka & Wood-Barcalow, 2015) has been supported by intervention research demonstrating that body appreciation can be successfully increased through structured programs. A systematic review of interventions for children and adolescents found that cognitive dissonance, peer support, and psychoeducation approaches effectively improve body appreciation and body-esteem, particularly among adolescent girls (Guest et al., 2022). Cognitive dissonance-based interventions have shown effectiveness at improving body appreciation, with even single-session programs demonstrating significant improvements in secondary school girls aged 14-15 years (Halliwell et al., 2015), while self-compassion interventions have also shown promise for increasing body appreciation (Toole & Craighead, 2016). Even interventions primarily designed to target eating disorder symptoms have been shown to produce small to moderate improvements in body appreciation (d = 0.15-0.41; Linardon et al., 2022). However, most intervention research has focused on late adolescents and young adults in university settings, with substantially less research examining whether body appreciation can be effectively targeted in early adolescence within school-based contexts, particularly through brief single-session formats.

Schools as Universal Prevention Settings

Schools provide natural settings for universal body image prevention approaches. They offer sustained contact with young people and the opportunity to engage large groups during critical developmental periods (Diedrichs & Halliwell, 2012). Schools also represent environments where multiple risk factors for body dissatisfaction converge, including peer

influence, weight-based teasing, and media use (Yager, 2024). School-based interventions have the potential to reach young people before their thoughts and opinions about appearance become fixed, while they experience the bodily changes that accompany puberty (Diedrichs & Halliwell, 2012). This universal approach is particularly important given that many young people experiencing eating disorder symptoms do not seek professional help, with barriers including poor mental health literacy, stigma, and lack of family support (Nicula et al., 2022). School-based delivery can provide prevention support to all students during early adolescence when body image concerns typically emerge, without requiring individual help-seeking or clinical referral.

Evidence supports the effectiveness of school-based body image interventions, though with important qualifications. Yager et al.'s (2013) systematic review of 15 classroom-based programs found that seven interventions produced significant improvements in body image immediately post-intervention. Effective programs shared several characteristics: they targeted younger adolescents aged 12-13 years, incorporated media literacy and peer-focused content, and avoided psychoeducation approaches. The review found that psychoeducation was not included in effective programs, consistent with broader prevention research suggesting information-based approaches are ineffective with adolescents. However, fewer than 20% of programs demonstrated sustained effects at follow-up, highlighting considerable challenges in maintaining initial improvements over time.

Implementation feasibility represents a significant consideration for school-based interventions. Multi-session programs face substantial challenges due to competing curriculum demands, resource constraints, and scheduling difficulties, potentially limiting their scalability and sustainability (Yager et al., 2013; Yager, 2024). Single-session interventions offer feasible alternatives that can reach broader populations with fewer

resources and reduced implementation burden. While multi-session programs generally produce larger and more sustained effects (Alleva et al., 2015), recent meta-analytic evidence suggests that intervention effectiveness is not strictly dependent on session number, with brief interventions capable of producing meaningful improvements, at least in the short term (Brichacek & Neill, 2025).

Despite evidence for school-based intervention effectiveness, most programs have focused on reducing negative outcomes such as body dissatisfaction rather than targeting body appreciation as a primary outcome. Additionally, many interventions show stronger effects for girls than boys (Ahuja et al., 2024), raising questions about whether programs produce comparable benefits across sexes. Critical gaps remain in understanding how to optimally promote body appreciation in school settings, particularly regarding brief intervention formats, sex differences in effectiveness, individual predictive factors, and functional assessment approaches.

Single-Session Interventions

Empirical evidence for single-session body image interventions shows mixed results, particularly regarding body appreciation as an outcome. International research demonstrates some promise, with cognitive dissonance-based programs producing moderate to large improvements in body appreciation among adolescent girls (Halliwell et al., 2015), and media literacy approaches showing sustained improvements in body satisfaction at eight-week follow-up (Bell et al., 2022). However, other studies report null effects across body image outcomes (Guest et al., 2022; Craddock et al., 2024). The Australian evidence base is particularly limited, with only one single-session school-based study published nearly two decades ago, which focused on media literacy and internalisation reduction but did not assess body appreciation (Wilksch et al., 2006). Furthermore, the limited single-session research

showing positive effects has been conducted predominantly with female-only samples (Halliwell et al., 2015) or found sex-specific effects favouring girls (Diedrichs et al., 2015), leaving open questions about whether brief interventions can enhance body appreciation comparably across sexes in Australian school contexts. Study 1 of this thesis addressed these gaps by evaluating a widely-disseminated single-session program with Australian early adolescents.

Research Gaps and Opportunities

The theoretical frameworks and empirical evidence reviewed above highlight four critical gaps in body image research that limit both theoretical understanding and practical application in school settings. Firstly, while body appreciation has been established as a distinct construct requiring deliberate cultivation, most intervention research has focused on university samples using multi-session formats (Guest et al., 2022). The Australian evidence base for single-session school-based interventions is particularly limited, with no published research examining whether body appreciation can be meaningfully enhanced through brief programs delivered in Australian school contexts. Given the practical constraints facing schools and the protective role body appreciation plays against eating disorder development, determining whether brief, school-based interventions can effectively promote body appreciation represents an important research priority. Evaluation of widely-disseminated programs delivered by organisations such as the Butterfly Foundation would provide important evidence for informing school-based prevention efforts.

Secondly, despite growing evidence that body image concerns affect males, intervention research remains heavily female-focused. The most comprehensive systematic review of body image interventions among boys identified 41 relevant studies, but only three exclusively targeted boys, with 38 involving mixed-gender groups where boys often

comprised minorities of participants (Ahuja et al., 2024). This review found that few interventions showed effectiveness specifically for boys' body image, with most benefiting girls instead, though some promise for interventions employing positive body image and embodiment techniques were noted. This gender imbalance is problematic given evidence that males face unique body image challenges and barriers to help-seeking (Richardson & Paslakis, 2021). Understanding whether body appreciation interventions produce comparable effects for male and female adolescents is essential for developing inclusive prevention approaches.

Thirdly, research has identified numerous correlates of body appreciation (Linardon et al., 2022) but limited understanding of predictors, particularly in adolescents. While sociocultural factors (media, family, peers) are well-established influences on body image development, these environmental factors are often difficult to modify through brief school-based interventions. Individual protective factors such as self-esteem, resilience, and positive affect represent theoretically grounded potential predictors that align with positive psychology frameworks and may be more directly modifiable through intervention. However, these factors have received minimal empirical attention as simultaneous predictors in body image contexts during early adolescence. Understanding which individual characteristics most strongly predict body appreciation development could inform targeted intervention strategies that build internal strengths to complement environmental risk reduction efforts.

Finally, while existing measures effectively assess psychological symptoms of body dissatisfaction, no tools specifically capture how appearance concerns interfere with daily school functioning. Research and clinical practice lack instruments to identify students experiencing significant appearance-related impairment who may require individual support beyond universal prevention programs. Understanding the functional consequences of appearance concerns—such as interference with academic engagement, peer relationships,

and school participation—represents an important gap. Development of valid, reliable assessment tools for measuring appearance-related school interference would provide both research and clinical benefits, enabling identification of students most in need of support and providing outcome measures that capture real-world functional improvements beyond symptom reduction.

These gaps represent opportunities for advancing body appreciation research while addressing practical needs in school settings. The research programme described below was designed to address each of these gaps through three complementary studies examining intervention effectiveness, predictive factors, and functional assessment approaches.

1.3 Thesis Overview

This thesis addresses critical gaps in body image science through three interconnected studies that collectively advance understanding of positive body image in adolescents while providing practical tools for intervention and assessment. This thesis integrates sociocultural theory with positive psychology principles, moving beyond deficit models toward strength-based approaches that actively build resilience and body appreciation. While sociocultural theory identifies environmental risk factors (media, family, peers) that contribute to body dissatisfaction, positive psychology approaches focus on building individual strengths and protective factors. This integration recognises that effective intervention may require both reducing exposure to risk factors and enhancing protective psychological resources. Given the practical limitations of changing environmental factors through brief school interventions, identifying and strengthening individual characteristics such as resilience, self-esteem, and positive affect may provide alternative pathways to promoting positive body image development.

Study 1 evaluates the effectiveness of a single-session, school-based intervention in improving body appreciation and related outcomes in male and female adolescents. The study addresses the male research deficit by including adolescent boys and girls, while focusing on positive body image outcomes rather than only deficit reduction. The Butterfly Foundation's Becoming Media Savvy programme provides a practically implementable intervention that combines media literacy with strength-building approaches. The study adopts a practical approach to intervention evaluation, testing whether this brief programme can produce measurable improvements in body appreciation, self-esteem, internalisation of appearance ideals, social comparison tendencies, and media literacy. While the specific mechanisms underlying any observed changes cannot be definitively established through this design, the multiple outcome measures will provide insight into which domains are most responsive to brief intervention, informing future research.

Study 2 examines individual-level predictors of body appreciation in adolescents, focusing on modifiable characteristics that could inform future intervention development. Understanding which individual factors predict body appreciation during early adolescence is essential for developing targeted interventions. Self-esteem, resilience, and positive affect represent theoretically grounded potential predictors that align with positive psychology frameworks but have not been examined as simultaneous predictors during the early adolescent period. These factors may be more malleable to intervention and could enhance body appreciation by building the psychological resources that support positive body image development.

Study 3 develops and validates a novel measure of appearance-related school interference, addressing a critical gap in both research and clinical assessment. While existing measures assess psychological symptoms of body dissatisfaction, no tools specifically capture how appearance concerns interfere with daily school functioning. This measure

serves multiple purposes within this thesis: it provides a functional outcome measure that could be used in future intervention studies, and more importantly, it offers a practical screening tool to identify students experiencing significant appearance-related impairment who may require individual support beyond universal prevention programmes.

These three studies form an integrated thesis. Study 1 provides initial evidence on single-session intervention effectiveness, Study 2 identifies individual factors that predict body appreciation to inform future intervention targets, and Study 3 develops tools for identifying students most in need of support. Together, they advance both theoretical understanding of positive body image development and practical approaches to supporting adolescent wellbeing, with each study informing the others to create a comprehensive approach to body image intervention and assessment in school settings.

Thesis Aims and Contributions

The overarching aim of this thesis is to advance understanding of body appreciation in early adolescence through examination of intervention effectiveness, individual predictive factors, and functional impacts in school contexts.

This thesis makes several significant contributions to body appreciation research. Theoretically, it advances understanding of positive body image during early adolescence, a critical developmental period when body appreciation patterns are most malleable, by identifying protective factors, examining program effectiveness, and assessing practical outcomes in school settings. While much body appreciation research has focused on adult populations, this thesis specifically targets adolescents aged 12 to 14 during the formative period of body image development.

Methodologically, the combination of experimental intervention testing, predictive modelling, and psychometric scale development within a single thesis provides

comprehensive examination from multiple perspectives. The development of a school-specific functional outcome measure addresses a significant gap by examining how body appreciation translates into real-world benefits in adolescents' daily experiences. Validation of interventions and measures for diverse Australian adolescent populations further strengthens the evidence base.

Practically, this research provides evidence-based intervention protocols for school implementation, assessment tools for screening and outcome evaluation, and implementation guidance for sustainable school-based programs. The prevention-focused approach during early adolescence, before negative patterns become entrenched, offers unique insights into protective factor development with implications for educational policies, cost-effective prevention programming, and working with diverse adolescent populations.

Chapter 2: Study 1 – Examining the Effectiveness of a Single-Session School-Based Body Image Program for Promoting Body Appreciation in Early Adolescents

2.1 Introduction and Literature Review

Body dissatisfaction and negative body image are prevalent concerns among early adolescents. Recent Australian evidence reports that 37.9% of boys and 20.7% of girls experience moderate body dissatisfaction, while 6.8% of boys and 19.6% of girls experience clinically significant body dissatisfaction, with higher rates seen in adolescents aged 13 and 14 years old (McLean et al., 2022). Both body dissatisfaction and negative body image are well-established risk factors for the development of eating disorders, depression, low self-esteem, and reduced quality of life (Bornioli et al., 2021; Paxton et al., 2006; Stice & Shaw, 2002). In response to this challenge, schools have increasingly become key locations for delivering preventive body image programs, offering access to large numbers of young people during a critical developmental window when appearance-related concerns often emerge and intensify (Yager et al., 2013). Within this context, single-session body image programs have emerged as an efficient approach to prevention. These brief programs aim to address body image concerns while minimising disruption to academic instruction, reducing implementation costs, and requiring minimal teacher training or ongoing commitment (Diedrichs et al., 2015).

Despite the appeal of brief prevention programs, questions remain about whether they can produce meaningful, sustained improvements in body image outcomes, particularly for constructs like body appreciation in early adolescent populations. While some brief programs have demonstrated effects on reducing media internalisation and improving body satisfaction, further examination of the effectiveness of single-session programs for cultivating body appreciation among early adolescents in Australian school settings is needed (Bell et al.,

2022; Wilksch et al., 2006). Understanding the impact of single-session programs has direct implications for resource allocation, policy development, and the wellbeing of young people who participate in these programs.

Theoretical Perspectives Underlying Body Image Concerns

Body image concerns among adolescents arise through multiple interacting theoretical mechanisms that inform intervention program development. Sociocultural theory, specifically the tripartite influence model, identifies peers, parents, and media as primary sources transmitting appearance ideals and reinforcing the importance of appearance conformity (Thompson et al., 1999). These key influences convey messages about ideal body shapes through direct pressure, modelling, and appearance-focused commentary, with internalisation of these appearance ideals and social comparison representing a well-established mediating risk factors for body dissatisfaction and disordered eating (Tylka, 2021; Shroff & Thompson, 2006).

Social comparison theory (Festinger, 1954) explains how individuals evaluate their own appearance by comparing themselves to others, with upward comparisons to those perceived as more attractive typically producing body dissatisfaction. Contemporary adolescents encounter unprecedented opportunities for appearance comparison through social media platforms that provide constant exposure to curated, filtered images leading to increased body dissatisfaction (Scully et al., 2020; Fardouly & Vartanian, 2016).

Objectification theory (Fredrickson & Roberts, 1997) proposes that females often view their bodies from an observer's perspective due to societal objectification, leading to habitual monitoring of appearance. In adolescents, this internalised self-objectification is linked to negative outcomes, including unhealthy eating, body-related shame, anxiety, and disordered eating behaviours (Baceviciene et al., 2022; Dakanalis et al., 2015).

Finally, developmental theory highlights early adolescence as a period of heightened vulnerability due to pubertal changes, increased peer focus, and identity formation processes that make appearance particularly important (Smolak, 2011). During this stage, body dissatisfaction and self-objectification often emerge, with peer comparison and pubertal changes increasing attention to appearance, and early body image concerns predicting later disordered eating and unhealthy behaviours (Jones, 2004; Paxton et al., 2006). These theories demonstrate that adolescents' body image and related health behaviours reflect the combined effects of sociocultural pressures, social comparison, self-objectification, and developmental vulnerabilities, highlighting the need for interventions that address these interacting mechanisms.

Intervention Approaches for Body Image Programs

These theoretical frameworks inform the development of body image prevention programs, with different program approaches targeting specific mechanisms to reduce body image concern. Psychoeducational and cognitive-dissonance approaches represent two effective intervention strategies in classroom settings (Kusina & Exline, 2019). Understanding these distinct intervention approaches is essential for evaluating brief program effectiveness.

Psychoeducational approaches in body image programs focus on increasing knowledge and awareness about sociocultural appearance pressures by explaining how peers, family, and media influence body image development, with the assumption that enhanced understanding will lead to attitude and behaviour change (Garner, 1997). While all three sources of influence may be addressed in program content, school-based programs have predominantly focussed on media literacy components, as media messages represent a universal, modifiable target well-suited to classroom-based delivery. These interventions

typically include media literacy components that teach adolescents to critically evaluate media messages and recognise digital manipulation techniques used to create unrealistic appearance ideals. Meta-analytic evidence demonstrates that school-based media health literacy interventions can significantly improve media literacy and reduce body image concerns, eating concerns, and thin-ideal internalisation among adolescents (Kurz et al., 2022; Zuair & Sopory, 2022). Controlled studies show that even brief interactive lessons can buffer the negative effects of thin-ideal media (Wilksch et al., 2006). Additionally, a recent social media literacy program reported reductions in dietary restraint and depressive symptoms in adolescent girls, highlighting that psychoeducational interventions can also positively influence health-related behaviours (Gordon et al., 2021). The theoretical mechanism underlying psychoeducational approaches assumes that knowledge acquisition and critical awareness provide cognitive tools for resisting appearance pressures.

Cognitive-dissonance based approaches target attitudinal change by creating psychological discomfort when participants publicly argue against appearance ideals they may personally endorse. Grounded in Festinger's (1957) theory, these interventions leverage the inconsistency between beliefs and behaviours to motivate genuine attitude change. Participants engage in verbal, written, and behavioural exercises where they actively critique appearance ideals, creating dissonance that drives critical evaluation (Stice et al., 2012). School-based dissonance programs demonstrate effectiveness among adolescent girls aged 12 to 13 years, with participants reporting reductions in body dissatisfaction and thin ideal internalisation, plus increased resilience to negative media effects (Halliwell & Diedrichs, 2014). The Body Project, a widely implemented dissonance-based program, uses group-based exercises to improve body acceptance and reduce eating disorder risk in adolescents and young women (Becker & Stice, 2017; Stice et al., 2011). Together, these approaches provide evidence-based frameworks for body image prevention in early adolescence, demonstrating

that programs can effectively address both knowledge and attitudinal components of body image concerns.

Empirical Evidence on Body Image Program Effectiveness

While these psychoeducational and cognitive-dissonance approaches provide theoretically-grounded frameworks for prevention, empirical evidence examining their effectiveness in school settings reveals important considerations regarding intervention duration and format. Research examining body image intervention effectiveness has investigated the relationship between intervention duration and outcomes, with studies examining both multi-session and single-session formats. This evidence provides important context for understanding optimal intervention approaches for different populations and outcomes.

Australian Multi-Session School Programs. Australia has developed an evidence base for multi-session school-based body image interventions. Media Smart, an eight-lesson media literacy program, demonstrated sustained reductions in shape and weight concern, body dissatisfaction, and dieting at 30-month follow-up with adolescent boys and girls (Wilksch & Wade, 2009). Happy Being Me, evaluated across multiple iterations ranging from three to six sessions, improved body dissatisfaction, thin ideal internalisation, and self-esteem in adolescent girls, with improvements in body dissatisfaction maintained at three follow-up and improvement in thin internalisation maintained a six-month follow-up. (Richardson & Paxton, 2010; Dunstan et al., 2017). Further variations of Happy Being Me, have also reported improvements in upward appearance comparisons for adolescent girls at three-month follow-up (McLean et al., 2019). BodyThink, a four-session program showed sex-specific effects, with girls demonstrating higher media literacy and lower thin ideal internalisation, and boys showing higher media literacy and body satisfaction (Richardson et

al., 2009). SoMe a four-session social media literacy body image program demonstrated limited effects, with improvements in dietary restraint and depressive symptoms only for girls at six-month follow-up, there were no improvements in body dissatisfaction, self-esteem, or internalisation compared to controls (Gordon et al., 2021). While these multi-session programs demonstrate effectiveness, their substantial time requirements (three to eight 50-minute lessons) can present implementation barriers in schools facing competing curricular demands and limited resources. This practical constraint underscores the need to investigate whether brief, single-session programs might offer a viable alternative for Australian schools.

Body Appreciation as a Prevention Target

While multi-session programs reviewed above have demonstrated effectiveness in improving various body image outcomes, contemporary body image research increasingly focuses on positive body image, particularly body appreciation, as an important prevention target that extends beyond simple reduction of body dissatisfaction or negative body image (Tylka, 2011, 2012; Tylka & Wood-Barcalow, 2015). Body appreciation encompasses acceptance of and respect for one's body regardless of how it compares to idealised appearance standards, appreciation of body functionality and capabilities rather than focusing solely on appearance attributes, and active protection of body image through selective filtering and rejection of negative appearance-related information from media and social environments (Avalos et al., 2005; Tylka & Wood-Barcalow, 2015). This multifaceted construct represents a distinct positive orientation toward the body rather than merely an absence of body dissatisfaction, and demonstrates unique protective effects against eating disorder symptoms, depression, and low self-esteem beyond the protective effects of reduced body dissatisfaction alone (Avalos et al., 2005; Linardon et al., 2022). Longitudinal research with Australian adolescent girls (aged 12-16) shows that higher body appreciation at baseline is associated with healthier behaviours one year later, including reduced dieting and

substance use alongside greater physical activity engagement (Andrew et al., 2016). Body appreciation also protects girls from internalising thin ideals and both girls and boys from disordered eating in the presence of media pressure (Jankauskiene & Baceviciene, 2022) and predicts mental well-being one year later among Norwegian adolescents (Urke et al., 2021).

To our knowledge, no previous single-session school-based intervention research in Australia has examined body appreciation as a primary outcome variable. Australian school-based intervention research has focused primarily on traditional risk reduction outcomes including body dissatisfaction, thin-ideal internalisation, dietary restraint, and eating disorder symptoms (Sarraj et al., 2025). This gap limits understanding of whether body appreciation can be meaningfully enhanced through single-session school-based programs in the Australian context.

Single-Session Body Image Interventions

Given body appreciation's protective role and the importance as a prevention target, the development of brief single-session body image interventions that might enhance body appreciation has garnered increasing research attention due to their potential broader dissemination within school settings. While multi-session programs generally produce larger and more sustained effects, single-session formats offer several distinct advantages that make them particularly well-suited to school-based prevention contexts. First, single-session programs maximise reach by minimising disruption to school timetables, making them feasible for widespread adoption across schools with competing curricular demands and limited resources (Diedrichs et al., 2015; Yager et al., 2013). Second, brief interventions can be delivered by trained external facilitators, as is the case with the Butterfly Foundation's programs, addressing the teacher training and institutional support challenges that have been identified as significant implementation barriers in school-based prevention research (Sarraj

et al., 2025; Diedrichs et al., 2015). Third, single-session formats are increasingly delivered digitally, with emerging evidence of sustained effects (Bell et al., 2022), though face-to-face delivery by trained external facilitators offers complimentary advantages including real-time facilitated discussion and structured group activities. Forth, from a public health perspective, even small effect sizes produced by brief universal interventions can translate into meaningful population-level benefits when delivered at scale, potentially preventing the onset of body image concerns before they become entrenched (Stice et al., 2007).

These advantages suggest that single-session interventions occupy an important place in the prevention landscape alongside more intense multi-session approaches, particularly as a first-line universal prevention tools that can reach large numbers of young people efficiently. However, the evidence base for single-session interventions remains limited, with mixed findings regarding their effectiveness in improving body image outcomes among adolescents (Kusina & Exline, 2019). International research provides some evidence that single-session interventions can produce improvements in specific body image outcomes. Digital Bodies, a brief classroom-based intervention designed to address social media-related body image concerns, demonstrated improvements in body satisfaction among British adolescents aged 12-13 years that were sustained at eight-week follow-up (Bell et al., 2020). This study represents an important exception in demonstrating that brief interventions can produce lasting effects on body satisfaction. Similarly, Diedrichs et al. (2015) evaluated a 90-minute single-session adaptation of the Dove Confident Me program with British adolescents aged 11-13 years. This cluster randomised trial found short-term improvements in body esteem (among girls only), negative affect, dietary restraint, and eating disorder symptoms immediately post-intervention, with effect sizes ranging from small to medium. However, these effects were not maintained at follow-up, and the authors concluded that a multi-session version would likely be necessary to achieve sustained improvements.

Despite the growing body of research on single-session interventions, body appreciation has rarely been examined as an outcome variable in this literature. Most single-session studies have focused on reducing body image pathology through measures of body dissatisfaction, body esteem, or body satisfaction, rather than examining whether positive body image constructs can be enhanced through brief interventions. A notable exception is the work of Halliwell et al. (2015), who were the first to explore body appreciation as an outcome measure and evaluated a one-hour dissonance-based intervention delivered by undergraduate students to 62 adolescent girls in UK secondary schools. This study found that body appreciation significantly improved from pre- to post-intervention with moderate to large effect sizes, alongside reductions in body dissatisfaction. This finding is particularly important as it demonstrates that body appreciation can be enhanced through a brief intervention using cognitive dissonance techniques. However, the study's limitations include the absence of follow-up data to assess sustainability of effects and a relatively small sample size.

In contrast, Guest et al. (2022) found no significant improvements in body appreciation following a single-session board game intervention with children aged 9-11 years in UK primary schools, despite using the validated Body Appreciation Scale-2 for Children (BAS-2C). While knowledge of appearance-related issues increased immediately post-intervention, these gains were not maintained at two-week follow-up, and there were no changes in body appreciation, media literacy, or acceptance of visible difference. The authors concluded that increased dosage or supplementary discussions may be necessary to achieve meaningful changes in body appreciation. Similarly, a large-scale evaluation of the Dove Confident Me single-session body image lesson in Indonesia with 1,926 adolescents found no significant improvements in body esteem or other body image outcomes, though the intervention was deemed acceptable and caused no harm (Craddock et al., 2024). These null

findings underscore the challenges inherent in producing meaningful body image improvements through brief interventions.

The Australian evidence base for single-session body image interventions is remarkably limited. Only one Australian study has examined the effects of a single-session school-based intervention. Wilksch et al. (2006) evaluated six different single media literacy lessons with adolescent boys and girls (mean age 13.79 years). Classes were randomly assigned to receive one of six lesson formats focusing on various media literacy topics, including media stereotypes, advertising tactics, sociocultural pressures, and consumer activism. The lessons ranged in approach from examining airbrushed images and discussing advertising tactics to developing media awareness presentations and engaging in consumer activism through writing protest letters to advertisers.

The study found reductions in media ideal internalisation immediately post-intervention, with boys showing significantly lower scores on four of five SATAQ-3 subscales and girls showing lower scores on one subscale. However, the study had significant limitations that restrict its contribution to understanding whether brief interventions can improve body appreciation in Australian contexts. Critically, media internalisation was the only outcome variable assessed at both baseline and post-intervention. While various eating disorder risk factors including body dissatisfaction were measured at baseline to identify potential moderators, no body image outcomes including body appreciation, body satisfaction, or body dissatisfaction were assessed post-intervention. Furthermore, no follow-up assessment was conducted beyond the immediate post-intervention timepoint, limiting any conclusions about the sustainability of the reductions in media internalisation.

Notably, no other Australian single-session school-based body image intervention studies have been published in the nearly two decades since this research was conducted.

This gap in the Australian research literature is particularly significant given that body appreciation has been identified as a key protective factor against eating disorder development and a marker of positive psychological functioning. While international evidence provides limited and mixed support for the effectiveness of single-session interventions in improving body appreciation (Halliwell et al., 2015; Guest et al., 2022), no Australian research has examined whether body appreciation can be meaningfully enhanced through brief school-based interventions. Furthermore, the absence of follow-up data in the sole Australian single-session study limits understanding of whether any positive effects of brief interventions might be sustained over time in Australian school contexts. This represents a critical gap in the evidence base that warrants investigation.

Sex-Based Patterns in Intervention Outcomes

Beyond questions about whether brief interventions can enhance body appreciation, a second critical consideration concerns whether programs produce comparable effects for male and female adolescents. Evidence for body image intervention effectiveness varies considerably by participant sex, with important implications for program development and implementation. Single-session interventions showing positive effects have been conducted predominantly with female-only samples. Halliwell et al. (2015), the only single-session study demonstrating body appreciation improvements, evaluated the program exclusively with adolescent girls. Similarly, Diedrichs et al. (2015) found that several effects from their 90-minute single-session intervention, including improvements in body esteem and dietary restraint, emerged only among girls and not boys, despite the mixed-sex sample. This pattern extends to multi-session programs with a systematic review examining 41 body image intervention studies for boys found that only three exclusively targeted boys, with the remaining 38 employing mixed-gender samples, and few interventions demonstrated effectiveness for boys' body image outcomes (Ahuja et al., 2024).

This sex-differentiated pattern is evident in Australian research, where two multi-session interventions have specifically targeted body image concerns among adolescent boys with limited success. Athletes Training and Learning to Avoid Steroids (ATLAS), a 10-session program adapted from a US intervention, produced small improvements in body satisfaction and supplement use attitudes; however, these effects were no longer significant after adjusting for multiple comparisons (Yager et al., 2019). Subsequently, Goodform, a four-session teacher-delivered intervention developed specifically for Australian boys using cognitive dissonance and social learning theory approaches, was evaluated in a cluster randomised controlled trial across nine schools. Despite rigorous design and theoretically-grounded content, Goodform produced no significant changes in body dissatisfaction, supplement use, or related attitudes at post-intervention or eight-week follow-up (Yager et al., 2023). These null findings, combined with established differences in the nature of body image concerns between boys (focused on muscularity) and girls (focused on thinness), highlight the importance of examining whether brief interventions produce comparable effects across sexes or whether sex-specific adaptations may be necessary to improve effectiveness for male adolescents.

Becoming Media Savvy: An Unevaluated Australian Program

Given the limited and mixed evidence for single-session interventions, particularly regarding body appreciation outcomes and sex-differentiated effects, rigorous evaluation of widely-disseminated programs is essential for informing evidence-based practice in Australian schools. Organisations like the Butterfly Foundation have played a central role in delivering body image programs to schools across Australia, providing trained presenters to remove significant implementation barriers and increase program reach. Since 2006, Butterfly's prevention programs have reached over 2.3 million young people through education initiatives in schools, sport, and community organisations (Butterfly Foundation,

2025). However, as noted in a recent scoping review of Australian school-based programs, several of their widely implemented programs lack published research evaluation (Sarraj et al., 2025).

The Becoming Media Savvy program, a single-session intervention delivered by the Butterfly Foundation to Year 7-8 students, represents one such program without controlled research evaluation despite its use in Australian schools. The one-hour presentation employs psychoeducational and media literacy approaches to address social influences on body image (peers, family, and media), increase critical awareness of digital image manipulation, explore social media impacts on body esteem, and provide strategies for positive self-talk and peer support. Given the program's implementation as one of the school-based body image initiatives in Australia, coupled with the absence of Australian single-session research examining body appreciation as an outcome, evaluation of Becoming Media Savvy addresses a critical gap in the evidence base.

The Current Study

This study addresses key gaps in body image intervention research by providing the first evaluation of the single-session Becoming Media Savvy program and by examining body appreciation as the primary outcome within an Australian school-based context. Targeting body appreciation offers an important contribution, as positive body image functions not only as the absence of dissatisfaction but as a protective factor associated with well-being, resilience to sociocultural pressures, and healthier behavioural outcomes. Evaluating whether a brief, single-session format can effectively enhance body appreciation is particularly relevant for schools, where time and resource constraints limit the feasibility of longer programs. Evidence of improvements would support the utility of scalable, time-efficient interventions; conversely, null effects would clarify the limitations of single-session

approaches and guide future program development. Based on the theoretical frameworks and empirical evidence reviewed above, three hypotheses were tested.

Hypothesis 1 (Primary Outcome). Adolescents receiving the Becoming Media Savvy program were expected to show significantly greater increases in body appreciation compared to a control group at 1-week and 12-week follow-up.

Hypothesis 2 (Secondary Outcomes). Program participants were expected to demonstrate greater improvements in self-esteem and media literacy, alongside reductions in thin-ideal internalisation, muscular-ideal internalisation, appearance-focused conversations, and appearance-related social comparison at both follow-up assessments compared to controls.

Hypothesis 3 (Sex Differences). Given consistent sex differences in adolescent body image concerns, as well as evidence that body image interventions often show stronger effects for girls than boys (Ahuja et al., 2025; Griffiths et al., 2016; Hoffmann & Warschburger, 2017; McLean et al., 2022), exploratory analyses examined whether sex moderated intervention effects. Based on this literature, it was tentatively expected that girls might benefit more from the program than boys.

2.2 Method

Participants

Participants were recruited from three co-educational high schools in the West/Southwest metropolitan Melbourne area. The initial sample comprised of 362 participants (195 females, 163 males, one gender fluid, one trans-female, and two participants who preferred not to identify their gender). Due to insufficient sample sizes for reliable statistical analysis of gender diverse participants ($n = 4$), only participants identifying as male or female were retained for analysis.

Of the 358 participants who completed baseline assessment, 322 (89.9%) completed 1-week follow-up, 309 (86.3%) completed 12-week follow-up, and 269 (75.1%) provided complete data across all three timepoints (intervention $n = 140$, control $n = 129$). Complete case analysis was employed, retaining only participants who provided data across all three time points (n = 269, 75.1% of the baseline sample), rather than an intention-to-treat approach which would have retained all randomised participants regardless of missing data. The mixed factorial repeated measures ANOVA used as the primary analytic approach inherently requires complete data across all timepoints, meaning complete case analysis was a consequence of the chosen analytical strategy rather than an independent methodological decision. The approach was further supported by two considerations. Attrition analysis revealed no significant differences between completers and non-completers on age, $t(356) = -0.30$, $p = .762$, sex distribution, $\chi^2(1) = 1.23$, $p = .268$, or group allocation, $\chi^2(1) = 0.40$, $p = .841$. However, completers reported slightly lower muscular internalisation, $t(356) = -2.36$, $p = .019$, $d = -0.17$, and higher media literacy, $t(356) = 2.26$, $p = .025$, $d = 0.21$, at baseline. No significant differences were observed for the remaining five baseline variables (all $p > .05$). These findings suggest attrition was largely non-systematic, with balanced dropout across conditions and that data was plausibly missing at random. Second, the final analytical sample substantially exceeded the a priori required sample size of 96, with post-hoc power analysis confirming greater than 99% power ($1- \beta = .999$) to detect the specified effect, indicating attrition did not meaningfully compromise statistical power. It is acknowledged that complete case analysis can produce biased effect estimates when data is not missing completely at random (Sterne et al., 2009), and more robust approaches such as multiple imputation or full maximum likelihood are recommended for future research. The largely non-systematic pattern of attrition and the adequately powered final sample provide justification for the approach adopted, though it is acknowledged as a limitation.

The final analytic sample of 269 participants included 153 females (56.9%) and 116 males (43.1%), with a mean age of 12.80 years (*SD* = 0.69). Participants were randomly assigned to intervention or control conditions at the year level. Table 1 presents the demographic characteristics of participants in the final analytical sample measured at baseline

Table 1

Participant Demographics by Group Allocation

Characteristic	**Total (N = 269)**	**Intervention (n = 140)**	**Control (n = 129)**	**Test Statistic**	***p***
Sex					
Male	116 (43.1%)	62 (44.3%)	54 (41.9%)	$\chi^2 = 0.16$	.713
Female	153 (56.9%)	78 (55.7%)	75 (58.1%)		
Age					
M (*SD*)	12.80 (0.69)	13.01 (0.65)	12.51 (0.61)	$t = 7.46$	<.001
Born in Australia					
Yes	204 (75.8%)	98 (70.0%)	106 (82.2%)	$\chi^2 = 5.43$	.023
No	65 (24.2%)	42 (30.0%)	23 (17.8%)		
Parental Country of Birth					
Both parents born in Australia	77 (28.6%)	49 (35.0%)	28 (21.7%)		
One parent born in Australia	65 (24.2%)	21 (15.0%)	44 (34.1%)		
Both parents born overseas	86 (31.9%)	51 (36.4%)	22 (17.1%)		
Not stated	41 (15.3%)	19 (13.6%)	22 (17.1%)		

Note. Percentages may not sum to 100% due to rounding. [a]Parental country of birth represents both parents combined.

As can be seen in Table 1, the sample consisted of slightly more females than males, with three-quarters born in Australia. Groups were broadly comparable across demographic characteristics, although statistically significant differences were observed for age and country of birth. Table 2, presents participants' social media use.

Table 2

Social Media Use Characteristics by Group Allocation

Characteristic	Total (N = 269)	Intervention (n = 140)	Control (n = 129)
Social Media Use			
Yes	236 (87.7%)	116 (82.9%)	120 (93.0%)
No	32 (11.9%)	23 (16.4%)	9 (7.0%)
Social Media Frequency			
Multiple times per day	95 (35.3%)	46 (32.9%)	49 (38.0%)
Daily	85 (31.6%)	40 (28.6%)	45 (34.9%)
A few times per week	30 (11.2%)	15 (10.7%)	15 (11.6%)
Weekly	10 (3.7%)	5 (3.6%)	5 (3.9%)
Less often	23 (8.6%)	14 (10.0%)	9 (7.0%)
Not applicable	25 (9.3%)	19 (13.6%)	6 (4.7%)
Social Media Duration			
Less than 10 minutes	33 (12.3%)	22 (15.7%)	11 (8.5%)
10 to 30 minutes	58 (21.6%)	26 (18.6%)	32 (24.8%)
30 minutes to 1 hour	53 (19.7%)	28 (20.0%)	25 (19.4%)
1 to 2 hours	39 (14.5%)	15 (10.7%)	24 (18.6%)
More than 2 hours	60 (22.3%)	29 (20.7%)	31 (24.0%)
Not applicable	25 (9.3%)	19 (13.6%)	6 (4.7%)

Note. Percentages may not sum to 100% due to rounding. Not applicable refers to participants who reported no social media use. One participant did not complete the items relating to social media.

As can be seen in Table 2, most participants reported using social media. Social media use was frequent and substantial with two-thirds used it daily or multiple times per day, and over one-fifth reported sessions exceeding 2 hours.

Design

This study used a cluster-randomised controlled design, with year level (Year 7 vs. Year 8) as the unit of randomisation to accommodate school scheduling feasibility while maintaining experimental control. Year levels were randomly assigned to either the intervention condition (Becoming Media Savvy program) or a wait-list control condition who received the program after the 12-week follow-up measures were completed. The study used a 2 (Condition: intervention vs. control) × 2 (Sex: male vs. female) × 3 (Time: baseline, 1-week post-intervention, 12-week follow-up) mixed factorial design, with Condition and Sex as between-subjects factors and Time as a within-subjects factor.

The primary outcome was body appreciation. Secondary outcomes included self-esteem, media literacy, thin-ideal internalisation, muscular-ideal internalisation, social comparison, and appearance conversations. All outcome variables were measured at three time points: baseline (T1), one-week post-program (T2), and 12 weeks post-program (T3).

Within each of the three participating schools, Year 7 and Year 8 cohorts were randomly assigned to intervention or control conditions, resulting in six clusters (three schools × two year levels). While randomisation was conducted at the year-level to control for potential school-level confounds, individual students were treated as the unit of analysis. This approach is discussed as a limitation in the Discussion.

Program Description

Becoming Media Savvy program, is a single-session body image and media literacy presentation delivered by trained presenters from the Butterfly Foundation, an Australian national charity for those impacted by eating disorders and body image issues. The program is designed for Year 7–8 students (ages 12–14) and was delivered during regular school hours in whole-class formats. Sessions typically lasted 60 minutes.

The program comprises five integrated components, delivered sequentially:

1. Self-esteem and body image foundation – Introduces self-esteem and body image as internal feelings rather than appearance-based constructs. Students explore a range of influences on self-perception, including family (with particular emphasis on siblings), peers, teachers, coaches, and media. This component encourages reflection on how comments, role modelling, and messages from others may influence body confidence, and highlights the idea that individuals can act as positive role models within their own social and family environments.

2. Friendship and social influences – Examine the distinction between peers and friends and their differential impacts on body image. The session addresses appearance-based teasing and encourages reflection on positive friendship qualities beyond physical appearance. Students consider how friendships and social networks can influence thoughts and feelings about themselves and their bodies.

3. Media literacy and critical thinking – Explores how media shapes perceptions of beauty and attractiveness. Students are introduced to the prevalence of digital manipulation, including Photoshop and social media filters, and discuss advertising strategies and celebrity influence. This component encourages students to critically evaluate media messages and recognise unrealistic appearance standards.

4. Social media awareness – Focuses on the impact of social media on body image and self-esteem. Students are introduced to the trigger–response framework, contrasting unhelpful responses (criticise, compare, compete, compensate) with more positive alternatives (admire, motivate, balance, compliment). Discussion emphasises ways to foster more positive and supportive social media experiences.
5. Positive communication and action – Emphasise non-appearance-based communication through structured activities such as the Ribbon compliment exercise, discussions about reducing "fat talk," and recognising achievements and personal qualities in oneself and others. Students are encouraged to reflect on how their words and behaviours can influence the wellbeing of themselves and their peers.

The program is supported by video clips (*Change One Thing*, *Safe on Social*, *Role Modelling*) and facilitator-led discussions. Core messages reinforced throughout the session include that self-esteem and body image are about feelings rather than appearance; media images are frequently manipulated; negative comparisons are unhelpful; appearance-based teasing is never acceptable; everyone deserves to feel good about themselves; and help-seeking is important. Overall, the program provides structured information and guided opportunities for reflection but does not explicitly teach skills or employ formal cognitive–behavioural techniques.

Although the program materials do not explicitly reference theoretical frameworks, the content broadly aligns with sociocultural models of body image by acknowledging the influence of media, peers, and wider social contexts on self-perception. Family influences, particularly those related to siblings and role modelling within the home, are briefly introduced as part of broader discussions of social influence but are not a primary or sustained focus of the intervention.

From this perspective, the program can be understood primarily as a psychoeducational intervention, providing students with information and guided reflection to help them recognise and critically evaluate environmental influences on body image and self-esteem. The emphasis on media literacy, social comparison, and peer-related influences is consistent with the Tripartite Influence Model (Thompson et al., 1999) and Social Comparison Theory (Festinger, 1954). However, the program does not explicitly operationalise these theories through structured skill training or targeted behaviour change techniques.

The Becoming Media Savvy program identifies *positive body image* as a key protective factor it aims to support. Body appreciation represents a well-validated operationalisation of positive body image (Tylka & Wood-Barcalow, 2015), making it an appropriate primary outcome measure for evaluating the program's stated goals. However, the program's approach highlights awareness and critical evaluation of sociocultural influences (specifically media influences), through psychoeducational content, assuming that reducing negative influences and building critical awareness creates conditions for positive body image to emerge. The present study examines whether this psychoeducational approach produces measurable improvements in body appreciation, and important empirical question with implications for understanding pathways to positive body image development in early adolescence.

The Butterfly Foundation workshop manual explicitly identifies positive body image as a protective factor the program aims to support, alongside high self-esteem, critical processing of media images, and emotional wellbeing. These protective factors align closely with the core features of body appreciation as conceptualised by Tylka and Wood-Barcalow (2015), including holding favourable opinions of the body independent of appearance, rejecting internalised sociocultural ideals, and engaging in body-protective behaviours. Specific program components map onto these mechanisms in theoretically meaningful ways: program

components 3 and 4 (media literacy and social media awareness) address internalisation of unrealistic appearance deals through critical evaluation of digital manipulation and media messages; program component 5 (positive communication) fosters non-appearance-based self-perception through structured activities emphasising personal qualities and achievements; and the emphasis on positive self-talk and complimenting others across program components 4 and 5 supports emotional wellbeing and self-directed coping that underpin body appreciative attitudes. It is acknowledged, however, that these mechanisms are addressed indirectly through psychoeducation and guided reflection rather than structured skill training or formal cognitive-behavioural techniques. Whether this psychoeducational approach produces measurable improvements in body appreciation therefore remained an important empirical question and a central aim of the present study.

Measures

Media Literacy

The Critical Thinking about Media Messages (CTMM) scale (Scull et al., 2010), was used to assess participants' level of media literacy. The 6-item scale was developed to measure adolescents' critical thinking about media messages they are exposed to, for example "I think about the things advertisers do to get my attention". Response scale ranged from 0 (*never*) to 5 (*always*), with items combined to attain a total score (range 0 to 30), with higher scores reflecting an increase of critical thinking about media. The CTMM has been recommended for use in the evaluation of media-literacy based prevention programs, with an examination of the psychometric properties providing support for the instrument's factor structure, test-retest reliability, and construct validity (McLean et al., 2016b). Scores on the CTMM have reported high internal consistency with a female adolescent sample (α =.90) (McLean et al., 2016b). Cronbach's alpha for the current sample was good (α = 0.88). Full reliability analysis for all study measures at all time points can be found in Appendix C.

Body Appreciation

The Body Appreciation Scale-II (BAS-II) (Tylka & Wood-Barcalow, 2015b), was used to measure body appreciation. The BAS-II measures participants acceptance, respect and attention towards bodily needs, favourable opinions towards one's body and rejection of media messages depicting narrow beauty ideals, for example "I appreciate the different and unique characteristics of my body". Participants respond to 10-items on a scale ranging from 1 (*never*) to 5 (*always*), with items summed to attain a total score, with higher scores indicting individuals with greater body appreciation/acceptance. The BAS-II was refined from the original Body Appreciation Scale (Avalos et al., 2005), to eliminate sex-specific items and body dissatisfaction-based language making it more appropriate for positive body image research and for use with an adolescent sample. The BAS-II has reported high internal consistency for adolescent females ($\alpha = 0.94$ at baseline and $\alpha = 0.95$ at post-intervention) (Halliwell et al., 2015). Cronbach's alpha for the current sample was excellent ($\alpha = 0.93$).

Self-Esteem

Participant's self-esteem was measured using the Rosenberg Self-esteem Scale (RSES) (Rosenberg, 1965). The 10-item scale was designed to assess participant's global self-esteem and feelings of self-worth, for example "I take a positive attitude toward myself". Items are scored on a scale ranging from 1 (*strongly disagree*) to 4 (*strongly agree*). Total scores ranged from 10 to 40, with higher scores indicating greater self-esteem. The RSES has been shown to be a reliable and valid measure of self-esteem with high internal consistency in a cross-cultural adolescent sample ($\alpha = 0.86$) (Supple et al., 2013). Cronbach's alpha for the current sample was good ($\alpha = 0.88$).

Internalisation of Thin and Muscular Appearance Ideals

The 10-item Internalisation subscale of the Sociocultural Attitudes Towards Appearance Questionnaire-4 (Schaefer et al., 2015), was used to assess sociocultural influences on appearance ideals. The internalisation subscale of the SATAQ-4 assesses internalisation of appearance ideals most relevant to females (thin/low body fat) for example, "I want my body to look very thin" and males (muscular/athletic) for example, "I think a lot about looking muscular". Participants indicate their level of agreement with the statements on a scale of 1 (*definitely disagree*) to 5 (*definitely agree*), with higher scores indicating greater appearance-related sociocultural influence. The SATAQ-4 has reported good psychometric properties with a female university-aged sample (Schaefer et al., 2015). Further research with an adolescent female sample has demonstrated adequate test-retest reliability and scores with good internal consistency (α = 0.84) (McLean et al., 2015). Cronbach's alpha was good for the thin internalisation subscale (α = 0.84), and the muscular internalisation subscale (α = 0.88).

Appearance Comparisons

The Physical Appearance Comparison Scale (PACS) (Thompson et al., 1991) was used to assess participants' tendency to compare their appearance to the appearance of others in different social contexts. For example, "The best way for a person to know if they are overweight or underweight is to compare their figure to the figure of others". The 5-items are scored on a scale from 1 (never) to 5 (always), all items are summed (item 4 is reverse-scored) to obtain a total score (range 5-25), with higher scores indicating greater frequency of appearance comparisons. Scores on PACS have demonstrated good internal consistency for an adolescent sample of girls (α=0.84) and boys (α=0.79). (Hargreaves & Tiggemann, 2004). Cronbach's alpha for the current sample was good (α = 0.85).

Appearance Conversations

The Appearance Conversations with Friends subscale of the Appearance Culture Among Peers Scale (Jones et al., 2004), was used to measure the frequency in which adolescents engaged in discussions about expectations for their bodies and appearance enhancements with their friends, for example "My friends and I talk about what we would like our bodies to look like". The 5-items are scored on a range from 1 (never) to 5 (very often), with higher scores indicating more frequent discussions with friends about appearance. Scores on the Appearance Conversations with Friends scale have indicated strong internal consistency for adolescents (α=0.93) (Zimmer-Gembeck et al., 2023). Cronbach's alpha for the current sample was excellent (α = 0.91).

Procedure

Ethics approval for the study was granted from the Victoria University Human Research Ethics Committee (VUHREC). Additional approval was confirmed by the Department of Education and Training Victoria and the Catholic Education Office to conduct research in secondary schools. Recruitment for the study was conducted in collaboration with the Butterfly Foundation, the organisation responsible to delivering the Becoming Media Savvy program.

Secondary schools across metropolitan Melbourne that had previously expressed interest in Butterfly Foundation education programs were invited to participate in the study and were provided with detailed information outlining the study aims, procedures, and time commitments. Information about the research project was also disseminated via the Butterfly Foundation's social media platforms, with interested schools encouraged to contact the research team for further details. Schools that expressed interest were subsequently contacted to arrange meetings with school leadership, wellbeing staff, and relevant teachers to discuss participation and study logistics.

Following approval from school principals and relevant staff, participating classes were organised by year level (Year 7 and Year 8). Randomisation to intervention or wait-list control conditions occurred at the year level within each school using randomisation software. This approach ensured that both intervention and control conditions were represented within each participating school while minimising contamination between conditions. The timing of data collection was coordinated with each school to minimise disruption to regular teaching schedules. Randomisation was conducted by the primary researcher using the Experimental Design Generator and Randomiser (EDGAR; Brown, 2005), an online randomisation tool. Within each of the three participating schools, Year 7 and Year 8 cohorts were randomly assigned to intervention or waitlist control conditions using this tool, resulting in six clusters (three schools x two year levels). Formal allocation concealment was not implemented, reflecting the pragmatic constraints of conducting research within real-world school settings, where timetabling and logistical considerations necessitated transparency in condition assignment with school personnel. This is acknowledged as a limitation of the study.

Information letters describing the study were distributed to parents/guardians via school newsletters and/or the school's student management system (Compass), according to school preference. Information and consent forms were distributed to 658 families, of whom 415 provided written parental consent (63.1% response rate). Student assent was obtained in person on the first day of data collection prior to survey administration.

Assessment timepoints were selected to capture both immediate and longer-term program effects while minimising potential artefacts associated with measurement timing. The one-week post program assessment (T2) was designed to allow a brief interval between program delivery and outcome measurement, avoiding the potential inflation of effect sizes associated with administering outcome measures immediately following the intervention

delivery (Diedrichs et al., 2015). This approach is consistent with post-intervention assessment protocols used in comparable school-based body image intervention research (McLean et al., 2019; Richardson et al., 2010). The 12-week follow up (T3) was selected to assess whether any initial gains were maintained over a meaningful period, consistent with follow-up intervals used in comparable research (McLean et al., 2019; Richardson et al., 2010). It is acknowledged that the optimal timing of outcome assessments for brief psychoeducational interventions remains an open empirical question, and this is discussed further in the limitations section.

Data collection occurred at three time points. At baseline (T1), participants completed self-report questionnaires during class time under researcher supervision. Surveys were administered primarily via Qualtrics using school-issued iPads, with hard copy questionnaires provided to students without access to a device. Prior to survey completion, participants were reminded of the purpose of the study, assured of confidentiality, and informed that participation was voluntary and that they could withdraw at any time without penalty. Researchers were present to answer procedural questions and clarify item wording if required.

One week following baseline assessment, students in the intervention condition participated in the Becoming Media Savvy program, delivered during regular school hours by trained presenters from the Butterfly Foundation. Sessions were conducted in whole-class formats and lasted approximately 60 minutes. Students assigned to the wait-list control condition continued with their regular classes during this period.

One week after the intervention (T2), all participants completed post-intervention questionnaires following the same procedures as baseline. Twelve weeks later, participants completed follow-up questionnaires (T3), again administered during class time using

identical procedures. Students in the wait-list control condition received the Becoming Media Savvy program after completion of all data collection, ensuring equitable access to the intervention.

Fidelity was monitored by the primary researcher, who attended all program sessions. During each session, the researcher used the Butterfly Foundation presenter manual (Butterfly Foundation, 2017), as a checklist to verify that all program components were delivered as intended. Following each session, the researcher conducted a brief debrief with the Butterfly Foundation presenter to confirm that all components had been covered and to identify any deviations from the manual. No significant deviations from the program protocol were identified across any of the sessions. Formal quantitative fidelity measures or independent observation were not employed, which is acknowledged as a limitation of the study, and future research could incorporate structured fidelity checklists or independent observer ratings to provide a more rigorous assessment of program delivery.

Statistical Analysis

Preliminary Analysis

All statistical analyses were conducted using IBM SPSS Statistics version 29. Prior to analysis, data were screened for missing values, outliers, and distributional assumptions. Little's missing completely at random (MCAR) test was performed to determine the correct missing data mechanism (Little & Rubin, 1987).

In order to explore whether there was baseline equivalence a series of independent samples t-tests were conducted to examine if there were significant differences in study variables (1) body appreciation; (2) self-esteem (3) appearance conversations; (4) thin internalisation; (5) muscular internalisation; (6) social comparison; and (7) media literacy. Normality was assessed by Shapiro-Wilk test (p <.05). Histograms and Q-Q normality plots

were used to assess the distribution of the dependent variables. Skewness and kurtosis were assessed with acceptable ranges (±2). Homogeneity of variances was assessed by Levene's test of homogeneity of variances ($p > .05$).

Primary Analysis

A series of 3 (Time) × 2 (Condition) × 2 (Sex) mixed analysis of variance (ANOVA) were conducted to examine the effects of the intervention on the primary and secondary outcome variables. Each repeated measures ANOVA included time (three levels: baseline, 1-week post-intervention, and 12-week follow-up) as the within-subjects factor, and condition (intervention vs. control) and sex (male vs. female) as the between-subjects factors. Sex was included as a between-subjects factor in all analysis to account for known sex differences in body image variables and to test whether intervention effects differed for boys versus girls. Mauchly's test of sphericity was used to determine if the assumption of sphericity was met for the interaction, if the assumption was violated ($p = < .05$), ε Greenhouse-Geisser adjustment was interpreted and reported. Homogeneity of variances was assessed by Levene's test of homogeneity of variances ($p > .05$) for between-subjects effects (condition and sex).

Body appreciation was designated as the primary outcome ($\alpha = .05$). The remaining six variables (self-esteem, thin internalisation, muscular internalisation, social comparison, appearance conversations, and media literacy) were secondary outcomes, with Bonferroni correction applied to control Type I error ($\alpha = .05/6 = .0083$, rounded to $\alpha = .01$). Bonferroni correction was applied when interpreting main effects and interactions for secondary outcomes. Although randomisation was conducted at the year level, analyses treated individual students as the unit of analysis without multilevel modelling. This is discussed as a limitation.

An a priori power analysis was conducted using G*Power 3.1.9.7 (Faul et al., 2007) to determine the required sample size for detecting the primary Time × Condition interaction in a repeated measures ANOVA. Based on effect sizes reported in previous school-based body image intervention research (Cohen's d = 0.30-0.52 for multi-session programs; Richardson & Paxton, 2010; Wilksch & Wade, 2009), a small-to-medium effect size of f = 0.15 (equivalent to Cohen's d = 0.30) was specified as the minimally meaningful program effect. Assuming $\alpha = .05$, desired power = .90, two groups (intervention vs. control), three measurement occasions (baseline, 1-week, 12-week follow-up), and a correlation among repeated measures of $r = .50$, the analysis indicated a required sample size of $n = 96$. The achieved sample size of $n = 269$ substantially exceeded this requirement. Post-hoc power analysis confirmed that with $n = 269$, the study achieved greater than 99% power ($1 - \beta = .999$) to detect the specified effect of $f = 0.15$. Sensitivity analysis further demonstrated that the study had 90% power to detect effects as small as $f = 0.089$ (Cohen's $d = 0.18$), providing excellent sensitivity to identify even very small program effects if present.

2.3 Results

Preliminary Analysis

Missing values analysis identified the percentage of item-missing data was 0.63% (504/79,416). Visual inspection of the data indicated arbitrary missingness. Little's MCAR was not significant, $\chi^2(28455) = 28493.66$, $p = .435$, indicating the data were missing completely at random (Little & Rubin, 1987). Maximum likelihood expected maximisation (EM) algorithm was applied in SPSS to impute missing data for participants missing individual scale items, provided at least 50% of items within each scale were completed. EM imputation process is efficient, minimises bias, and is considered valid when data are MCAR and the percentage of missing data is small (Scafer, 1999; Scheffer, 2002; Enders, 2001).

Prior to examining intervention effects, baseline equivalence between intervention and control groups was assessed through independent samples t-tests. Visual inspection of boxplots identified 11 mild outliers. These values were considered genuine were retained for analyses. Scores were not normally distributed, as assessed by Shapiro-Wilk test (p <.05). However, histograms and Q-Q normality plots were used to assess the distribution of the dependent variables. All variables appeared approximately normally distributed, and patterns of skewness and kurtosis were similar across both groups and values were all within acceptable ranges (±2). There was homogeneity of variances for all variables, as assessed by Levene's test of homogeneity of variances (p > .05). As the sample size is adequate (n = 269), normality is assumed based on the Central Limit Theorem.

Independent samples t-tests were conducted to examine baseline equivalence between the intervention and control groups across all study variables (see Appendix F for full results). Groups were generally equivalent at baseline, with no significant differences observed for body appreciation, self-esteem, muscular internalisation, social comparison, appearance conversations, or media literacy (all ps > .05). However, one significant baseline difference emerged for thin internalisation, $t(267) = -1.33$, $p = .028$, $d = -0.27$, with the control group (M = 2.97, SD = 0.92) reporting higher levels than the intervention group (M = 2.77, SD = 1.01). Analyses proceeded as planned, with this baseline difference noted as a limitation.

Primary Analysis

A series of mixed repeated measures analysis of variance ANOVA were conducted to examine the effects of the intervention on the primary (body appreciation) and secondary (self-esteem; thin internalisation, muscular internalisation, appearance conversations, social comparison; and media literacy) outcome variables. Each repeated measures ANOVA

included time (three levels: baseline, 1-week post-intervention, and 3-month follow-up) as the within-subjects factor, and group (intervention vs. control) and sex (male vs. female) as the between-subjects factors. There was homogeneity of variances, as assessed by Levene's test of homogeneity of variances ($p > .05$), except for appearance conversations at baseline ($p = .002$) and 1-week post program ($p = <.001$). However, given the approximately equal group sizes and robustness of ANOVA to this violation with adequate sample size, the analysis proceeded. Mauchly's test of sphericity was violated ($p = < .05$), ε Greenhouse-Geisser adjustment was interpreted and reported for all variables. Descriptive statistics for all variables across time points are presented in Table 3.

Table 3

Descriptive Statistics for All Outcome Variables by Sex, Condition, and Time

Variable	Intervention			Control		
	Baseline *M* (*SD*)	1-Week *M* (*SD*)	12-Week *M* (*SD*)	Baseline *M* (*SD*)	1-Week *M* (*SD*)	12-Week *M* (*SD*)
Males (n = 62 intervention, n = 54 control)						
Body appreciation	3.81 (0.85)	3.86 (0.95)	3.73 (0.92)	3.72 (0.94)	3.85 (0.97)	3.84 (0.82)
Self-esteem	2.92 (0.56)	3.03 (0.59)	2.96 (0.61)	2.84 (0.54)	3.01 (0.57)	2.98 (0.52)
Appearance conversations	1.73 (0.88)	1.56 (0.68)	1.81 (0.92)	1.77 (0.85)	1.59 (0.68)	1.68 (0.85)
Thin internalisation	2.53 (0.94)	2.53 (0.88)	2.54 (0.89)	2.84 (0.97)	2.69 (0.85)	2.52 (0.84)
Muscular internalisation	2.93 (0.98)	2.71 (0.88)	2.73 (0.95)	3.09 (1.11)	3.07 (1.12)	2.98 (1.12)
Social comparison	2.14 (1.01)	1.98 (0.94)	2.17 (0.93)	2.13 (0.97)	1.93 (0.82)	1.95 (0.95)
Media literacy	3.15 (1.15)	3.20 (1.24)	3.14 (1.26)	3.53 (1.02)	3.35 (1.12)	3.20 (1.42)
Females (n = 78 intervention, n = 75 control)						
Body appreciation	3.69 (0.88)	3.72 (0.91)	3.66 (0.89)	3.59 (0.84)	3.60 (0.90)	3.70 (0.90)
Self-esteem	2.81 (0.64)	2.93 (0.65)	2.91 (0.65)	2.78 (0.52)	2.84 (0.59)	2.91 (0.63)
Appearance conversations	2.47 (1.06)	2.42 (1.00)	2.44 (0.99)	2.51 (1.13)	2.40 (1.16)	2.43 (1.14)
Thin internalisation	2.85 (1.03)	2.78 (1.00)	2.72 (1.08)	3.07 (0.89)	3.06 (0.87)	2.98 (0.89)
Muscular internalisation	2.46 (0.92)	2.33 (0.96)	2.33 (1.00)	2.65 (0.93)	2.82 (1.02)	2.67 (0.94)
Social comparison	2.79 (1.05)	2.62 (1.01)	2.80 (0.96)	2.69 (1.09)	2.57 (1.05)	2.52 (1.03)
Media literacy	3.58 (1.15)	3.43 (1.35)	3.35 (1.33)	3.22 (1.16)	3.19 (1.23)	3.04 (1.20)

Note. Total N = 269. All measures scored on 5-point Likert scales, except self-esteem (1-4) with higher scores indicating greater endorsement of the construct.

Results of the repeated measures ANOVA for the primary variable body appreciation are summarised in Table 4.

Table 4

Repeated Measures ANOVA Results for Body Appreciation

Source	***F***	***df***	***p***	***ηp²***
Within-subjects effects				
Time	0.89	1.77, 467.83	.400	.003
Time × Condition	2.51	1.77, 467.83	.089	.009
Time × Sex	0.69	1.77, 467.83	.484	.003
Time × Condition × Sex	0.14	1.77, 467.83	.846	.001
Between-subjects effects				
Condition	0.10	1, 265	.748	<.001
Sex	2.03	1, 265	.155	.008
Condition × Sex	0.10	1, 265	.750	<.001

Note. $n = 269$. Greenhouse-Geisser corrections applied to the degrees of freedom for within-subjects effects ($\varepsilon = .883$, $p = <.001$).

As can be seen in Table 4, no significant main effects or interactions, including the Time x Group interaction, $F(1.77, 467.83) = 2.51$, $p = .089$, partial $\eta^2 = .009$, for body appreciation. Estimated marginal means for group and time are presented in Table 5.

Table 5

Estimated Marginal Means and 95% confidence Intervals for Body Appreciation by Condition and Time

Time Point	Intervention	Control
	M (*SE*) [95% CI]	*M* (*SE*) [95% CI]
Baseline	3.75 (0.08) [3.61, 3.90]	3.66 (0.08) [3.50, 3.81]
1-week post-program	3.79 (0.08) [3.64, 3.95]	3.72 (0.08) [3.56, 3.89]
12-week follow-up	3.70 (0.08) [3.55 3.85]	3.77 (0.08) [3.61, 3.92]

Note. $n = 269$ (Intervention = 140, Control = 129). Body appreciation measured on a 5-point scale, with higher scores indicating greater body appreciation.

As can be seen in Table 5, while the control group showed improvement from baseline to follow-up, the intervention group declined slightly from baseline to follow-up. Table 6, presents the Time x Condition interaction effects for the six secondary variables.

Table 6

Time × Condition Interaction Effects for Secondary Outcomes

Dependent Variable	*F*	*df*	*p*	ηp²
Self-Esteem	1.11	1.78, 472.46	.327	.004
Thin Internalisation[a]	1.09	1.89, 501.75	.335	.004
Muscular Internalisation	3.90	1.94, 514.81	.022	.014
Social Comparison	2.85	1.93, 510.9	.061	.011
Media Literacy	0.63	1.91, 506.97	.525	.002
Appearance Conversations	0.66	1.94, 514.11	.513	.002

Note. N = 269. Degrees of freedom were adjusted using Greenhouse-Geisser corrections due to violation of sphericity assumptions for all variables. Bonferroni-corrected alpha of $p < .01$ applied to secondary outcomes. [a] Significant group main effect at baseline, $F(1,265) = 3.92$, $p = .049$. [b] Marginal effect that did not survive Bonferroni-correction multiple comparisons.

As can be seen in Table 6, none of the six secondary outcomes demonstrated significant Time x Condition interactions after applying the Bonferroni-corrected alpha ($p < .01$.) Additionally, Time × Sex, Time × Condition × Sex, and Sex × Condition interactions were not significant across all secondary outcomes (all $ps > .05$). Complete repeated measures ANOVA tables for all secondary variables, including main effects for sex, condition, and time and can be found in Appendix G, and full estimated marginal means can be found in Appendix G.

For self-esteem, a significant main effect of time emerged, $F(1.78, 472.46) = 12.16$, $p < .001$, $\eta p^2 = .044$, with self-esteem increasing from baseline ($M = 2.84$, $SE = 0.04$) to post-intervention ($M = 2.95$, $SE = 0.04$) and remaining stable at follow-up ($M = 2.94$, $SE = 0.04$),

regardless of group. No significant sex differences were observed $F(1, 265) = 2.01$, $p = .157$, $\eta p^2 = .008$.

For thin internalisation, a significant main effect of time emerged, $F(1.89, 501.75) = 4.00$, $p = .021$, $\eta p^2 = .015$, with thin internalisation decreasing from baseline ($M = 2.82$, $SE = 0.06$) to 12-week follow-up ($M = 2.69$, $SE = 0.06$) across both groups, though this effect did not meet the Bonferroni-corrected threshold ($p < .01$). A significant main effect of sex was observed, $F(1, 265) = 8.86$, $p = .003$, $\eta p^2 = .032$ with females ($M = 2.91$, $SE = 0.08$) reporting significantly higher thin internalisation than males ($M = 2.61$, $SE = 0.08$). A significant between-subjects main effect for group emerged, $F(1, 265) = 3.92$ $p = .049$, $\eta p^2 = .015$, with the control group ($M = 2.86$, $SE = 0.07$) reporting higher thin internalisation overall than the intervention group ($M = 2.66$ $SE = 0.07$), reflecting a baseline difference between groups.

For muscular internalisation, no significant main effect of time was observed $F(1.94, 514.81) = 2.50$, $p = .085$, $\eta p^2 = .009$. A marginally significant Time x Condition interaction emerged, $F(1.94, 514.81) = 3.90$, $p = .022$, $\eta p^2 = .014$, though this did not meet the Bonferroni-corrected threshold ($p < .01$). Descriptively, the intervention group showed a decreased from baseline ($M = 2.69$, $SE = 0.08$) to 1-week post program ($M = 2.52$, $SE = 0.08$) that was maintained at 12-week follow-up ($M = 2.53$ $SE = 0.09$), while the control group increase from baseline ($M = 2.87$, $SE = 0.09$) to 1-week post program ($M = 2.94$, $SE = 0.09$) before decreasing at follow-up ($M = 2.83$, $SE = 0.09$). Significant between-subjects main effects emerged for group, $F(1, 265) = 7.31$, $p = .007$ $\eta p^2 = .027$, with the control group ($M = 2.88$, $SE = 0.08$) reporting higher muscular internalisation overall than the intervention group ($M = 2.58$, $SE = 0.08$), and for sex, $F(1, 265) = 11.59$, $p < .001$, $\eta p^2 = .042$, with males ($M = 2.92$, $SE = 0.08$) reporting higher muscular internalisation than females ($M = 2.54$, $SE = 0.07$).

For social comparison, a significant main effect of time emerged, $F(1.93, 510.69) = 5.75$, $p = .004$, $\eta p^2 = .021$, with social comparison decreasing from baseline ($M = 2.43$, $SE = 0.06$) to 1-week post-program ($M = 2.28$ $SE = 0.06$) before partially rebounding at 12-week follow-up ($M = 2.36$, $SE = 0.06$) across both groups. A significant main effect of sex was observed, $F(1, 265 = 31.56$, $p < .001$, $\eta p^2 = .106$, with females ($M = 2.67$, $SE = 0.07$) reporting substantially higher social comparison than males ($M = 2.05$, $SE = 0.08$).

For media literacy, a significant main effect of time emerged, $F(1.91, 506.97) = 5.09$, $p = .007$, $\eta p^2 = .019$, with media literacy declining slightly from baseline ($M = 3.37$, $SE = 0.07$) to 12-week follow-up ($M = 3.18$, $SE = 0.08$) across both groups. No significant sex differences were observed, $F(1, 265) = 0.08$, $p = .775$, $\eta p^2 = <.001$.

For appearance conversations, a significant main effect of time emerged, $F(1.94, 514.11) = 3.95$, $p = .021$, $\eta p^2 = .015$, with appearance conversations decreasing from baseline ($M = 2.12$, $SE = 0.06$) to post-program ($M = 1.99$, $SE = 0.06$) before returning toward baseline levels at 12-week follow-up ($M = 2.09$, $SE = 0.06$), though this effect did not meet the Bonferroni-corrected threshold ($p < .01$). A significant main effect of sex was observed, $F(1, 265) = 50.62$, $p < .001$, $\eta p^2 = .160$, with females ($M = 2.45$, $SE = 0.07$) reporting substantially higher appearance conversations than males ($M = 1.69$, $SE = 0.08$).

Summary of Results

The present study examined the effects of a single-session body image program across multiple outcome variables using a repeated measures design with assessments at baseline, 1-week post-intervention, and 12-week follow-up. For the primary outcome of body appreciation, no significant effects were observed. The Time × Group interaction was non-significant, indicating that body appreciation did not change between the intervention and control groups across the three assessment points. Neither group membership nor sex

independently predicted body appreciation levels, and no significant changes in body appreciation occurred over time for either group.

Analysis of the six secondary outcomes revealed a similar pattern. None of the Time × Group interactions reached statistical significance after applying Bonferroni correction for multiple comparisons ($\alpha = .01$). Muscular internalisation showed a marginal Time × Group interaction ($p = .022$) that did not survive correction, with descriptive patterns suggesting the intervention group decreased while the control group initially increased before declining. However, this effect should be interpreted cautiously given the lack of statistical significance after correction.

Across several secondary outcomes, significant main effects of time emerged, indicating that participants in both groups experienced changes over the 12-week study period regardless of intervention condition. Self-esteem and social comparison showed significant improvements over time for all participants. There were favourable significant decreases for appearance conversations, thin internalisation, however media literacy showed significant declines. These time effects occurred independently of group assignment, suggesting natural developmental or environmental influences rather than program-specific effects.

Notable sex differences were observed across multiple variables, with females reporting significantly higher levels of thin internalisation, appearance conversations, and social comparison compared to males, while males reported higher muscular internalisation. Baseline group differences were detected for thin internalisation, with the control group reporting higher levels on both variables. These baseline differences persisted as significant between-subjects main effects throughout the study period.

In summary, the single-session program did not produce significant effects on body appreciation or any secondary outcome variables when compared to the control condition. The observed changes over time appeared to reflect natural variation common to both groups rather than program-specific improvements.

2.4 Discussion

This study provided the first evaluation of Becoming Media Savvy, a single-session body image program delivered by the Butterfly Foundation to Australian adolescents. This study examined whether the one-hour media literacy program could improve body appreciation (H1, primary outcome), self-esteem, media literacy, and reduce appearance-ideal internalization, social comparison, and appearance conversations (H2, secondary outcomes), with exploratory examination of sex differences (H3).

Contrary to hypotheses, the intervention produced no significant improvements on any outcome after correction for multiple comparisons. For body appreciation, no time × condition interaction emerged (H1 not supported). All six secondary outcomes similarly showed no intervention effects (H2 not supported). Additionally, no sex differences emerged (H3 not supported), indicating the program produced no benefits for either males or females. This study contributes to the limited research on single-session body image programs and to our knowledge represents the first Australian school-based single-session study examining body appreciation as a primary outcome, providing evidence about the limitations of single-session approaches for producing meaningful change in this positive body image construct.

Primary Outcome: Body Appreciation

The null findings suggest that this single-session program was unable to produce meaningful improvements in body appreciation. These findings align with evidence that body appreciation may be particularly challenging to enhance through interventions. Guest et al.

(2022) found no improvements following a single-session intervention with children aged 9-11, while Forbes et al. (2023) found no group effects following a four-session program with Australian adolescent girls. Although Halliwell et al. (2015) reported body appreciation improvements following a one-hour dissonance-based program with 62 adolescent girls, this study lacked follow-up data and had a relatively small sample size, potentially limiting conclusions about sustained effects. Additionally, post-program assessment occurred only 2-3 days after the intervention, earlier than the typical one-week timeframe, which may have captured short-lived effects that would not have been sustained at standard post-program intervals. The present findings, combined with null findings from both single-session and multi-session programs, suggest that body appreciation may represent a particularly challenging target for brief school-based prevention programs. As a multifaceted construct requiring body acceptance, appreciation of body functionality, and the capacity to filter appearance-related information in body protective ways (Tylka & Wood-Barcalow, 2015), body appreciation may require more sustained approaches than brief programs can provide.

Although the time × condition interaction did not reach statistical significance, the descriptive pattern warrants consideration. Control participants showed slight improvements across time points (baseline $M = 3.66$ to follow-up $M = 3.77$), whereas intervention participants showed slight declines (baseline $M = 3.75$ to follow-up $M = 3.70$). While not statistically significant, this pattern raises questions about potential unintended consequences. Single-session programs that raise awareness of appearance ideals and sociocultural pressures without providing adequate time to develop protective skills may inadvertently increase appearance-focused attention without providing tools to manage them effectively. Studies examining patient reports from individuals in treatment for anorexia nervosa found that 14% identified health education activities as triggering factors in eating disorder onset (Lin et al., 2023). However, the absence of improvement in both groups also requires consideration of

baseline body appreciation levels. It is important to note that despite the slight decline in the intervention group, both groups' scores remained above the average range (scale range 1–5) and are consistent with higher body appreciation scores reported across adolescents in Lithuania, Denmark, Portugal, and Sweden (Baceviciene & Jankauskiene, 2020; Lemoine et al., 2018). The relatively high baseline body appreciation in the present sample could suggest ceiling effects may have limited improvement potential, particularly given the universal prevention context in which students with already adequate levels of body appreciation have limited capacity for future enhancement in a brief single-session format. The present descriptive pattern underscores the importance of ensuring that body image programs provide the opportunity to practice protective strategies rather than simply introducing appearance-related concepts. However, given the lack of statistical significance, this interpretation remains speculative and requires systematic investigation in future research.

Secondary Outcomes (H2)

Self-Esteem

Self-esteem showed a significant main effect of time with both groups improving from baseline through follow-up, but no time × condition interaction. The intervention produced no advantage despite Becoming Media Savvy explicitly defining self-esteem, encouraging positive self-talk, and promoting self-compassion strategies. This finding mirrors Forbes et al.'s (2023) evaluation of Dove Confident Me with Australian girls, where both intervention and comparison groups showed significant improvements in self-esteem at post-test and 3-month follow-up. Forbes et al. (2023) noted that improvements in both intervention and comparison groups have been identified in other prevention research and may reflect that if many participants already score within the normal range at baseline, there may be limited scope to improve their scores. This explanation fits the present data, where

baseline self-esteem ($M = 2.84$ on a 1-4 scale) was already above the scale midpoint, indicating generally adequate self-esteem prior to the program.

An alternative explanation for the significant main effect for time in both the intervention and control conditions in the current sample may reflect *measurement reactivity*, in which the process of completing self-report questionnaires can prompt self-reflection and cognitive change independent of intervention effects itself (French & Sutton, 2010). As the control participants improved without receiving any program content whatsoever, simply completing measures of self-esteem at three time points may have prompted participants to reflect and evaluate their self-esteem, this process may account for observed improved changes across both groups in the current study.

Media Literacy

Media literacy showed a significant main effect of time with both groups declining from baseline ($M = 3.37$) to follow-up ($M = 3.18$), with no intervention advantage. This unexpected finding raises fundamental questions about media literacy intervention approaches. This finding is not consistent with previous research which found that multisession and even brief interactive lessons have demonstrated improvements in media literacy for adolescents (Kurz et al., 2022; Richardson et al., 2009; Wilksch et al., 2006).

However, this pattern of decline, though distinct in some respects, has precedent in the literature. McLean et al. (2019) found that CTMM declined significantly from pre-to-post program in both intervention conditions of their Happy Being Me evaluation while their active control group showed no significant change. Their study used the same CTMM measure and found that students receiving body image interventions showed unexpected declines in critical thinking about media messages, while those receiving an eating-focused control intervention did not. In contrast, the present study found CTMM declines in both

intervention and control groups, suggesting the pattern may extend beyond intervention-specific effects. While the patterns differ in scope, both studies demonstrate unexpected CTMM declines that challenge fundamental assumptions about media literacy measurement and intervention approaches

First, it questions whether the CTMM captures the type of critical thinking these interventions target. The CTMM assesses general critical thinking about media messages rather than appearance-specific media literacy (photoshop recognition, beauty ideal construction). Students may have learned about digital manipulation in the Becoming Media Savvy program without developing broader critical thinking the CTMM measures. However, if this were purely a measurement validity issue, we would expect intervention groups to show no improvement on CTMM rather than active declines. McLean et al.'s (2019) finding that intervention groups showed significant declines while the active control remained stable suggests the interventions themselves contributed to reduced critical thinking, not simply that CTMM failed to detect intervention-specific learning. The present study's finding that both intervention and control groups declined adds further complexity, indicating the pattern may extend beyond program effects to broader developmental or contextual factors.

Second, the universal decline raises the possibility that critical thinking about media messages may naturally decline during early adolescence. As social media use intensifies and social identity becomes increasingly shaped by heavily curated platforms, adolescents may disengage from effortful critical evaluation when awareness of manipulation offers limited protection. Kleemans et al. (2018) found that adolescent girls rated retouched and reshaped Instagram images more positively than original photos and judged manipulated images as realistic, despite these images directly causing lower body image. Similarly, Ganson et al. (2023) found that photo filter use, where boys and men actively engage in image manipulation themselves, was associated with increased muscle dysmorphia symptomology,

drive for size, and greater functional impairment. These findings reveal a contradiction, adolescents can recognise digital manipulation yet continue to internalise appearance ideals and experience harm. When critical awareness provides limited protection, adolescents may disengage from cognitively demanding media analysis that offers limited benefit, leading to the observed CTMM declines.

These findings challenge the assumption underlying media literacy interventions, that awareness of manipulation techniques translates to changed behaviours. Recent research provides an explanation for why media literacy approaches may be less effective. Bennett et al. (2023) found that while skepticism toward media messages was associated with lower body dissatisfaction, critical thinking about media messages was positively associated with greater body dissatisfaction in young women. Bennett et al. (2023) explain that critical analysis of media messages requires sustained attention to the very content individuals are trying to resist, meaning that interventions promoting critical thinking may counterproductively increase appearance-focused attention rather than reducing body image concerns.

This may explain the present findings. Becoming Media Savvy required students to view images of Victoria's Secret models, athletes, and celebrities; discuss stereotypical appearance ideals, and analyse Photoshop techniques and digital manipulation. While the program intended students to develop protective "critical eye" skills to prevent media manipulation, this approach required sustained cognitive engagement with appearance-based media content. Students spent this section of the session examining idealised images, articulating specific appearance standards, and thinking critically about how these images were constructed. Even when framed analytically, this exposure to and analysis of appearance ideals may increase rather than decrease their importance and influence, particularly when adolescents return to the same social media environments immediately after the session. This

concern is especially significant in the current sample, where 88% of participants reported using social media, with 67% using it daily or multiple times per day and 22% reporting individual sessions exceeding 2 hours. A single one-hour program, with only a portion of the session teaching critical analysis of media messages likely cannot compete with this level of ongoing exposure to appearance-focused content, particularly when the program itself requires attention to the very images and ideals it aims to help students resist.

These findings, combined with McLean et al.'s (2019) CTMM declines and Bennett et al.'s (2023) evidence that critical thinking about media increases rather than decreases body dissatisfaction, suggests media literacy approaches may require a change in direction in favour of behavioural strategies that aim to reduce actual media consumption, curate less appearance-focused digital environments, or help students develop alternative sources of self-worth rather than focussing on their online presence.

Thin-Ideal Internalisation

Thin-ideal internalisation showed a marginal main effect of time that did not survive Bonferroni correction, with slight decreases from baseline to follow-up for both groups. However, no time x condition interaction emerged, indicating no program effect. Additionally, baseline difference was observed with the control group reporting higher thin-ideal internalisation than the intervention group, though both groups showed similar patterns of change over time. This null finding contrasts with previous body image intervention research demonstrating significant reductions in thin-ideal internalisation. School-based dissonance programs have been successful in reducing thin-ideal internalisation among adolescent girls aged 12-13 years (Halliwell & Diedrichs, 2014). Australian multi-session programs including Media Smart (8 lessons; Wilksch & Wade, 2009), Happy Being Me (3-6 sessions; Richardson & Paxton, 2010; Dunstan et al., 2017), and BodyThink (4 sessions;

Richardson et al., 2009) have all demonstrated reductions in thin-ideal internalisation. Meta-analytic evidence further demonstrates that school-based media literacy interventions can significantly reduce thin-ideal internalisation among adolescents (Kurz et al., 2022; Zuair & Sopory, 2022). Critically, these successful interventions involved multiple sessions, providing participants with repeated exposure to content and multiple opportunities to practice challenging thin-ideal messages. The present findings suggest that the specific media literacy approach presented in Becoming Media Savvy was not successful in reducing thin-ideal internalisation despite evidence that both dissonance-based and media literacy approaches can effectively target this outcome when delivered with multiple sessions.

Although Becoming Media Savvy addresses beauty ideals and digital manipulation, it does not employ cognitive dissonance strategies proven most effective for reducing thin ideal internalisation (Stice et al., 2007, 2008). Instead, the program required students to explicitly discuss and articulate stereotypical appearance ideals (e.g., "thin" for females) while viewing images of Victoria's Secret models and celebrities embodying these standards. This approach, while intended to highlight the unrealistic nature of these ideals, may have inadvertently reinforced their importance through sustained attention and detailed articulation, similar to the mechanism Bennett et al. (2023) identified for critical thinking about media messages. Students learned that these appearance ideals are pervasive and media-constructed, but this knowledge alone was insufficient without active, repeated practice generating counter-arguments that cognitive dissonance interventions are centred on.

Muscular-Ideal Internalisation

Muscular-ideal internalisation showed a marginal time × condition interaction that did not survive Bonferroni correction. Descriptively, the intervention group showed decreases from baseline through 1-week post-program and 12-week follow-up, while the control group

increased from baseline to 1-week post-program before decreasing at follow-up. Although groups were equivalent at baseline, their trajectories diverged over time, resulting in a significant between-subjects main effect for group, with control participants reporting higher muscular-ideal internalisation overall than intervention participants when averaged across all timepoints.

However, the failure to meet the Bonferroni-corrected significance threshold ($p < .01$) precludes confident interpretation of this pattern as an intervention effect. Additional factors support caution. The small effect size ($\eta p^2 = .014$) indicates limited practical significance, particularly when compared to interventions demonstrating significant reductions in muscular-ideal internalisation. In contrast, interventions have demonstrated significant reductions in muscular-ideal internalisation, including single-session media literacy lessons in boys (Wilksch et al., 2006) and cognitive dissonance programs in men (Brown et al., 2017), suggesting that muscular-ideal internalisation can be effectively targeted when interventions include adequate and targeted content. Becoming Media Savvy dedicates limited content to muscular-ideal concerns, and this marginal effect on a secondary outcome appears inconsistent with null findings across all other outcomes including the primary outcome of body appreciation. Given that males reported significantly higher muscular-ideal internalisation than females ($\eta p^2 = .042$), it is possible that even minimal program content addressing muscular ideals briefly heightened awareness in male participants who score higher on this outcome. However, this interpretation remains speculative given that the effect did not reach the corrected significance threshold and intervention effects did not differ by sex.

Social Comparison and Appearance Conversations

Social comparison and appearance conversations showed similar patterns. There were temporary reductions at 1-week post-program that rebounded toward baseline by 12-week follow-up, with these patterns occurring equally in intervention and control groups. Although the intervention group received substantial content on social comparison including "the comparison trap", covering who people compare themselves to (family, peers, and celebrities), what they compare (looks, body parts, fashion, intelligence, and talents), and appearance-based teasing and "fat talk", the identical pattern in the control group indicates this content did not produce intervention-specific effects.

A potential explanation for this pattern of findings is measurement reactivity, in which the process of completing self-report questionnaires can prompt self-reflection and cognitive change independent of the intervention itself (French & Sutton, 2010). For participants in both groups, initially completing questionnaires about social comparison and appearance conversations at baseline may have prompted awareness of these behaviours. At 1-week, completing these same questionnaires for the second time likely reinforced this awareness, with participants potentially more conscious of and perhaps temporarily modifying their comparison behaviours and appearance conversations. However, by 12-week follow-up, sufficient time had passed that participants were no longer actively thinking about the questionnaires or these behaviours, and scores returned to baseline levels as participants resumed their typical peer interaction patterns. This pattern suggests that neither the intervention program nor the temporary awareness from questionnaire completion produced lasting behavioural change in these deeply embedded social interaction patterns.

Sex Differences

No sex-specific intervention effects emerged for any outcome (H3 not supported). These null findings for both sexes align with long-standing challenges in secondary school

body image prevention. Yager et al.'s (2013) seminal systematic review found that no classroom-based programs were effective in improving body image for both boys and girls together. More recently, Ahuja et al.'s (2025) systematic review of body image interventions for boys found that few interventions showed effectiveness on boys' body image but most benefited girls. Critically, Ahuja et al. (2025) found that despite testing various intervention types, such as media literacy, cognitive dissonance, positive body image, and mindfulness-based approaches, none have demonstrated consistent effectiveness, and evidence for improving boys'body image remains inconclusive. This pattern persists even with targeted approaches. Australian male-focused programs have demonstrated limited effectiveness despite multi-session formats (Yager et al., 2019; 2023). The present findings, showing null effects for both sexes following a media literacy approach, align with this documented pattern of limited effectiveness in secondary school body image prevention.

Despite the absence of intervention effects, substantial sex differences emerged across outcomes. Females reported significantly higher thin-ideal internalisation, social comparison, and appearance conversations than males. In contrast, males reported significantly higher muscular-ideal internalisation than females. These patterns align with established research on sex differences in adolescent body image, with girls reporting greater thin-ideal internalisation, appearance social comparisons, and appearance conversations, while boys report greater muscular-ideal internalisation (Brunet et al., 2010; Jones, 2004).

Understanding the Null Findings

The null findings across all outcomes likely resulted from multiple interacting factors that constrained the program impact regardless of outcome domain. Baseline scores suggested a relatively low-risk sample which might have limited room for change. Positive constructs (body appreciation, self-esteem, media literacy) showed ceiling effects, while

negative constructs (social comparison, appearance conversations, appearance-ideal internalization) showed floor effects. This pattern may indicate that universal prevention not be efficient when most students already demonstrate adequate levels of body image and related measures. This interpretation is supported by findings from a meta-analytic review of standalone body image interventions which identified that interventions screening participants for negative body image prior to the implementation of the sessions demonstrate significantly larger effects than unscreened interventions, suggesting approaches targeting high-risk students may be more appropriate (Alleva et al., 2015).

Beyond baseline constraints, Becoming Media Savvy's single-session format likely provided insufficient time to develop sustained behaviour change. Positive outcomes must compete with powerful sociocultural pressures, and with 88% of study participants reporting social media use (67% daily or more), a brief program cannot counteract such exposure pressures. This format limitation is documented in previous literature. While single-session interventions can produce short-term improvements not maintained at follow-up (Diedrichs et al., 2015), multi-session programs demonstrate sustained effects (Richardson & Paxton, 2010; Wilksch & Wade, 2009). Additionally, the psychoeducational approach assumed providing information drives behaviour change. Kelly and Barker (2016) identify this as one of six common errors that undermine health behaviour interventions, demonstrating that providing information alone is insufficient for behavioural change. Stice et al. (2007) also noted that interventions including psychoeducation were significantly less effective than those without it. This may further explain the null findings across study variables.

Finally, the school-based delivery format could have limited student engagement and buy-in. Unlike voluntary intervention programs where participants self-select based on identified need, students participated as part of their regular curriculum regardless of personal relevance or motivation. Self-Determination Theory distinguishes between controlled

motivation, driven by external requirements, and autonomous motivation, reflecting genuine interest or perceived value (Ryan & Deci, 2000). Autonomous motivation consistently predicts superior intervention engagement and outcomes in health contexts (Ng et al., 2012). This suggests universal school-based programs may face engagement challenges when delivered to students with varying levels of need and interest.

Theoretical and Practical Implications

The null findings from this evaluation provide important evidence about program safety. While Becoming Media Savvy demonstrated no measurable benefits across outcomes, the program also demonstrated no evidence of harm. This finding is valuable given that some school-based health and nutrition activities have been identified as iatrogenic, with 14% of patients in treatment for anorexia nervosa citing such education as triggers for their eating disorders (Lin et al., 2023). This study provides controlled evaluation evidence about program safety that was previously unavailable.

These findings highlight broader challenges in negative body image prevention. Programs can achieve extensive reach without demonstrating measurable effectiveness, with face validity rather than empirical evidence driving adoption. The absence of controlled evaluation for Becoming Media Savvy prior to this study, despite being widely adopted by schools for years, demonstrates this research-practice gap. Yager (2024) argues that universal programs often appear to have "failed" when evaluated using traditional research criteria and null findings emerge, yet evidence-based programs that have been evaluated for safety should still be shared with teachers as alternatives to unevaluated practices. This perspective highlights an important tension in prevention research, while evaluated safe programs represent progress, the field must also ensure that limited resources prioritise approaches with demonstrated effectiveness to maximise public health impact.

The transparent reporting of null findings is essential for advancing prevention research. Axford et al. (2022) argue that researchers often overlook or rationalise null findings through problematic practices including selective reporting, inappropriate subgroup testing, or blaming methodological limitations. The authors contend these approaches undermine the scientific evidence base, result in wasted research resources, and inhibit innovation in intervention development. These null findings from the current study provide evidence by demonstrating what does not work in adolescent body image prevention. This knowledge strengthens the evidence base and enables researchers and practitioners to make more informed decisions about intervention selection, program development, and resource allocation.

The intervention was implemented as designed, with experienced facilitators in school settings, yet produced no measurable effects. This suggests the issue could lie with the intervention mechanism itself. The psychoeducational approach, which relies on providing information to change attitudes and behaviours, shows limited effectiveness for body image concerns, with meta-analytic evidence demonstrating that programs without psychoeducational content produce larger effects (Stice et al., 2007). In contrast, cognitive dissonance interventions have demonstrated sustained reductions in thin-ideal internalisation and eating disorder symptoms (Stice et al., 2008). Moreover, media literacy scores declined from baseline to follow-up in both groups, providing additional evidence of psychoeducational limitations. This finding aligns with McLean et al.'s (2019) evidence that media literacy alone fails to maintain effects compared to other intervention styles and Bennett et al.'s (2023) finding that critical thinking about media messages is associated with increased rather than decreased body dissatisfaction. These findings suggest the cognitive-analytical media literacy model requires rethinking in favour of approaches that reduce media consumption or develop alternative sources of self-worth.

Beyond mechanism limitations, the program's brief format cannot address the complexity of body image development. Axford et al. (2022) argue that brief interventions are insufficient for problems with multiple underlying causes. Body image concerns emerge through multiple interacting mechanisms operating over years. Specifically, sociocultural pressures (Thompson et al., 1999), social comparison amplified by social media (Fardouly & Vartanian, 2016), self-objectification (Fredrickson & Roberts, 1997), and developmental vulnerabilities (Smolak, 2011) contribute to body image development. Such complexity cannot be meaningfully addressed through brief psychoeducational interventions. Enhancing body appreciation in early adolescence requires identifying the modifiable psychological factors that serve as robust predictors of positive body image, then designing interventions that systematically build these strengths rather than focusing solely on appearance-related content.

Limitations

Several limitations should be considered when interpreting the findings of Study 1. The study was conducted with students aged 12–14 years, a developmental period characterised by change in body image and self-esteem (Lacroix et al., 2023). Both intervention and control groups showed improvements across several psychosocial outcomes, including self-esteem and reductions in thin-ideal internalisation, which may reflect normative developmental processes rather than program effects. While age-related developmental change during early adolescence may have limited the detection of program-related effects, the mean age difference between the intervention and control groups is unlikely to have meaningfully influenced between-group comparisons. The total sample mean age ($M = 12.80$, $SD = 0.65$) was typical for Year 7–8 students, and the restricted age range further reduces the likelihood that age differences account for the observed null

findings. Age was not included as a covariate due to violations of assumptions required for covariate-based analyses.

The study employed cluster randomisation at the year level within schools, however statistical analyses did not explicitly account for clustering. This approach is consistent with several previous school-based body image intervention studies that have used cluster randomisation but relied on single-level analytic strategies (Halliwell et al., 2015; McLean et al., 2019). Simulation and review work indicates that cluster randomised trials analysed without explicitly accounting for clustering can experience inflated Type I error rates when standard methods assume independent observations (Kahan et al., 2016). Several factors mitigate this concern in the current study. Randomisation occurred within schools, controlling for school-level confounds, and null effects were observed consistently across all seven outcome variables. In addition, a Bonferroni correction was applied to adjust for multiple comparisons, further reducing the likelihood of Type I error. As inflation of Type I error primarily affects the interpretation of statistically significant findings, it is unlikely to explain the absence of program effects observed in this study. Nevertheless, future trials would benefit from hierarchical modelling approaches that explicitly account for nested data structures. Additionally, formal allocation concealment was not implemented, reflecting the pragmatic constraints of real-world school-based research, and this represents a methodological limitation that may have introduced bias in condition assignment.

A baseline difference was observed for thin-ideal internalisation, with higher scores in the control group compared to the intervention group. Although analyses focused on change over time rather than absolute levels, this imbalance suggests imperfect randomisation and complicates interpretation of thin-ideal outcomes (Overall & Doyle, 1994). Importantly, no program effects were detected for thin-ideal internalisation, indicating that the program did not produce measurable benefits for either group. Given that thin-ideal internalisation is

typically more relevant for girls, and that the sample contained a greater proportion of girls than boys, future research may benefit from stratified randomisation or sex-specific analytic approaches to further reduce baseline imbalances on sex-sensitive constructs. The use of complete case analysis, while justified by the largely non-systematic pattern of attrition and the adequately powered sample, also represents a methodological limitation, and more robust approaches such as multiple imputation or full information maximum likelihood are recommended for future research.

Finally, the timing of outcome assessments may have limited sensitivity to program effects. The one-week post-program assessment may have been too early to capture meaningful cognitive or behavioural change, while the 12-week follow-up may have missed short-term awareness gains that dissipated over time. However, the consistency of null findings across both follow-up points suggests that assessment timing alone is unlikely to account for the absence of observed program effects. A further limitation concerns intervention fidelity. Whilst the primary researcher attended all sessions and used the Butterfly Foundations presenter manual as a delivery checklist, formal quantitative fidelity measures and independent observer ratings were not adequately employed, limiting the ability to fully determine program delivery consistency and participant engagement with content.

Future Research Directions

The null findings suggest the need for rethinking of body image prevention approaches rather than incremental improvements to existing models. Research should identify robust predictors of positive body image that could inform genuinely novel intervention targets. Study 2 of the thesis takes this approach, examining predictors of body appreciation in early adolescence, including self-esteem, resilience, and positive affect, to

identify potentially modifiable factors that might serve as future intervention targets. If these factors emerge as stronger predictors of body appreciation, this may suggest that body image interventions could prioritise building general psychological resources rather than appearance-specific content.

Additionally, the natural developmental improvements observed in some outcomes (self-esteem, thin-ideal internalisation), combined with ceiling and floor effects suggesting most students already have adequate levels of body appreciation and secondary variables, raise questions about whether universal prevention during early adolescence is the most efficient approach. Screening and targeted prevention models could identify adolescents showing declining or low body appreciation and provide intensive support to this higher-risk group, concentrating resources where most needed.

Conclusion

This study provided the first evaluation of Becoming Media Savvy, a single-session body image program delivered to Australian adolescents aged 12–14 years. Contrary to expectations, this brief, universal, media literacy-focused program did not produce significant improvements on body appreciation or any secondary outcomes after correcting for multiple comparisons. A marginal effect on muscular-ideal internalisation was observed but did not survive correction.

These null findings offer important lessons for prevention science. Transparent reporting of null results enables the field to learn from approaches that are safe but of limited impact (Axford et al., 2022). The evaluation demonstrated program safety, with no evidence of harm, which is valuable given that some school-based health education interventions can be iatrogenic (Lin et al., 2023). The consistent null results highlight several lessons for future prevention efforts. Baseline constraints in this sample, including ceiling and floor effects,

limited the potential of universal prevention when most students already demonstrated adequate functioning. The single-session format provided insufficient opportunity for sustained behavioural change. Finally, psychoeducational approaches that primarily provide information showed limited effectiveness, consistent with prior meta-analytic evidence (Stice et al., 2007). Understanding these factors informs more effective program design and resource allocation.

These findings have practical implications. Single-session psychoeducational approaches targeting body appreciation in early adolescence appear to have limited effectiveness. Schools can draw on these findings to recognise these limitations and consider alternative strategies, including evidence-based multi-session programs with demonstrated sustained effects, interventions targeting high-risk students identified through screening, or systemic modifications to school cultures that perpetuate appearance pressures. These results also highlight the importance of rigorous evaluation before widespread implementation, ensuring that programs achieve measurable benefits and that resources are invested in approaches likely to produce meaningful improvements in adolescent body appreciation. Future programs may also benefit from moving beyond appearance-focused content to interventions that build broader psychological resources, as explored in Study 2.

The first study in this thesis provides foundational learning about what does not work in brief body image programs. The subsequent studies build on these lessons by examining predictors of body appreciation to identify more promising prevention targets (Study 2), and by developing the Appearance-Related School Interference (ARSI) scale to assess practical outcomes that extend beyond traditional body image measures (Study 3). Together, these three studies offer complementary perspectives on adolescent body appreciation: the limitations of brief programs, the identification of individual psychological resources that may serve as intervention targets, and contextually appropriate practical assessment.

Collectively, they contribute to a more comprehensive understanding of body appreciation in early adolescence, advancing both prevention approaches and measurement in this critical developmental period.

Chapter 3: Study 2 – Protective Factors for Body Appreciation in Early Adolescence: A Strengths-Based Approach

3.1 Introduction and Literature Review

The Importance of Body Appreciation in Early Adolescence

Body appreciation has emerged as a critical predictor of psychological well-being, adaptive health behaviours, and resilience against eating disorders (Halliwell et al., 2013; Tylka & Wood-Barcalow, 2015a). Unlike body satisfaction, which focuses on satisfaction with appearance, body appreciation represents a more comprehensive positive relationship with one's body, valuing one's body, self-respect, and resistance of unrealistic appearance ideals (Linardon et al., 2022). The significance of body appreciation extends beyond individual well-being, with research demonstrating its protective role against depression, anxiety, media-induced body dissatisfaction, and disordered eating behaviours that commonly emerge during adolescence (Andrew et al., 2015; Bacevičienė & Jankauskienė, 2020; Winter et al., 2017). Recent prospective research has confirmed these protective effects, with Linardon et al. (2023) demonstrating that body appreciation significantly predicted decreased depressive symptoms and increased self-esteem, flourishing, and wellbeing over a three-month period in adult women, with effects remaining significant after controlling for negative body image. Understanding the factors that predict body appreciation during the developmental window of early adolescence represents an important step toward developing effective prevention and intervention strategies.

Recent longitudinal research has confirmed that positive body image in adolescence comprises multiple distinct but related components, with body appreciation emerging as the most central factor that predicts positive developmental outcomes including identity synthesis and decreased identity confusion over time (Uyar et al., 2024). Similarly, Iannattone et al.

(2025) used latent profile analysis to examine specific body image profiles of Italian adolescents and identified that those in the 'weak negative body image and strong positive body image' profile demonstrated significantly reduced eating disorder symptoms, thin-ideal internalisation, and social comparison, suggesting positive body image, specifically body appreciation, may protect adolescents from harmful outcomes.

Rationale for Individual Protective Factors Approach

Understanding the factors that predict body appreciation in adolescents has become increasingly important for developing evidence-based interventions that promote positive body image during this critical developmental period. While extensive research has identified numerous external factors that influence body image, including family dynamics (Amianto et al., 2018), peer relationships (Kenny et al., 2016), and media exposure (Vandenbosch et al., 2022), these variables often lie beyond adolescents' immediate control and require systemic or long-term environmental changes to address effectively. In contrast, individual psychological factors represent modifiable targets within adolescents' sphere of influence, making them particularly valuable approaches for intervention development and body image promotion (Linardon et al., 2022; Piko et al., 2020).

The focus on early adolescence adolescents aged 12-14 years is supported by developmental and empirical evidence (Yager et al., 2013). This developmental stage represents the onset of puberty for most individuals, bringing rapid physical changes that can dramatically alter body perception and challenge existing self-concept (Mulgrew, 2020). Unlike older adolescents who have had time to adjust to pubertal changes, young adolescents are experiencing these physical transformations for the first time, making them particularly vulnerable to body dissatisfaction and negative body image (Cash & Smolak, 2011; Voelker et al., 2015). A recent meta-analysis exploring normative body image development suggests

that sensitive periods may occur earlier than previously thought, with girls showing worsening body image from as young as 10 years old (Lacroix et al., 2023). This research suggests that the early adolescent period may represent an opportunity to influence body image development before negative patterns become entrenched, emphasising the importance of identifying protective factors during this vulnerable period.

Beyond justifying the importance of this developmental period, there are specific theoretical and empirical reasons to expect that the relationships between individual psychological factors and body appreciation may differ in early adolescents compared to older adolescents and adults. First, the self-concept is less consolidated in early adolescence, with self-esteem more reactive to social feedback and peer evaluation during this period than in later development (Harter, 1999; Orth & Robins, 2014). This developmental instability may amplify the relationship between global self-esteem and body appreciation in younger adolescents relative to older samples, where self-esteem is more stable and less susceptible to situational influences. Second, emotion regulation capacities, which underpin both resilience and positive affect, continue to develop throughout adolescence, with early adolescents demonstrating less mature regulatory strategies compared to older adolescents and adults (Gullone et al., 2010). As a result, the protective contribution of resilience and positive affect may operate differently, and potentially more powerfully, during this formative period when regulatory skills are still developing. Third, pubertal timing introduces rapid physical changes that are unique to early adolescence and that do not feature in adult body image research, potentially altering the mechanisms through which psychological resources protect body appreciation (Lacroix et al., 2023). Together, these developmental considerations suggest that findings from adult or older adolescent samples cannot be straightforwardly extrapolated to early adolescents, providing theoretical justification for examining these relationships specifically within the 12-14 age window.

Theoretical Frameworks

The examination of individual protective factors for body appreciation is grounded in two complementary theoretical frameworks that converge on the importance of building individual psychological resources during adolescence. Fredrickson's (2001) broaden-and-build theory of positive emotions provides a framework for understanding how individual psychological factors create lasting change. This theory proposes that experiencing positive emotions expands people's awareness and behavioural options in the moment while simultaneously developing lasting psychological assets such as resilience and effective coping strategies. Longitudinal research has provided empirical support for this theory, with Gomez-Baya et al. (2018) demonstrating that adaptive responses to positive affect, such as positive rumination, predicted greater self-esteem and life satisfaction over a one-year period in middle adolescents, initiating positive developmental cycles toward enhanced psychological adjustment. Positive emotions may also mitigate the effects of negative emotions by facilitating faster recovery from stress and negative experiences and promoting long-term physical and mental wellbeing (Garland et al., 2010).

Resiliency theory provides a complementary framework that emphasises adolescents' inherent strengths and capabilities rather than viewing them as problems to be managed (Zimmerman, 2013). This theory conceptualises resilience as a dynamic process where individuals use protective factors to achieve positive outcomes, with the protective factor model suggesting that personal strengths may work together to enhance their protective benefits (Fergus & Zimmerman, 2005; Zimmerman, 2013). While self-esteem, resilience, and positive affect have been studied individually in relation to body appreciation, no research has examined these three factors as simultaneous predictors during the early adolescent period. This gap is theoretically significant because resiliency theory suggests that multiple protective factors working together may provide stronger prediction than individual factors

alone (Rutter, 1987). This is particularly important as adolescents may require diverse psychological resources to successfully navigate body image challenges that they face. This assets approach focuses on building positive qualities and experiences rather than solely preventing negative behaviours, supporting the examination of how these internal resources may collectively predict body appreciation outcomes (Benson et al., 2011).

Individual Protective Factors: Evidence Base

Self-esteem as a Protective Factor. Self-esteem, conceptualised as individuals' overall sense of personal worth and self-acceptance, represents internal self-evaluation patterns and cognitive frameworks that can be modified during adolescence (Orth & Robins, 2014; Rosenberg, 1965). Unlike appearance-based self-worth, which fluctuates with external validation and social comparison processes healthy global self-esteem provides a stable foundation for body appreciation (Tylka & Wood-Barcalow, 2015b). Meta-analytic evidence provides support for the relationship between self-esteem and body appreciation. Linardon et al. (2022) conducted the first comprehensive meta-analysis of body appreciation research, analysing 240 studies and demonstrating that self-esteem shows the strongest positive correlation with body appreciation ($r = 0.57$) among all psychological correlates examined. Crucially, this relationship remained significant ($r = 0.48$) even after controlling for negative body image, confirming that self-esteem's protective effects operate through positive body image pathways rather than merely reflecting the absence of body dissatisfaction (Linardon et al. 2022). Prospective research further demonstrates the protective relationship between body appreciation and self-esteem, with Linardon et al. (2023) showing that body appreciation significantly predicted increased self-esteem over a three-month period, supporting theoretical models of upward spirals between these constructs. Cross-cultural research by Piko et al. (2020) confirmed self-esteem as the strongest predictor of body appreciation in Hungarian female adolescents, with multiple regression analysis showing self-esteem

accounted for the majority of variance in body appreciation scores, substantially exceeding other psychological factors. Additionally, trajectory research has identified that adolescents with higher self-esteem significantly predicted membership in high body esteem trajectories over a four-year period (Lacroix et al., 2022). Gender-specific analyses suggest that self-esteem may play a more significant role in the development of body image attitudes in girls than boys (Nichols et al., 2018), underscoring the importance of examining these relationships separately by gender.

Resilience as a Protective Factor. Resilience, understood as adaptive responses that enable positive functioning despite challenges, encompasses the coping strategies, emotional regulation skills, and capacity to bounce back from adversity that allow individuals to maintain psychological wellbeing in the face of stressors (Luthar et al., 2000). The resilience framework is particularly relevant to body image research given that adolescents routinely encounter appearance-related pressures from family, friends, and potentially harmful media messages that can challenge body esteem (Tanguay et al., 2025). Recent large-scale longitudinal research demonstrates that internal psychological factors including self-esteem, emotional regulation, and optimism consistently show the strongest protective effects for resilience among early adolescents aged 12-14, with girls reporting lower levels of resilience compared with boys (Marquez et al., 2023).

Recent longitudinal research has demonstrated the interconnected nature of resilience and self-esteem as protective factors. Liu et al. (2021) found positive mutual effects between self-esteem and resilience over a 2-year period in early adolescents suggesting these factors operate collaboratively rather than independently. Additionally, recent research demonstrates that resilience operates through multiple pathways to enhance psychological well-being, with psychological resilience mediating the relationship between self-esteem and positive developmental outcomes including body image (Liu et al., 2025). While research has not yet

examined resilience as a specific correlate of body appreciation, related constructs including adaptive emotion regulation show moderate positive associations with body appreciation (r = 0.38), supporting the theoretical connection between resilience-related skills and positive body image (Linardon et al., 2022). Resilience skills are inherently learnable through evidence-based interventions, with systematic reviews showing that resilience-focused programs demonstrate overall effectiveness in promoting resilience among adolescents, particularly when delivered in school settings with sustained benefits for up to 6 months post-intervention (Pinto et al., 2021).

Positive Affect as a Protective Factor. Positive affect is the tendency to experience frequent positive emotions, enthusiasm, alertness, and high energy and represents emotional regulation abilities and optimistic cognitive styles that directly influence daily psychological experiences (Watson et al., 1998). Meta-analytic evidence provides strong empirical support for positive affect as a protective factor for body appreciation. Linardon et al. (2022) demonstrated a strong positive correlation between positive affect and body appreciation (r = 0.49) across diverse populations, indicating that individuals who experience frequent positive emotions show significantly higher levels of body appreciation. This relationship likely operates through enhanced capacity to focus on body functionality rather than appearance, increased gratitude for bodily capabilities, and reduced focus on perceived physical flaws. More broadly, longitudinal research provides evidence for positive affect's unique predictive power across psychological development. Kim et al. (2024) demonstrated in a large-scale study spanning from adolescence to adulthood that higher positive affect is generally associated with better outcomes in physical health, psychological well-being, and social engagement, suggesting that positive affect represents a stable protective factor that creates lasting psychological resources through broaden-and-build mechanisms. Furthermore, Bolier et al. (2013), demonstrated that positive affect can be systematically cultivated through

evidence-based interventions, with meta-analytic research indicating that positive psychology interventions including self-help interventions, group training, and individual therapy show significant effects for subjective well-being and psychological well-being, making it a viable target for body image intervention development.

Intervention Evidence for Individual Factors

Research demonstrates that self-esteem, resilience, and positive affect can be effectively enhanced through evidence-based interventions specifically designed for adolescent populations, supporting their selection as modifiable targets for body appreciation promotion. Positive psychology interventions have demonstrated significant improvements in self-esteem alongside reduction in anxiety and enhanced overall wellbeing, particularly when delivered in school settings (Abu Omar et al., 2024; Ebrahiminejad et al., 2016; Goyal et al., 2023). Similarly, resilience programs show effectiveness in enhancing resilience in children and adolescents, with systematic reviews identifying that resilience-focused programs demonstrate overall effectiveness in promoting resilience among adolescents, with the strongest effects when delivered in school settings and sustained benefits for up to 6 months post-intervention (Pinto et al., 2021). Positive affect can also be enhanced through structured interventions, with comprehensive positive education programs showing significant increases in positive affect and improved positivity in early adolescents, with benefits maintained at 5-month follow-up (Laakso et al., 2021). The combined evidence from multiple intervention studies supports the malleability of these individual factors during adolescence and validates their selection as targets for body appreciation promotion during this developmentally sensitive period.

Research Gaps and Study Rationale

Despite research on individual factors influencing body appreciation and the demonstrated effectiveness of interventions targeting self-esteem, resilience, and positive affect, significant gaps remain in our understanding of how these factors function as predictors of body appreciation in adolescent populations. The first comprehensive meta-analysis of body appreciation research examining psychological correlates of body appreciation found only five studies investigated body appreciation as an outcome (Linardon et al., 2022). While research has begun to demonstrate body appreciation's protective effects including predicting decreased depressive symptoms, increased self-esteem, and wellbeing over time (Linardon et al., 2023; Urke et al., 2021), this research has focused primarily on body appreciation as a predictor of outcomes rather than identifying the individual factors that predict body appreciation development during critical developmental periods.

Most importantly, no studies to date have comprehensively examined self-esteem, resilience, and positive affect together as simultaneous predictors of body appreciation specifically in the critical 12-14 age group. Meta-analytic evidence shows that while self-esteem demonstrates the strongest individual correlation with body appreciation *(r* = 0.57), positive affect also shows a strong relationship *(r* = 0.49), but their relative contributions when examined simultaneously remain unknown (Linardon et al., 2022). From a practical perspective, examining these factors simultaneously is crucial for efficient intervention development, as understanding their relative predictive strength when considered together can guide the prioritisation of intervention components and resource allocation in prevention programs.

While recent research has begun examining components of this relationship such as Lacroix et al.'s (2022) identification of self-esteem and positive affect as predictors of body esteem trajectories, Piko et al.'s (2020) examination of self-esteem and body appreciation in older adolescents, and Liu et al.'s (2021) demonstration of mutual effects between self-esteem

and resilience, these studies either examined factors separately, used different age groups, or focused on related but distinct outcomes. The early adolescent period represents a particularly important window because it coincides with pubertal onset, peak vulnerability to body dissatisfaction, and optimal neuroplasticity for intervention (Lacroix et al., 2023). Understanding protective factors during this specific developmental window before negative body image patterns become entrenched is essential for developing targeted prevention approaches that can promote the lasting positive outcomes demonstrated in longitudinal research.

This approach aligns with strengths-based intervention models that emphasise building individual capabilities and resilience rather than solely addressing deficits or pathology (Zimmerman, 2013), while recognising young adolescents' emerging capacity for agency and self-determination in shaping their psychological wellbeing and body image outcomes. The identification of the strongest individual predictors of body appreciation has important implications for designing efficient prevention programs that can build psychological resources before body image problems develop.

Study Aims and Hypotheses

The primary aim of this study is to examine the relative predictive strength of self-esteem, resilience, and positive affect on body appreciation in young adolescents aged 12-14 years, with separate analyses conducted for girls and boys to identify potential gender differences in these predictive relationships. Given the theoretical importance of examining these factors together rather than in isolation to understand their relative contributions to body appreciation, this study addresses a critical gap in understanding how multiple protective factors operate simultaneously during this vulnerable developmental period.

Based on the theoretical frameworks and empirical evidence reviewed, it is hypothesised that self-esteem, resilience, and positive affect will demonstrate significant positive predictive relationships with body appreciation, with self-esteem emerging as the strongest predictor. It is also hypothesised that these predictive relationships between individual psychological factors and body appreciation will differ between girls and boys in both pattern and strength, reflecting documented sex differences in body image development and the differential sociocultural pressures experienced during early adolescence

3.2 Method

Participants

Participants in the present study were drawn from the same cohort as Study 1 but address a distinct research question using baseline data only. The sample comprised 353 adolescents (160 males, 193 females) aged 12 to 14 years ($M = 12.80$, $SD = 0.69$), who provided valid baseline data. Participants were recruited from three secondary schools in Victoria, Australia. Table 1, presents participant demographics.

Table 1.

Participant Demographics

Characteristic	Total (N = 353)
Sex	
Male	160 (45.3%)
Female	193 (54.7%)
Age	
12 years old	126 (35.7%)
13 years old	172 (48.7%)
14 years old	55 (15.6%)
Born in Australia	
Yes	261 (73.9%)
No	92 (26.1%)
Parental Country of Birth	
Both parents born in Australia	94 (26.6%)
One parent born in Australia	100 (28.3%)
Both parents born in overseas	112 (31.7%)
Not stated	47 (13.3%)

Note. Percentages may not sum to 100% due to rounding.

As shown in Table 1, the sample was slightly more female than male, most participants were born in Australia, and parental country of birth reflected a mix of both Australian-born and overseas-born parents.

Measures

Body Appreciation

Body appreciation was assessed using the Body Appreciation Scale-II (BAS-II) (Tylka & Wood-Barcalow, 2015b), The BAS-II measures participants acceptance, respect and attention towards bodily needs, favourable opinions towards one's body and rejection of media messages depicting narrow beauty ideals, for example "I appreciate the different and unique characteristics of my body". Participants respond to 10-items on a scale ranging from 1 (never) to 5 (always), with items summed to attain a total score, with higher scores indicting individuals with greater body appreciation. The BAS-II was refined from the original Body Appreciation Scale (Avalos et al., 2005), to eliminate sex-specific items and body dissatisfaction-based language making it more appropriate for positive body image research and for use with an adolescent sample. The BAS-II has reported strong reliability in adolescent samples (α = 0.93) (Alcaraz-Ibáñez et al., 2017). This was consistent with the current sample of boys (α = 0.93) and girls (α = 0.94).

Self-Esteem

Participant's self-esteem was measured using the Rosenberg Self-esteem Scale (RSES) (Rosenberg, 1965). The 10-item scale was designed to assess participant's global self-esteem and feelings of self-worth, for example "I take a positive attitude toward myself". Items are scored on a scale ranging from 0 (strongly disagree) to 3 (strongly agree). Total scores ranged from 0 to 30, with higher scores indicating greater self-esteem. The RSES has been shown to be a reliable and valid measure of self-esteem with high internal consistency in an cross-cultural adolescent sample (α = 0.86) (Supple et al., 2013). Similar reliability was reported with the current sample of boys (α = 0.85) and girls (α = 0.90).

Positive Affect

The positive affect subscale of the Positive and Negative Affect Schedule-Children (PANAS-C) (Ebesutani et al., 2012), was used to assess participants' level of positive and

negative affect. The positive affect subscale of the PANAS-C is a 5-item scale that consists of singular-words that describe different feelings and emotions. Five-items measure positive affect eg. "happy". Participants are asked to indicate to what extent they have felt this way during the past week on a scale from 1 (very slightly) to 5 (extremely). Participants responses are summed for each subscale (range 5 -- 25) with higher scores indicating greater levels of positive affect. Scores on this measure have demonstrated good internal consistency with a youth sample on the positive affect scale (α = 0.86) (Ebesutani et al., 2012). Reliability with the current sample was boys (α = 0.84) and girls (α = 0.88).

Resilience

The Child and Youth Resilience Measure (CYRM-12) (Liebenberg et al., 2013), was used to assess resilience features in adolescents. The CYRM-12 was derived from the original CYRM-28 measure designed to explore the resources available to young people that may strengthen resilience across three components individual, relational, and community. Sample items are "My family stands by me during difficult times" and "I have opportunities to develop skills that will be useful in later life". Response scale ranged from 1 (not at all) to 5 (a lot), with items summed to attain a total score (range 12 to 60), with higher scores indicating greater global resilience. Subscales of individual, relational and community resilience can be explored separately by summing the appropriate items. The CYRM has been identified as a reliable and valid measure of self-reported youth resilience (Liebenberg et al., 2012). Scores on this measure have demonstrated high internal consistency with an adolescent sample (α = 0.92) (Mu & Hu, 2016). Reliability for the current sample was good, boys (α = 0.80) and girls (α = 0.82).

Procedure

See Chapter 2 (page 53-55) for a description of the procedure. Participants for the current study were those who completed data collection at Time 1.

Statistical Analysis

Data were analysed using SPSS version 29 and a priori power analysis was conducted using G*Power (Faul et al., 2007) to determine the minimum sample size required for analyses. Prior to conducting the main analyses, data screening procedures were undertaken to examine missing data patterns, identify extreme scores, and assess assumptions (Tabachnick & Fidell, 2013). Missing data were evaluated using Little's (2019) MCAR test, and patterns of missingness were examined to determine the appropriate handling strategy. Outliers were identified using standardised z-scores (±3) and examined through boxplots and scatterplots to assess their impact on subsequent analysis (Field, 2013).

Preliminary Analysis

Descriptives statistics, including means, standard deviations, skewness, and kurtosis, were calculated for all study variables. Sex differences on (1) body appreciation, (2) self-esteem; (3) resilience and (4) positive affect were explored using independent samples t-test with alpha level set at .05. Effect sizes (*d*) were interpreted using Cohen's (1988) convention (small = .20, medium = .50, large = .80). Bivariate Pearson correlations were conducted to examine the relationship between body appreciation and the predictor variables (1) self esteem,; (2) resilience; and (3) positive affect. Correlation coefficients (*r*) were interpreted using Cohen's (1988) guidelines (small = .10, moderate = .30, strong = .50).

Primary Analysis

Hierarchical multiple regression analyses were conducted to examine the predictive relationships between self-esteem, resilience, positive affect, and body appreciation. Hierarchical rather than standard simultaneous regression was selected because the

theoretical frameworks underpinning this study generate predictions about the relative importance of predictors and their incremental contributions. Specifically, resiliency theory and the existing empirical literature both identify self-esteem as the strongest individual correlate of body appreciation (Linardon et al., 2022), suggesting it should be entered first to establish its baseline contribution before examining the additional variance explained by resilience and positive affect. This approach allows for the systematic testing of whether resilience and positive affect contribute meaningfully predictive variance beyond self-esteem, directly addressing the study's aim of understanding the relative and incremental contributions of these three factors simultaneously. Variables were therefore entered in theoretically meaningful blocks to assess the incremental variance explained at each step.

Although longitudinal data were available for a subset of participants from Study 1, the decision to use baseline cross-sectional data was determined by the measures administered at each timepoint. Resilience and positive affect, two of the three predictor variables, were assessed at baseline only and were not included in follow-up data collection. As longitudinal analysis requires predictor variables to be assessed at multiple time points, the use of baseline cross-sectional data was the only viable analytical approach give the available measures.

Model assumptions were verified at each step, and R^2 change were interpreted using Cohen's (1988) conventions (f^2) (small = .02, medium = .15, large = .35). Prior to analysis, the assumptions underlying hierarchical multiple regression were evaluated. Normality of residuals was assessed through visual inspection of histograms, Q-Q plots, and P-P plots. Homoscedasticity was examined through scatterplots of standardised residuals against predicted values. Independence of residuals was evaluated using the Durbin-Watson (1950) statistic (acceptable range: 1.5- 2.5). Linearity assumptions were assessed through examination of partial regression plots and component-plus-residual plots. Multicollinearity

was assessed using tolerance values (> 0.10), variance inflation factors (VIF < 10), and condition indices (< 30). Pearson product-moment correlations between predictor variables were examined to identify potentially problematic relationships (r > .90) (Field, 2013; Hair et al., 2019; Tabachnick Fidell, 2013).

3.3 Results

Preliminary Analysis

Examination of missing data showed missing response rates ranged from 0.0% to 1.1%. Little's (2019) Missing Completely at Random (MCAR) test was not significant, indicating data were missing completely at random, χ^2 (1275) = 1197.83, p = .94. As missing response rate was well below the accepted level of 5% per scale item, Expectation-Maximisation (EM) algorithm was used to impute missing response items (Enders, 2010; Malan et al., 2020). There were five participants with extreme scores on scale items, indicated by z-scores (±3), who were removed from analysis (remaining, n = 353) (Field, 2013). All scale items were examined for normality and were within the recommended ranges for skewness (< ± 2) and kurtosis (< ± 2) (Tabachnick & Fidell, 2013). Visual inspection of scatterplots confirmed linear relationships between the study variables. A priori power analysis was conducted using G*Power (Faul et al., 2007) with $\alpha = 0.05$, power = 0.80, and up to three predictors. For detecting medium effect sizes ($f^2 = 0.15$), the required sample size was $n = 57$ per group. The final sample exceeded these requirements, providing sufficient power to detect meaningful associations.

Sample Characteristics and Sex Differences

Independent samples t-tests were conducted to examine sex difference in body appreciation, self-esteem, resilience, and positive affect. Table 2, presents the findings.

Table 2.

Sex Differences in Body Appreciation, Resilience, Positive Affect, and Self-esteem

	Girls (*n* = 193)	Boys (*n* = 160)				
Measure	*M(SD)*	*M (SD)*	*t*	*df*	*p*	*d*
Body Appreciation	3.55 (0.96)	3.85 (0.88)	3.04	351	.003	0.33
Self-esteem	2.74 (0.62)	2.94 (0.52)	3.42 [a]	349.95	<.001	0.36
Resilience	3.99 (0.59)	3.90 (0.60)	-1.47	351	.143	-0.16
Positive Affect	3.61 (0.91)	3.67 (0.81)	0.67	350	.501	0.07

Note: M = mean; *SD* = Standard deviation; *df* = degrees of freedom; *d* = Cohen's d effect size. [a] Equal variance not assumed (Levene's test significant at $p < .05$.)

As can be seen in Table 2, boys scored significantly higher on body appreciation and self-esteem compared to girls, this difference demonstrated a small-to-medium effect size. There were no significant differences found between sexes for resilience or positive affect. Examination of mean scores across all measures revealed that participants demonstrated high levels of psychological functioning relative to scale ranges. Self-esteem scores (out of possible 0-3), were in the high range for both groups, resilience and positive affect scores (out of 1-5), were above the midpoint. Body appreciation scores (out of 1-5) were also above

the scale midpoint for both groups. This pattern indicates the sample comprised relatively high-functioning adolescents with above-average levels of psychological well-being across all domains measured.

Bivariate correlation analyses were computed to assess the relationship between body appreciation and (1) self-esteem; (2) resilience; and (3) positive affect. Table 3 presents the descriptives and intercorrelations among the primary variables for girls.

Table 3.

Means, Standard Deviations, and Correlations Between Study Variables - Girls

Variable	M	SD	1.	2.	3.	4.
1. Body Appreciation	3.55	0.96	-			
2. Self-Esteem	2.74	0.62	.82***	-		
3. Resilience	3.99	0.59	.63***	.65***	-	
4. Positive Affect	3.61	0.91	.55***	.63***	.65***	-

n = 193; *** Correlation significant at *p* = <.001 level (2-tailed).

As can be seen in Table 3, all variables demonstrated significant positive correlations with one another. Notably, body appreciation showed a strong positive correlation with self-esteem, whereas all other associations were moderate. Table 4, presents the descriptives and intercorrelations among the primary variables for boys.

Table 4.

Means, Standard Deviations, and Correlations Between Study Variables - Boys

Variable	M	SD	1.	2.	3.	4.
1. Body Appreciation	3.85	0.88	-			
2. Self-Esteem	2.94	0.52	.64***	-		
3. Resilience	3.90	0.60	.53***	.57***	-	
4. Positive Affect	3.67	0.81	.54***	.51***	.56***	-

n = 158; *** Correlation significant at *p* = <.001 level (2-tailed).

As can be seen in Table 4, results for boys indicated significant moderate positive associations between all variables, with body appreciation and self-esteem showing the strongest association. These empirical differences in baseline functioning and distinct correlation patterns , and theoretical predictions for gender-differentiated pathways provided justification for conducting separate regression analyses rather than assuming universal relationships across sex groups.

Hierarchical Multiple Regression

Hierarchical multiple regression was used to determine how much of the variance in body appreciation could be explained by scores on self-esteem, resilience, and positive affect. There was independence of residuals, as assessed by a Durbin-Watson statistic of 2.09 for girls and 1.96 for boys (Field, 2013; Durbin & Watson, 1950). There was a linear relationship between the dependent and independent variables collectively as assessed by scatterplots. The assumption of homoscedasticity was assessed by plotting the standardised residuals against the standardised predicted values. Visual inspection of the plot indicated that the residuals

were approximately equally spread across the range of predicted values, with no evidence of funnelling or systematic patterns, suggesting the assumption of homoscedasticity was met (Hair et al., 2019). There was no evidence of multicollinearity, as assessed by tolerance collinearity statistic > 0.1, for girls (0.48 - 0.58) or boys (0.58 -- 0.68), and VIF < 10 (girls = 2.09; boys = 1.73) (Tabachnik & Fidell, 2013; Field, 2013; Cook, 1977). There were no multivariate outliers, as assessed by Mahalanobis distance ($D^2 = 14.30$, critical value = 16.27, $p < .001$). No cases had undue influence on the model, as assessed by Cook's distance values (maximum = 0.13, all values < 1) (Tabachnik & Fidell, 201; Field, 2013). The assumption of normality was met as assessed by inspection of histograms and Q-Q Plots.

For boys, the hierarchical regression demonstrated that each step contributed significantly to the prediction of body appreciation (See Table 4). In Step 1, self-esteem explained 40.3% of the variance in body appreciation, $F(1,156) = 105.47$, $p < .001$. The addition of resilience in Step 2 resulted in a significant increase in explained variance to 44.5%, $\Delta R^2 = .042$, Fchange$(1,155) = 11.65$, $p < .001$. Finally, the inclusion of positive affect in Step 3 further increased the explained variance to 47.8%, $\Delta R^2 = .033$, Fchange$(1,154) = 9.77$, $p = .002$. The final model was significant, $F(3,154) = 47.05$, $p = < .001$, and all three predictors remained significant. Table 5, presents the results of the hierarchical multiple regression analysis for boys.

Table 5.

Hierarchical Multiple Regression Predicting Body Appreciation Among Adolescent Boys

Step/Variable	*B*	*SE*	β	*t*	*p*
Constant	0.70	0.31	-	2.25	.026
Step 1					
Self-esteem	1.07	0.10	0.64	10.27	< .001
R^2			.403		
Step 2					
Constant	-0.003	0.37	-	-0.01	.995
Self-esteem	0.83	0.12	0.49	6.78	< .001
Resilience	0.36	0.11	0.25	3.41	< .001
R^2			.445		
ΔR^2			.042		
Step 3					
Constant	-0.08	0.36	-	-0.23	.819
Self-esteem	0.72	0.12	0.43	5.81	< .001
Resilience	0.23	0.11	0.16	2.07	.040
Positive Affect	0.25	0.08	0.23	3.13	.002
R^2			.478		
ΔR^2			.033		

Note: Dependent variable: Body Appreciation. $n = 158$; p significant at <.05.

As can be seen in Table 5, the hierarchical regression demonstrated a progressive pattern where each step contributed significantly to the prediction of body appreciation in boys.

For girls, the hierarchical regression showed that self-esteem in Step 1 explained 66.5% of the variance in body appreciation, $F(1,191) = 379.01$, $p < .001$. The addition of resilience at Step 2 resulted in a modest but significant increase to 68.3%, $\Delta R^2 = .018$, $Fchange(1,190) = 10.84$, $p = < .001$. However, the inclusion of positive affect at Step 3 contributed no additional variance $\Delta R^2 = .000$, $Fchange(1,189) = 0.04$, $p = .846$. The final model for girls was significant, $F(3,189) = 135.78$, $p = < .001$, however only two predictors: self-esteem and resilience remained significant. Table 6, presents the results of the multiple regression analysis for girls.

Table 6.

Hierarchical Multiple Regression Predicting Body Appreciation Among Adolescent Girls

Step/Variable	*B*	*SE*	β	*t*	*p*
Constant	0.12	0.18	-	0.65	.516
Step 1					
Self-esteem	1.26	0.06	0.82	19.47	< .001
R^2			.665		
Step 2					
Constant	-0.53	0.27	-	-2.01	.045
Self-esteem	1.08	0.08	0.70	12.99	< .001
Resilience	0.29	0.09	0.18	3.29	.001
R^2			.683		
ΔR^2			.018		
Step 3					
Constant	-0.54	0.27	-	-2.02	.045
Self-esteem	1.08	0.09	0.70	12.17	< .001
Resilience	0.29	0.10	0.18	3.08	.002
Positive Affect	-0.01	0.06	-0.01	-0.20	.846
R^2			.683		
ΔR^2			.000		

Note: Dependent variable: Body Appreciation. n = 158; p significant at <.05.

Effect Sizes for Hierarchical Multiple Regression

Effect sizes were calculated using Cohen's f^2 to determine the magnitude of variance explained by each step in the hierarchical regression models. Cohen's f^2 represents the effect

size for R^2 change and is calculated as $f^2 = R^2change / (1 - R^2total)$, with conventional interpretations of small ($f^2 = 0.02$), medium ($f^2 = 0.15$), and large ($f^2 = 0.35$) effects.

For boys, self-esteem in Step 1 demonstrated a large effect size ($f^2 = 0.68$), indicating that self-esteem alone accounted for substantial variance in body appreciation. The addition of resilience in Step 2 showed a small-to-medium effect ($f^2 = 0.08$), while the inclusion of positive affect in Step 3 also demonstrated a small-to-medium effect ($f^2 = 0.06$). These effect sizes indicate that while self-esteem provided the strongest individual contribution, both resilience and positive affect made meaningful additional contributions to predicting body appreciation in boys.

For girls, self-esteem in Step 1 demonstrated a very large effect size ($f^2 = 1.99$), substantially exceeding Cohen's conventional large effect threshold and indicating that self-esteem accounted for the majority of predictable variance in body appreciation. The addition of resilience in Step 2 showed a small effect ($f^2 = 0.06$), while positive affect in Step 3 showed no effect ($f^2 = 0.000$). The exceptionally large effect size for self-esteem in girls highlights its dominant role in predicting body appreciation, with other factors contributing minimally once self-esteem was included in the model.

3.4 Discussion

The current study examined the relative predictive strength of self-esteem, resilience, and positive affect on body appreciation in young adolescents aged 12-14 years, with separate analyses conducted for girls and boys to identify potential sex differences in these predictive relationships. The findings provide insights into the individual psychological factors that predict body appreciation during this critical developmental period and reveal notable sex differences in these predictive patterns.

Support for Study Hypotheses

The first hypothesis, predicting that self-esteem, resilience, and positive affect would demonstrate significant positive predictive relationships with body appreciation, with self-esteem as the strongest predictor, was partially supported. Self-esteem emerged as the strongest predictor of body appreciation, explaining 40.3% of variance in boys and 66.5% in girls. However, support was partial because not all three factors remained significant when examined together. While all three factors were significant predictors for boys, positive affect failed to contribute unique predictive variance for girls despite significant bivariate correlations.

The findings for self-esteem align closely with Piko et al.'s (2020) research in Hungarian female adolescents, where multiple regression analysis demonstrated that self-esteem accounted for the majority of variance (58%) in body appreciation scores, substantially exceeding other psychological factors such as life satisfaction and optimism. The current study extends these findings by demonstrating similar patterns across both sex groups and confirming self-esteem's dominant predictive role in adolescents. These findings complement Linardon et al.'s (2023) prospective evidence that body appreciation predicts self-esteem over time, suggesting these constructs may operate in mutually reinforcing cycles during adolescent development, with the current cross-sectional findings representing one component of this bidirectional relationship. The findings support trajectory research by Lacroix et al. (2022), which identified that adolescents with higher self-esteem significantly predicted membership in high body esteem trajectories over a four-year period, suggesting that the predictive relationships observed in the current study may have lasting developmental implications. The findings are also consistent with meta-analytic evidence showing self-esteem demonstrates the strongest positive association with body appreciation in women (Linardon et al., 2022). The current study extends these findings to an adolescent sample,

including males where the strongest associations were reported between self-esteem and body appreciation.

The second hypothesis, predicting that predictive relationships between individual psychological factors and body appreciation would differ between girls and boys in both pattern and strength, was supported. Significant differences emerged in both the pattern and strength of relationships across sex groups. In terms of pattern differences, girls demonstrated a two-factor model where only self-esteem and resilience remained significant predictors, while boys showed a three-factor model where self-esteem, resilience, and positive affect all contributed unique predictive variance.

Regarding strength differences, effect size analysis quantified these differential patterns. Self-esteem demonstrated a very large effect size in girls compared to a large but more moderate effect in boys. For boys, resilience and positive affect each contributed small-to-medium additional effects, supporting a multi-pathway model. In contrast, for girls, resilience showed only a small effect and positive affect no effect, confirming self-esteem's dominance in female body appreciation outcomes. These findings suggest that the psychological pathways to body appreciation operate differently during early adolescence depending on sex, supporting theoretical predictions.

Sex Differences in Predictive Patterns

The substantial differences in how psychological factors predict body appreciation across sex groups represents this study's most important finding. For girls, self-esteem functions as the dominant organising principle indicating that global self-evaluation processes are strongly associated with body appreciation outcomes in this cross-sectional sample, while resilience provides a modest but significant additional contribution. This two-factor model suggests that while global self-evaluation processes are central to body appreciation

development in girls, adaptive coping skills such as resilience also contribute meaningfully to their body appreciation outcomes, partially supporting resiliency theory's emphasis on multiple protective factors operating together (Fergus & Zimmerman, 2005; Zimmerman, 2013; (Rutter, 1987). The contribution of resilience across both sex groups aligns with meta-analytic evidence from Linardon et al. (2022), showing emotion regulation demonstrates moderate associations with body appreciation, as emotion regulation represents a core resilience component that supports adaptive responses to appearance-related stressors. For boys, a multi-pathway model emerged where self-esteem, resilience, and positive affect each contributed meaningful variance, with more balanced effect sizes across the three predictors. The finding that all three factors maintained significant predictive power more strongly aligns with the resiliency theory framework which suggests multiple individual protective factors may operate together to enhance positive outcomes (Rutter, 1987; Zimmerman, 2013).

The finding that positive affect significantly predicted body appreciation in boys but showed no effect for girls extends understanding of how predictive pathways differ by sex. Despite showing a strong bivariate correlation with body appreciation *(r* = .55) in girls, positive affect failed to contribute unique predictive variance when examined alongside self-esteem and resilience. A possible explanation of this finding is that the dominance of self-esteem in girls' predictive model may absorb the predictive power of positive affect, indicating that global self-evaluation processes are so central to female body appreciation that they encompass other positive psychological pathways.

Supporting this interpretation, qualitative research by Mahon and Hevey (2021), indicates that boys use more varied active coping strategies and demonstrate greater positive agency when processing body-related content. While girls are less likely to use active and acceptance strategies and may struggle to internalise positive messages even when they can identify them cognitively (Mahon & Hevey., 2021). Additionally, Marquez et al. (2023)

reported that the effects of protective factors were stronger among those at lower levels of adversity exposure. A possible explanation for the current sample could be that typically girls are more likely to be exposed to body image challenges compared to males, and as a result the protective effects may be reduced due to higher levels of exposure. This finding may explain the current pattern, as girls typically face greater appearance-related pressures during early adolescence, potentially diminishing the independent protective effects of positive affect and resilience relative to the foundational role of self-esteem.

The substantial variance explained by individual factors should be interpreted within the context of body image research. While these effect sizes exceed findings in the field as seen in Piko et al. (2020), they could reflect the high-functioning nature of the current sample and may not generalise to more diverse populations with greater psychological variability. Despite this, the substantial variance explained by individual factors in the current sample demonstrates that building psychological resources during early adolescence can meaningfully predict positive outcomes in body appreciation.

Theoretical Implications

The current findings provide support for the complementary theoretical frameworks established in this study while revealing sex-specific patterns. The dominance of self-esteem as a predictor supports resiliency theory's emphasis on individual psychological assets as protective factors (Zimmerman, 2013). For girls particularly, the very large effect size for self-esteem demonstrates how individual psychological resources during adolescence are strongly associated with body appreciation outcomes, as predicted by positive youth development approaches. The sex differences in predictive patterns provide refinements to existing theoretical models. Boys' results strongly support resiliency theory's protective factor model, where multiple factors operated together with balanced contributions. This aligns with

the framework that different protective factors working together provide comprehensive protection when adolescents face challenges requiring diverse psychological resources.

Fredrickson's (2001) broaden-and-build theory of positive emotions receives differential support across sex groups. While the theory's mechanisms appear to operate for boys, where positive affect maintained predictive power, the pattern observed for girls suggests that emotional pathways to positive body image may operate differently during female adolescent development. Rather than challenging this theory, these findings suggest that the mechanisms may operate through different pathways for girls, possibly with positive emotions building resources indirectly through self-esteem enhancement.

Implications and Directions for Intervention Research

The sex-specific predictive patterns identified in the study suggest potential targets for future intervention research, though important methodological cautions apply. Evidence-based interventions successfully targeting these psychological factors already exist and have demonstrated effectiveness in adolescent populations. For example, positive psychology and mindfulness-based interventions have demonstrated improvements in self-esteem when delivered in school settings (Abu Omar et al., 2024; Ebrahiminejad et al., 2016), with cognitive behavioural and self-compassion techniques showing effectiveness (Langford et al., 2022). Digital and mobile-based interventions combining cognitive behavioural therapy, mindfulness, and acceptance-based approaches also show effectiveness in increasing self-esteem (Bruhns et al., 2021). Resilience-focused programs demonstrate effectiveness in school settings with sustained benefits for up to 6-months post-intervention (Pinto et al., 2021). Positive affect can be cultivated through various positive psychology intervention approaches, with benefits maintained at 5-month follow-up (Laakso et al., 2021; Bolier et al., 2013).

However, the cross-sectional correlational design prevents causal inferences about whether interventions targeting these factors would improve body appreciation. While self-esteem, resilience, and positive affect correlate with body appreciation, these associations do not establish causal pathways. The correlational patterns provide testable hypotheses for future experimental research but should not be interpreted as evidence for specific intervention approaches without experimental validation. Determining whether the sex-specific predictive patterns observed have implications for intervention effectiveness requires systematic investigation through appropriately designed longitudinal and experimental studies, as discussed in Section 3.4.6

Connection to Study 1 and Broader Thesis

The current findings provide context for understanding Study 1's null intervention results and offer important insights for intervention design based on established theoretical and empirical foundations. The large effect sizes observed in this study for individual psychological factors ($R^2 = 0.68$) for girls, ($R^2 = 0.48$ for boys) suggest that empowering adolescents to build internal psychological resources may be more effective than brief external interventions, aligning with resiliency theory's emphasis on cultivating individual assets rather than addressing external factors alone (Zimmerman, 2013). Although this interpretation requires experimental validation given the cross-sectional nature of the current data.

This interpretation is supported by the intervention evidence established in the introduction, which demonstrates that effective programs targeting these psychological factors typically require sustained, multi-session approaches. Self-esteem interventions showing significant effects adopt positive psychology and mindfulness-based approaches delivered over extended periods in school settings (Abu Omar et al., 2024; Ebrahiminejad et

al., 2016). While multi-session resilience and positive psychology programs demonstrate effectiveness with sustained benefits for up to 6 months post-intervention (Laakso et al., 2021; Pinto et al., 2021). The meta-analytic evidence from Bolier et al. (2013) further supports this pattern, showing that positive psychology interventions using self-help and individual approaches can produce significant effects, suggesting that comprehensive approaches targeting individual psychological resources could be more effective than brief, single-session interventions.

The theoretical frameworks established in this study provide additional context for Study 1's outcomes. Fredrickson's (2001) Broaden-and-build theory suggests that developing lasting psychological strengths requires ongoing positive experiences that progressively broaden individuals' cognitive and behavioural capacities over time. Similarly, Rutter's (1987) resiliency theory's challenge model indicates that developing adaptive responses to adversity, in this case body image challenges, requires ongoing exposure to manageable stressors that build coping capabilities over time. These theoretical predictions align with recent qualitative research indicating that individual activities may be more beneficial than group approaches for improving self-esteem and positive body image in school-aged adolescents (Artigues-Barberà et al., 2025), suggesting that personalised approaches targeting specific psychological pathways may be more effective than universal group interventions, though this requires experimental testing to confirm.

For Study 3, these findings have important implications for developing and understanding appearance-based school interference measures. The sex differences observed suggest that appearance-related school interference may be particularly problematic for girls given their heavy reliance on self-esteem for body appreciation. Understanding how school-based appearance pressures specifically undermine self-esteem, the most critical protective factor identified, could inform more targeted intervention approaches and provide insight into

the mechanisms by which appearance-based interference impacts body appreciation development. Additionally, the multi-pathway model observed in boys suggests that appearance-based interference measures may need to assess differential impacts across various psychological resources, as boys rely on a more diverse set of protective factors that could each be vulnerable to different types of school-based appearance pressures.

Limitations

Several limitations require acknowledgment when interpreting these findings. The cross-sectional design prevents causal inferences, and bidirectional relationships cannot be ruled out given empirical evidence for mutual effects between these variables (Liu et al., 2021; Linardon et al., 2023). The high-functioning nature of the sample may have artificially inflated correlations and effect sizes compared to more representative populations, as evidenced by the stronger self-esteem correlation observed (r = .82 in girls) compared to meta-analytic findings (r = .57; Linardon et al., 2022).

The especially large effect size for self-esteem in girls raises questions about discriminant validity. While this may reflect genuine theoretical overlap during female adolescent development, it could indicate measurement redundancy in high-functioning samples. Substantial unexplained variance (31.7% for girls, 52.2% for boys) indicates important predictors identified in the literature review could be missing from the model. The introduction established that family dynamics (Amianto et al., 2018), peer relationships (Kenny et al., 2016), media exposure (Vandenbosch et al., 2022), social comparison tendencies, and pubertal development stage all influence body image development. The absence of these external and developmental factors may limit understanding of the broader ecological context within which individual psychological factors may operate.

Future Directions and Conclusion

The current findings generate several specific research priorities. Building on the findings from this study, longitudinal studies examining relationships between self-esteem, resilience, positive affect, and body appreciation across adolescent development are critically needed to establish causal pathways and identify optimal intervention timing. Such research should examine whether early intervention targeting the specific predictive patterns identified in this study, the intensive self-esteem focus and secondary resilience building for girls and multi-domain approaches for boys, leads to sustained improvements in body appreciation over time. The timing of such interventions is particularly important given evidence that sensitive periods for body image development may occur earlier than previously thought, with girls showing worsening body image from as young as 10 years old (Lacroix et al., 2023). This supports the importance of the 12-14 age window examined in this study and suggests that early intervention during this period may be critical for preventing negative body image trajectories.

Investigation of mechanisms underlying the sex differences represents another priority, particularly testing whether positive affect influences body appreciation indirectly through self-esteem in girls. Mixed-methods research could explore how girls and boys differently experience and apply positive emotions in relation to body image could resolve the unexpected finding that positive affect failed to predict body appreciation in girls despite strong bivariate correlations. This research should specifically test whether positive affect influences body appreciation indirectly through self-esteem in girls (as suggested by the dominance of self-esteem in their predictive model) or whether different emotional processing patterns during early female adolescent development fundamentally alter broaden-and-build mechanisms. Understanding these pathways would address the theoretical challenge this study poses to Fredrickson's (2001) theory while advancing knowledge of how resiliency theory's protective factors operate differently across gender groups

Replication across diverse populations is essential given this sample's high-functioning characteristics and reasonably advantaged socioeconomic status, which may limit generalisability. Future research should examine these relationships across diverse populations, including adolescents from different cultural and socio-economic backgrounds, and gender-diverse adolescents excluded from current analysis due to small sample sizes.

Finally, intervention research testing gender-tailored approaches based on these findings represents the most immediate practical priority. Randomised controlled trials comparing universal versus sex-specific interventions could determine whether the observed predictive differences translate into differential intervention effectiveness, building on the established evidence base while addressing the null findings from Study 1 that suggested brief universal approaches may be insufficient.

This study provides evidence for sex-specific predictive patterns in body appreciation among early adolescents, with important implications for both theoretical understanding and intervention development. The finding that self-esteem demonstrated especially large effects in girls' body appreciation while boys demonstrated a multi-pathway model across three factors suggests that effective body image interventions could be tailored to these differences. Findings suggest that girls may benefit most from intensive self-esteem focused approaches with additional resilience components, while boys require comprehensive interventions addressing multiple psychological domains simultaneously.

These findings contribute to growing evidence supporting strengths-based approaches to body image promotion while highlighting the critical importance of considering sex-specific developmental pathways in prevention and intervention efforts. The substantial variance explained by individual psychological factors suggests that these resources are strongly associated with positive body image outcomes during early adolescence, and that

targeting them may represent a promising avenue for intervention. Whether this approach produces lasting improvements more effectively than external environmental interventions remain an important question for future experimental research. While replication across diverse populations is needed, these findings establish important theoretical foundations and generate compelling directions for future research and intervention development in positive body image promotion.

Chapter 4: Study 3 – Development of the Appearance-Related School Interference Scale

4.1 Introduction and Literature Review

Functional Impact of Body Image Concerns

Appearance concerns represent a significant challenge during adolescence which can interfere with daily functioning. A recent national survey of Australian adolescents reported that 57% were dissatisfied with their bodies, and nearly half indicated that body dissatisfaction had stopped them from going to school (Butterfly Foundation, 2023). While extensive research documents the psychological and physical impact of body image concerns, their specific effects on classroom-based activities remain under-researched and not thoroughly understood. The school environment presents unique challenges where appearance concerns can interfere with important academic activities such as participation in group work, public speaking, physical education engagement, and contributions to class discussions (Lovegrove & Rumsey, 2005; Bang et al., 2020; Carmona et al., 2015). Current measurement tools fail to adequately capture these specific classroom-based interferences due to appearance concerns, creating a critical gap in understanding.

Theoretical Framework

While social comparison to idealised images in the media are well-established, peer comparisons warrant further attention in the classroom environment. The school environment, with its constant peer presence and evaluative nature creates frequent opportunities for appearance-related social comparison. According to Festinger's (1954) theory of social comparison, individuals gauge their own capabilities through comparison with others. In educational contexts, this comparative process occurs when students evaluate their abilities and seek out accurate appraisals of themselves among peers, while this can

foster increased performance in the classroom, it can also negatively impact students (Di Stasio et al., 2016).

Social comparison behaviours, particularly those focused on appearance, have significant implications for adolescent wellbeing and social dynamics. Research shows that frequent upward appearance comparisons predict increased social anxiety over time, which consequently leads to decreased positive peer connections (Rapee et al., 2022). These comparison behaviours emerge early, with Australian children as young as eight already engaging in social comparisons across various domains, notably comparing themselves more to peers than media figures (Tatangelo & Ricciardelli, 2017). The appearance-focused culture among friends can be particularly influential, leading to increased appearance-based rejection sensitivity in both boys and girls through a process of internalising appearance ideals, social comparison, and appearance-focused conversations (Webb et al., 2014). Furthermore, higher levels of social comparison and competition are associated with increased rates of both bullying and victimisation in young adolescents (Di Stasio et al., 2016), highlighting how these comparison behaviours can contribute to broader negative peer dynamics.

Self-objectification, originally conceptualised by Fredrickson and Roberts (1997), refers to the process whereby people adopt an external viewpoint on themselves, viewing themselves as objects to be evaluated based on appearance rather than capabilities. While historically considered a predominantly female experience, evidence shows this phenomenon increasingly affects males as well. Research demonstrates that increased body surveillance during adolescence leads to greater internalisation of appearance ideals and prioritisation of appearance over competence, with effects persisting into emerging adulthood 5 years later (Vangeel et al., 2018). The consequences of self-objectification extend beyond self-perception as it significantly reduces cognitive and emotional capacity, limiting individuals' ability to

fully engage in various life aspects (Merino et al., 2024). This cognitive impact is demonstrated in experimental studies showing that self-objectification impairs cognitive performance (Fredrickson et al., 1998), and while appearance-based compliments can temporarily boost mood, they simultaneously undermine cognitive performance in both men and women during mathematical tasks (Kahalon et al., 2018). Current measurement tools do not adequately capture these theoretically important aspects of classroom interference.

Developmental and Sex Influences

The transition from primary to secondary education emerges as a critical period for appearance-related concerns, marked by significant psychological and social changes. This transition coincides with the greatest changes in body image development between the ages of 10 to 14 years old (Lacroix et al., 2023). During this time, students typically experience declines in self-concept and self-esteem, with research indicating that the transition itself may contribute to these challenges (Coelho et al., 2020). Changes in peer groups and adjustment to new social environments might account for these challenges to appearance. Studies have revealed self-representations during the transition from late childhood to early adolescence show girls were more negatively impacted by the transition to school compared to boys (Schaffhuser et al., 2017), whereas other studies showed no sex differences (Coelho et al., 2017).

This vulnerability is further complicated by the concurrent timing of puberty, which has been linked to lower levels of physical self-concept (Onetti et al., 2019). Experiencing puberty early has negative impacts, especially for girls, with early-maturing girls increasingly vulnerable to experiencing body shame (Sicilia et al., 2024; Sun et al., 2024).Sex differences during this phase may be explained by an increased awareness of traditional gender roles, leading to heightened conformity pressures, particularly regarding appearance ideals such as

thinness for girls and muscularity for boys (Keery et al., 2004; Vuong et al., 2021). Furthermore, evidence suggests that girls and boys who experience early maturation seek out and are more vulnerable to the influence of media related appearance ideals compared to on time peers (Rousseau et al., 2017).

Puberty can also be a time of dramatic emotional change, which can correspond with increases in psychological distress and with shifts in psychological health (Mendle, 2014; Mendle & Koch, 2019). A large-scale cross-cultural study exploring sex differences in adolescent mental health reported girls have poorer mental health outcomes compared to boys, and this is most evident for measures of psychological distress and life satisfaction (Campbell et al., 2021). Poorer psychological wellbeing is a known risk factor for body dissatisfaction (Hicks et al., 2022). Similarly, individuals with lower levels of body appreciation have been shown to be more affected by negative information in their environment, which in turn may further impact mental health (Swami et al., 2024; Hopkins et al., 2021). The combined impact of heightened emotional and appearance concerns may limit social participation in the school environment. The combination of new social environments, physical and emotional changes, and emerging appearance pressures makes this transition particularly complex for young adolescents' self-perception and emotional well-being. To develop an effective measure of appearance-related classroom interference, it is important to understand the impact of these concerns in educational settings.

Body Image and Education Engagement

Appearance concerns can significantly impact adolescents' educational experiences and academic outcomes through multiple interrelated pathways. While early research primarily focused on examining the direct relationship between body size perception and academic success as measured by grades, more recent investigations have revealed a more

complex relationship of factors. Yanover and Thompson (2008a) made a significant contribution by introducing the concept of *academic interference* to describe how body image disturbances manifest behaviourally and impact academic performance in university students. Their research demonstrated that academic interference was positively associated with higher levels of appearance concern, greater preoccupation with weight, more negative overall appearance evaluation, and lower grade point average (Yanover & Thompson, 2008a, 2008b). Although their findings focused on students with disordered eating behaviours, they established a crucial foundation for understanding how appearance concerns can manifest in educational settings.

The behavioural impact of appearance concerns in educational settings impacts various forms of academic avoidance and disengagement. Lovegrove and Rumsey's (2005) seminal study revealed the pervasiveness of these effects, finding that one-third of students avoid class participation due to appearance concerns, while appearance-related school absences affected 10% of students overall, rising notably to 20% among 15-year-olds. Physical education classes emerge as particularly vulnerable to appearance-related avoidance, with potential implications for both physical activity engagement and associated academic and mental health benefits (Bang et al., 2020). Importantly, Carmona et al. (2015) highlighted the role of peer group dynamics in shaping these behaviours, demonstrating that classes with heightened collective body size concerns showed increased body avoidance behaviours among their members, suggesting that adolescents modify their behaviour to align with peer group characteristics.

The social dimension of academic settings amplifies these effects, as appearance concerns create barriers to essential educational interactions including group work participation, student-teacher relationships, and academic help-seeking behaviours,

particularly in contexts where appearance-based social comparisons are prominent (Webb et al., 2014; Rapee et al., 2022). These patterns of avoidance carry significant developmental implications, potentially serving as early indicators of school refusal and broader academic disengagement (Ingul et al., 2019). The interruption of crucial social, cognitive, and emotional development during this period (Zendegui et al., 2021) can have far-reaching consequences, with school avoidance linked to poor mental health outcomes and adverse effects persisting into adulthood (Knollman et al., 2010).

Despite the substantial portion of adolescent life spent in educational settings, there remains a notable gap in empirical research specifically examining appearance-related academic interference during this crucial developmental period. This limitation in our understanding is particularly significant given the unique characteristics of adolescent educational environments and their potential influence on appearance concerns. The development of targeted measures to explore these relationships represents an essential step toward better understanding and addressing the impact of appearance concerns on academic engagement during adolescence.

Body Image and Academic Interference Measures Limitations

Existing body image measures reveal significant gaps in assessing classroom-specific interference. While numerous instruments are available to measure body image concerns, only a few have attempted to capture how these concerns interfere with daily functioning, and even fewer focus specifically on educational settings. The Body Image Quality of Life Inventory (BIQLI) (Cash & Fleming, 2002) effectively measures the broad impact that body image has on daily functioning, however it lacks specific items needed to assess appearance-related school interference. The social functioning dimension items are too broad (‘my body image affects how I interact with others’), failing to capture the unique challenges within

educational settings such as classroom participation or specific learning activities. Similarly, the Body Image Avoidance Questionnaire (BIAQ) (Rosen et al., 1991) is another highly reliable and widely used measure within body image research. However, its primary focus is on avoidance of social situations, clothing choices, and eating-related avoidance, there are no items specific to education contexts.

There are extremely limited scales that explore specifically how body image concerns impact participation in school. The Eating and Body Image Disturbances Academic Interference Scale (EBIDAIS) (Yanover & Thompson, 2008a), while examining academic impacts, focuses narrowly on disordered eating behaviours (binging and purging) rather than general appearance concerns and was developed for college students rather than adolescents. The Life Engagement Scale (LES) (Diedrichs et al., 2015) assesses how appearance concerns prevent engagement in various life activities, including school attendance and social events. However, it includes only two school-related items within its broader life activities focus, lacking specificity for classroom situations. Respectively, the Body Image Life Disengagement Questionnaire (BILD-Q) (Atkinson & Diedrichs, 2021) also addresses body image interference across life domains, yet is limited by only two school items ("go to school" and "raise my hand"), which lack sufficient depth for capturing the range of classroom behaviours affected by appearance concerns, such as group work participation and contributing to class discussions. These collective limitations highlight the need for a comprehensive measure that comprehensively assesses how appearance concerns affect various aspects of academic engagement, including subtle avoidance behaviours, specific classroom activities, and specific classroom demands during adolescence.

Existing measurement tools reveal a critical gap in our ability to understand and assess how appearance concerns affect students' academic engagement. Current academic

interference measures while offering some valuable insights, have notable limitations for addressing appearance-specific concerns, focusing instead on general anxiety and broad educational engagement. The School Anxiety Inventory-Short Version (SAI-SV) (García-Fernández et al., 2014) focuses narrowly on classroom performance anxiety, particularly public speaking situations. While relevant to appearance concerns, it misses broader indicators of appearance-related interference like avoidance behaviours or social withdrawal. The SAI-SV is a strong validated measurement of peer evaluation anxiety, however it does not distinguish between general performance anxiety and appearance-specific concerns.

The Child Anxiety Life Interference Scale (CALIS) (Lyneham et al., 2013) takes a more comprehensive approach to anxiety's impact on daily functioning, including three school-related items. However, its general anxiety focus means it does not capture the unique ways appearance concerns might interfere with academic engagement. The items are too broad (‘Do fears of worries make it difficult for you to get school work done?’) to identify appearance-specific patterns of interference. Similarly, the School Interference Questionnaire (SIQ) (Zendegui et al., 2021) examines school refusal, social avoidance, and academic impairment related to mental health, but does not directly address how appearance concerns impact classroom participation, academic engagement, or specific learning activities. While established instruments like the SAI-SV, CALIS, and SIQ examine related aspects of school functioning, none specifically target the distinct ways appearance concerns manifest in educational settings. The limitations of existing measures, particularly their lack of focus on specific classroom activities highlights the need for a new measurement tool that can capture these important dimensions.

Rationale, Aims, Hypotheses

There are significant gaps in understanding how appearance-related concerns interfere with adolescents' academic engagement, particularly within classroom settings. Current measurement tools inadequately capture how appearance concerns present within the classroom environment. The impact of appearance concerns becomes especially critical during educational transitions, such as entering high school a period of heightened vulnerability to peer influence and body image pressures. While research has documented general effects of appearance concerns on academic performance, sex-specific differences remain understudied. Understanding how appearance concerns impact classroom participation is essential for supporting student well-being and academic success. To address these research gaps, a specialised measure to assess appearance-related school interference is required.

Although the ARSI scale assesses a construct that is conceptually distinct from body appreciation, its development is directly motivated by and connected to the overarching positive body image framework of this thesis. Body appreciation, as conceptualised by Tylka and Wood-Barcalow (2015), encompasses not only favourable opinions of one's body but also the enactment of body-protective behaviours, actively caring for and protecting the body from harmful influences. Appearance-related school interference represents a concrete behavioural manifestation of what occurs when body appreciation I absent of undermined in the school context. When adolescents avoid raising their hand, withdraw from group work, or disengage from physical education due to appearance concerns, these behaviours reflect the antithesis of body appreciation, a preoccupation with appearance-based evaluation that interferes with functional engagement and undermines the body-protective behaviours central to positive body image.

The first aim of the study was to develop a measure of Appearance-related School Interference (ARSI), assessing the extent to which appearance concerns impede adolescents'

participation in in classroom activities. The second aim was to confirm the factor structure of the measure in a separate subsample of adolescents. The final aim was to assess the reliability of the scale and examine its relationships with theoretically related constructs in adolescent boys and girls. It was expected that the newly developed scale will capture a unidimensional construct of appearance-related school interference. It was predicted that psychometric properties will be supported across sex, but that girls will score higher on appearance-related school interference compared to boys. It is predicted that the new scale will show negative correlations with body appreciation, emotional wellbeing (positive affect) and psychological strength (self-esteem and resilience), and school satisfaction. While the scale will show positive correlations with measures for risk factors of body image concerns (social comparison, appearance conversations, and internalisation of appearance ideals), negative affect, and school anxiety.

4.2 Method

Participants

A total of 362 adolescent participants were recruited for the scale development and validation study. The sample consisted of 194 females, 164 males, one genderfluid, one trans female, and two participants who preferred not to state. Participants were aged between 12-14 years (M = 12.80, SD = 0.69). Participants were recruited from three co-educational Victorian Government secondary schools located in the West/Southwest metropolitan area of Melbourne, Victoria. The Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) (Australian Bureau of Statistics, 2021) provide information about the economic and social conditions of people and households within an area (*1* = least advantaged to *5* = most advantaged). The three schools used in the study were ranked four and five on the index. Due to the small number of participants (n = 4) who identified as genderfluid, trans-female, and

gender not stated, these were not able to be meaningfully analysed and were unfortunately removed from analysis.

The remaining participants ($n = 358$) were randomly split into two samples. The first sample was used for the exploratory factor analysis (EFA) and comprised 195 participants (100 females, 95 males) with an age range of 12-14 years ($M = 12.75$, $SD = 0.73$). Most participants were born in Australia (74.4%). There were 10.2% of participants born in Asia/Southeast Asia, United Kingdom (5.1%), New Zealand (4.1%), Europe (1%), United States (1.5%), Middle East (1%), Other/Not Stated (2.6%).

The second sample ($n = 163$) was used for the confirmatory factor analysis (CFA) component of the study. The sample consisted of 94 females, 69 males, aged between 12-14 years ($M = 12.87$, $SD = 0.63$). Most participants were born in Australia (74.2%). There were 9.2% participants born in Asia/Southeast Asia, United Kingdom (3.0%), New Zealand (4.9%), Europe (3.0%), United States/Canada (1.2%), Other/Not Stated (4.5%).

Measures

Resilience

The Child and Youth Resilience Measure (CYRM-12; Liebenberg et al., 2013), was used to assess resilience features in adolescents. The CYRM-12 was derived from the original CYRM-28 measure designed to explore the resources available to young people that may strengthen resilience across three components individual, relational, and community. Sample items are "My family stands by me during difficult times" and "I have opportunities to develop skills that will be useful in later life". Response scale ranged from 1 (*not at all*) to 5 (*a lot*), with items summed to attain a total score (range 12 to 60), with higher scores indicating greater global resilience. Subscales of individual, relational and community resilience can be explored separately by summing the appropriate items. The CYRM has been

identified as a reliable and valid measure of self-reported youth resilience (Liebenberg et al., 2012). Scores on this measure have demonstrated high internal consistency with an adolescent sample (α = 0.92) (Mu & Hu, 2016).

Affect

The Positive and Negative Affect Schedule-Children (PANAS-C; Ebesutani et al., 2012), was used to assess participants' level of positive and negative affect. The PANAS-C is a 10-item scale that consists of singular-words that describe different feelings and emotions. Five-items measure negative affect eg "sad", and five-items measure positive affect eg. "happy". Participants are asked to indicate to what extent they have felt this way during the past week on a scale from 1 (very *slightly*) to 5 (*extremely*). Participants responses are summed for each subscale (range 5 – 25) with higher scores indicating greater levels of positive and negative affect. Scores on this measure have demonstrated good internal consistency with a youth sample on the positive affect scale (α = 0.86) and the negative affect subscale (α = 0.89; Ebesutani et al., 2012).

Body Appreciation

Body appreciation was assessed using the Body Appreciation Scale-II (BAS-II) (Tylka & Wood-Barcalow, 2015b), The BAS-II measures participants acceptance, respect and attention towards bodily needs, favourable opinions towards one's body and rejection of media messages depicting narrow beauty ideals, for example "I appreciate the different and unique characteristics of my body". Participants respond to 10-items on a scale ranging from 1 (*never)* to 5 (*always*), with items summed to attain a total score, with higher scores indicting individuals with greater body appreciation. The BAS-II was refined from the original Body Appreciation Scale (Avalos et al., 2005), to eliminate sex-specific items and body dissatisfaction-based language making it more appropriate for positive body image

research and for use with an adolescent sample. The BAS-II has reported high internal consistency for adolescent females (α = 0.94 at baseline and α =0.95 at post-intervention) (Halliwell et al., 2015).

Self-Esteem

Participant's self-esteem was measured using the Rosenberg Self-esteem Scale (RSES) (Rosenberg, 1965). The 10-item scale was designed to assess participant's global self-esteem and feelings of self-worth, for example "I take a positive attitude toward myself". Items are scored on a scale ranging from 0 (*strongly disagree)* to 3 (*strongly agree)*. Total scores ranged from 0 to 30, with higher scores indicating greater self-esteem. The RSES has been shown to be a reliable and valid measure of self-esteem with high internal consistency in an cross-cultural adolescent sample (α = 0.86) (Supple et al., 2013).

Appearance Conversations

The Appearance Conversations with Friends subscale of the Appearance Culture Among Peers Scale (Jones et al., 2004), was used to measure the frequency in which adolescents engaged in discussions about expectations for their bodies and appearance enhancements with their friends, for example "My friends and I talk about what we would like our bodies to look like". The 5-items are scored on a range from 1 (never) to 5 (very often), with higher scores indicating more frequent discussions with friends about appearance. Scores on the Appearance Conversations with Friends scale have indicated satisfactory internal consistency for both boys (α=0.84) and girls (α=0.89) (Lawler & Nixon, 2011).

Internalisation of Appearance Ideals

The 10-item Internalisation subscale of the Sociocultural Attitudes Towards Appearance Questionnaire-4 (Schaefer et al., 2015), was used to assess sociocultural

influences on appearance ideals. The Internalisation subscale of the SATAQ-4 assesses internalisation of appearance ideals most relevant to females (thin/low body fat) for example, "I want my body to look very thin" and males (muscular/athletic) for example, "I think a lot about looking muscular". Participants indicate their level of agreement with the statements on a scale of 1 (*definitely disagree*) to 5 (*definitely agree*), with higher scores indicating greater appearance-related sociocultural influence. The SATAQ-4 has reported good psychometric properties with a female university-aged sample (Schaefer et al., 2015). Further research with an adolescent female sample has demonstrated good internal consistency ($\alpha = 0.84$) (McLean et al., 2015).

Appearance Comparisons

The Physical Appearance Comparison Scale (PACS) (Thompson et al., 1991) was used to assess participants' tendency to compare their appearance to the appearance of others in different social contexts. Example item is "The best way for a person to know if they are overweight or underweight is to compare their figure to the figure of others". The 5-items are scored on a scale from 1 (never) to 5 (always), all items are summed (item 4 is reverse-scored) to obtain a total score (range 5-25), with higher scores indicating greater frequency of appearance comparisons. Scores on PACS have demonstrated good internal consistency for an adolescent sample of girls (α=0.84) and boys (α=0.79). (Hargreaves & Tiggemann, 2004).

School Satisfaction

Participants school satisfaction was assessed using the school-subscale of the Multidimensional Student's Life Satisfaction Scale (MSLSS) (Huebner, 2001). The MSLSS was designed to assess global life satisfaction and to provide a profile of a young person's satisfaction with specific life domains such as family, friends and school. The school-subscale consists of 8-items which target students' emotional engagement and satisfaction

with their school experience, for example "I look forward to going to school". Responses are rated on a 4-point scale ranging from 1 (*never)* to 4 (*almost always*). Three items are reverse scored then summed with the remaining items to obtain a total score (range 8 to 26), with higher scores indicating greater levels of participants' satisfaction with their school experience. Previous research using the school-subscale of the MSLSS for adolescent sample has reported good levels of internal consistency (α = 0.91) (Lewis et al., 2011).

School Anxiety

School anxiety was measured using the Public Performance subscale of the Social Phobia and Anxiety Inventory for Children (SPAI-C) (Beidel et al., 1995). The SPAI-C was designed to assess a range of potentially anxiety-producing situations and examine physical and cognitive characteristics of social phobia as well as avoidance behaviours, for example, "I feel scared when others watch me do things". The 4-item subscale is scored using the response range of 1 (*never*) to 3 (*most of the time*), with items summed to obtain a total, higher scores indicating greater public performance anxiety. As recommended by Storch et al. (2004) a slight modification was made to the measure to make it developmentally appropriate for adolescents, the word 'scared' was replaced with 'nervous'. Good internal consistency was reported for the original measure (α=0.92) (Beidel et al., 1995). with equal findings of internal consistency for the modified wording (a=0.92) (Storch et al., 2004).

Procedure

Appearance-related School Interference

The ARSI scale was developed to assess if concerns or worries about appearance made it difficult for early adolescents to engage in a range of school classroom activities. Development of the ARSI involved several steps. Firstly, three key domains were identified where appearance concerns may impact adolescents' school participation: (1) verbal

classroom participation (e.g. Speaking in class, asking questions), (2) peer collaboration activities (e.g. Group work, peer discussion), and (3) performance-based activities (e.g. presentations, demonstrations). Items were sourced from existing validated measures based on specific criteria: relevance to school contexts, demonstrated reliability in previous research, and conceptual alignment with our appearance-interference construct.

The initial scale items were adapted and reworded from existing literature and measures related to academic interference (Yanover & Thompson, 2008a; 3 items), school performance anxiety (García-Fernández et al., 2014; 4 items), anxiety interference (Beidel et al., 1995; Lyneham et al., 2013; 3 items), and student engagement (Hart et al., 2011; 3 items). Five additional scale items were generated to address gaps in the existing measures, particularly focussing on classroom activities common in Australian high schools. Through this process, an initial pool of 18-items were specifically designed to capture classroom activities (ie. "Raising hand in class, speaking or asking a question, and participating in group work") that students might be reluctant to participate in due to worries or concerns about their appearance.

Secondly, the 18-items were reviewed and refined by the members of the research team to be relevant for an adolescent audience with respect to content, language, and reading level Following this process, the 18-items were rated for suitability by the research team anonymously using Qualtrics. This pool was refined to 10-items that comprehensively represented the range of classroom activities adolescents might avoid due to appearance concerns. Participants responded to the 10 items on a 5-point Likert scale ranging from 1 (*not at all)* to 5 (*a great deal*), with all items used to calculate a mean score, with higher scores indicting greater school interference due to appearance concerns.

All items use the stem "Do concerns or worries about your appearance make it difficult to..." followed by specific classroom behaviours. A 5-point unipolar response scale was selected based on several considerations. Krosnick and Presser (2010) suggests that 5-point scales often provide a balance between reliability and respondent burden, while unipolar formats are appropriate for measuring the degree of interference (a naturally unipolar construct ranging from none to extreme). This format also reduces potential acquiescence bias that can occur with agree-disagree response formats and is developmentally appropriate for early adolescents' cognitive processing capabilities (Krosnick & Presser, 2010).

Statistical Analysis

Exploratory Factor Analysis

Data were analysed using SPSS version 29. Missing data, extreme scores, and normality were assessed on the scale items. Preliminary tests were used to evaluate the data to determine if the ARSI was suitable for EFA using intercorrelations (> .3), the Kaiser-Meyer-Olkin (KMO) test for sampling adequacy (0-1), with > .6 being the minimum to suggest factorability, and Bartlett's test of sphericity ($p < .05$). Scale items were removed if they did not meet acceptable values. The EFA used principle axis factoring for extraction as the intent was to identify a latent factor structure (Fabrigar et al., 1999). An oblique (promax) rotation was selected which allows factors to be correlated with computational efficiency and interpretability (Brown, 2015; Abdi, 2003). Factors were extracted based on eigenvalues greater than 1 (Kaiser, 1960), and visual inspection of the scree plot. Extracted communalities were explored, with items greater than ≥ .4 indicating acceptability for retention (Tabachnick & Fidell, 2013). Loading patterns were explored with factor loadings ≥ .4 considered meaningful to interpret (Brown, 2015). Cronbach's alpha was used to establish internal

reliability, means and standard deviations were explored for whole sample and separately by sex. Sex differences were analysed using an independent samples t-test.

Confirmatory Factor Analysis

Data were analysed using SPSS version 29 and SPSS AMOS version 29. Missing data, extreme scores, and normality were assessed on the scale items. Squared root transformation was conducted on positively skewed data (Osborne, 2002). To examine the factor structure of the ARSI one model was selected (see Figure 1). This model was analysed using CFA with maximum likelihood estimation method. The seven items were specified to load onto one latent factor, based on the unidimensional factor structure identified during the EFA. The model was evaluated for model fit using the Comparative Fit Index (CFI), the chi-square/degrees of freedom ratio (CMIN/DF), the Normed Fit Index (NFI), the Goodness of Fit Index (GFI), the Tucker-Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and Standardised Root Mean Square Residual (SRMR) based on common standards (good fit: CFI ≥ .95; CMIN/DF ≤ 3.0; NFI ≥ .95 GFI ≥ .95; TLI ≥ .95; RMSEA ≤ .05; SRMR ≤ .08; Bentler, 1990; Kline, 2015; Schumacker & Lomax, 2004).

Reliability and Validity

Missing data, extreme scores and normality were assessed on all variables. To examine the construct validity of the interference scale, Pearson's correlation coefficients were computed between the school interference scale and several theoretically relevant variables to confirm construct validity. SPSS syntax and output for analyses can be found in Appendices K.

4.3 Results

Exploratory Factor Analysis (EFA)

Preliminary Analyses for EFA

Examination of missing data showed 16 participants (8.21%) were missing responses to scale items. There were 15 participants missing a single response, and the remaining participant was missing two items. Inspection of the missing responses showed the highest missing response rate was 2.6% for item (" How much do worries or concerns about your appearance make it difficult for you to speak or read aloud in class?"), the remaining missing response rates ranged from 0.0% to 1.5%. Little's Missing Completely at Random (MCAR) test was not significant, indicating data were missing completely at random, $\chi 2\ (89) = 108.06$, $p = .08$. As missing response rate was less than 5% per scale item, Expectation Maximisation (EM) algorithm was used to impute missing response items (Malan et al., 2020). Nine univariate outliers were identified following z-score transformation, with values ±3. They were removed from analysis (remaining, $n = 186$). All scale items were examined for normality with five items exceeding the recommended ranges for skewness (< ±2) and kurtosis (< ±2) (Tabachnick & Fidell, 2013). Data for the five items were transformed using square root transformation to assist with the positive skew of the data which reduced all items within the recommended range (Osborne, 2002). Kurtosis values were all within the acceptable range (Tabachnick & Fidell, 2013).

Primary EFA Analysis

A preliminary EFA was run on the 10-item questionnaire. Sample size (n= 186) was adequate, exceeding the 1:20 cases to item ratio (Hair et al., 1995), and the minimum necessary sample size of 180 based on variables-to-factor ratio of at least seven (Mundfrom et al., 2005). Regarding factorability, KMO = 0.90, indicating good sampling adequacy, and Bartlett's test of sphericity was statistically significant, $\chi 2\ (45) = 1181.02$, $p < .001$, indicating that the data were appropriate for EFA. The correlation matrix suggested there was

potential multicollinearity with the data, with determinant of the R-matrix < .00001 (Field, 2013). The suitability of EFA was assessed by initial inspection of the correlation matrix which showed that one item ("Speak or read aloud in front of the class") was highly correlated with two other items ("Answer a question in front of the class"; r = .78, and "Give a speech or presentation"; r = .78). As these items were highly correlated and conceptually similar this item was removed. Further inspection of the correlation matrix identified two items ("At home, how much does time spent exercising, interfere with getting your school work done?" and " How much does looking after your appearance (doing your hair, looking after your skin, choosing what to wear) interfere with getting your school work done?"), had multiple correlation coefficients of < 0.3 with other scale items and were subsequently removed from further analysis.

The final EFA was conducted on the remaining 7-items of the scale. The correlation matrix showed that all variables had correlation coefficients >.3. Multicollinearity was acceptable as indicated by the determinant of the correlation matrix (.011), there was good sampling adequacy (KMO = .90), and Bartlett's test of sphericity was statistically significant, $\chi 2$ (21) = 826.95, p = < .001, indicating the data were suitable for EFA. Inspection of the scree plot indicated a single factor solution should be retained. Principle axis factoring with Promax rotation revealed that one component had an eigenvalue of 4.29 which explained 61.29% of the total variance. Inspection of the communalities table identified that all items were greater than the recommended minimum value of 0.4 (range .43 - .70), showing acceptability for retention (Tabachnick & Fidell, 2013).

Additional analysis was performed separately by sex, the single factor solution was upheld in females (eigenvalue = 4.60; variance explained = 65.66%), and males (eigenvalue = 4.05; variance explained = 57.87%). There was one item with a communality of .35, for males which is below the recommended minimum 0.4 value (Tabachnick & Fidell, 2013).

However, Child (2006) suggests that communality values > 0.2 can still be considered acceptable. Factor loadings, descriptives, reliability, and the analyses by sex for the final EFA are presented in Table 1.

Table 1.

Factor Loadings, Descriptive Statistics, and Reliability for the ARSI.

ARSI Item	Overall (*N* = 186)	Girls (*n* = 95)	Boys (*n* = 91)
1. Participate in physical education class	.66	.72	.59
2. Give a speech or presentation	.72	.75	.72
3. Participate in class activities	.82	.87	.77
4. Answer a question or speak in front of class	.80	.78	.82
5. Go up to the whiteboard	.82	.85	.79
6. Participate in group work	.84	.89	.80
7. Raise your hand in class	.81	.81	.81
Cronbach's alpha	.83	.84	.82
M (*SD*)[a]	1.43 (0.49)	1.45 (0.53)	1.39 (0.46)
Skewness (*SE*)	1.18 (0.18)	1.21 (0.25)	1.10 (0.25)
Kurtosis (*SE*)	0.63 (0.36)	0.65 (0.49)	0.38 (0.50)

Note: All items begin with " Do concerns or worries about your appearance make it difficult for you to…". Items were scored on a scale *1* (not at all) to *5* (a great deal).
[a] Mean scores on ASRI were not significantly different for girls and boys, $t(184) = -0.84$, $p = .40$.

As can be seen in Table 1, all items in the overall EFA had factor loadings ≥ .6, with the majority considered strong. The separate analysis by sex demonstrated strong loadings across all items for girls. For boys, one item (Item 1) loading was ≤ .6, however all other item loadings were strong, as the item has theoretical relevance it was retained. The 7-item scale demonstrated good internal consistency in the full sample as assessed by Cronbach's alpha,

this was also upheld in boys and girls. Overall, the analysis provides preliminary support for the 7-item ARSI as a valid and reliable measure for use in an adolescent males and females.

Confirmatory Factor Analysis (CFA)

Preliminary Analyses for CFA

Examination of missing data showed three participants (1.84%) were missing more than 50% of responses to scale items and were removed from further analysis. Of the remaining 160 participants, there were no missing responses to scale items. There were eight participants with extreme scores on scale items, indicated by z-scores >3, who were removed from analysis (remaining $n = 152$) (Field, 2013). All scale items were examined for normality with three items exceeding the recommended ranges for skewness ($< \pm 2$) and kurtosis ($< \pm 2$) (Tabachnick & Fidell, 2013). The three items were transformed using square root transformation to aid with the positive skew of the data which helped bring all items within the recommended range (Tabachnick & Fidell, 2013).

The results of the CFA indicated mixed evidence for model fit. The Chi-square test was significant, $\chi 2(14) = 35.74$, $p = .001$, suggesting the model deviated significantly from the observed data. However, it is important to note that the Chi-square test is sensitive to sample size and may indicate misfit even when the model is adequate (Schermelleh-Engel et al., 2003). As such, the Chi-square test was not the sole determinant of model fit. The CMIN/DF ratio, which is considered another indicator of model fit, was 2.55, which falls within the recommended range of 1 to 3, indicating an acceptable model fit (Bentler, 1990). Similarly, the additional goodness-of-fit indices (NFI, CFI, GFI, TLI, & SRMR) met the recommended thresholds, suggesting a strong model fit (Hu & Bentler, 1999). Values for the goodness of fit indices are presented in Table 2. Conversely, the RMSEA was 0.10, which exceeds the threshold of 0.08, indicating a marginal fit (Steiger, 1990). The PCLOSE value for the

RMSEA was 0.02, which is less than the recommended cutoff of 0.05, suggesting that the model fit is less than ideal. Taken together, the results indicate that further refinement of the model, such as allowing covariances based on the modification indices (MI) may improve the model fit (MacCallum et al., 1992).

Inspection of the MI suggested two areas where the model could potentially be improved to enhance model fit by adding covariances between error terms or adjusting the regression weights. The first modification was adding covariance between error terms 6 and 7 (MI = 10.81, Parameter Change = .01) which suggested that allowing a relationship between these error terms might improve the model fit. The item pair ("participate in group work", "raise your hand in class") could conceivably share conceptual overlap, however, the modification was considered modest.

The stronger modification was indicated for the covariance between error term 2 and 3 (MI = 12.85, Parameter Change = .10), which suggested that adding this covariance would lead to a more substantial improvement in model fit. The item pair ("give a speech or presentation", "participate in class activities") involves communication and interaction with others. It could be explainable that the underlying factor (interference) shares conceptual similarity across both items. Additionally, the modification indices for regression weights suggested possible improvements for this pair. The regression weight from Item 3 to Item 2 (MI = 4.12, Parameter Change = .08) suggested that freeing or adjusting this parameter might improve the model. As suggested by Whittaker (2012), too many adjustments based on MI alone should be avoided due to the risk of overfitting the model to the sample data. While there is no universal threshold for MI, Kline (2016) reported that MI > 10 could be used as a guideline for significant modifications in CFA. Taken together, as the goal for CFA is to only

make changes to the model that improve fit and are justifiable conceptually, the stronger covariance of error 2 and error 3 was used to respecify the model.

After respecifying the model, a second CFA was conducted to assess the fit of the modified model. The results of the model fit indices suggested significant improvements compared to the initial model. The Chi-square statistic for the respecified model was $\chi 2(13) = 22.10$, $p = .054$, which was non-significant, indicating an improvement in model fit. While the Chi-square test remains sensitive to sample size, the result suggests that the respecified model fits the data better than the original model. The CMIN/DF ratio decreased from 2.55 to 1.70, indicating a strong fit (values between 1 and 3 are considered acceptable).

Similarly, the additional goodness-of-fit indices (NFI, CFI, GFI, and TLI,) all improved with the respecified model exceeded the recommended thresholds, suggesting a very strong to excellent fit (Hu & Bentler, 1999). The RMSEA improved from marginal fit to an acceptable fit with the PCLOSE value indicating that the RMSEA was no longer significantly greater than 0.05. The SRMR remained excellent. Values for the goodness of fit indices for the initial and respecified model are presented in Table 2.

Table 2

Model Fit Indices for the Two Models of School-Related Interference

	NFI	CFI	GFI	TLI	SRMR	RMSEA	CI(90%)	AIC	BIC
Original	.96	.98	.93	.96	.030	.10	.06 - .14	63.74	106.07
Respecified	.98	.99	.96	.98	.025	.07	.00 - .12	52.10	97.46

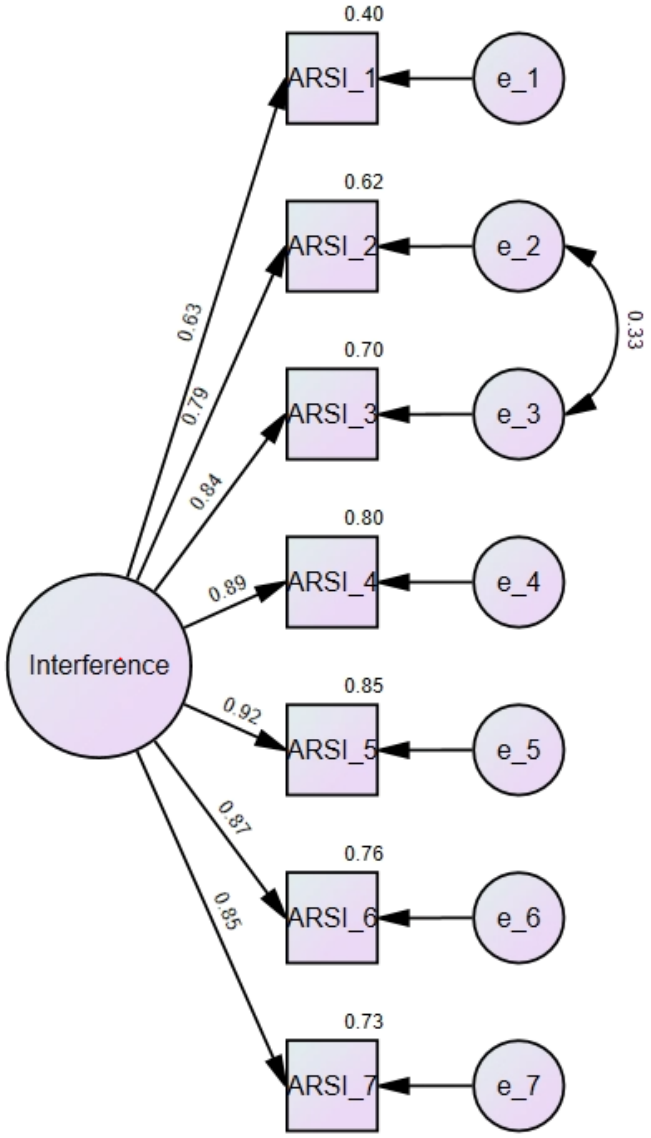
Note. CMIN = Chi-square statistics; DF = Degrees of freedom; NFI = Normed Fit Index; CFI = Comparative fit index; SRMR = Standardized Root Mean Square Residual; RMSEA = Room Mean Square Error of Approximation.

As shown in Table 2, the results suggest that the respecified model demonstrates a significant improvement in fit over the original model, with improvements across key fit

indices, indicating a better representation of the observed data. Figure 1 presents the path diagram for the respecified model of the ARSI.

Figure 1.

Path Diagram for Final Model of ARSI



Note. The large circle represents the latent construct of interference, with the squares representing measured indicator variables, and the small circles representing error variances. The double-headed arrow represents the covariance between error terms.

As can be seen in Figure 1, the path diagram illustrates the unidimensional structure of the ARSI. All factor loadings were statistically significant ($p < .05$), and the proportion of variance in the item that is explained by the latent factor (interference) ranged between 40 – 85%. While most items exceed the acceptable threshold levels of variance explained (> 0.50), Item 1 showed lower variance explained, however the item was considered theoretically important to the performance-based activities domain, so it was retained in the final model.

Reliability and Validity Testing

Preliminary Analysis

Several methods to assess the reliability and validity of a scale were used. To assess the reliability of the scale, Cronbach's alpha was calculated. The ARSI demonstrated good internal consistency ($\alpha = 0.88$), which was also analyses was run separately by sex (females $\alpha = 0.86$; males $\alpha = 0.92$) Additionally, Composite Reliability (CR) was computed with the construct showing good reliability. Factor loadings from the CFA model ranged from 0.63 to 0.92, showing support that items were strong indicators of the respective latent variable. Scale descriptives, CR and Factor loadings can be seen in Table 3.

Table 3.

CFA Factor Loadings, Descriptive Statistics, Reliability for the ARSI

ARSI Item		Factor Loadings	R^2
1. Participate in physical education class		0.63	0.40
2. Give a speech or presentation		0.79	0.62
3. Participate in class activities		0.84	0.70
4. Answer a question or speak in front of class		0.89	0.80
5. Go up to the whiteboard		0.92	0.85
6. Participate in group work		0.87	0.76
7. Raise your hand in class		0.85	0.73
Average Variance Explained	0.69		
Composite Reliability	0.94		
Skewness (*SE*)	1.20 (0.20)		
Kurtosis (*SE*)	0.23 (0.39)		
M (*SD*) [a]	1.22 (0.28)		

N = 152. Factor Loadings ≥ 0.50, $R^2 \geq 0.50$ = good, 0.30 = acceptable, CR ≥ 0.70 = good reliability, AVE ≥ 0.50 = adequate convergent validity [a] Mean scores on ASRI were not significantly different for girls and boys, $t(151) = -1.80$, $p = .074$.

As can be seen in Table 3, the majority of items had factor loadings > 0.70 demonstrating the scale items were good indicators of the latent construct. Although Item 1 had the lowest factor loading, it still exceeded the acceptable threshold of > 0.50.

Convergent Validity

Convergent validity was assessed using the *average variance extracted* (AVE). The AVE of was above the recommended threshold of 0.50, indicating that the latent variable explained a substantial portion (69%) of the variance. This suggests a good level of convergent validity. Pearson's correlation analyses were conducted to further explore convergent validity. The correlation coefficient was computed between scores on the ARSI and several theoretically relevant variables related to body image. Negative correlations were found for body appreciation, emotional wellbeing (positive affect) and psychological strength (self-esteem and resilience), and school satisfaction. Whereas positive correlations were reported for key risk factors (social comparison, appearance conversations, internalisation of appearance ideals), negative affect and school performance anxiety. Pearson's correlation coefficients can be seen in Table 4.

Table 4

Pearson's Correlation Coefficient Between ARSI and Construct Validity Measures

Variable	Girls	Boys
CYRM (Resilience)	-.47**	-.20
PANAS-P (Positive Affect)	-.33**	-.11
MSSS (School Satisfaction)	-.46**	-.34**
BAS (Body Appreciation)	-.48**	-.29*
RSES (Self-Esteem)	-.49**	-.36**
ACFS (Appearance Conversations)	.42**	.50**
SATAQ-T (Thin Ideal)	.38**	.39**
SATAQ-M (Muscular Ideal)	.13	.32*
PACS (Appearance Comparison)	.43**	.54**
SPAI (School Phobia and Anxiety)	.55**	.25*
PANAS-N (Negative Affect)	.37**	.55**

Note. *p < .05. **p < .01.

As can be seen in Table 4, girls reported significant correlations between scores on the ARSI and most variables, except muscular internalisation. Whereas for boys, resilience and positive affect were not significantly related to appearance-related school interference.

4.4 Discussion

The present study aimed to validate and confirm the factor structure of the Appearance-Related School Interference (ARSI) scale for adolescents through exploratory and confirmatory factor analyses. The results provided evidence supporting the predicted unidimensional 7-item scale. The scale reported good psychometric properties across females and males and established construct validity by exploring the relationship of appearance concerns on school-related activities and related constructs. The ARSI provides a

measurement tool that addresses a critical gap in understanding how body image concerns impact academic participation.

Scale Development and Factor Structure

The initial development phase and EFA, resulted in the refinement of the original 10-item questionnaire to a more focused 7-item scale. This refinement process involved the removal of two items due to poor inter-item correlations, and one due to high multicollinearity. The elimination of these items strengthened the scale conceptually and provided statistical robustness, resulting in the predicted unidimensional structure that explained 61.29% of the total variance. The subsequent CFA provided additional support for the unidimensional structure of the scale, though initial fit indices suggested room for improvement. A conceptually justified re-specification of the initial model recognised the shared communication and interaction components of this item pair while maintaining the scale's theoretical integrity. After respecifying the model, results supported an acceptable model fit.

Psychometric Properties

A noteworthy finding following the EFA was the absence of significant mean differences between boys and girls, suggesting that the appearance-related school interference may impact both sexes similarly and provides support for the scales use for both male and female adolescents. This finding could indicate the scale items capture aspects of classroom-based activities that are not inherently gendered. Another explanation could be the specific developmental stage of the sample. Early adolescence is a time where body image concerns are particularly important for both sexes, even if the types of concerns (thinness for girls and muscularity for boys) (Ricciadelli & Yager, 2016) vary, potentially creating comparable levels of interference in academic settings.

The ARSI demonstrated good psychometric properties across both validation phases. The scale exhibited strong internal consistency in both the initial sample (α = 0.83) and the confirmation sample (α = 0.88), with similarly robust reliability coefficients when examined separately by sex. The high composite reliability (0.94) and average variance extracted (0.69) for the confirmation sample, further support the scale's reliability and convergent validity. The stability of the factor structure across sex (EFA) further reinforces the ARSI's applicability to both male and female adolescents. However, sex invariance was unable to be conducted with the CFA due to sample size constraints. Further exploration of convergent validity between the ARSI and study variables showed relationships in the predicted directions, with notable sex differences in the strength of those relationships.

Correlations with Psychological Well-being Variables

Resilience and positive affect demonstrated significant moderate negative correlations with ARSI for girls (r = -0.47 and r = -0.33, respectively) indicating that higher levels of appearance-related school interference were associated with lower resilience and positive affect. This finding is consistent with existing literature that highlights the impact of body image issues on psychological wellbeing and resilience in adolescent girls. Research has shown that girls often face societal pressures to conform to specific appearance standards, which can lead to increased vulnerability to stress, reduced positive emotions, and decreased coping abilities (Merino et al., 2024). The internalisation of these pressures can impact adolescent's ability to bounce back from challenges, thereby affecting their overall resilience and mood (Zhao et al., 2023). In contrast, boys exhibited weaker non-significant negative correlations (r = -0.20 and r = -0.11, respectively), suggesting that appearance-related concerns do not impact their positive emotional experience and resilience to the same extent. Matera et al. (2024) highlighted that males use different coping strategies while

dealing with appearance concerns compared to females and this can lead to better overall psychological wellbeing. This could be a possible explanation for weaker associations with the ARSI for boys.

Body appreciation and self-esteem showed robust moderate negative correlations with ARSI for girls (r = -0.48, and r = -0.49, respectively), reinforcing the notion that girls experiencing higher school–related interference tend to have lower body appreciation and self-esteem. For boys, the correlation was also negative but not as strong (r = -0.29, and r = -0.36, respectively). This sex difference was expected as previous research consistently demonstrates that body image concerns and lower self-esteem are typically more common among girls compared to boys (Petrovics et al., 2021; Delfabbro et al., 2011 Importantly, what the ARSI adds to our understanding of body appreciation and self-esteem is the measurement of associated behavioural impacts in the school environment. These correlations indicate that adolescents in the current sample with lower body appreciation and self-esteem also report more school interference, such as avoiding speaking up in class, difficulty concentrating on schoolwork, and reluctance to participate in group activities. While the correlational nature of these data does not allow for causal inferences, the associations highlight an important link between attitudinal body image constructs and actual school-based behaviours, suggesting that interventions addressing appearance-related concerns may need to consider both attitudinal and behavioural domains.

Positive correlations between ARSI and negative affect suggests that higher levels of appearance-related interference are associated with increased negative emotions. For girls, the correlation was moderate (r = 0.37), while for boys, it was stronger (r = 0.55), indicating that boys may experience heightened negative emotions linked to appearance concerns compared to girls. This finding is particularly interesting as stronger relationships between negative affect and body image variables are typically reported for girls (Cruz-Sáez et al.,

2020). Negative affect heightens the risk of body image concerns which can contribute to reduced feelings of self-worth (Rodgers et al., 2014). Boys may be more affected in the classroom by societal pressures regarding appearance than previously understood.

Correlations with Appearance-Related Cognitions and Behaviours

Positive ARSI demonstrated moderate to strong positive correlations with social comparison for both girls ($r = 0.43$) and boys ($r = 0.54$). This finding is theoretically important as it suggests that appearance-related school interference and social comparison may share underlying cognitive processes. Adolescents who frequently compare their appearance to peers may become hyper-aware of perceived discrepancies, which could manifest as classroom avoidance and reduced participation. This particularly strong correlation for boys is notable and potentially indicates a shift in societal norms regarding male body image (Tatangelo & Ricciardelli, 2017). Future research should examine whether interventions targeting social comparison cognitions could reduce appearance-related interference in school settings.

Similarly, the positive correlation between ARSI and appearance conversations is notable, with girls showing a moderate correlation of $r = 0.42$ and boys a stronger correlation of $r = 0.50$. This suggests that both boys and girls who engage in more conversations about appearance are likely to experience greater interference in their school life due to concerns about their looks. This is an unexpected finding as previous research predominantly finds boys engage in fewer appearance related conversations with friends compared to girls (Bell et al., 2021). The stronger correlation in boys may indicate that discussions surrounding appearance are particularly impactful for them in the school environment, potentially reflecting increased societal pressures that encourage boys to conform to certain body ideals (Jankauskiene & Baceviciene, 2023).

The similarity in positive correlation values between the ARSI and thin internalisation for boys ($r = 0.39$) and girls ($r = 0.38$), suggest that both sexes who internalise thin appearance ideals are likely to experience greater appearance-related school interference. Although most research shows that girls are more likely to conform to thin ideals, there is evidence to suggest boys are also impacted by the desire to look lean with lower levels of body fat as well as muscular (Hoffmann & Warschburger, 2019). In contrast, the correlation for muscular internalisation is low and not significant, for girls ($r = 0.13$), whereas is was moderate for boys ($r = 0.32$). The stronger correlation for boys likely reflects the emphasis on muscularity and strength as ideals for male bodies (Dondzilo et al., 2019). The findings suggest that boys who are preoccupied with achieving a muscular physique, may experience interference with their school participation.

Correlations with School-Related Outcomes

Further analysis reveals that school satisfaction also exhibited significant negative correlations with ARSI, particularly for girls ($r = -0.46$). This highlights that girls experiencing greater school interference due to appearance concerns report lower satisfaction with their school experience. This finding is concerning as lower school satisfaction has been shown in previous research to be related to feelings of hopelessness, school absence, and increased health complaints (Horanicova et al., 2022). Boys, while also negatively correlated, show less severity in this relationship ($r = -0.34$), further emphasising the disparity in the impact of appearance-related issues between girls and boys.

The correlation between the ARSI with school performance anxiety is particularly interesting as it had the largest difference between sexes, with girls showing a strong correlation ($r = 0.55$), compared to boys ($r = 0.25$). This suggests that girls who experience greater appearance-related interference are more likely to report higher levels of

performance anxiety in school settings. This finding is supported by research indicating that body image concerns can significantly affect academic engagement and this association is stronger for those with increased emotional problems (Guimond & Laursen, 2022). The lower correlation for boys may suggest that while they experience some level of performance anxiety related to appearance, it is less intense compared to their female counterparts.

Overall, these findings provide evidence of the convergent validity of the ARSI, as it correlates as expected with theoretically related constructs spanning psychological well-being, appearance-related cognitions and behaviours, and school-related outcomes. Importantly, these correlations demonstrate that the ARSI captures the interference experienced in school settings, a unique aspect of body image concerns that extends beyond attitudinal measures to encompass the behavioural and academic impacts of appearance-related worries. The pattern of associations provides insight into how appearance concerns are linked to various aspects of adolescent functioning, including emotional well-being, social cognitions, and educational experiences.

Theoretical and Practical Implications

The validation of the ARSI offers meaningful contributions to both theoretical understanding and practical applications in educational settings. Theoretically, the scale's unidimensional structure suggests that appearance-related school interference represents a cohesive construct that presents across various classroom-based activities. This finding compliments existing research on the widespread impact that body image concerns can have across life domains for adolescents (Atkinson & Diedrichs, 2021), while providing a more focused measurement tool to further assess specific interference within a classroom setting. The developing this novel measure, the ARSI provides a reliable measure enables future

research to explore bridges an important gap in the literature, as it enables systematic investigation of how appearance concerns directly impact academic engagement within the classroom. Building on established theoretical frameworks of self-objectification (Fredrickson & Roberts, 1997) and social comparison processes, the ARSI provides a reliable instrument for examining how appearance preoccupation may use cognitive resources and interfere with learning processes in education settings.

From a practical standpoint, the ARSI is an accessible measure for both research and clinical applications. It was designed and refined to be a concise measurement tool for use within the time-constrained school environment while maintaining comprehensive coverage of relevant behaviours. The strong factor loadings across items (ranging from 0.63 to 0.92) indicate that the scale effectively captures important aspects of classroom-based activities impacted by appearance concerns. Moreover, the scale's demonstrated reliability supports its use in educational settings.

Limitations and Future Directions

While there was psychometric support for the ARSI, several limitations should be considered. Although the CFA model fit was acceptable, caution needs to be taken as the confirmation can only be applied to the current sample of adolescents. As outlined by Whittaker (2012), following the modification of a structural equation model, as was conducted in this study, this is no longer considered confirmatory but rather it is now exploratory. Further validation using an independent sample and dataset would strengthen confidence in this revised model structure (MacCallum et al., 1992).

Additionally, while there is some diversity in the current sample (25.7% born overseas), the majority of participants were born in Australia and lived in a moderate to high

SES location (ABS, 2021), which may impact the generalisability of results. The age range of participants (12-14 years) may not represent the full adolescent experience of appearance concerns and how they could impact classroom participation. Further testing of the current model with larger, more diverse samples of adolescents would provide opportunities to examine measurement invariance across different demographic groups and cultural contexts.

Future research using the ARSI could conduct longitudinal studies to understand how appearance-related school interference might evolve throughout different periods of adolescent development and key academic periods. The ARSI could be used to explore the predictive validity for academic outcomes such as academic achievement and psychological wellbeing in adolescents. Cross-cultural investigations could explore validation of the scale across different cultural, socioeconomic, and gender diverse groups. Finally, educational application of the ARSI could be used to develop targeted classroom interventions and evidence-based teacher training modules to support student wellbeing and academic success.

Conclusion

This validation study establishes the Appearance-Related School Interference (ARSI) scale as a psychometrically robust instrument for measuring how appearance concerns impact adolescents' educational experiences. The findings support a unidimensional 7-item structure that demonstrates strong reliability and construct validity across both male and female adolescents. The scale's comparable performance across sexes challenges traditional assumptions about sex differences in appearance concerns and provides a valuable tool for understanding how these issues present in educational settings. The ARSI's relationships with established measures of psychological wellbeing, body appreciation, and academic engagement provide important insights into how appearance concerns impact the school experiences for adolescents. Particularly noteworthy are the unexpected findings regarding

male adolescents' vulnerability to appearance-related interference, suggesting that appearance concerns may affect boys' academic engagement more significantly than previously recognised. The scale's psychometric properties make it suitable for further research and applied settings. Schools and educators could use the ARSI to identify students whose academic engagement may be impacted by appearance concerns. Although further validation across diverse populations is needed, the ARSI represents an important step forward in understanding and addressing appearance-related barriers to academic engagement in adolescents.

Chapter 5: General Discussion and Conclusions

Overview

Body image concerns during adolescence represent a persistent challenge despite decades of intervention research and practice. Adolescents experience cumulative exposure to appearance-related messaging across critical developmental periods, with longitudinal research documenting that appearance-related socialisation begins as early as aged 10 and intensifies throughout mid-adolescence as physical appearance becomes a primary determinant of social status (Choukas-Bradley et al., 2022; Pivnick et al., 2022; Zimmer-Gembeck et al., 2023) Brief body image programs attempt to both counter years of appearance-focussed messaging and pre-empt the deepening of these concerns as young people transition into older adolescence, creating a gap between the duration of single-session approaches and the depth and trajectory of the concerns being addressed. This approach may fail to account for the cognitive demands of meaningful belief restructuring, environmental persistence of appearance-focused contexts, and substantial individual differences in psychological readiness for change (Cowan, 2016; Fardouly & Vartanian, 2016; Sweller, 2024; Thompson et al., 1999).

Additionally, brief information-based approaches assume that knowledge provision is sufficient for attitude change, yet this overlooks the relational and contextual factors central to adolescent development. Peer relationships play a particularly important role in shaping body image attitudes during this period (Brown & Larson, 2009; Jones, 2012), whilst information provision alone is insufficient for changing health-related behaviours (Kelly & Barker, 2016). The broader intervention landscape reflects these limitations, with recent systematic review identifying that only approximately half of interventions demonstrated effectiveness on at least one body image measure at post-intervention, though effect sizes

were typically small to medium and with limited maintenance at follow-up (Mahon & Seekis, 2022). Effective body image intervention in early adolescence requires understanding individual differences in intervention response, sufficient intervention intensity to address deeply ingrained beliefs, and assessment approaches capturing real-world impacts. The three studies in this thesis address each of these needs.

This thesis presented three studies that collectively advance understanding of body appreciation research promotion in early adolescence. Study 1 provided the first controlled evaluation of Becoming Media Savvy, a universal brief school-based program, establishing that the single-session psychoeducational approach was unable to produce meaningful improvements in body appreciation in early adolescence. Study 2 identified sex-specific psychological pathways to body appreciation, revealing that self-esteem, resilience, and positive affect operate through different mechanisms for girls versus boys, demonstrating that effective intervention requires approaches matched to individual predictive patterns rather than universal content. Study 3 developed and validated the Appearance-Related School Interference Scale, providing a tool to identify students whose appearance concerns interfere with educational participation, enabling screening for targeted intervention. Together, these studies establish that promoting body appreciation during early adolescence requires moving beyond brief universal programs toward extended, tailored approaches that build psychological resources, match intervention strategies to individual pathways, and assess real-world interference alongside traditional attitudes

Synthesis of Findings Across Studies

Study 1 provided the first controlled evaluation of Becoming Media Savvy, a single-session body image program delivered in Australian schools by the Butterfly Foundation. This evaluation demonstrated clear null findings across all outcomes, offering important

lessons for prevention science. As Axford et al. (2022) emphasise, transparent reporting of null results contributes valuable knowledge to guide future intervention design. The evaluation also established program safety which is valuable given evidence that some school-based health education can be iatrogenic (Lin et al., 2023). The decision to evaluate this program reflected that it represents the type of brief intervention schools adopt when addressing body image concerns within practical constraints.

The evaluation revealed several key lessons about intervention design. The psychoeducational approach showed limited effectiveness. This approach required students to view and analyse images of Victoria's Secret models, athletes, and celebrities whilst discussing appearance ideals. This approach appears problematic because teaching students to critically analyse media messages may paradoxically worsen body dissatisfaction, as extended exposure to appearance-ideals can strengthen rather than weaken their influence (Bennett et al., 2023). Meta-analytic evidence demonstrates that programs without psychoeducational content produce larger effects than those with such content (Stice et al., 2007), and the program lacked cognitive dissonance strategies proven effective for reducing appearance-ideal internalisation (Stice et al., 2008). Additionally, baseline constraints (ceiling and floor effects) in this sample suggested that universal prevention may have limited effectiveness when most students already show adequate functioning, consistent with meta-analytic evidence that selected interventions produce larger effects (Stice et al., 2007). Single-session format provided insufficient opportunity for sustained behavioural change, aligning with evidence that multi-session programs demonstrate superior maintenance of effects (Wilksch & Wade, 2009; Richardson & Paxton, 2010). The mandatory school-based delivery format may have limited engagement, as students who participate voluntarily show better intervention outcomes than those required to participate (Ng et al., 2012).

The learning from Study 1 suggests that if brief interventions are necessary due to practical constraints, they require fundamentally different approaches. Rather than psychoeducational media literacy programs that expose students to appearance ideals whilst teaching critical analysis, alternative approaches could employ cognitive dissonance strategies that engage students in active critique, focus on building psychological resources such as self-esteem and resilience (as explored in Study 2) rather than appearance-specific content, or target high-risk students identified through screening (as enabled by the ARSI scale developed in Study 3) rather than universal delivery. The absence of prior controlled evaluation despite implementation highlights a research-practice gap where programs can achieve extensive reach based on face validity rather than empirical evidence. This evaluation provides essential learning about what approaches show limited effectiveness, directly informing the directions pursued in Studies 2 and 3.

Given that Study 1 demonstrated brief universal programs show limited effectiveness, Study 2 addresses the critical question of what interventions should target instead. Study 2 identified that psychological resources including self-esteem, resilience, and positive affect are predictors of body appreciation, suggesting interventions should build general psychological strengths rather than focussing solely on appearance-specific content. Critically, the study reveals sex differences in predictive pathways that fundamentally challenge universal intervention assumptions. For girls, self-esteem demonstrated a large effect size explaining 66.5% of variance in body appreciation. Resilience provided modest additional contribution, whilst positive affect contributed no unique predictive variance despite strong bivariate correlation. For boys, all three factors contributed meaningful unique variance suggesting distributed reliance on diverse psychological resources.

These distinct patterns have important implications for understanding Study 1's null findings and designing future interventions. Becoming Media Savvy employed a universal

approach delivering identical content to all students, focussing on media literacy and appearance ideals. Study 2 reveals that this type of universal approach may not effectively address the different psychological mechanisms underlying body appreciation for girls versus boys. The findings suggest that future programs should target self-esteem as a primary mechanism for girls, given its dominance in predicting body appreciation. For boys, interventions should address multiple psychological resources including self-esteem, resilience, and positive affect, given all three contributed unique predictive variance. The finding that positive affect significantly predicted body appreciation in boys but showed no effect for girls despite equivalent bivariate correlations highlights why targeting the same mechanisms universally cannot address the different pathways that operate for each sex. Study 2 demonstrates that effective intervention requires matching strategies to the specific psychological pathways operating within particular groups.

The cross-sectional design cannot establish causal direction regarding the relationship between self-esteem and body appreciation. Research demonstrates that self-esteem and appearance concerns are closely related (Earl, 2022), whilst emerging evidence suggests bidirectional relationships. Tiggemann (2005) proposed that body image and self-esteem influence each other reciprocally during adolescence. Paxton et al. (2006) found that lower self-esteem predicted increased body dissatisfaction over time, whilst body dissatisfaction also predicted declining self-esteem, supporting reciprocal pathways. Linardon et al. (2022) noted that only 8 of 240 body appreciation studies examined prospective associations, highlighting reliance on cross-sectional designs. Recent evidence suggests that body appreciation promotes positive self-beliefs, which in turn are associated with positive mental health outcomes (Swami et al., 2024), indicating that body appreciation may serve as a foundation for broader positive self-evaluation. However, longitudinal research is required to

establish whether these patterns represent stable developmental pathways and whether pathways differ for girls and boys given the sex differences observed in this study.

Study 2 makes a unique contribution by demonstrating that psychological pathways to body appreciation differ not just in strength but in fundamental structure across sex. This represents an advance beyond previous research, which has examined whether body image interventions work differently for girls versus boys but not why these differences occur. Study 2 provides the mechanism: the psychological resources that promote body appreciation operate through completely different configurations for each sex. Meta-analyses demonstrate that programs delivered solely to females produce larger effects than mixed-sex programs (Stice et al., 2007), but the field has attributed this to social dynamics (girls feeling more comfortable discussing body image without boys present) rather than different psychological mechanisms requiring different intervention content. Notably, co-educational programs have shown improvements primarily among boys rather than girls (Yager et al., 2013), further highlighting the importance of understanding sex-specific mechanisms. Study 2 provides empirical evidence that interventions cannot assume universal mechanisms across all adolescents. The field has recognised that sex-specific delivery produces larger effects but why this occurs remained unclear. Study 2 addresses this gap by demonstrating that psychological resources operate through different pathways for girls versus boys, indicating that future interventions require matched strategies rather than universal content. These findings shift body image intervention development away from appearance-focused content towards building broader psychological resources including self-esteem, resilience, and positive affect that naturally promote body appreciation.

Study 3 makes a contribution by developing the first validated screening tool to identify adolescents experiencing educationally significant appearance-related interference. The Appearance-Related School Interference (ARSI) scale addressed a significant gap in body image assessment: existing measures assess how adolescents feel about their bodies but not whether appearance concerns prevent them from participating in school activities that matter for their academic and social development. This represents a conceptual shift from attitude assessment to interference-based screening. The ARSI is valuable because it assesses interference in authentic educational contexts, targets early adolescence when interference patterns emerge. The ARSI enables identification of students experiencing educationally significant interference who represent appropriate targets for resource-intensive intervention, addressing a critical need in school-based mental health screening.

Specifically, the ARSI assesses educational interference in authentic school contexts including participation in physical education, giving presentations, group work engagement, classroom participation capturing concrete behaviours that directly impact academic performance and peer relationships rather than abstract attitudes. It targets early adolescence (ages 12-14), a critical developmental period when appearance concerns escalate and educational interference patterns may first emerge but when existing assessment tools lack developmental specificity. The scale was developed and validated with psychometric evaluation including factor structure confirmation and establishment of reliability and validity. This developmental focus provides a nuanced empirical foundation compared to existing measures. The Body Image Quality of Life Inventory (Cash & Fleming, 2002) assesses general life impact but lacks school-context specificity. The Eating and Body Image Disturbances Academic Interference Scale (Yanover & Thompson, 2008) focuses narrowly on eating disorder symptoms rather than general appearance concerns. The Life Engagement Scale (Diedrichs et al., 2015) includes minimal school items.

The ARSI's contribution extends beyond student identification to advancing intervention research methodology. Study 1 evaluated Becoming Media Savvy using traditional attitude-based outcome measures (body appreciation, self-esteem, appearance-ideal internalisation), which showed null effects. The ARSI provides an alternative outcome assessment approach that captures appearance-related interference with school participation. This interference-based outcome may detect intervention impacts that attitude measures miss, particularly for programs targeting coping strategies or resilience rather than changing appearance-related beliefs. Additionally, the ARSI enables targeted intervention evaluation by identifying high-interference students for whom intensive support may be most beneficial, directly addressing the universal versus targeted delivery question raised by Studies 1 and 2.

For researchers, the ARSI provides an interference-based outcome measure complementing traditional attitude assessment and enables identification of high-interference samples for targeted intervention trials. For schools, it offers a brief (7-item), developmentally appropriate, screening instrument identifying students whose appearance concerns interfere with educational participation, enabling targeted resource allocation and early intervention before interference patterns become entrenched. The focus on real-world interference rather than attitudes positions the ARSI to advance both understanding and practice in adolescent body image.

Collectively, these three studies provide complementary insights that advance understanding of adolescent body appreciation. Study 1 demonstrated what does not work and identified the need for alternative approaches. Study 2 revealed that psychological pathways to body appreciation differ by sex, with girls showing self-esteem dominance whilst boys demonstrated more distributed predictive patterns across self-esteem, resilience, and positive affect. Study 3 developed a tool to identify students experiencing educationally significant appearance-related interference, addressing a critical gap in outcome assessment.

Together, these studies suggest that effective body image approaches for early adolescents require moving beyond brief universal programs towards interventions informed by individual differences in psychological pathways and assessed through real-world interference in addition to traditional attitudinal measures.

Theoretical Implications

The three studies together provide insight into theoretical mechanisms of attitude and behavioural change during early adolescence. Study 1 demonstrated that brief psychoeducational program was not effective at producing meaningful change in body appreciation. Study 2 revealed that psychological pathways to body appreciation differ by sex, with self-esteem dominating for girls, whilst boys showed distributed patterns across self-esteem, resilience and positive affect. These sex-specific patterns may reflect differences in developmental socialisation through objectification processes. Fredrickson and Roberts' (1997) objectification theory proposes that girls experience more pervasive appearance-based evaluation, leading to greater self-objectification where physical appearance becomes central to self-concept. This heightened appearance focus could explain why self-esteem, reflecting global self-evaluation, so strongly dominates body appreciation for girls, as self-worth becomes closely tied to body-related evaluations. In contrast, boys experience less objectification, potentially allowing for multiple psychological pathways to maintain independent influence on body appreciation. Study 3 established that impacts of appearance concerns, interference with educational participation, remain largely unmeasured despite their importance in identifying students requiring support. Together, these findings indicate that current intervention models may be missing something about how adolescents develop and change their body image attitudes. Other theoretical frameworks may offer plausible explanations for these patterns, each emphasising different aspects of adolescent development and intervention response.

Cognitive load and processing capacity theories may explain why brief programs may limit their ability to produce meaningful change. According to cognitive load theory, working memory has limited capacity for processing new information, particularly information that requires conscious effort and restructuring of existing knowledge (Sweller, 2024). Early adolescents and children have accumulated years of appearance-focused messaging from multiple sources, creating complex cognitive schemas. If challenging these schemas requires cognitive demands that exceed available processing capacity in a single session, meaningful attitude change may be unlikely regardless of intervention quality. Cowan (2016) demonstrated that working memory capacity continues to develop through adolescence, which may potentially limit adolescents' capacity for rapid schema change in a short amount of time. This framework suggests that extended interventions may work better not simply because they provide more contact time, but because they allow distributed practice and consolidation necessary for genuine cognitive restructuring. Carpenter et al. (2022) research on learning demonstrates that distributed practice produces superior long-term retention of information compared to massed practice, though direct application to attitude change about body image warrants investigation. However, the null findings of Study 1's brief single-session program could reflect cognitive overload rather than intervention design, as overloading the session with excess content may have impacted participants ability to process and retain the information, therefore limiting its ability to contribute to meaningful change. Additionally, Study 3's findings demonstrate that appearance concerns create additional cognitive interference in real-word educational settings. The ARSI captures how appearance worries divert attention and working memory resources away from classroom participation and academic engagement. This interference represents a practical manifestation of cognitive load theory as student may not fully process educational content or program material when cognitive resources are occupied by appearance-related concerns.

Beyond cognitive limitations, future interventions should consider peer influence and emotional connection frameworks that emphasise the unique role of peer relationships during adolescence. During this developmental period, peers emerge as a significant source of influence on adolescent attitudes, activities, and emotional wellbeing (Brown & Larson, 2009). Research demonstrates that adolescents are sensitive and attuned to social information from peers for emotional regulation processes, suggesting that peer relationships may serve as particularly powerful sources of emotional support during this period (Sahi et al., 2023; Sherman et al., 2016). The quality of these emotional connections is important as high quality peer relationships characterised by emotional support can buffer adolescents from negative outcomes, while low peer support can increase vulnerability to risk (Telzer, et al., 2015). This framework suggests that professionally delivered programs may not translate to an adolescent audience because they operate outside the emotionally important peer relationships through which adolescent attitudes naturally shift during this developmental period. Future intervention research should investigate whether peer-delivered or peer-involved approaches better active these emotional connection pathways, potentially enhancing intervention effectiveness beyond what professional delivery alone can achieve.

These theoretical frameworks emphasise different facets of a complex developmental process. Cognitive load theory highlights processing limitations that may constrain intervention effectiveness across adolescence, particularly for brief formats attempting rapid schema change. Peer influence frameworks emphasise the developmentally specific social influences that occur as adolescent attitudes naturally shift. These frameworks may also interact, for example peer-delivered interventions might benefit from distributed practice principles that account for cognitive processing limitations, whilst extended professional interventions could incorporate peer elements to activate emotional connection pathways.

Together, these theoretical considerations suggest that effective body image intervention during adolescence may require moving beyond information provision and brief skills training. The three studies' findings suggest that lasting change requires: (1) extended contact enabling time for cognitive consolidation rather than single-session exposure, (2) approaches matched to psychological pathways rather than universal content assuming identical mechanisms across boys and girls, (3) delivery context activating emotionally relevant influence processes such as authentic peer relationships rather than solely professional instruction, and (4) assessment of outcome capturing real-world impacts in additional to attitude shifts. Study 2's identification of sex-specific psychological pathways provides a foundation for potential targeted approaches, whilst Study 3's ARSI scale enables interference-based outcome assessment. These findings provide an opportunity to test whether interventions addressing these theoretical mechanisms are able to produce effective outcomes in body appreciation compared to brief universal psychoeducational programs that Study 1, demonstrated were unable to change.

Practical Implications for Intervention Design

Study 1's demonstration that brief universal interventions were unable to enhance adolescent body appreciation, combined with Study 2's evidence of individual differences in psychological pathways and Study 3's identification of appearance-based interference as an unmeasured outcomes, indicate that alternative approaches are needed. Several directions address the identified shortcomings whilst remaining feasible within the resource-constrained educational settings.

Extended Professional-led Interventions

Meta-analytic evidence demonstrates that extended contact multi-session interventions produce substantially larger effects than brief single-session approaches. Alleva

et al. (2015) identified that multisession interventions produced effect sizes 2.5 times larger than single-session interventions. Among adolescents specifically, effect sizes were the largest among all age groups. Additionally, Yager et al., (2013) showed that effective school-based intervention were multi-session and ran for an average of 5 hours. Brief interventions consistently produce short-lived effects, with improvements generally not maintained at follow-up (Diedrichs et al., 2015; Stice et al., 2004).

Extended contact may allow for development of relationships, repeated skill practice, and ongoing support as participants navigate real-world challenges, creating learning communities that enhance skill development through collaboration, constructive feedback, and supportive environments (Zamiri & Esmaeili, 2024). Rather than attempting to counter years of appearance-focused messaging through single-session programs, extended interventions could provide sustained engagement necessary for meaningful belief restructuring. Important, extended formats create opportunities to target the psychological resources identified in Study 2 as predictors of body appreciation. Program can incorporate activities designed explicitly to build self-esteem, resilience, and positive affect rather than solely reducing negative outcomes through appearance-focused content. Extended interventions may also facilitate shifts from appearance-focused evaluation to body appreciation, which requires sustained rather than brief exposure. The extended timeline would also allow assessment of individual progress and adjustment of intervention strategies based on participant response, addressing the sex-specific differences in self-esteem, resilience, and positive affect documented in Study 2. Additionally, digital interventions or app-based content could supplement in-person sessions, creating hybrid models that extend intervention contact whilst managing resource constraints. Research demonstrates that brief digital classroom-based interventions can improve adolescents' body satisfaction with effects sustained at follow-up (Bell et al., 2022).

Gender-Specific and Needs-Based Approaches

The sex differences in predictive pathways from Study 2 suggest that targeted approaches might prove more effective than universal programs. Research demonstrates that both group composition and gender-specific content significantly influence intervention effectiveness. Meta-analyses and systematic reviews demonstrate that programs offered solely to females produce significantly larger effects than those delivered to mixed-gender groups (Stice et al., 2007; Yager et al., 2013). The theoretical rationale emphasises that gender differences in body image concerns, girls focused on thinness ideals versus boys on muscularity, create distinct intervention needs. Additionally, social norms discouraging boys from discussing body image issues, especially in front of girls, suggest that mixed-gender formats may inhibit authentic participation (Hargreaves & Tiggemann, 2006). However, some evidence indicates no differences in co-educational versus single sex delivery of a multi-session body image program in school, with both groups showing improvement after the intervention (Agam-Bitton et al., 2018; Dunstan et al., 2017), which could suggest that specific content of the programs matters more than delivery format. Research on boys specifically remains limited. Ahuja et al. (2024) conducted a systematic review finding that only three of 41 studies exclusively targeted boys, with boys often struggling to discuss body image issues openly due to discomfort or vulnerability in the presence of girls (Hargreaves & Tiggemann, 2006; Standbu & Kvalem, 2014). Gender-specific interventions could address the specific protective factor profiles identified in Study 2, intensive self-esteem work and resilience building for girls versus balanced attention to self-esteem, resilience, and positive affect for boys.

Beyond gender, needs-based targeting could identify students experiencing high levels of appearance-related school interference using the ARSI scale developed in Study 3. Students identified as scoring high on the ARSI could receive intensive small-group

interventions that address both the psychological resources identified in Study 2, and the specific interference patterns documented in Study 3, such as practising techniques for managing appearance-related anxiety during classroom participation or physical education engagement. Reduced group size could enable personalised feedback and support whilst concentrating resources where most needed.

Peer-Enhanced and Peer-Led Interventions

During adolescence, peer relationships become primary sources of social and emotional support. The theoretical evidence presented above regarding empathic connection in peer contexts suggests that peer-involved interventions may operate in ways that professional-only delivery cannot (Brown & Larson, 2009). The findings from Study 1 that professionally delivered brief programs showed no effects despite expert facilitation suggest the need to explore alternative delivery models. Given Study 2's evidence that boys use varied psychological pathways including positive affect and resilience, peer-based approaches may better activate these resources through emotional connection and modelling. Study 3's reporting of appearance-related interference in school settings indicates that peer support during classroom challenges could provide real-time coping strategies that professional external delivery cannot replicate. Several areas for peer involvement warrant consideration, ranging from peer support elements within professional programs to fully peer-led interventions with appropriate training and oversight.

Evidence supporting peer-led prevention programs suggests they can produce similar and, in some cases, better outcomes compared to clinician-led programs. Multiple studies demonstrate that carefully implemented peer-led interventions achieve significant improvements in body image outcomes (Ciao et al., 2022; Stice et al., 2020; Yager et al., 2018). Notably, Stice et al. (2020) found in a four-year longitudinal study that the peer-led

prevention group was more effective in reducing the future onset of eating disorder diagnosis compared to the clinician-led group, presenting schools with a cost-efficient option that could potentially allow more participants to access programs.

The expert peer model requires systematic attention to selection, training, and supervision processes. The EVERYbody Project research provides evidence that peer models may achieve professional-level effectiveness when implemented with appropriate rigour (Ciao et al., 2022). When carefully selected college students with diversity and body image experience underwent extensive training and screening for advanced facilitation skills, they delivered interventions with medium to large effect sizes. Importantly, not all trained peers achieved 'expert' level despite completing the same training, demonstrating that systematic assessment and quality control are essential components of peer-led models. While implementing rigorous selection and supervision processes may be challenging in high school settings, a co-delivery approach where trained peers work alongside teachers may offer a practical alternative that maintains quality control while preserving the benefits of peer influence.

Emerging evidence suggests peer-led body image interventions warrant greater exploration, as they may operate within the emotionally salient peer relationships through which adolescent attitudes naturally shift. REbeL is a peer education program where adolescent high school students voluntarily participate in weekly meetings across eight months, engage in dissonance-based activities, select content from semi-manualised modules, and serve as advocates through school-wide awareness campaigns (Breithaupt et al., 2017; Eickman et al., 2018). Importantly, the self-selection model appears to naturally attract at-risk youth as baseline assessments revealed participants had elevated eating disorder cognitions compared to community samples (Breithaupt et al., 2017). The model is designed to be self-sustaining within school systems rather than requiring external professional facilitators,

addressing implementation barriers of professionally-delivered interventions. Peer-led content design could emphasise personal narrative sharing and emotional processing. Facilitators could be trained to share transformative stories authentically: What did negative body image prevent you from doing, feeling, experiencing? What are you able to do, feel, and experience now? This emotional authenticity may address the psychological pathways Study 2 identified, particularly positive affect for boys, in ways that media literacy and psychoeducation programs cannot replicate. Implementation challenges exist with peer facilitators in fidelity and participant engagement dependent of facilitator enthusiasm (Yager et al., 2018). Whilst there are positive reasons why peer-led facilitation would be beneficial, successful implementation would require high-level teacher support, systematic selection of appropriate peer leaders, and training on group facilitation.

Integrated Curriculum-Based Approaches

Successful implementation of integrated curriculum approaches requires alignment with existing school priorities and structures rather than introducing additional demands. The Australian Student Wellbeing Framework provides a foundational structure through which body image interventions could be strategically embedded (Australian Government Department of Education, 2024). This nationally endorsed framework identifies five interconnected domains: school leadership, inclusive practices, student agency, family-school-community collaboration, and systemic support mechanisms. These elements provide natural opportunities for body appreciation content within existing wellbeing curriculum. Rather than treating body image as a standalone topic requiring new curriculum space, researchers and schools could conduct needs assessments to identify where body appreciation content enhances or strengthens existing wellbeing initiatives. For example, programs addressing the framework's inclusive practices (creating school cultures that embrace diversity) could incorporate body diversity alongside other diversity dimensions. Similarly,

initiatives promoting student agency including promoting social and emotional skills, provide natural opportunities for functionality appreciation and self-compassion training. This alignment approach increases feasibility by positioning body image interventions as enhancements to mandated frameworks rather than additional burdens. School and teacher buy-in is likely enhanced when programs align with curriculum requirements, they're already accountable for, rather than requesting voluntary adoption of additional content.

Evidence supports embedding body image interventions within existing curriculum structures. Kurtz et al. (2022) conducted a meta-analysis of 17 controlled trials with 7,392 participants aged 10-15 years, finding significantly larger effects on positive body image and media literacy in intervention versus control groups. Study 1's implementation within a single 60-minute session reflected resource constraints typical in schools, but also highlighted the mismatch between standalone interventions and schools' integrated wellbeing approaches. Two programs illustrate how this integrated enhancement approach addresses limitations identified across the three studies whilst maintaining school feasibility: Embrace Kids Classroom Program (EKCP) and Dove Confident Me. Both represent substantial departures from the brief psychoeducational approach evaluated in Study 1, providing schoolteachers with comprehensive materials including lesson plans, videos, activity worksheets, and facilitator guides delivered over multiple session to support implementation fidelity.

The Embrace Kids EKCP provides five teacher-led lessons with film excerpts, activity worksheets, and meditation recordings mapped to the Australian Curriculum (Granfield et al., 2025). The program differs fundamentally from Becoming Media Savvy through its positive psychology foundation rather than risk-reduction focus. Granfield et al. (2025) evaluated the program's effectiveness on body appreciation, functionality appreciation, self-compassion, and wellbeing among Australian pre-adolescents, demonstrating that the EKCP directly targets the same primary outcome as Study 1 whilst incorporating elements consistent with

the predictors identified in Study 2. Key distinctions include: functionality appreciation activities (focusing on what bodies can do rather than how they look) directly targeting body appreciation through reduced self-objectification; self-compassion training explicitly building emotional regulation skills potentially addressing Study 2's positive affect and resilience pathways; and avoidance of viewing any idealised images, instead using documentary-style film excerpts showing diverse real young people. The program provides meditation practices and emotion-regulation tools that may reduce the appearance-related interference Study 3 documented, though this requires direct investigation. The EKCP's explicit mapping to the Australian curriculum and alignment with the Australian student wellbeing framework's elements, particularly *inclusion* (valuing diversity) and *student voice* (developing social and emotional skills), highlights how body image interventions can be purposefully designed to enhance existing educational priorities. As a program developed within the Australian educational context specifically to align with Framework requirements, the EKCP demonstrates how body appreciation content can be integrated as a natural extension of mandated wellbeing curriculum rather than competing for limited space.

Dove Confident Me provides five 45-minute teacher-led sessions (225 minutes versus Becoming Media Savvy's 60 minutes) with detailed implementation materials. Diedrichs et al. (2021) evaluated the program among adolescents, assessing body esteem, social comparisons, appearance conversations, and self-esteem, with findings demonstrating small but sustained improvements in body esteem at post-intervention and both two-month and six-month follow-up. The program's key differences from Study 1's approach include: distributed practice enabling skill consolidation rather than single-session exposure; interactive skills-based learning through role plays practicing how to challenge appearance comparisons and body talk rather than passive information delivery; and avoidance of sustained attention to idealised images by using purpose-built videos demonstrating the manipulation process itself.

The program incorporates self-affirmation activities and behavioural activism planning that may build the psychological resources Study 2 identified, though these connections require empirical testing. Session content addressing appearance-related conversations provides behavioural strategies potentially relevant to reducing the classroom interference Study 3 documented.

Both programs demonstrate how multi-session teacher-led approaches can address Study 1's limitations through extended contact and skills practice, incorporate psychological resource-building relevant to Study 2's findings, and potentially reduce Study 3's documented interference. Critically, their alignment with established educational frameworks and provision of comprehensive teacher support materials enable feasible implementation within existing curriculum structures, addressing the practical barriers that constrain standalone intervention approaches. Furthermore, programs embedded within mandated frameworks are more likely to be sustained beyond initial implementation, as they become part of routine practice rather than dependent on funding and external providers. By embedding body image content within existing framework-aligned wellbeing curriculum, these programs could become an extension of schools' existing commitment to student safety, inclusion, and wellbeing.

Measurement and Assessment Implications

The development of the ARSI scale in Study 3 addresses a critical gap in body image assessment and has direct implications for intervention resource allocation. Traditional body image assessment focuses primarily on internal attitudes and satisfaction levels, treating body image as a psychological state measurable through self-reported evaluations. Whilst these measures capture important aspects of body image, they do not identify which students are experiencing appearance-related interference significant enough to warrant intervention. A

student scoring low on body appreciation might experience minimal interference, whilst another scoring moderately might experience substantial educational disruption requiring support. The ARSI addresses this limitation by providing a screening tool that identifies students whose appearance concerns meaningfully interfere with educational participation.

Psychological measurement research increasingly recognises the importance of interference assessment alongside symptom measurement. Patterson and Mausbach (2010) demonstrated that performance-based measures, which assess capacity in controlled conditions, exceed other assessment approaches such as self-report in terms of reliability and validity. Rapee et al. (2012) emphasised that interference is a key factor in the clinical importance of mental health problems in children, yet interference from appearance concerns has been surprisingly overlooked. Wille et al. (2008) demonstrated that impairment assessment identifies students experiencing pronounced difficulties despite not meeting symptom thresholds on screening instruments. For screening purposes, interference is particularly informative, as it indicates which individuals are experiencing difficulties significant enough to warrant intervention.

Without tools to assess difficulties, schools miss opportunities for early identification and targeted support. The critical question for screening purposes is not simply whether adolescents are dissatisfied with their appearance, but whether appearance concerns prevent them from participating fully in educational activities, engaging with peers, and accessing learning opportunities. This distinction is essential for resource allocation as schools have limited capacity for intensive intervention and need to identify students most likely to benefit from such support.

The ARSI enables this identification. As a brief, school-appropriate screening instrument assessing concrete behaviours such as participation in physical education, giving

presentations, engaging in group work, raising hands in class, it identifies students experiencing educationally significant interference. This screening approach changes how intervention resources can be allocated. Rather than universal programs for all students regardless of need or targeting solely based on appearance dissatisfaction scores that may not indicate impact, schools can use the ARSI to identify students experiencing appearance-related interference who require targeted support. This screening-to-intervention pathway addresses limitations identified across all three studies: Study 1 demonstrated that universal brief programs are limited, Study 2 revealed that individual differences require tailored approaches, and Study 3 provides the tool enabling identification of students for whom intensive targeted intervention is most appropriate.

This screening approach enables several specific applications. Small group interventions could target students identified through ARSI screening, focussing on skills for managing appearance-related anxiety in the specific contexts where interference occurs: classroom participation techniques for students avoiding raising hands, physical education engagement strategies for students skipping PE class, presentation skills for students experiencing anxiety during speeches. The ARSI not only identifies which students need support but indicates which educational contexts require intervention focus, enabling precise targeting of group intervention content. This represents a shift from universal delivery of standardised content to targeted delivery of context-specific skills matched to identified interference patterns.

The shift towards screening aligns with broader trends in school-based mental health towards identifying students to assist with and improve their educational participation. Rather than treating body image concerns as purely psychological states requiring attitude change, screening frames appearance concerns as barriers to educational engagement that intervention should reduce. This reframing has implications for how schools conceptualise body image

support: not as optional wellness programming but as educational access intervention ensuring that appearance concerns do not prevent students from fully participating in learning opportunities.

Real-time assessment methods using ecological momentary assessment or digital tracking could enhance screening by capturing dynamic relationships between appearance concerns, environmental factors, and interference as they occur naturally. This would strengthen screening within school settings by identifying not only which students experience interference, but also when and in which contexts interference is most pronounced, enabling more targeted intervention planning. The ARSI represents an initial step towards screening in body image, establishing proof-of-concept that brief school-based assessment can identify educationally significant interference. Comprehensive screening systems will require continued development and validation in diverse school contexts, but Study 3 provides the foundation and demonstrates feasibility.

Limitations

Several overarching limitations warrant acknowledgement when interpreting the findings from this thesis. The sample characteristics present limitations for generalisability. Participants were recruited from three schools in West/South West metropolitan Melbourne with relatively high socio-economic status (IRSAD rankings of 4 and 5), limiting generalisability to adolescents from diverse socio-economic or cultural backgrounds. The predominately Anglo-Australian sample may not reflect the experiences of adolescents from culturally and linguistically diverse backgrounds, who may experience different patterns of body image development and different relationships between psychological factors and body appreciation. Recent research examining body appreciation across 65 nations and 40 languages has demonstrated significant cultural variations, with large differences observed

across nations and languages (Swami et al., 2023). This suggests that the relationships identified in this thesis may not generalise across different cultural contexts. Cultural factors may influence how self-esteem, resilience, and positive affect operate as predictors of body appreciation, with some cultures potentially emphasising collective versus individual psychological resources.

Four participants who identified as gender fluid, trans-female, or preferred no to state their gender were removed from analyses due to insufficient numbers for meaningful statistical analysis. This represents a significant limitation in understanding body appreciation across gender diverse identities, as their findings cannot inform intervention approaches for gender-diverse adolescents, a population that may experience unique body image challenges during adolescence. Future research should prioritise inclusive recruitment strategies to achieve adequate sample sizes of gender-diverse participants. Methodologically, researchers could consider gender-inclusive analysis approaches such as employing qualitative methods to explore gender-diverse adolescents' experiences in depth (Thornton et al., 2026). At the intervention level, existing programs including Becoming Media Savvy may present challenges for gender-diverse adolescents, as content addressing appearance ideals framed around binary gender categories, specifically thin ideal for females and the muscular ideal for males, which may not reflect the experiences of gender-diverse young people. Future intervention development should adapt existing content to ensure relevance across gender-diverse identities. This could include incorporating diverse body ideals beyond binary gender norms, using inclusive language throughout the program materials, and involving gender-diverse young people in the co-design processes to ensure programs are both relevant and affirming (Thornton et al., 2026).

All three studies were conducted with the same cohort of early adolescents, which provided important methodological advantages including consistency in measurement,

comparability across studies, and the ability to conduct complementary analyses that collectively address a coherent set of research questions about body appreciation in early adolescence. In the present thesis, each study addressed a distinct research question using different analytical samples and methodological approaches appropriate to those aims. These included evaluating a program, identifying psychological predictors, and developing a measurement tool, demonstrating a dataset sufficiently rich to support multiple independent lines of inquiry. Study 1 used a longitudinal sample of 269 participants with complete data across three timepoints; Study 2 used baseline data only from 353 participants; and Study 3 used a split-sample methodology with separate subsamples for scale development and validation. However, reliance on a single cohort may limit the generalisability of the findings to other adolescent populations. Future research should aim to replicate these studies in independent samples.

Beyond sample characteristics, methodological choice present limitations. The use of self-report measures introduces potential biases including social desirability responding and shared method variance. Whilst measures demonstrated good psychometric properties in this sample, adolescents' self-perceptions may be influenced by developmental factors affecting self-awareness and reporting accuracy. The strong correlation between body appreciation and self-esteem in girls (r = .82) warrants particular consideration, as it approaches levels that question whether these constructs function as truly independent variables in this population. This strong association may reflect either genuine theoretical overlap between global self-evaluation and body-specific appreciation, or potential measurement redundancy in a high-functioning sample where participants respond similarly across related psychological constructs.

Finally, most of the research was cross sectional in nature limiting inferences about causal relationships and developmental processes. Future research would benefit from

incorporating a multi -method strategy of assessment including behavioural measures, peer reports, and qualitative exploration. Longitudinal research is needed to examine how protective factors and functional interference change over time and how they may relate to more long-term outcomes for body appreciation in adolescents.

Despite these limitations this thesis also has several important strengths. The multi study approach allowed for comprehensive examination of adolescent body appreciation and the inclusion of both male and female participants addressed the historical gender bias within the body image literature particularly at the adolescent level. The integration of controlled evaluation intervention research with exploring predictors of body appreciation represents an innovative approach that could inform future intervention development within the body appreciation area. The development of a new measure to assess the appearance related school interference scale followed established psychometric principles and provides an important resource for future research.

Future Research Directions

Intervention Research

Future intervention research should systematically compare intervention approaches varying in duration, format, and facilitator to establish which produces optimal outcomes for adolescents. Study 1's demonstration that single-session programs are insufficient indicates that longer or more intensive approaches are necessary for meaningful change in adolescent body appreciation. Specific research directions include establishing dose-response relationships by determining the number of sessions producing meaningful outcomes and identifying where benefits plateau, identifying minimum effective contact hours required for sustained change, and examining whether intervention intensity can be tailored based on baseline severity or individual difference profiles. Research examining peer-led interventions

within schools should explore minimum competency levels required for impactful peer facilitation and long-term sustainability, examining whether peer-led programs can be maintained beyond initial implementation with adolescent samples.

Research should directly test whether interventions targeting the protective factor profiles identified in Study 2 produce better outcomes than universal approaches. Randomised trials should compare sex-specific interventions emphasising self-esteem and resilience for girls versus balanced protective factors for boys against standard universal programs, incorporating both attitudinal measures and interference-based scales like the ARSI. Interventions designed to help students maintain school engagement despite appearance concerns represent a novel approach warranting evaluation.

Engaging stakeholders including educators, parents, and adolescents in the research process is essential. Participatory approaches to intervention design, implementation, and evaluation may produce programs that are more acceptable, feasible, and effective in real world contexts. Formal Public and Patient Involvement and Engagement (PPIE) frameworks provide a structured approach to embedding stakeholder voices throughout the research process (Thornton et al., 2026). Meaningful PPIE requires moving beyond tokenistic consultation toward genuine co-production, where young people are involved as active partners rather than passive participants (Hawke et al., 2018; Rouncefield-Swales et al., 2021). Practical strategies include establishing youth advisory panels, compensating participants appropriately, and providing flexible and accessible formats for engagement (Hawke et al., 2018). Particular attention should be given to overcoming barriers to including minoritised groups, such as gender-diverse adolescents, culturally and linguistically diverse young people, and those from lower socio-economic backgrounds, who are underrepresented in body image research and may face distinct appearance-related challenges (Rouncefield-Swales et al., 2021). Strategies to address these barriers include partnering with community

organisations, providing materials in multiple languages, offering flexible and remote participation options, and ensuring research teams reflect the diversity of the communities being studied (Thornton et al., 2026). Embedding PPIE principles throughout the research process, rather than treating engagement as an add-on, is fundamental to developing body image intervention that are relevant, acceptable, and effective across diverse adolescent populations. Additionally, research should examine how body image interventions align with existing school wellbeing frameworks, determining how body appreciation programming integrates within comprehensive student support systems rather than operating as standalone initiatives.

The Australian government's implementation of age-restricted access to social media platforms beginning in December 2025 creates opportunity for research comparing body image development trajectories among adolescents with different social media exposure. Cohort studies examining adolescents before and after restrictions are implemented could provide valuable evidence about environmental contributions to body image concerns.

Mechanism Research

Future research should examine mechanisms through which protective factors influence body image outcomes using longitudinal designs that establish cause-and-effect sequences. This addresses a gap in the literature, as Linardon et al. (2022) found that only eight of 240 body appreciation studies examined prospective associations, highlighting reliance on cross-sectional designs that cannot establish causal pathways. Critical questions include whether self-esteem promotes body appreciation, whether body appreciation enhances self-esteem, or whether both develop through reciprocal processes in adolecents. Other avenues include identifying critical periods for enhancing protective factors, determining whether protective factors represent stable traits or malleable states responsive to

intervention, and understanding how self-esteem, resilience, and positive affect foster increased body appreciation to inform targeted intervention approaches.

Research should examine additional protective factors not included in this thesis, such as proactive coping strategies and social support mechanisms. The unexplained variance in body appreciation for both males and females suggests that other psychological, social, or contextual factors contribute to body appreciation development. Identifying the full range of protective factors could inform more comprehensive prevention approaches. Research should also examine how protective factors operate across diverse cultural contexts, as substantial cross-cultural variation in body appreciation suggests that psychological mechanisms may function differently depending on cultural values (Swami et al., 2023).

Applied Research

Future research should examine the ARSI scale's effectiveness as a screening tool in different contexts and applications. This includes examining its predictive validity for identifying students who subsequently experience academic interference difficulties, establishing whether screening identifies students who genuinely require support. Research should evaluate the ARSI's classification accuracy and determine appropriate cutoff scores for early identification, as finding the balance between identifying students needing support versus those functioning adequately is critical for resource allocation in schools (Catts et al., 2009). Schools could benefit from screening as recent evidence suggests that children aged 8-10 years old with low body image satisfaction are experiencing negative impacts to their academic engagement (Guimond & Laursen, 2022). Investigation of relationships between ARSI scores and long-term academic and body image outcomes would establish whether early identification of impact enables more effective early intervention.

Research should examine whether the ARSI detects reductions in impact of appearance concerns following intervention, establishing its use as a secondary outcome measure complementing traditional attitude-based body image measures. This would determine whether successful interventions not only improve body appreciation but also reduce the extent to which appearance concerns interfere with students' daily school participation. However, the ARSI's primary value lies in its screening and identification capability rather than as a primary outcome measure for universal intervention trials.

Conclusions

This thesis contributes important knowledge to adolescent body image research by establishing what does not work, identifying how psychological pathways differ, and providing a validated tool for measuring real-world impacts. Through complementary examination of intervention effectiveness, protective mechanisms, and interference-based assessment, this work adds empirical evidence that challenges prevailing assumptions in body image prevention. The multi-study approach expands understanding by revealing interconnected limitations in current practice, that brief universal programs show limited effectiveness, psychological pathways operate differently across sex, and traditional attitude-based assessment misses educationally significant interference.

This thesis adds specific knowledge about protective factors that advances strength-based body image research. The finding that self-esteem, resilience, and positive affect operate through fundamentally different pathways for girls versus boys expands understanding of body appreciation development and challenges universal intervention assumptions. This knowledge contributes empirical foundation for matching intervention components to individual predictive patterns rather than assuming identical mechanisms across populations. These findings establish that psychological mechanisms underlying body

appreciation are not consistent across adolescent groups, expanding understanding of how interventions should be designed and delivered.

This thesis contributes the Appearance-Related School Interference Scale, a validated tool addressing a critical gap in body image assessment. By enabling measurement of educational interference rather than solely attitudes, the ARSI expands assessment approaches in adolescent body image research. This contribution aligns with broader recognition in psychological research that interference represents a key factor in clinical importance (Rapee et al., 2012), which has been surprisingly overlooked in traditional body image assessment. The ARSI contributes practical capability to identify which adolescents require intervention based on real-world interference rather than appearance dissatisfaction alone, expanding options for evidence-based resource allocation in schools.

Study 1's controlled evaluation of Becoming Media Savvy adds essential evidence contributing to understanding of what effective intervention requires: extended contact enabling cognitive consolidation, approaches matched to individual psychological pathways, delivery contexts activating emotionally salient peer relationships, and assessment capturing real-world interference alongside attitudes. However, significant research and implementation challenges remain to be addressed.

The tools and insights provided by this work can support efforts to help young people develop and maintain positive relationships with their bodies as they navigate the challenges and opportunities of adolescence. By addressing complementary areas of intervention effectiveness, protective mechanisms, and appropriate assessment methods, this thesis provides both immediate practical contributions and foundation for future advances within the field of adolescent body appreciation.

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Appendices

Appendix A. Table of Study Measures

Table of Study Measures

	Scale	No. of items	Scale Range
Resilience	Child and Youth Resilience Measure (CYRM-12) (Liebenberg et al., 2012).	12	1-5
Media Literacy	Critical Thinking About Media Messages (CTMM) (Scull et al. 2010)	6	1-5
Affect	Positive and Negative Affect Schedule – Child (PANAS-C) (Ebesutani et al., 2012).	10	1-5
Body Appreciation	Body Appreciation Scale-II (BAS-II) (Tylka & Wood-Barcalow, 2015).	10	1-5
Self-Esteem	Rosenberg Self-Esteem Scale (RSES) (Rosenberg, 1965).	10	1-4
Internalisation of Appearance Ideals	Sociocultural Attitudes Towards Appearance Scale- (SATAQ-4) (Thompson et al., 2004).	10	1-5
Social Comparison	The Physical Appearance Comparison Scale (PACS). (Thompson et al., 1991).	5	1-5
Appearance-related Conversations	Appearance Conversations with Friends Scale (ACFS) (Jones et al., 2004).	5	1-5
Appearance-related School Interference	Purpose-built scale developed for Study 3 to measure appearance-related school interference.	10	1-5
Social Phobia and Anxiety	Social Phobia and Anxiety Inventory for Children (SPAI-C). (Beidel et al., 1995; Storch et al., 2004).	4	1-3
School Satisfaction	Multidimensional Student's Life Satisfaction Scale – School Subscale (MSLSS) (Huebner, 2001)	8	1-4

Higher scores indicate greater endorsement of the construct.

Appendix B. Participant Study Measures

Critical Thinking About Media Messages

Please indicate how often you do the following when you see advertisements on TV, magazines, billboards, internet.

	Never	Very Rarely	Sometimes	Often	Always
I think about the purpose behind a message I see on television	1	2	3	4	5
I think about who created the message I see on the ad	1	2	3	4	5
I think about what the people who made the media message want me to believe	1	2	3	4	5
I think about the things the advertisers do to get my attention	1	2	3	4	5
I think about whether the things that advertisers want me to do are good for me	1	2	3	4	5
I try and think about how true or false an advertisement is	1	2	3	4	5

Child/Youth Resilience Measure

Listed below are a number of questions about you, your family, your community, and your relationships with people. These questions are designed to better understand how you cope with daily life and what role the people around you play in how you deal with daily challenges.

Directions for participants: To what extent do the statements below DESCRIBE YOU? Circle one answer for each statement. There are no right or wrong answers.

	Does not describe me at all	**Describes me a little**	**Describes me somewhat**	**Describes me quite a bit**	**Describes me a lot**
1. I have people I look up to	1	2	3	4	5
2. Getting an education is important to me	1	2	3	4	5
3. My parent(s)/caregiver(s) know a lot about me	1	2	3	4	5
4. I try to finish what I start	1	2	3	4	5
5. I am able to solve problems without harming myself or others (for example by using drugs and/or being violent)	1	2	3	4	5
6. I know where to go in my community to get help	1	2	3	4	5
7. I feel I belong at my school	1	2	3	4	5
8. My family stands by me during difficult times	1	2	3	4	5
9. My friends stand by me during difficult times	1	2	3	4	5
10. I am treated fairly in my community	1	2	3	4	5
11. I have opportunities to develop skills that will be useful later in life (like job skills and skills to care for others)	1	2	3	4	5
12. I enjoy my community's traditions	1	2	3	4	5

Positive and Negative Affect Scale

This scale consists of a number of words that describe different feelings and emotions. Read each item and then circle the appropriate answer next to each word. Indicate to what extent you have felt this way during the past week.

	Very Slightly	**A Little**	**Moderately**	**Quite a bit**	**Extremely**
1. Sad	1	2	3	4	5
2. Happy	1	2	3	4	5
3. Scared	1	2	3	4	5
4. Miserable	1	2	3	4	5
5. Cheerful	1	2	3	4	5
6. Proud	1	2	3	4	5
7. Afraid	1	2	3	4	5
8. Joyful	1	2	3	4	5
9. Mad	1	2	3	4	5
10. Lively	1	2	3	4	5

Body Appreciation Scale-2

Please indicate whether the question is true about you always, often, sometimes, seldom, or never.

	Never	**Seldom**	**Sometimes**	**Often**	**Always**
1. I respect my body	1	2	3	4	5
2. I feel good about my body	1	2	3	4	5
3. I feel that my body has at least some good qualities	1	2	3	4	5
4. I take a positive attitude towards my body	1	2	3	4	5
5. I am attentive to my body's needs	1	2	3	4	5
6. I feel love for my body	1	2	3	4	5
7. I appreciate the different and unique characteristics of my body	1	2	3	4	5
8. My behaviour reveals my positive attitude toward my body; for example, I hold my head up high and smile	1	2	3	4	5
9. I am comfortable in my body	1	2	3	4	5
10. I feel like I am beautiful even if I am different from media images of attractive people (eg. Models, actresses/actors)	1	2	3	4	5

Self-Esteem Scale

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly disagree, circle 1. If you disagree with the statement, circle 2. If you agree, circle 3. If you strongly agree, circle 4.

	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**
1. On the whole, I am satisfied with myself	1	2	3	4
2. At times I think I am no good at all.	1	2	3	4
3. I feel that I have a number of good qualities.	1	2	3	4
4. I am able to do things as well as most other people	1	2	3	4
5. I feel I do not have much to be proud of.	1	2	3	4
6. I certainly feel useless at times.	1	2	3	4
7. I feel that I'm a person of worth, at least on an equal plane with others.	1	2	3	4
8. I wish I could have more respect for myself.	1	2	3	4
9. All in all, I am inclined to feel that I am a failure	1	2	3	4
10. I take a positive attitude toward myself.	1	2	3	4

Appearance Conversations Amongst Friends Scale

Please indicate whether the question is true about you never, seldom, sometimes, often, or very often

	Never	**Seldom**	**Sometimes**	**Often**	**Very Often**
1. My friends and I talk about how our bodies look in our clothes	1	2	3	4	5
2. My friends and I talk about what we would like our bodies to look like	1	2	3	4	5
3. My friends and I talk about how important it is to always look attractive	1	2	3	4	5
4. My friends and I talk about the size and shape of our bodies	1	2	3	4	5
5. My friends and I talk about what we can do to always look our best	1	2	3	4	5

Sociocultural Attitudes Towards Appearance Questionnaire

Directions for participants. Please read each of the following statements carefully and indicate the number that best reflects your agreement with the statement.

	Not at all	**A little**	**A moderate amount**	**Very much**	**Extremely**
1. It is important for me to look athletic	1	2	3	4	5
2. I think a lot about looking muscular	1	2	3	4	5
3. I want my body to look very thin	1	2	3	4	5
4. I want my body to look like it has little fat	1	2	3	4	5
5. I think a lot about looking thin	1	2	3	4	5
6. I spend a lot of time doing things to look more athletic	1	2	3	4	5
7. I think a lot about looking athletic	1	2	3	4	5
8. I want my body to look very lean	1	2	3	4	5
9. I think a lot about having very little body fat	1	2	3	4	5
10. I spend a lot of time doing things to look more muscular	1	2	3	4	5

Physical Appearance Comparison Scale

Using the following scale please select a number that comes closest to how you feel:

	Never	**Seldom**	**Sometimes**	**Often**	**Always**
1. At parties of other social events, I compare my physical appearance to the physical appearance of others	1	2	3	4	5
2. The best way for a person to know if they are overweight or underweight is to compare their figure to the figure of others	1	2	3	4	5
3. At parties or other social events, I compare how I am dressed to how other people are dressed	1	2	3	4	5
4. Comparing your “looks” to the “looks” of others is a bad way to determine if you are attractive or unattractive	1	2	3	4	5
5. In social situations, I sometimes compare my figure to the figure of other people	1	2	3	4	5

Appearance-related Academic Interference Scale

Directions for participants: Please indicate whether the question is true about you not at all, a little, a moderate amount, a lot or a great deal.

	Not at all	A little	A moderate Amount	A lot	A great deal
1. How much do concerns or worries about your appearance make it difficult for you to participate in physical education classes at school?	1	2	3	4	5
2. How much do concerns or worries about your appearance make it difficult for you to stand in front of the class and give a speech or presentation?	1	2	3	4	5
3. How much do concerns or worries about your appearance make it difficult for you to participate in class activities?	1	2	3	4	5
4. How much do concerns or worries about your appearance make it difficult for you to speak or read aloud in front of the class?	1	2	3	4	5
5. How much do concerns or worries about your appearance make it difficult for you to answer a question in front of the class?	1	2	3	4	5
6. How much do concerns or worries about your appearance make it difficult for you to go up to the whiteboard?	1	2	3	4	5
7. How much do concerns or worries about your appearance make it difficult for you to participate in group work?	1	2	3	4	5
8. How much do concerns or worries about your appearance make it difficult for you to raise your hand in class?	1	2	3	4	5
9. How much does looking after your appearance (doing your hair, looking after your skin, choosing what to wear) interfere with getting your school work done?	1	2	3	4	5
10. How much does time spent exercising interfere with getting your school work done?	1	2	3	4	5

Social Phobia and Anxiety Interference Scale

Directions for participants: Please indicate whether the question is true about you hardly ever, sometimes or most of the time.

	Hardly ever	**Sometimes**	**Most of the time**
1. I feel nervous when speaking or reading in class	1	2	3
2. I feel nervous when answering questions in front of class	1	2	3
3. I feel nervous when speaking in front of a group	1	2	3
4. I feel nervous when other watch me do something	1	2	3

Multidimensional Students' Life Satisfaction Scale

Directions for participants: Please indicate whether the question is true about you never, sometimes, often or almost always.

	Never	Sometimes	Often	Almost always
I look forward to going to school	1	2	3	4
I like being in school	1	2	3	4
School is interesting	1	2	3	4
I wish I didn't have to go to school	1	2	3	4
There are many things about school I don't like	1	2	3	4
I enjoy school activities	1	2	3	4
I learn a lot at school	1	2	3	4
I feel bad at school	1	2	3	4

Appendix C. Reliability Analysis for Study Measures

Cronbach's Alpha Reliability Analyses for Scales

Scale	Time 1	Time 2	Time 3
CTMM	.88	.92	.94
CYRM	.84	-	-
PANAS -A	.86	.88	.89
PANAS-N	.77	.80	.80
BAS	.93	.95	.94
RSES	.88	.89	.90
ACFS	.91	.93	.92
SATAQ-T	.84	.84	.85
SATAQ-M	.88	.90	.86
PACS	.85	.86	.84
ARSI	.93	.93	.93
SPAI	.84	.88	.86
MSLSS	.89	.90	.90

Note. n =269 (males =116, females = 153). ARSI is for original 10-item scale. PACS with item-4 removed.

Appendix D. Ethics Approval Documentation

Quest Ethics Notification - Application Process Finalised - Application Approved

quest.noreply@vu.edu.au
Mon 30/01, 15:37
Laurie.Chapin@vu.edu.au; jenny.sharples@vu.edu.au; Emily Debor

Reply all |

Flag for follow up. Start by 03 March 2017. Due by 03 March 2017.

Dear PROF JENNY SHARPLES,

Your ethics application has been formally reviewed and finalised.

» Application ID: HRE16-286
» Chief Investigator: PROF JENNY SHARPLES
» Other Investigators: MS Emily Keohane, DR LAURA CHAPIN
» Application Title: Investigating the Impact of a Single-Session School-Based Body Image Intervention in Adolescents: Exploring the Relationship Between Psychological Wellbeing, Resilience, School Engagement and Intervention Outcomes
» Form Version: 13-07

The 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 approval date; 30/01/2017.

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

Department of
Education & Training

2 Treasury Place
East Melbourne Victoria 3002
Telephone: 03 9637 2000
DX210083

2017_003300

Ms Emily Keohane
College of Health and Biomedicine
Victoria University
PO Box 14428
MELBOURNE 8001

Dear Ms Keohane

Thank you for your application of 3 February 2017 in which you request permission to conduct research in Victorian government schools titled *Investigating a School-Based Body Image Program in adolescents. Exploring the relationship between wellbeing, resilience, school engagement and gender.*

I am pleased to advise that on the basis of the information you have provided your research proposal is approved in principle subject to the conditions detailed below.

1. The research is conducted in accordance with the final documentation you provided to the Department of Education and Training.

2. Separate approval for the research needs to be sought from school principals. This is to be supported by the Department of Education and Training approved documentation and, if applicable, the letter of approval from a relevant and formally constituted Human Research Ethics Committee.

3. The project is commenced within 12 months of this approval letter and any extensions or variations to your study, including those requested by an ethics committee must be submitted to the Department of Education and Training for its consideration before you proceed.

4. As a matter of courtesy, you advise the relevant Regional Director of the schools or governing body of the early childhood settings that you intend to approach. An outline of your research and a copy of this letter should be provided to the Regional Director or governing body.

5. You acknowledge the support of the Department of Education Training in any publications arising from the research.

Your details will be dealt with in accordance with the *Public Records Act 1973* and the *Privacy and Data Protection Act 2014*. Should you have any queries or wish to gain access to your personal information held by this department please contact our Privacy Officer at the above address.

VICTORIA
State
Government

Research Application 0592: Outcome (Approved)

R research@cem.edu.au Reply all |
Fri 24/02, 14:35
Emily Deborah Keohane; research@cem.edu.au

You forwarded this message on 02/03/2017 17:01

Dear Mrs Keohane

Congratulations, your research application, 0592 - 'Investigating a School-Based Body Image Program in Adolescents. Exploring the Relationship Between Wellbeing, Resilience, School Engagement, and Gender.', has been approved by Catholic Education Melbourne.

I am pleased to advise that your research application is approved in principle subject to the eight standard conditions outlined below.

1. The decision as to whether or not research can proceed in a school rests with the school's principal, so you will need to obtain their approval directly before commencing any research activity. You should provide the principal with an outline of your research proposal and indicate what will be asked of the school. A copy of this email of approval, and a copy of notification of approval from your organisation's/university's Ethics Committee, should also be provided.

2. A copy of the approval notification from your institution's Ethics Committee must be forwarded to this Office (if not already provided), together with any modifications to your research protocol requested by the Committee. You may not start any research in Catholic schools until this step has been completed.

3. A Working with Children (WWC) check – or registration with the Victorian Institute of Teaching (VIT) – is necessary for all researchers visiting schools. Appropriate documentation must be shown to the principal before starting the research in the school.

4. No student is to participate in the research study unless s/he is willing to do so and consent is given by a parent/guardian.

5. Any substantial modifications to the research proposal, or additional research involving use of the data collected, will require a further research application to be submitted to Catholic Education Melbourne.

6. Data relating to individuals or the school are to remain confidential and protected in line with the Privacy Act 1988 (Commonwealth).

7. Since participating schools have an interest in research findings, you should consider ways in which the results of the study could be made available for the benefit of the school community.

8. At the conclusion of the study, a copy or summary of the research findings should be forwarded to Catholic Education Melbourne. It would be appreciated if you could submit this via email to research@cem.edu.au.

Appendix E. Becoming Media Savvy Program Components

Becoming Media Savvy – Program Components

Component	Description	Key Activities / Materials	Core Messages
Self-Esteem & Body Image Foundation	Introduces self-esteem and body image as internal feelings rather than appearance-based constructs; explores various influences on self-perception, including family (especially siblings), peers, teachers, and media.	Facilitator-led discussion; reflection prompts on influences (family, peers, coaches, teachers, media); PowerPoint slides	Self-esteem and body image are about feelings rather than appearance; everyone can feel good about themselves
Friendship & Social Influences	Examines differences between peers and friends; discusses appearance-based teasing and peer influence	Friend Qualities activity; group discussion	Friends and peers can positively or negatively influence body image; encourage supportive behaviours
Media Literacy & Critical Thinking	Explores media influence on beauty ideals and body satisfaction; demonstrates digital manipulation; examines advertising strategies and celebrity endorsements	Video clips (*Change One Thing*), PowerPoint slides, group discussion	Media images are heavily manipulated; develop a critical eye for unrealistic standards
Social Media Awareness	Discusses the impact of social media on body image and self-esteem; introduces trigger-response framework	Trigger-Response framework discussion (Criticise, Compare, Compete, Compensate vs Admire, Motivate, Balance, Compliment)	Recognise triggers; use strategies to shift to positive social media engagement
Positive Communication & Action	Encourages non-appearance-based compliments and reflection; highlights "fat talk" and body talk reduction	Ribbon activity (compliment partners and self); group discussion; Role Modelling clip	Words have power; compliment achievements and attributes beyond appearance; positive role modelling

- Duration: 60 minutes (single-session)
- Delivery: Whole-class, facilitator-led by trained Butterfly Foundation presenters
- Materials: PowerPoint presentation, video clips, interactive activities
- Focus: Structured psychoeducation and guided reflection; no formal skills training or cognitive-behavioural exercises

Appendix F. Table of Independent Samples T-test at Baseline

Independent Samples T-Tests Comparing Intervention and Control Groups at Time 1

Variable	Intervention *M* (SD)	Control *M* (SD)	*t*(df)	*p*	95% CI [LL, UL]	*d*
Body App	3.75 (0.87)	3.64 (0.88)	0.97 (267)	.332	[-0.11, 0.31]	0.12
Self-esteem	2.82 (0.62)	2.83 (0.54)	0.79 (267)	.423	[-0.08, 0.19]	0.10
Thin Int	2.77 (1.01)	2.97 (0.92)	-1.33 (267)	.028*	[-0.49, -0.03]	-0.27
Muscular Int	2.67 (0.98)	2.86 (1.05)	-0.46 (267)	.186	[-0.40, 0.09]	-0.16
Social Comp	2.56 (1.11)	2.45 (1.06)	0.37 (267)	.712	[-0.21, 0.31]	0.05
App Conversations	2.18 (1.11)	2.18 (1.08)	-0.46 (267)	.644	[-0.32, 0.20]	-0.06
Media Literacy	3.35 (1.17)	3.31 (1.10)	0.32 (267)	.751	[-0.23, 0.32]	0.04

Note. *M* = mean; *SD* = standard deviation; LL = lower limit; UL = upper limit.
For all comparisons, Intervention *n* = 140 and Control *n* = 129.
p = sig at <.05 values are two-tailed.

Appendix G. Table of Repeated Measures ANOVA Results for All Secondary Variables

Variable	Time × Sex	Time × Group × Sex	Group × Sex	Main Effect of Sex	Main Effect of Group	Main Effect of Time
Self-Esteem	$F(1.78, 472.46) = 1.21$, $p = .297$, $\eta p^2 = .005$	$F(1.78, 472.46) = 0.70$, $p = .481$, $\eta p^2 = .003$	$F(1, 265) = 0.02$, $p = .899$, $\eta p^2 < .001$	$F(1, 265) = 2.01$, $p = .157$, $\eta p^2 = .008$	$F(1, 265) = 0.25$, $p = .619$, $\eta p^2 = .001$	$F(1.78, 472.46) = 12.16$, $p < .001$**, $\eta p^2 = .044$
Thin Internalisation	$F(1.89, 501.75) = 0.12$, $p = .879$, $\eta p^2 < .001$	$F(1.89, 501.75) = 1.99$, $p = .140$, $\eta p^2 = .007$	$F(1, 265) = 0.26$, $p = .609$, $\eta p^2 = .001$	$F(1, 265) = 8.86$, $p = .003$**, $\eta p^2 = .032$	$F(1, 265) = 3.92$, $p = .049$*, $\eta p^2 = .015$	$F(1.89, 501.75) = 4.00$, $p = .021$*, $\eta p^2 = .015$
Muscular Internalisation	$F(1.94, 514.81) = 1.18$, $p = .308$, $\eta p^2 = .004$	$F(1.94, 514.81) = 0.19$, $p = .820$, $\eta p^2 = .001$	$F(1, 265) = 0.15$, $p = .697$, $\eta p^2 = .001$	$F(1, 265) = 11.59$, $p < .001$**, $\eta p^2 = .042$	$F(1, 265) = 7.31$, $p = .007$*, $\eta p^2 = .027$	$F(1.94, 514.81) = 2.50$, $p = .085$, $\eta p^2 = .009$
Social Comparison	$F(1.93, 510.69) = 0.10$, $p = .896$, $\eta p^2 < .001$	$F(1.93, 510.69) = 0.16$, $p = .842$, $\eta p^2 = .001$	$F(1, 265) = 0.05$, $p = .829$, $\eta p^2 < .001$	$F(1, 265) = 31.56$, $p < .001$**, $\eta p^2 = .106$	$F(1, 265) = 1.18$, $p = .279$, $\eta p^2 = .004$	$F(1.93, 510.69) = 5.75$, $p = .004$**, $\eta p^2 = .021$
Appearance Conversations	$F(1.94, 514.11) = 1.15$, $p = .317$, $\eta p^2 = .004$	$F(1.94, 514.11) = 0.47$, $p = .621$, $\eta p^2 = .002$	$F(1, 265) = 0.01$, $p = .914$, $\eta p^2 < .001$	$F(1, 265) = 50.62$, $p < .001$**, $\eta p^2 = .160$	$F(1, 265) < 0.01$, $p = .947$, $\eta p^2 < .001$	$F(1.94, 514.11) = 3.95$, $p = .021$*, $\eta p^2 = .015$
Media Literacy	$F(1.91, 506.97) = 0.05$, $p = .945$, $\eta p^2 < .001$	$F(1.91, 506.97) = 1.63$, $p = .199$, $\eta p^2 = .006$	$F(1, 265) = 3.47$, $p = .064$, $\eta p^2 = .013$	$F(1, 265) = 0.08$, $p = .775$, $\eta p^2 < .001$	$F(1, 265) = 0.17$, $p = .681$, $\eta p^2 = .001$	$F(1.91, 506.97) = 5.09$, $p = .007$**, $\eta p^2 = .019$

Note. $N = 269$. All within-subjects effects (Time, Time × Group, Time × Sex, Time × Group × Sex) report Greenhouse-Geisser corrected values due to violations of sphericity. ηp^2 = partial eta-squared. *Significant at $p < .05$. ** Significant at Bonferroni-corrected alpha for secondary outcomes, $p = .008$.

Appendix H. Table of Estimated Marginal Means

Estimated Marginal Means, Standard Errors, and 95% Confidence Intervals for All Variables

Variable	Group	Sex	Time	M	SE	95% CI
Body Appreciation	Intervention	Male	Baseline	3.81	0.11	[3.59, 4.03]
		Female	Baseline	3.70	0.10	[3.50, 3.89]
	Control	Male	Baseline	3.72	0.12	[3.49, 3.96]
		Female	Baseline	3.59	0.10	[3.39, 3.79]
	Intervention	Male	1-week	3.86	0.12	[3.63, 4.10]
		Female	1-week	3.72	0.11	[3.51, 3.93]
	Control	Male	1-week	3.85	0.13	[3.60, 4.10]
		Female	1-week	3.60	0.11	[3.39, 3.81]
	Intervention	Male	12-week	3.73	0.11	[3.51, 3.95]
		Female	12-week	3.66	0.10	[3.46, 3.86]
	Control	Male	12-week	3.84	0.12	[3.60, 4.07]
		Female	12-week	3.70	0.10	[3.49, 3.90]
Self-Esteem	Intervention	Male	Baseline	2.92	0.07	[2.78, 3.07]
		Female	Baseline	2.81	0.07	[2.68, 2.94]
	Control	Male	Baseline	2.84	0.08	[2.69, 3.00]
		Female	Baseline	2.78	0.07	[2.65, 2.91]
	Intervention	Male	1-week	3.03	0.08	[2.88, 3.18]
		Female	1-week	2.93	0.07	[2.79, 3.06]
	Control	Male	1-week	3.01	0.08	[2.85, 3.17]
		Female	1-week	2.84	0.07	[2.70, 2.98]
	Intervention	Male	12-week	2.96	0.08	[2.80, 3.11]
		Female	12-week	2.91	0.07	[2.78, 3.05]
	Control	Male	12-week	2.98	0.08	[2.82, 3.14]
		Female	12-week	2.91	0.07	[2.77, 3.05]
Thin Internalisation	Intervention	Male	Baseline	2.53	0.12	[2.29, 2.77]

		Female	Baseline	2.85	0.11	[2.64, 3.07]
	Control	Male	Baseline	2.84	0.13	[2.58, 3.09]
		Female	Baseline	3.07	0.11	[2.85, 3.28]
	Intervention	Male	1-week	2.53	0.12	[2.31, 2.76]
		Female	1-week	2.78	0.10	[2.58, 2.98]
	Control	Male	1-week	2.69	0.12	[2.44, 2.93]
		Female	1-week	3.06	0.11	[2.86, 3.27]
	Intervention	Male	12-week	2.54	0.12	[2.30, 2.77]
		Female	12-week	2.72	0.11	[2.51, 2.93]
	Control	Male	12-week	2.52	0.13	[2.27, 2.77]
		Female	12-week	2.98	0.11	[2.77, 3.20]
Muscular Internalisation	Intervention	Male	Baseline	2.93	0.12	[2.68, 3.17]
		Female	Baseline	2.46	0.11	[2.24, 2.68]
	Control	Male	Baseline	3.09	0.13	[2.82, 3.35]
		Female	Baseline	2.65	0.11	[2.42, 2.87]
	Intervention	Male	1-week	2.71	0.13	[2.46, 2.96]
		Female	1-week	2.33	0.11	[2.11, 2.55]
	Control	Male	1-week	3.07	0.14	[2.80, 3.33]
		Female	1-week	2.82	0.11	[2.59, 3.04]
	Intervention	Male	12-week	2.73	0.13	[2.48, 2.98]
		Female	12-week	2.33	0.11	[2.10, 2.55]
	Control	Male	12-week	2.98	0.14	[2.71, 3.25]
		Female	12-week	2.68	0.12	[2.45, 2.90]
Social Comparison	Intervention	Male	Baseline	2.14	0.13	[1.88, 2.40]
		Female	Baseline	2.79	0.12	[2.56, 3.02]
	Control	Male	Baseline	2.13	0.14	[1.85, 2.40]
		Female	Baseline	2.69	0.12	[2.45, 2.92]
	Intervention	Male	1-week	1.98	0.12	[1.74, 2.23]

		Female	1-week	2.62	0.11	[2.40, 2.84]
	Control	Male	1-week	1.93	0.13	[1.67, 2.19]
		Female	1-week	2.57	0.11	[2.35, 2.79]
	Intervention	Male	12-week	2.17	0.12	[1.93, 2.41]
		Female	12-week	2.80	0.11	[2.59, 3.02]
	Control	Male	12-week	1.95	0.13	[1.69, 2.21]
		Female	12-week	2.52	0.11	[2.30, 2.74]
Appearance Conversations	Intervention	Male	Baseline	1.73	0.13	[1.48, 1.98]
		Female	Baseline	2.47	0.11	[2.25, 2.70]
	Control	Male	Baseline	1.77	0.14	[1.50, 2.04]
		Female	Baseline	2.52	0.12	[2.29, 2.74]
	Intervention	Male	1-week	1.56	0.12	[1.33, 1.79]
		Female	1-week	2.42	0.11	[2.21, 2.63]
	Control	Male	1-week	1.59	0.13	[1.34, 1.84]
		Female	1-week	2.40	0.11	[2.19, 2.61]
	Intervention	Male	12-week	1.81	0.13	[1.57, 2.06]
		Female	12-week	2.44	0.11	[2.22, 2.66]
	Control	Male	12-week	1.68	0.14	[1.42, 1.95]
		Female	12-week	2.44	0.12	[2.21, 2.66]
Media Literacy	Intervention	Male	Baseline	3.15	0.14	[2.87, 3.43]
		Female	Baseline	3.58	0.13	[3.33, 3.84]
	Control	Male	Baseline	3.53	0.15	[3.23, 3.83]
		Female	Baseline	3.22	0.13	[2.96, 3.47]
	Intervention	Male	1-week	3.20	0.16	[2.89, 3.52]
		Female	1-week	3.43	0.14	[3.16, 3.71]
	Control	Male	1-week	3.35	0.17	[3.02, 3.69]
		Female	1-week	3.19	0.14	[2.91, 3.48]
	Intervention	Male	12-week	3.14	0.16	[2.82, 3.47]

	Female	12-week	3.35	0.15	[3.06, 3.64]
Control	Male	12-week	3.20	0.18	[2.85, 3.55]
	Female	12-week	3.04	0.15	[2.74, 3.33]

Note. *M* = estimated marginal mean; *SE* = standard error; *CI* = confidence interval. *N* = 269 (intervention *n* = 140, control *n* = 129; males *n* = 116, females *n* = 153). Estimated marginal means derived from repeated measures ANOVA models with Sex, Group, and Time as factors. All measures used 5-point Likert-type scales except Self-esteem (4-point scale). Higher scores indicate greater endorsement of the construct except for Body Appreciation and Self-Esteem where higher scores indicate more positive outcomes.

Appendix I. Study 1 Syntax and Output

Descriptives and Baseline

```
DATASET ACTIVATE DataSet3.
EXAMINE VARIABLES=BodyApp_T1  SelfEst_T1 ThinInt_T1 MuscInt_T1
AV_T1_APP_CONVERSATIONS_T SocComp_T1
  BY Group
 /PLOT BOXPLOT HISTOGRAM NPPLOT
 /COMPARE GROUPS
 /STATISTICS DESCRIPTIVES
 /CINTERVAL 95
 /MISSING LISTWISE
 /NOTOTAL.

T-TEST GROUPS=Group(1 2)
 /MISSING=ANALYSIS
 /VARIABLES=BodyApp_T1  SelfEst_T1 ThinInt_T1 MuscInt_T1
AV_T1_APP_CONVERSATIONS_T SocComp_T1
  MedLit_T1
 /ES DISPLAY(TRUE)
 /CRITERIA=CI(.95).
```

Group Statistics

	Group Allocation	N	Mean	Std. Deviation	Std. Error Mean
BodyApp_T1	Intervention	140	3.7471	.86834	.07339
	Control	129	3.6434	.88245	.07770
SelfEst_T1	Intervention	140	2.8586	.60537	.05116
	Control	129	2.8039	.52818	.04650
ThinInt_T1	Intervention	140	2.7100	.99995	.08451
	Control	129	2.9705	.92368	.08133
MuscInt_T1	Intervention	140	2.6671	.97527	.08242
	Control	129	2.8295	1.03050	.09073
AVERAGE T1_APPEARANCE CONVERSATIONS	Intervention	140	2.1429	1.04992	.08873
	Control	129	2.2031	1.08310	.09536
SocComp_T1	Intervention	140	2.5000	1.07665	.09099
	Control	129	2.4516	1.07396	.09456
MedLit_T1	Intervention	140	3.3917	1.16400	.09838
	Control	129	3.3475	1.11357	.09804

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
						Significance				95% Confidence Interval of the Difference
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
BodyApp_T1	Equal variances assumed	.582	.446	.971	267	.166	.332	.10373	.10681	-.10656	.31402
	Equal variances not assumed			.971	264.447	.166	.333	.10373	.10688	-.10670	.31417
SelfEst_T1	Equal variances assumed	1.531	.217	.787	267	.216	.432	.05470	.06952	-.08219	.19158
	Equal variances not assumed			.791	266.222	.215	.430	.05470	.06914	-.08143	.19082
ThinInt_T1	Equal variances assumed	1.542	.215	-2.214	267	.014	.028	-.26054	.11767	-.49222	-.02887
	Equal variances not assumed			-2.221	266.998	.014	.027	-.26054	.11729	-.49147	-.02962
MuscInt_T1	Equal variances assumed	.342	.559	-1.327	267	.093	.186	-.16231	.12230	-.40312	.07849
	Equal variances not assumed			-1.324	262.079	.093	.187	-.16231	.12258	-.40368	.07905
AVERAGE T1_APPEARANCE CONVERSATIONS	Equal variances assumed	1.085	.298	-.463	267	.322	.644	-.06024	.13009	-.31638	.19590
	Equal variances not assumed			-.462	263.621	.322	.644	-.06024	.13026	-.31673	.19624
SocComp_T1	Equal variances assumed	.129	.719	.369	267	.356	.712	.04845	.13124	-.20985	.30685
	Equal variances not assumed			.369	265.316	.356	.712	.04845	.13123	-.20983	.30683
MedLit_T1	Equal variances assumed	.649	.421	.317	267	.376	.751	.04412	.13914	-.22983	.31808
	Equal variances not assumed			.318	266.618	.375	.751	.04412	.13889	-.22934	.31758

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval Lower	Upper
BodyApp_T1	Cohen's d	.87514	.119	-.121	.358
	Hedges' correction	.87760	.118	-.121	.357
	Glass's delta	.88245	.118	-.122	.357
SelfEst_T1	Cohen's d	.56967	.096	-.143	.335
	Hedges' correction	.57128	.096	-.143	.334
	Glass's delta	.52818	.104	-.136	.343
ThinInt_T1	Cohen's d	.96414	-.270	-.510	-.030
	Hedges' correction	.96686	-.269	-.509	-.030
	Glass's delta	.92368	-.282	-.523	-.040
MuscInt_T1	Cohen's d	1.00213	-.162	-.401	.078
	Hedges' correction	1.00495	-.162	-.400	.078
	Glass's delta	1.03050	-.158	-.397	.083
AVERAGE T1_APPEARANCE CONVERSATIONS	Cohen's d	1.06596	-.057	-.296	.183
	Hedges' correction	1.06896	-.056	-.295	.182
	Glass's delta	1.08310	-.056	-.295	.184
SocComp_T1	Cohen's d	1.07536	.045	-.194	.284
	Hedges' correction	1.07839	.045	-.194	.283
	Glass's delta	1.07396	.045	-.194	.284
MedLit_T1	Cohen's d	1.14010	.039	-.201	.278
	Hedges' correction	1.14331	.039	-.200	.277
	Glass's delta	1.11357	.040	-.200	.279

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control (i.e., the second) group.

Body Appreciation

```
GLM BodyApp_T1 BodyApp_T2 BodyApp_T3 BY Sex Group
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  /METHOD=SSTYPE(3)
  /SAVE=RESID COOK LEVER
  /PLOT=PROFILE(Time*Group Time*Sex) TYPE=LINE ERRORBAR=CI
MEANREFERENCE=NO YAXIS=AUTO
  /EMMEANS=TABLES(OVERALL)
  /EMMEANS=TABLES(Sex) COMPARE ADJ(BONFERRONI)
  /EMMEANS=TABLES(Group) COMPARE ADJ(BONFERRONI)
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  /EMMEANS=TABLES(Sex*Group)
```

```
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/EMMEANS=TABLES(Sex*Group*Time)
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/CRITERIA=ALPHA(.05)
/WSDESIGN=Time
/DESIGN=Sex Group Sex*Group.
```

Within-Subjects Factors

Measure: MEASURE_1

Time	Dependent Variable
1	BodyApp_T1
2	BodyApp_T2
3	BodyApp_T3

Between-Subjects Factors

		Value Label	N
Sex	1	Male	116
	2	Female	153
Group Allocation	1	Intervention	140
	2	Control	129

Descriptive Statistics

	Sex	Group Allocation	Mean	Std. Deviation	N
BodyApp_T1	Male	Intervention	3.8129	.85325	62
		Control	3.7241	.93968	54
		Total	3.7716	.89168	116
	Female	Intervention	3.6949	.88213	78
		Control	3.5853	.84048	75
		Total	3.6412	.86088	153
	Total	Intervention	3.7471	.86834	140
		Control	3.6434	.88245	129
		Total	3.6974	.87504	269
BodyApp_T2	Male	Intervention	3.8629	.94769	62
		Control	3.8481	.96656	54
		Total	3.8560	.95237	116
	Female	Intervention	3.7192	.90612	78
		Control	3.6000	.90345	75
		Total	3.6608	.90381	153
	Total	Intervention	3.7829	.92417	140
		Control	3.7039	.93478	129
		Total	3.7450	.92838	269
BodyApp_T3	Male	Intervention	3.7323	.92254	62
		Control	3.8352	.81938	54
		Total	3.7802	.87379	116
	Female	Intervention	3.6603	.88616	78
		Control	3.6960	.90291	75
		Total	3.6778	.89164	153
	Total	Intervention	3.6921	.89989	140
		Control	3.7543	.86837	129
		Total	3.7219	.88381	269

Box's Test of Equality of Covariance Matrices[a]

Box's M	17.032
F	.926
df1	18
df2	208703.048
Sig.	.546

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b] Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Time	.867	37.641	2	<.001	.883	.898	.500

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Time	Sphericity Assumed	.373	2	.187	.891	.411	.003	1.781	.204
	Greenhouse-Geisser	.373	1.765	.212	.891	.400	.003	1.572	.193
	Huynh-Feldt	.373	1.796	.208	.891	.401	.003	1.600	.195
	Lower-bound	.373	1.000	.373	.891	.346	.003	.891	.156
Time * Sex	Sphericity Assumed	.290	2	.145	.692	.501	.003	1.384	.167
	Greenhouse-Geisser	.290	1.765	.164	.692	.484	.003	1.222	.159
	Huynh-Feldt	.290	1.796	.162	.692	.486	.003	1.244	.160
	Lower-bound	.290	1.000	.290	.692	.406	.003	.692	.132
Time * Group	Sphericity Assumed	1.053	2	.527	2.511	.082	.009	5.023	.503
	Greenhouse-Geisser	1.053	1.765	.596	2.511	.089	.009	4.434	.471
	Huynh-Feldt	1.053	1.796	.586	2.511	.088	.009	4.512	.475
	Lower-bound	1.053	1.000	1.053	2.511	.114	.009	2.511	.352
Time * Sex * Group	Sphericity Assumed	.058	2	.029	.138	.871	.001	.276	.071
	Greenhouse-Geisser	.058	1.765	.033	.138	.846	.001	.244	.070
	Huynh-Feldt	.058	1.796	.032	.138	.849	.001	.248	.070
	Lower-bound	.058	1.000	.058	.138	.710	.001	.138	.066
Error(Time)	Sphericity Assumed	111.120	530	.210					
	Greenhouse-Geisser	111.120	467.834	.238					
	Huynh-Feldt	111.120	476.067	.233					
	Lower-bound	111.120	265.000	.419					

a. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
BodyApp_T1	Based on Mean	.536	3	265	.658
	Based on Median	.305	3	265	.822
	Based on Median and with adjusted df	.305	3	255.835	.822
	Based on trimmed mean	.444	3	265	.722
BodyApp_T2	Based on Mean	.237	3	265	.871
	Based on Median	.177	3	265	.912
	Based on Median and with adjusted df	.177	3	255.632	.912
	Based on trimmed mean	.189	3	265	.904
BodyApp_T3	Based on Mean	.972	3	265	.406
	Based on Median	.868	3	265	.458
	Based on Median and with adjusted df	.868	3	263.390	.458
	Based on trimmed mean	.983	3	265	.401

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

Tests of Between-Subjects Effects

Measure: MEASURE_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	10989.096	1	10989.096	5510.193	<.001	.954	5510.193	1.000
Sex	4.053	1	4.053	2.032	.155	.008	2.032	.295
Group	.206	1	.206	.103	.748	.000	.103	.062
Sex * Group	.203	1	.203	.102	.750	.000	.102	.062
Error	528.495	265	1.994					

a. Computed using alpha = .05

7. Group Allocation * Time

Measure: MEASURE_1

Group Allocation	Time	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Intervention	1	3.754	.075	3.607	3.901
	2	3.791	.079	3.636	3.946
	3	3.696	.075	3.548	3.845
Control	1	3.655	.078	3.501	3.809
	2	3.724	.083	3.561	3.887
	3	3.766	.079	3.610	3.921

8. Sex * Group Allocation * Time

Measure: MEASURE_1

Sex	Group Allocation	Time	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	Intervention	1	3.813	.111	3.594	4.032
		2	3.863	.118	3.631	4.095
		3	3.732	.113	3.511	3.954
	Control	1	3.724	.119	3.489	3.959
		2	3.848	.126	3.600	4.097
		3	3.835	.121	3.598	4.073
Female	Intervention	1	3.695	.099	3.500	3.890
		2	3.719	.105	3.512	3.926
		3	3.660	.100	3.463	3.858
	Control	1	3.585	.101	3.386	3.785
		2	3.600	.107	3.389	3.811
		3	3.696	.102	3.494	3.898

Self-Esteem

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 /METHOD=SSTYPE(3)
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MEANREFERENCE=NO YAXIS=AUTO
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 /EMMEANS=TABLES(Sex) COMPARE ADJ(BONFERRONI)
 /EMMEANS=TABLES(Group) COMPARE ADJ(BONFERRONI)
 /EMMEANS=TABLES(Time) COMPARE ADJ(BONFERRONI)
 /EMMEANS=TABLES(Sex*Group)
 /EMMEANS=TABLES(Sex*Time)
 /EMMEANS=TABLES(Group*Time)
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 /PRINT=DESCRIPTIVE ETASQ OPOWER HOMOGENEITY
 /CRITERIA=ALPHA(.05)
 /WSDESIGN=Time
 /DESIGN=Sex Group Sex*Group.
```

Within-Subjects Factors

Measure: MEASURE_1

Time	Dependent Variable
1	SelfEst_T1
2	SelfEst_T2
3	SelfEst_T3

Between-Subjects Factors

		Value Label	N
Sex	1	Male	116
	2	Female	153
Group Allocation	1	Intervention	140
	2	Control	129

Descriptive Statistics

	Sex	Group Allocation	Mean	Std. Deviation	N
SelfEst_T1	Male	Intervention	2.9226	.56174	62
		Control	2.8426	.53539	54
		Total	2.8853	.54871	116
	Female	Intervention	2.8077	.63691	78
		Control	2.7760	.52475	75
		Total	2.7922	.58293	153
	Total	Intervention	2.8586	.60537	140
		Control	2.8039	.52818	129
		Total	2.8323	.56926	269
SelfEst_T2	Male	Intervention	3.0290	.59268	62
		Control	3.0093	.57142	54
		Total	3.0198	.58044	116
	Female	Intervention	2.9269	.65041	78
		Control	2.8373	.59270	75
		Total	2.8830	.62237	153
	Total	Intervention	2.9721	.62537	140
		Control	2.9093	.58782	129
		Total	2.9420	.60734	269
SelfEst_T3	Male	Intervention	2.9565	.60534	62
		Control	2.9815	.51910	54
		Total	2.9681	.56455	116
	Female	Intervention	2.9128	.64634	78
		Control	2.9080	.62876	75
		Total	2.9105	.63569	153
	Total	Intervention	2.9321	.62666	140
		Control	2.9388	.58434	129
		Total	2.9353	.60562	269

Box's Test of Equality of Covariance Matrices[a]

Box's M	32.988
F	1.794
df1	18
df2	208703.048
Sig.	.020

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b] Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Time	.878	34.287	2	<.001	.891	.907	.500

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Time	Sphericity Assumed	2.060	2	1.030	12.156	<.001	.044	24.312	.996
	Greenhouse-Geisser	2.060	1.783	1.155	12.156	<.001	.044	21.672	.992
	Huynh-Feldt	2.060	1.814	1.135	12.156	<.001	.044	22.056	.993
	Lower-bound	2.060	1.000	2.060	12.156	<.001	.044	12.156	.935
Time * Sex	Sphericity Assumed	.205	2	.102	1.208	.300	.005	2.416	.264
	Greenhouse-Geisser	.205	1.783	.115	1.208	.297	.005	2.153	.250
	Huynh-Feldt	.205	1.814	.113	1.208	.297	.005	2.191	.252
	Lower-bound	.205	1.000	.205	1.208	.273	.005	1.208	.195
Time * Group	Sphericity Assumed	.187	2	.094	1.106	.332	.004	2.212	.245
	Greenhouse-Geisser	.187	1.783	.105	1.106	.327	.004	1.972	.232
	Huynh-Feldt	.187	1.814	.103	1.106	.327	.004	2.007	.234
	Lower-bound	.187	1.000	.187	1.106	.294	.004	1.106	.182
Time * Sex * Group	Sphericity Assumed	.119	2	.059	.701	.497	.003	1.401	.168
	Greenhouse-Geisser	.119	1.783	.067	.701	.481	.003	1.249	.161
	Huynh-Feldt	.119	1.814	.065	.701	.484	.003	1.271	.162
	Lower-bound	.119	1.000	.119	.701	.403	.003	.701	.133
Error(Time)	Sphericity Assumed	44.909	530	.085					
	Greenhouse-Geisser	44.909	472.457	.095					
	Huynh-Feldt	44.909	480.824	.093					
	Lower-bound	44.909	265.000	.169					

a. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
SelfEst_T1	Based on Mean	1.280	3	265	.281
	Based on Median	1.198	3	265	.311
	Based on Median and with adjusted df	1.198	3	255.970	.311
	Based on trimmed mean	1.264	3	265	.287
SelfEst_T2	Based on Mean	.361	3	265	.781
	Based on Median	.273	3	265	.845
	Based on Median and with adjusted df	.273	3	256.099	.845
	Based on trimmed mean	.291	3	265	.832
SelfEst_T3	Based on Mean	.894	3	265	.445
	Based on Median	.751	3	265	.523
	Based on Median and with adjusted df	.751	3	255.064	.523
	Based on trimmed mean	.865	3	265	.460

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

Tests of Between-Subjects Effects

Measure: MEASURE_1
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	6681.424	1	6681.424	7486.518	<.001	.966	7486.518	1.000
Sex	1.798	1	1.798	2.014	.157	.008	2.014	.293
Group	.221	1	.221	.248	.619	.001	.248	.079
Sex * Group	.014	1	.014	.016	.899	.000	.016	.052
Error	236.502	265	.892					

a. Computed using alpha = .05

7. Group Allocation * Time

Measure: MEASURE_1

Group Allocation	Time	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Intervention	1	2.865	.048	2.770	2.961
	2	2.978	.052	2.876	3.079
	3	2.935	.052	2.833	3.037
Control	1	2.809	.051	2.709	2.909
	2	2.923	.054	2.817	3.030
	3	2.945	.054	2.838	3.052

8. Sex * Group Allocation * Time

Measure: MEASURE_1

Sex	Group Allocation	Time	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Male	Intervention	1	2.923	.072	2.780	3.065
		2	3.029	.077	2.878	3.181
		3	2.956	.077	2.804	3.109
	Control	1	2.843	.078	2.690	2.995
		2	3.009	.082	2.847	3.172
		3	2.981	.083	2.818	3.144
Female	Intervention	1	2.808	.065	2.681	2.935
		2	2.927	.069	2.792	3.062
		3	2.913	.069	2.777	3.048
	Control	1	2.776	.066	2.646	2.906
		2	2.837	.070	2.700	2.975
		3	2.908	.070	2.770	3.046

4. Time

Estimates

Measure: MEASURE_1

Time	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
1	2.837	.035	2.768	2.906
2	2.951	.037	2.877	3.024
3	2.940	.037	2.866	3.014

Pairwise Comparisons

Measure: MEASURE_1

(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	95% Confidence Interval for Difference[b] Upper Bound
1	2	-.113*	.021	<.001	-.163	-.064
	3	-.102*	.028	<.001	-.170	-.035
2	1	.113*	.021	<.001	.064	.163
	3	.011	.027	1.000	-.053	.075
3	1	.102*	.028	<.001	.035	.170
	2	-.011	.027	1.000	-.075	.053

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

2. Sex

Estimates

Measure: MEASURE_1

Sex	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Male	2.957	.051	2.857	3.057
Female	2.861	.044	2.775	2.948

Pairwise Comparisons

Measure: MEASURE_1

(I) Sex	(J) Sex	Mean Difference (I-J)	Std. Error	Sig.[a]	95% Confidence Interval for Difference[a]	
					Lower Bound	Upper Bound
Male	Female	.095	.067	.157	-.037	.228
Female	Male	-.095	.067	.157	-.228	.037

Based on estimated marginal means

a. Adjustment for multiple comparisons: Bonferroni.

Thin Internalisation

```
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  /PLOT=PROFILE(Time*Group Time*Sex) TYPE=LINE ERRORBAR=CI
MEANREFERENCE=NO YAXIS=AUTO
  /EMMEANS=TABLES(OVERALL)
  /EMMEANS=TABLES(Sex) COMPARE ADJ(BONFERRONI)
  /EMMEANS=TABLES(Group) COMPARE ADJ(BONFERRONI)
  /EMMEANS=TABLES(Time) COMPARE ADJ(BONFERRONI)
  /EMMEANS=TABLES(Sex*Group)
  /EMMEANS=TABLES(Sex*Time)
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/CRITERIA=ALPHA(.05)
/WSDESIGN=Time
/DESIGN=Sex Group Sex*Group.
```

Within-Subjects Factors

Measure: MEASURE_1

Time	Dependent Variable
1	ThinInt_T1
2	ThinInt_T2
3	ThinInt_T3

Between-Subjects Factors

		Value Label	N
Sex	1	Male	116
	2	Female	153
Group Allocation	1	Intervention	140
	2	Control	129

Descriptive Statistics

	Sex	Group Allocation	Mean	Std. Deviation	N
ThinInt_T1	Male	Intervention	2.5290	.93745	62
		Control	2.8370	.96667	54
		Total	2.6724	.95949	116
	Female	Intervention	2.8538	1.03028	78
		Control	3.0667	.88552	75
		Total	2.9582	.96482	153
	Total	Intervention	2.7100	.99995	140
		Control	2.9705	.92368	129
		Total	2.8349	.97113	269
ThinInt_T2	Male	Intervention	2.5323	.88035	62
		Control	2.6852	.84995	54
		Total	2.6034	.86597	116
	Female	Intervention	2.7769	1.00077	78
		Control	3.0613	.86554	75
		Total	2.9163	.94468	153
	Total	Intervention	2.6686	.95383	140
		Control	2.9039	.87575	129
		Total	2.7814	.92306	269
ThinInt_T3	Male	Intervention	2.5355	.89132	62
		Control	2.5222	.83546	54
		Total	2.5293	.86205	116
	Female	Intervention	2.7179	1.07845	78
		Control	2.9813	.89272	75
		Total	2.8471	.99730	153
	Total	Intervention	2.6371	1.00060	140
		Control	2.7891	.89523	129
		Total	2.7100	.95281	269

Box's Test of Equality of Covariance Matrices[a]

Box's M	21.534
F	1.171
df1	18
df2	208703.048
Sig.	.275

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b] Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Time	.944	15.302	2	<.001	.947	.964	.500

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Time	Sphericity Assumed	2.319	2	1.160	3.997	.019	.015	7.994	.715
	Greenhouse-Geisser	2.319	1.893	1.225	3.997	.021	.015	7.568	.697
	Huynh-Feldt	2.319	1.928	1.203	3.997	.020	.015	7.707	.703
	Lower-bound	2.319	1.000	2.319	3.997	.047	.015	3.997	.513
Time * Sex	Sphericity Assumed	.068	2	.034	.117	.889	.000	.235	.068
	Greenhouse-Geisser	.068	1.893	.036	.117	.879	.000	.222	.068
	Huynh-Feldt	.068	1.928	.035	.117	.882	.000	.226	.068
	Lower-bound	.068	1.000	.068	.117	.732	.000	.117	.063
Time * Group	Sphericity Assumed	.632	2	.316	1.090	.337	.004	2.179	.241
	Greenhouse-Geisser	.632	1.893	.334	1.090	.335	.004	2.063	.235
	Huynh-Feldt	.632	1.928	.328	1.090	.335	.004	2.101	.237
	Lower-bound	.632	1.000	.632	1.090	.298	.004	1.090	.180
Time * Sex * Group	Sphericity Assumed	1.155	2	.578	1.991	.138	.007	3.982	.412
	Greenhouse-Geisser	1.155	1.893	.610	1.991	.140	.007	3.770	.400
	Huynh-Feldt	1.155	1.928	.599	1.991	.139	.007	3.839	.404
	Lower-bound	1.155	1.000	1.155	1.991	.159	.007	1.991	.290
Error(Time)	Sphericity Assumed	153.748	530	.290					
	Greenhouse-Geisser	153.748	501.745	.306					
	Huynh-Feldt	153.748	510.969	.301					
	Lower-bound	153.748	265.000	.580					

a. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
ThinInt_T1	Based on Mean	.894	3	265	.445
	Based on Median	1.064	3	265	.365
	Based on Median and with adjusted df	1.064	3	263.947	.365
	Based on trimmed mean	.932	3	265	.426
ThinInt_T2	Based on Mean	1.219	3	265	.303
	Based on Median	1.170	3	265	.322
	Based on Median and with adjusted df	1.170	3	257.982	.322
	Based on trimmed mean	1.259	3	265	.289
ThinInt_T3	Based on Mean	2.283	3	265	.079
	Based on Median	2.034	3	265	.109
	Based on Median and with adjusted df	2.034	3	260.187	.109
	Based on trimmed mean	2.239	3	265	.084

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

Tests of Between-Subjects Effects

Measure: MEASURE_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	6006.231	1	6006.231	2940.693	<.001	.917	2940.693	1.000
Sex	18.097	1	18.097	8.860	.003	.032	8.860	.843
Group	8.004	1	8.004	3.919	.049	.015	3.919	.505
Sex * Group	.537	1	.537	.263	.609	.001	.263	.080
Error	541.250	265	2.042					

a. Computed using alpha = .05

2. Sex

Estimates

Measure: MEASURE_1

Sex	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Male	2.607	.077	2.456	2.758
Female	2.910	.067	2.778	3.041

Pairwise Comparisons

Measure: MEASURE_1

(I) Sex	(J) Sex	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
Male	Female	-.303*	.102	.003	-.503	-.103
Female	Male	.303*	.102	.003	.103	.503

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Univariate Tests

Measure: MEASURE_1

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Contrast	6.032	1	6.032	8.860	.003	.032	8.860	.843
Error	180.417	265	.681					

The F tests the effect of Sex. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Computed using alpha = .05

3. Group Allocation

Estimates

Measure: MEASURE_1

Group Allocation	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Intervention	2.658	.070	2.519	2.796
Control	2.859	.074	2.714	3.004

Pairwise Comparisons

Measure: MEASURE_1

(I) Group Allocation	(J) Group Allocation	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
Intervention	Control	-.201*	.102	.049	-.402	-.001
Control	Intervention	.201*	.102	.049	.001	.402

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Univariate Tests

Measure: MEASURE_1

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Contrast	2.668	1	2.668	3.919	.049	.015	3.919	.505
Error	180.417	265	.681					

The F tests the effect of Group Allocation. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Computed using alpha = .05

4. Time

Estimates

Measure: MEASURE_1

Time	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	2.822	.059	2.705	2.938
2	2.764	.056	2.654	2.874
3	2.689	.058	2.575	2.803

Pairwise Comparisons

Measure: MEASURE_1

(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	Upper Bound
1	2	.058	.044	.566	-.048	.163
	3	.132*	.052	.035	.007	.258
2	1	-.058	.044	.566	-.163	.048
	3	.075	.044	.280	-.032	.182
3	1	-.132*	.052	.035	-.258	-.007
	2	-.075	.044	.280	-.182	.032

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

8. Sex * Group Allocation * Time

Measure: MEASURE_1

Sex	Group Allocation	Time	Mean	Std. Error	95% Confidence Interval Lower Bound	Upper Bound
Male	Intervention	1	2.529	.122	2.290	2.768
		2	2.532	.115	2.305	2.759
		3	2.535	.119	2.301	2.770
	Control	1	2.837	.130	2.581	3.094
		2	2.685	.123	2.442	2.928
		3	2.522	.128	2.270	2.774
Female	Intervention	1	2.854	.108	2.640	3.067
		2	2.777	.103	2.575	2.979
		3	2.718	.106	2.508	2.927
	Control	1	3.067	.111	2.849	3.284
		2	3.061	.105	2.855	3.268
		3	2.981	.109	2.768	3.195

Muscular Internalisation

```
GLM MuscInt_T1 MuscInt_T2 MuscInt_T3 BY Sex Group
  /WSFACTOR=Time 3 Polynomial
  /METHOD=SSTYPE(3)
  /SAVE=RESID COOK LEVER
  /PLOT=PROFILE(Time*Group Time*Sex) TYPE=LINE ERRORBAR=CI
MEANREFERENCE=NO YAXIS=AUTO
  /EMMEANS=TABLES(OVERALL)
  /EMMEANS=TABLES(Sex) COMPARE ADJ(BONFERRONI)
  /EMMEANS=TABLES(Group) COMPARE ADJ(BONFERRONI)
```

```
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/EMMEANS=TABLES(Sex*Group)
/EMMEANS=TABLES(Sex*Time)
/EMMEANS=TABLES(Group*Time)
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/PRINT=DESCRIPTIVE ETASQ OPOWER HOMOGENEITY
/CRITERIA=ALPHA(.05)
/WSDESIGN=Time
/DESIGN=Sex Group Sex*Group.
```

Within-Subjects Factors

Measure: MEASURE_1

Time	Dependent Variable
1	MuscInt_T1
2	MuscInt_T2
3	MuscInt_T3

Between-Subjects Factors

		Value Label	N
Sex	1	Male	116
	2	Female	153
Group Allocation	1	Intervention	140
	2	Control	129

Descriptive Statistics

	Sex	Group Allocation	Mean	Std. Deviation	N
MuscInt_T1	Male	Intervention	2.9258	.98463	62
		Control	3.0852	1.11362	54
		Total	3.0000	1.04507	116
	Female	Intervention	2.4615	.92318	78
		Control	2.6453	.93090	75
		Total	2.5516	.92850	153
	Total	Intervention	2.6671	.97527	140
		Control	2.8295	1.03050	129
		Total	2.7450	1.00355	269
MuscInt_T2	Male	Intervention	2.7097	.87716	62
		Control	3.0667	1.11525	54
		Total	2.8759	1.00664	116
	Female	Intervention	2.3256	.95950	78
		Control	2.8160	1.01862	75
		Total	2.5660	1.01587	153
	Total	Intervention	2.4957	.94037	140
		Control	2.9209	1.06314	129
		Total	2.6996	1.02165	269
MuscInt_T3	Male	Intervention	2.7323	.94985	62
		Control	2.9815	1.11881	54
		Total	2.8483	1.03491	116
	Female	Intervention	2.3256	.99824	78
		Control	2.6747	.93738	75
		Total	2.4967	.98143	153
	Total	Intervention	2.5057	.99450	140
		Control	2.8031	1.02439	129
		Total	2.6483	1.01799	269

Box's Test of Equality of Covariance Matrices[a]

Box's M	23.846
F	1.297
df1	18
df2	208703.048
Sig.	.178

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b] Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Time	.971	7.905	2	.019	.971	.989	.500

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Time	Sphericity Assumed	1.341	2	.671	2.500	.083	.009	4.999	.501
	Greenhouse-Geisser	1.341	1.943	.690	2.500	.085	.009	4.856	.494
	Huynh-Feldt	1.341	1.979	.678	2.500	.084	.009	4.947	.498
	Lower-bound	1.341	1.000	1.341	2.500	.115	.009	2.500	.350
Time * Sex	Sphericity Assumed	.631	2	.316	1.177	.309	.004	2.353	.258
	Greenhouse-Geisser	.631	1.943	.325	1.177	.308	.004	2.286	.255
	Huynh-Feldt	.631	1.979	.319	1.177	.309	.004	2.329	.257
	Lower-bound	.631	1.000	.631	1.177	.279	.004	1.177	.191
Time * Group	Sphericity Assumed	2.090	2	1.045	3.897	.021	.014	7.793	.703
	Greenhouse-Geisser	2.090	1.943	1.076	3.897	.022	.014	7.570	.694
	Huynh-Feldt	2.090	1.979	1.056	3.897	.021	.014	7.711	.700
	Lower-bound	2.090	1.000	2.090	3.897	.049	.014	3.897	.503
Time * Sex * Group	Sphericity Assumed	.102	2	.051	.191	.826	.001	.382	.080
	Greenhouse-Geisser	.102	1.943	.053	.191	.820	.001	.371	.079
	Huynh-Feldt	.102	1.979	.052	.191	.824	.001	.378	.080
	Lower-bound	.102	1.000	.102	.191	.663	.001	.191	.072
Error(Time)	Sphericity Assumed	142.163	530	.268					
	Greenhouse-Geisser	142.163	514.814	.276					
	Huynh-Feldt	142.163	524.429	.271					
	Lower-bound	142.163	265.000	.536					

a. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
MuscInt_T1	Based on Mean	1.017	3	265	.386
	Based on Median	.953	3	265	.415
	Based on Median and with adjusted df	.953	3	256.272	.415
	Based on trimmed mean	1.027	3	265	.381
MuscInt_T2	Based on Mean	1.117	3	265	.342
	Based on Median	.976	3	265	.405
	Based on Median and with adjusted df	.976	3	249.218	.405
	Based on trimmed mean	1.130	3	265	.337
MuscInt_T3	Based on Mean	.810	3	265	.489
	Based on Median	.821	3	265	.483
	Based on Median and with adjusted df	.821	3	261.633	.483
	Based on trimmed mean	.804	3	265	.492

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

Tests of Between-Subjects Effects

Measure: MEASURE_1
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	5880.104	1	5880.104	2449.638	<.001	.902	2449.638	1.000
Sex	27.810	1	27.810	11.586	<.001	.042	11.586	.924
Group	17.542	1	17.542	7.308	.007	.027	7.308	.768
Sex * Group	.364	1	.364	.152	.697	.001	.152	.067
Error	636.105	265	2.400					

a. Computed using alpha = .05

2. Sex

Estimates

Measure: MEASURE_1

Sex	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Male	2.917	.083	2.753	3.081
Female	2.541	.072	2.399	2.684

Pairwise Comparisons

Measure: MEASURE_1

(I) Sex	(J) Sex	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
Male	Female	.375*	.110	<.001	.158	.593
Female	Male	-.375*	.110	<.001	-.593	-.158

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Univariate Tests

Measure: MEASURE_1

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Contrast	9.270	1	9.270	11.586	<.001	.042	11.586	.924
Error	212.035	265	.800					

The F tests the effect of Sex. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Computed using alpha = .05

3. Group Allocation

Estimates

Measure: MEASURE_1

Group Allocation	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Intervention	2.580	.076	2.430	2.730
Control	2.878	.080	2.721	3.035

Pairwise Comparisons

Measure: MEASURE_1

(I) Group Allocation	(J) Group Allocation	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
Intervention	Control	-.298*	.110	.007	-.515	-.081
Control	Intervention	.298*	.110	.007	.081	.515

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Univariate Tests

Measure: MEASURE_1

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Contrast	5.847	1	5.847	7.308	.007	.027	7.308	.768
Error	212.035	265	.800					

The F tests the effect of Group Allocation. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Computed using alpha = .05

7. Group Allocation * Time

Measure: MEASURE_1

Group Allocation	Time	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Intervention	1	2.694	.083	2.529	2.858
	2	2.518	.084	2.352	2.684
	3	2.529	.085	2.362	2.696
Control	1	2.865	.087	2.693	3.037
	2	2.941	.088	2.767	3.116
	3	2.828	.089	2.653	3.003

8. Sex * Group Allocation * Time

Measure: MEASURE_1

Sex	Group Allocation	Time	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	Intervention	1	2.926	.124	2.681	3.171
		2	2.710	.126	2.462	2.958
		3	2.732	.127	2.483	2.981
	Control	1	3.085	.133	2.823	3.348
		2	3.067	.135	2.801	3.332
		3	2.981	.136	2.714	3.248
Female	Intervention	1	2.462	.111	2.243	2.680
		2	2.326	.112	2.105	2.547
		3	2.326	.113	2.103	2.548
	Control	1	2.645	.113	2.422	2.868
		2	2.816	.114	2.591	3.041
		3	2.675	.115	2.448	2.901

Social Comparison

```
GLM SocComp_T1 SocComp_T2 SocComp_T3 BY Sex Group
  /WSFACTOR=Time 3 Polynomial
  /METHOD=SSTYPE(3)
  /SAVE=RESID COOK LEVER
  /PLOT=PROFILE(Time*Group Time*Sex) TYPE=LINE ERRORBAR=CI
MEANREFERENCE=NO YAXIS=AUTO
  /EMMEANS=TABLES(OVERALL)
  /EMMEANS=TABLES(Sex) COMPARE ADJ(BONFERRONI)
  /EMMEANS=TABLES(Group) COMPARE ADJ(BONFERRONI)
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/EMMEANS=TABLES(Sex*Group)

/EMMEANS=TABLES(Sex*Time)

/EMMEANS=TABLES(Group*Time)

/EMMEANS=TABLES(Sex*Group*Time)

/PRINT=DESCRIPTIVE ETASQ OPOWER HOMOGENEITY

/CRITERIA=ALPHA(.05)

/WSDESIGN=Time

/DESIGN=Sex Group Sex*Group.
```

Within-Subjects Factors

Measure: MEASURE_1

Time	Dependent Variable
1	SocComp_T1
2	SocComp_T2
3	SocComp_T3

Between-Subjects Factors

		Value Label	N
Sex	1	Male	116
	2	Female	153
Group Allocation	1	Intervention	140
	2	Control	129

Descriptive Statistics

	Sex	Group Allocation	Mean	Std. Deviation	N
SocComp_T1	Male	Intervention	2.1371	1.01088	62
		Control	2.1250	.97341	54
		Total	2.1315	.98932	116
	Female	Intervention	2.7885	1.04530	78
		Control	2.6867	1.08747	75
		Total	2.7386	1.06389	153
	Total	Intervention	2.5000	1.07665	140
		Control	2.4516	1.07396	129
		Total	2.4768	1.07363	269
SocComp_T2	Male	Intervention	1.9839	.94182	62
		Control	1.9259	.81644	54
		Total	1.9569	.88236	116
	Female	Intervention	2.6186	1.01188	78
		Control	2.5733	1.04766	75
		Total	2.5964	1.02643	153
	Total	Intervention	2.3375	1.02790	140
		Control	2.3023	1.00665	129
		Total	2.3206	1.01602	269
SocComp_T3	Male	Intervention	2.1694	.93077	62
		Control	1.9537	.95175	54
		Total	2.0690	.94270	116
	Female	Intervention	2.8045	.96080	78
		Control	2.5233	1.02764	75
		Total	2.6667	1.00082	153
	Total	Intervention	2.5232	.99590	140
		Control	2.2849	1.03208	129
		Total	2.4089	1.01852	269

Box's Test of Equality of Covariance Matrices[a]

Box's M	22.618
F	1.230
df1	18
df2	208703.048
Sig.	.226

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b] Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Time	.962	10.178	2	.006	.964	.981	.500

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Time	Sphericity Assumed	3.332	2	1.666	5.745	.003	.021	11.490	.866
	Greenhouse-Geisser	3.332	1.927	1.729	5.745	.004	.021	11.071	.857
	Huynh-Feldt	3.332	1.963	1.697	5.745	.004	.021	11.277	.862
	Lower-bound	3.332	1.000	3.332	5.745	.017	.021	5.745	.666
Time * Sex	Sphericity Assumed	.059	2	.030	.102	.903	.000	.205	.066
	Greenhouse-Geisser	.059	1.927	.031	.102	.896	.000	.197	.065
	Huynh-Feldt	.059	1.963	.030	.102	.899	.000	.201	.065
	Lower-bound	.059	1.000	.059	.102	.749	.000	.102	.062
Time * Group	Sphericity Assumed	1.654	2	.827	2.851	.059	.011	5.703	.559
	Greenhouse-Geisser	1.654	1.927	.858	2.851	.061	.011	5.495	.548
	Huynh-Feldt	1.654	1.963	.843	2.851	.060	.011	5.597	.553
	Lower-bound	1.654	1.000	1.654	2.851	.092	.011	2.851	.391
Time * Sex * Group	Sphericity Assumed	.094	2	.047	.162	.850	.001	.325	.075
	Greenhouse-Geisser	.094	1.927	.049	.162	.842	.001	.313	.075
	Huynh-Feldt	.094	1.963	.048	.162	.846	.001	.319	.075
	Lower-bound	.094	1.000	.094	.162	.687	.001	.162	.069
Error(Time)	Sphericity Assumed	153.696	530	.290					
	Greenhouse-Geisser	153.696	510.686	.301					
	Huynh-Feldt	153.696	520.177	.295					
	Lower-bound	153.696	265.000	.580					

a. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
SocComp_T1	Based on Mean	.592	3	265	.621
	Based on Median	.699	3	265	.553
	Based on Median and with adjusted df	.699	3	261.135	.554
	Based on trimmed mean	.669	3	265	.572
SocComp_T2	Based on Mean	1.964	3	265	.120
	Based on Median	2.007	3	265	.113
	Based on Median and with adjusted df	2.007	3	257.367	.113
	Based on trimmed mean	2.009	3	265	.113
SocComp_T3	Based on Mean	.486	3	265	.692
	Based on Median	.589	3	265	.623
	Based on Median and with adjusted df	.589	3	263.715	.623
	Based on trimmed mean	.496	3	265	.685

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

Tests of Between-Subjects Effects

Measure: MEASURE_1
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	4387.586	1	4387.586	1845.316	<.001	.874	1845.316	1.000
Sex	75.050	1	75.050	31.564	<.001	.106	31.564	1.000
Group	2.794	1	2.794	1.175	.279	.004	1.175	.191
Sex * Group	.111	1	.111	.047	.829	.000	.047	.055
Error	630.087	265	2.378					

a. Computed using alpha = .05

2. Sex

Estimates

Measure: MEASURE_1

Sex	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Male	2.049	.083	1.886	2.212
Female	2.666	.072	2.524	2.808

Pairwise Comparisons

Measure: MEASURE_1

(I) Sex	(J) Sex	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
Male	Female	-.617*	.110	<.001	-.833	-.401
Female	Male	.617*	.110	<.001	.401	.833

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Univariate Tests

Measure: MEASURE_1

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Contrast	25.017	1	25.017	31.564	<.001	.106	31.564	1.000
Error	210.029	265	.793					

The F tests the effect of Sex. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Computed using alpha = .05

4. Time

Estimates

Measure: MEASURE_1

Time	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	2.434	.064	2.309	2.560
2	2.275	.060	2.158	2.393
3	2.363	.060	2.245	2.481

Pairwise Comparisons

Measure: MEASURE_1

(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	.159*	.042	<.001	.057	.261
	3	.072	.050	.456	-.048	.192
2	1	-.159*	.042	<.001	-.261	-.057
	3	-.087	.048	.218	-.204	.029
3	1	-.072	.050	.456	-.192	.048
	2	.087	.048	.218	-.029	.204

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

8. Sex * Group Allocation * Time

Measure: MEASURE_1

Sex	Group Allocation	Time	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	Intervention	1	2.137	.132	1.878	2.396
		2	1.984	.123	1.741	2.227
		3	2.169	.123	1.926	2.412
	Control	1	2.125	.141	1.848	2.402
		2	1.926	.132	1.666	2.186
		3	1.954	.132	1.693	2.214
Female	Intervention	1	2.788	.117	2.558	3.019
		2	2.619	.110	2.402	2.835
		3	2.804	.110	2.588	3.021
	Control	1	2.687	.120	2.451	2.922
		2	2.573	.112	2.353	2.794
		3	2.523	.112	2.302	2.744

Media Literacy

GLM MedLit_T1 Lit_T2 MedLit_T3 BY Sex Group

```
  /WSFACTOR=Time 3 Polynomial

  /METHOD=SSTYPE(3)

  /SAVE=RESID COOK LEVER

  /PLOT=PROFILE(Time*Group Time*Sex) TYPE=LINE ERRORBAR=CI
MEANREFERENCE=NO YAXIS=AUTO

  /EMMEANS=TABLES(OVERALL)

  /EMMEANS=TABLES(Sex) COMPARE ADJ(BONFERRONI)

  /EMMEANS=TABLES(Group) COMPARE ADJ(BONFERRONI)

  /EMMEANS=TABLES(Time) COMPARE ADJ(BONFERRONI)

  /EMMEANS=TABLES(Sex*Group)

  /EMMEANS=TABLES(Sex*Time)

  /EMMEANS=TABLES(Group*Time)

  /EMMEANS=TABLES(Sex*Group*Time)

  /PRINT=DESCRIPTIVE ETASQ OPOWER HOMOGENEITY

  /CRITERIA=ALPHA(.05)

  /WSDESIGN=Time

  /DESIGN=Sex Group Sex*Group.
```

Within-Subjects Factors

Measure: MEASURE_1

Time	Dependent Variable
1	MedLit_T1
2	Lit_T2
3	MedLit_T3

Between-Subjects Factors

		Value Label	N
Sex	1	Male	116
	2	Female	153
Group Allocation	1	Intervention	140
	2	Control	129

Descriptive Statistics

	Sex	Group Allocation	Mean	Std. Deviation	N
MedLit_T1	Male	Intervention	3.1505	1.14588	62
		Control	3.5309	1.02027	54
		Total	3.3276	1.10115	116
	Female	Intervention	3.5833	1.14961	78
		Control	3.2156	1.16498	75
		Total	3.4031	1.16802	153
	Total	Intervention	3.3917	1.16400	140
		Control	3.3475	1.11357	129
		Total	3.3705	1.13818	269
Lit_T2	Male	Intervention	3.2043	1.23895	62
		Control	3.3519	1.11670	54
		Total	3.2730	1.18084	116
	Female	Intervention	3.4338	1.34608	78
		Control	3.1933	1.22782	75
		Total	3.3159	1.29088	153
	Total	Intervention	3.3321	1.30017	140
		Control	3.2597	1.18070	129
		Total	3.2974	1.24254	269
MedLit_T3	Male	Intervention	3.1425	1.25662	62
		Control	3.2006	1.41695	54
		Total	3.1695	1.32807	116
	Female	Intervention	3.3483	1.32524	78
		Control	3.0378	1.19796	75
		Total	3.1961	1.26989	153
	Total	Intervention	3.2571	1.29476	140
		Control	3.1059	1.29132	129
		Total	3.1846	1.29291	269

Box's Test of Equality of Covariance Matrices[a]

Box's M	16.523
F	.899
df1	18
df2	208703.048
Sig.	.580

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b] Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Time	.955	12.274	2	.002	.957	.974	.500

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Time	Sphericity Assumed	4.707	2	2.354	5.090	.006	.019	10.181	.820
	Greenhouse-Geisser	4.707	1.913	2.461	5.090	.007	.019	9.739	.808
	Huynh-Feldt	4.707	1.948	2.416	5.090	.007	.019	9.919	.813
	Lower-bound	4.707	1.000	4.707	5.090	.025	.019	5.090	.613
Time * Sex	Sphericity Assumed	.047	2	.023	.050	.951	.000	.101	.058
	Greenhouse-Geisser	.047	1.913	.024	.050	.945	.000	.096	.057
	Huynh-Feldt	.047	1.948	.024	.050	.948	.000	.098	.058
	Lower-bound	.047	1.000	.047	.050	.823	.000	.050	.056
Time * Group	Sphericity Assumed	.585	2	.293	.633	.532	.002	1.266	.156
	Greenhouse-Geisser	.585	1.913	.306	.633	.525	.002	1.211	.154
	Huynh-Feldt	.585	1.948	.300	.633	.528	.002	1.233	.155
	Lower-bound	.585	1.000	.585	.633	.427	.002	.633	.124
Time * Sex * Group	Sphericity Assumed	1.502	2	.751	1.625	.198	.006	3.249	.344
	Greenhouse-Geisser	1.502	1.913	.785	1.625	.199	.006	3.108	.336
	Huynh-Feldt	1.502	1.948	.771	1.625	.199	.006	3.166	.339
	Lower-bound	1.502	1.000	1.502	1.625	.204	.006	1.625	.246
Error(Time)	Sphericity Assumed	245.052	530	.462					
	Greenhouse-Geisser	245.052	506.969	.483					
	Huynh-Feldt	245.052	516.349	.475					
	Lower-bound	245.052	265.000	.925					

a. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
MedLit_T1	Based on Mean	.285	3	265	.836
	Based on Median	.189	3	265	.904
	Based on Median and with adjusted df	.189	3	257.987	.904
	Based on trimmed mean	.268	3	265	.848
Lit_T2	Based on Mean	1.025	3	265	.382
	Based on Median	.988	3	265	.399
	Based on Median and with adjusted df	.988	3	257.448	.399
	Based on trimmed mean	1.023	3	265	.383
MedLit_T3	Based on Mean	1.022	3	265	.383
	Based on Median	.900	3	265	.442
	Based on Median and with adjusted df	.900	3	261.962	.442
	Based on trimmed mean	1.052	3	265	.370

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

Tests of Between-Subjects Effects

Measure: MEASURE_1
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	8507.395	1	8507.395	2379.681	<.001	.900	2379.681	1.000
Sex	.294	1	.294	.082	.775	.000	.082	.059
Group	.607	1	.607	.170	.681	.001	.170	.070
Sex * Group	12.413	1	12.413	3.472	.064	.013	3.472	.459
Error	947.379	265	3.575					

a. Computed using alpha = .05

4. Time

Estimates

Measure: MEASURE_1

Time	Mean	Std. Error	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
1	3.370	.070	3.233	3.507
2	3.296	.077	3.145	3.447
3	3.182	.080	3.025	3.339

Pairwise Comparisons

Measure: MEASURE_1

(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b] Lower Bound	Upper Bound
1	2	.074	.054	.504	-.055	.204
	3	.188*	.065	.012	.032	.344
2	1	-.074	.054	.504	-.204	.055
	3	.114	.059	.166	-.028	.256
3	1	-.188*	.065	.012	-.344	-.032
	2	-.114	.059	.166	-.256	.028

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

8. Sex * Group Allocation * Time

Measure: MEASURE_1

Sex	Group Allocation	Time	Mean	Std. Error	95% Confidence Interval Lower Bound	Upper Bound
Male	Intervention	1	3.151	.143	2.868	3.433
		2	3.204	.158	2.893	3.516
		3	3.142	.164	2.819	3.466
	Control	1	3.531	.154	3.229	3.833
		2	3.352	.169	3.018	3.685
		3	3.201	.176	2.854	3.548
Female	Intervention	1	3.583	.128	3.332	3.835
		2	3.434	.141	3.156	3.711
		3	3.348	.147	3.060	3.637
	Control	1	3.216	.130	2.959	3.472
		2	3.193	.144	2.910	3.476
		3	3.038	.149	2.743	3.332

Appearance Conversations

```
GLM AppConv_T1 AppConv_T2 AppConv_T3 BY Sex Group
  /WSFACTOR=Time 3 Polynomial
  /METHOD=SSTYPE(3)
  /SAVE=RESID COOK LEVER
  /PLOT=PROFILE(Time*Group Time*Sex) TYPE=LINE ERRORBAR=CI
MEANREFERENCE=NO YAXIS=AUTO
  /EMMEANS=TABLES(OVERALL)
  /EMMEANS=TABLES(Sex) COMPARE ADJ(BONFERRONI)
```

```
/EMMEANS=TABLES(Group)  COMPARE ADJ(BONFERRONI)

/EMMEANS=TABLES(Time)  COMPARE ADJ(BONFERRONI)

/EMMEANS=TABLES(Sex*Group)

/EMMEANS=TABLES(Sex*Time)

/EMMEANS=TABLES(Group*Time)

/EMMEANS=TABLES(Sex*Group*Time)

/PRINT=DESCRIPTIVE ETASQ OPOWER HOMOGENEITY

/CRITERIA=ALPHA(.05)

/WSDESIGN=Time

/DESIGN=Sex Group Sex*Group.
```

Within-Subjects Factors

Measure: MEASURE_1

Time	Dependent Variable
1	AppConv_T1
2	AppConv_T2
3	AppConv_T3

Between-Subjects Factors

		Value Label	N
Sex	1	Male	116
	2	Female	153
Group Allocation	1	Intervention	140
	2	Control	129

Descriptive Statistics

	Sex	Group Allocation	Mean	Std. Deviation	N
AppConv_T1	Male	Intervention	1.7258	.88131	62
		Control	1.7704	.85067	54
		Total	1.7466	.86371	116
	Female	Intervention	2.4744	1.05983	78
		Control	2.5147	1.12954	75
		Total	2.4941	1.09113	153
	Total	Intervention	2.1429	1.04992	140
		Control	2.2031	1.08310	129
		Total	2.1717	1.06439	269
AppConv_T2	Male	Intervention	1.5581	.67764	62
		Control	1.5889	.68341	54
		Total	1.5724	.67754	116
	Female	Intervention	2.4205	1.00316	78
		Control	2.3973	1.15665	75
		Total	2.4092	1.07760	153
	Total	Intervention	2.0386	.97151	140
		Control	2.0589	1.06166	129
		Total	2.0483	1.01388	269
AppConv_T3	Male	Intervention	1.8129	.92106	62
		Control	1.6815	.84543	54
		Total	1.7517	.88529	116
	Female	Intervention	2.4385	.98669	78
		Control	2.4347	1.14059	75
		Total	2.4366	1.06139	153
	Total	Intervention	2.1614	1.00442	140
		Control	2.1194	1.08959	129
		Total	2.1413	1.04437	269

Box's Test of Equality of Covariance Matrices[a]

Box's M	43.085
F	2.343
df1	18
df2	208703.048
Sig.	.001

Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

Mauchly's Test of Sphericity[a]

Measure: MEASURE_1

Within Subjects Effect	Mauchly's W	Approx. Chi-Square	df	Sig.	Epsilon[b] Greenhouse-Geisser	Huynh-Feldt	Lower-bound
Time	.969	8.290	2	.016	.970	.988	.500

Tests the null hypothesis that the error covariance matrix of the orthonormalized transformed dependent variables is proportional to an identity matrix.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

b. May be used to adjust the degrees of freedom for the averaged tests of significance. Corrected tests are displayed in the Tests of Within-Subjects Effects table.

Tests of Within-Subjects Effects

Measure: MEASURE_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Time	Sphericity Assumed	2.450	2	1.225	3.945	.020	.015	7.890	.709
	Greenhouse-Geisser	2.450	1.940	1.263	3.945	.021	.015	7.653	.699
	Huynh-Feldt	2.450	1.976	1.240	3.945	.020	.015	7.796	.705
	Lower-bound	2.450	1.000	2.450	3.945	.048	.015	3.945	.508
Time * Sex	Sphericity Assumed	.713	2	.357	1.148	.318	.004	2.297	.253
	Greenhouse-Geisser	.713	1.940	.368	1.148	.317	.004	2.228	.249
	Huynh-Feldt	.713	1.976	.361	1.148	.318	.004	2.269	.251
	Lower-bound	.713	1.000	.713	1.148	.285	.004	1.148	.187
Time * Group	Sphericity Assumed	.410	2	.205	.660	.517	.002	1.321	.161
	Greenhouse-Geisser	.410	1.940	.211	.660	.513	.002	1.281	.159
	Huynh-Feldt	.410	1.976	.208	.660	.515	.002	1.305	.160
	Lower-bound	.410	1.000	.410	.660	.417	.002	.660	.128
Time * Sex * Group	Sphericity Assumed	.290	2	.145	.467	.627	.002	.933	.126
	Greenhouse-Geisser	.290	1.940	.149	.467	.621	.002	.905	.125
	Huynh-Feldt	.290	1.976	.147	.467	.625	.002	.922	.126
	Lower-bound	.290	1.000	.290	.467	.495	.002	.467	.105
Error(Time)	Sphericity Assumed	164.561	530	.310					
	Greenhouse-Geisser	164.561	514.107	.320					
	Huynh-Feldt	164.561	523.701	.314					
	Lower-bound	164.561	265.000	.621					

a. Computed using alpha = .05

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
AppConv_T1	Based on Mean	5.204	3	265	.002
	Based on Median	4.389	3	265	.005
	Based on Median and with adjusted df	4.389	3	263.744	.005
	Based on trimmed mean	5.230	3	265	.002
AppConv_T2	Based on Mean	13.096	3	265	<.001
	Based on Median	11.986	3	265	<.001
	Based on Median and with adjusted df	11.986	3	247.916	<.001
	Based on trimmed mean	13.123	3	265	<.001
AppConv_T3	Based on Mean	2.502	3	265	.060
	Based on Median	2.735	3	265	.044
	Based on Median and with adjusted df	2.735	3	259.930	.044
	Based on trimmed mean	2.756	3	265	.043

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Sex + Group + Sex * Group
Within Subjects Design: Time

Tests of Between-Subjects Effects

Measure: MEASURE_1
Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Intercept	3376.617	1	3376.617	1511.008	<.001	.851	1511.008	1.000
Sex	113.123	1	113.123	50.622	<.001	.160	50.622	1.000
Group	.010	1	.010	.004	.947	.000	.004	.051
Sex * Group	.026	1	.026	.012	.914	.000	.012	.051
Error	592.190	265	2.235					

a. Computed using alpha = .05

2. Sex

Estimates

Measure: MEASURE_1

Sex	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
Male	1.690	.080	1.531	1.848
Female	2.447	.070	2.309	2.584

Pairwise Comparisons

Measure: MEASURE_1

(I) Sex	(J) Sex	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
Male	Female	-.757*	.106	<.001	-.967	-.548
Female	Male	.757*	.106	<.001	.548	.967

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

Univariate Tests

Measure: MEASURE_1

	Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power[a]
Contrast	37.708	1	37.708	50.622	<.001	.160	50.622	1.000
Error	197.397	265	.745					

The F tests the effect of Sex. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

a. Computed using alpha = .05

4. Time

Estimates

Measure: MEASURE_1

Time	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
1	2.121	.062	2.000	2.243
2	1.991	.057	1.878	2.104
3	2.092	.061	1.971	2.212

Pairwise Comparisons

Measure: MEASURE_1

(I) Time	(J) Time	Mean Difference (I-J)	Std. Error	Sig.[b]	95% Confidence Interval for Difference[b]	
					Lower Bound	Upper Bound
1	2	.130*	.047	.017	.018	.242
	3	.029	.053	1.000	-.097	.156
2	1	-.130*	.047	.017	-.242	-.018
	3	-.101	.046	.090	-.212	.011
3	1	-.029	.053	1.000	-.156	.097
	2	.101	.046	.090	-.011	.212

Based on estimated marginal means

*. The mean difference is significant at the .05 level.

b. Adjustment for multiple comparisons: Bonferroni.

8. Sex * Group Allocation * Time

Measure: MEASURE_1

Sex	Group Allocation	Time	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	Intervention	1	1.726	.127	1.475	1.977
		2	1.558	.118	1.325	1.791
		3	1.813	.126	1.565	2.061
	Control	1	1.770	.137	1.502	2.039
		2	1.589	.127	1.340	1.838
		3	1.681	.135	1.416	1.947
Female	Intervention	1	2.474	.114	2.251	2.698
		2	2.421	.105	2.213	2.628
		3	2.438	.112	2.217	2.660
	Control	1	2.515	.116	2.287	2.743
		2	2.397	.107	2.186	2.609
		3	2.435	.115	2.209	2.660

Appendix J. Study 2 Syntax and Output

```
DATASET ACTIVATE DataSet1.
T-TEST GROUPS=Gender(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=AV_T1_BODY_APPRECIATION AV_T1_SELFESTEEM AV_T1_RESILIENCE
AV_T1_POSTIVE_AFFECT
  /ES DISPLAY(TRUE)
  /CRITERIA=CI(.95).


DESCRIPTIVES VARIABLES=AV_T1_BODY_APPRECIATION AV_T1_SELFESTEEM
AV_T1_RESILIENCE
 AV_T1_POSTIVE_AFFECT
  /STATISTICS=MEAN  STDDEV MIN MAX KURTOSIS SKEWNESS.


REGRESSION
  /DESCRIPTIVES MEAN STDDEV CORR SIG N
  /MISSING LISTWISE
  /STATISTICS COEFF OUTS R ANOVA COLLIN TOL CHANGE ZPP
  /CRITERIA=PIN(.05) POUT(.10)
  /NOORIGIN
  /DEPENDENT AV_T1_BODY_APPRECIATION
  /METHOD=ENTER AV_T1_SELFESTEEM
  /METHOD=ENTER AV_T1_RESILIENCE
  /METHOD=ENTER AV_T1_POSTIVE_AFFECT
  /SCATTERPLOT=(*ZPRED ,*ZRESID)
  /RESIDUALS DURBIN HISTOGRAM(ZRESID) NORMPROB(ZRESID)
  /SAVE MAHAL COOK.
```

Output

Descriptive Statistics

GENDER		Mean	Std. Deviation	N
Male	AV_T1_BODY_APPRECIATION	3.8494	.87512	158
	AV_T1_SELFESTEEM	2.9424	.51947	158
	AV_T1_RESILIENCE	3.8982	.60332	158
	AV_T1_POSTIVE_AFFECT	3.6747	.80618	158
Female	AV_T1_BODY_APPRECIATION	3.5503	.95624	193
	AV_T1_SELFESTEEM	2.7352	.62132	193
	AV_T1_RESILIENCE	3.9927	.59498	193
	AV_T1_POSTIVE_AFFECT	3.6145	.90703	193

Correlations

GENDER			AV_T1_BODY_APPRECIATION	AV_T1_SELFESTEEM	AV_T1_RESILIENCE	AV_T1_POSTIVE_AFFECT
Male	Pearson Correlation	AV_T1_BODY_APPRECIATION	1.000	.635	.530	.535
		AV_T1_SELFESTEEM	.635	1.000	.569	.509
		AV_T1_RESILIENCE	.530	.569	1.000	.557
		AV_T1_POSTIVE_AFFECT	.535	.509	.557	1.000
	Sig. (1-tailed)	AV_T1_BODY_APPRECIATION	.	<.001	<.001	<.001
		AV_T1_SELFESTEEM	.000	.	.000	.000
		AV_T1_RESILIENCE	.000	.000	.	.000
		AV_T1_POSTIVE_AFFECT	.000	.000	.000	.
	N	AV_T1_BODY_APPRECIATION	158	158	158	158
		AV_T1_SELFESTEEM	158	158	158	158
		AV_T1_RESILIENCE	158	158	158	158
		AV_T1_POSTIVE_AFFECT	158	158	158	158
Female	Pearson Correlation	AV_T1_BODY_APPRECIATION	1.000	.815	.634	.551
		AV_T1_SELFESTEEM	.815	1.000	.652	.630
		AV_T1_RESILIENCE	.634	.652	1.000	.651
		AV_T1_POSTIVE_AFFECT	.551	.630	.651	1.000
	Sig. (1-tailed)	AV_T1_BODY_APPRECIATION	.	<.001	<.001	<.001
		AV_T1_SELFESTEEM	.000	.	.000	.000
		AV_T1_RESILIENCE	.000	.000	.	.000
		AV_T1_POSTIVE_AFFECT	.000	.000	.000	.
	N	AV_T1_BODY_APPRECIATION	193	193	193	193
		AV_T1_SELFESTEEM	193	193	193	193
		AV_T1_RESILIENCE	193	193	193	193
		AV_T1_POSTIVE_AFFECT	193	193	193	193

Variables Entered/Removed[a]

GENDER	Model	Variables Entered	Variables Removed	Method
Male	1	AV_T1_SELFESTEEM[b]	.	Enter
	2	AV_T1_RESILIENCE[b]	.	Enter
	3	AV_T1_POSTIVE_AFFECT[b]	.	Enter
Female	1	AV_T1_SELFESTEEM[b]	.	Enter
	2	AV_T1_RESILIENCE[b]	.	Enter
	3	AV_T1_POSTIVE_AFFECT[b]	.	Enter

a. Dependent Variable: AV_T1_BODY_APPRECIATION

b. All requested variables entered.

Model Summary[d]

GENDER	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
						R Square Change	F Change	df1	df2	Sig. F Change	
Male	1	.635[a]	.403	.400	.67812	.403	105.471	1	156	<.001	
	2	.667[b]	.445	.438	.65608	.042	11.654	1	155	<.001	
	3	.692[c]	.478	.468	.63827	.033	9.774	1	154	.002	1.958
Female	1	.815[a]	.665	.663	.55498	.665	379.006	1	191	<.001	
	2	.826[b]	.683	.680	.54121	.018	10.842	1	190	.001	
	3	.826[c]	.683	.678	.54258	.000	.038	1	189	.846	2.093

a. Predictors: (Constant), AV_T1_SELFESTEEM

b. Predictors: (Constant), AV_T1_SELFESTEEM, AV_T1_RESILIENCE

c. Predictors: (Constant), AV_T1_SELFESTEEM, AV_T1_RESILIENCE, AV_T1_POSTIVE_AFFECT

d. Dependent Variable: AV_T1_BODY_APPRECIATION

ANOVA[a]

GENDER	Model		Sum of Squares	df	Mean Square	F	Sig.
Male	1	Regression	48.500	1	48.500	105.471	<.001[b]
		Residual	71.735	156	.460		
		Total	120.235	157			
	2	Regression	53.516	2	26.758	62.164	<.001[c]
		Residual	66.719	155	.430		
		Total	120.235	157			
	3	Regression	57.498	3	19.166	47.046	<.001[d]
		Residual	62.737	154	.407		
		Total	120.235	157			
Female	1	Regression	116.734	1	116.734	379.006	<.001[b]
		Residual	58.828	191	.308		
		Total	175.562	192			
	2	Regression	119.910	2	59.955	204.689	<.001[c]
		Residual	55.652	190	.293		
		Total	175.562	192			
	3	Regression	119.921	3	39.974	135.781	<.001[d]
		Residual	55.641	189	.294		
		Total	175.562	192			

a. Dependent Variable: AV_T1_BODY_APPRECIATION

b. Predictors: (Constant), AV_T1_SELFESTEEM

c. Predictors: (Constant), AV_T1_SELFESTEEM, AV_T1_RESILIENCE

d. Predictors: (Constant), AV_T1_SELFESTEEM, AV_T1_RESILIENCE, AV_T1_POSTIVE_AFFECT

Coefficients[a]

GENDER	Model		Unstandardized Coefficients		Standardized Coefficients			Correlations			Collinearity Statistics	
			B	Std. Error	Beta	t	Sig.	Zero-order	Partial	Part	Tolerance	VIF
Male	1	(Constant)	.701	.311		2.253	.026					
		AV_T1_SELFESTEEM	1.070	.104	.635	10.270	<.001	.635	.635	.635	1.000	1.000
	2	(Constant)	-.003	.365		-.007	.995					
		AV_T1_SELFESTEEM	.832	.123	.494	6.783	<.001	.635	.478	.406	.676	1.480
		AV_T1_RESILIENCE	.360	.106	.248	3.414	<.001	.530	.264	.204	.676	1.480
	3	(Constant)	-.082	.356		-.230	.819					
		AV_T1_SELFESTEEM	.722	.124	.429	5.813	<.001	.635	.424	.338	.622	1.607
		AV_T1_RESILIENCE	.230	.111	.158	2.070	.040	.530	.165	.120	.580	1.725
		AV_T1_POSTIVE_AFFECT	.248	.079	.228	3.126	.002	.535	.244	.182	.636	1.574
Female	1	(Constant)	.118	.181		.651	.516					
		AV_T1_SELFESTEEM	1.255	.064	.815	19.468	<.001	.815	.815	.815	1.000	1.000
	2	(Constant)	-.534	.265		-2.014	.045					
		AV_T1_SELFESTEEM	1.077	.083	.700	12.993	<.001	.815	.686	.531	.575	1.739
		AV_T1_RESILIENCE	.285	.087	.177	3.293	.001	.634	.232	.134	.575	1.739
	3	(Constant)	-.538	.267		-2.018	.045					
		AV_T1_SELFESTEEM	1.083	.089	.704	12.173	<.001	.815	.663	.498	.502	1.994
		AV_T1_RESILIENCE	.293	.095	.182	3.078	.002	.634	.218	.126	.479	2.086
		AV_T1_POSTIVE_AFFECT	-.012	.061	-.011	-.195	.846	.551	-.014	-.008	.503	1.990

a. Dependent Variable: AV_T1_BODY_APPRECIATION

Excluded Variables[a]

GENDER	Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics: Tolerance	VIF	Minimum Tolerance
Male	1	AV_T1_RESILIENCE	.248[b]	3.414	<.001	.264	.676	1.480	.676
		AV_T1_POSTIVE_AFFECT	.285[b]	4.175	<.001	.318	.741	1.349	.741
	2	AV_T1_POSTIVE_AFFECT	.228[c]	3.126	.002	.244	.636	1.574	.580
Female	1	AV_T1_RESILIENCE	.177[b]	3.293	.001	.232	.575	1.739	.575
		AV_T1_POSTIVE_AFFECT	.061[b]	1.137	.257	.082	.603	1.659	.603
	2	AV_T1_POSTIVE_AFFECT	-.011[c]	-.195	.846	-.014	.503	1.990	.479

a. Dependent Variable: AV_T1_BODY_APPRECIATION

b. Predictors in the Model: (Constant), AV_T1_SELFESTEEM

c. Predictors in the Model: (Constant), AV_T1_SELFESTEEM, AV_T1_RESILIENCE

Collinearity Diagnostics[a]

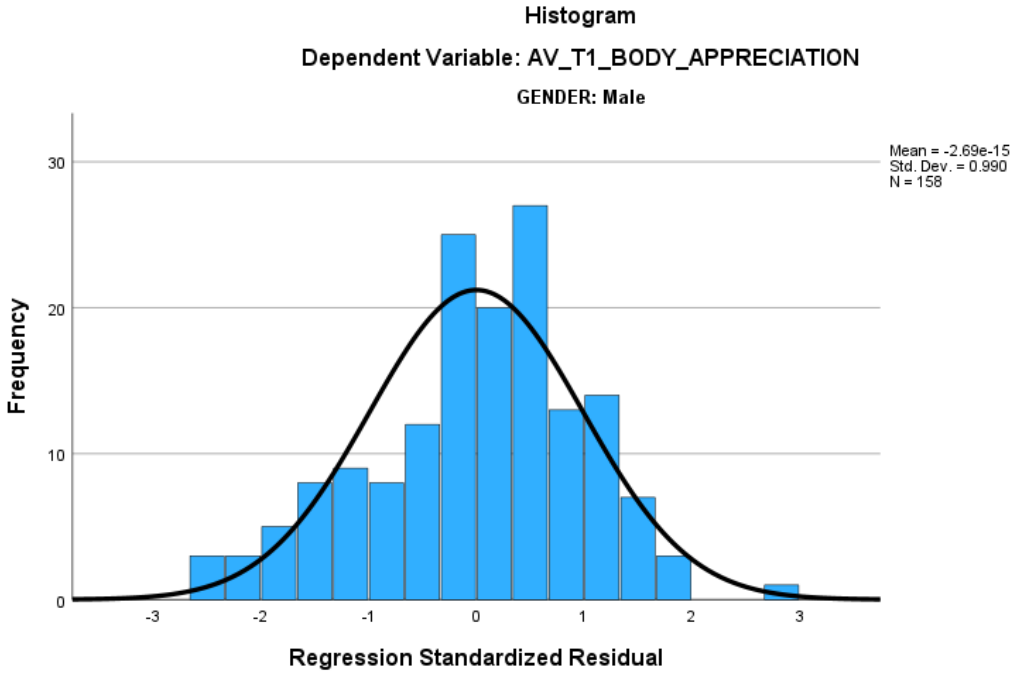
GENDER	Model	Dimension	Eigenvalue	Condition Index	Variance Proportions: (Constant)	AV_T1_SELFESTEEM	AV_T1_RESILIENCE	AV_T1_POSTIVE_AFFECT
Male	1	1	1.985	1.000	.01	.01		
		2	.015	11.452	.99	.99		
	2	1	2.974	1.000	.00	.00	.00	
		2	.015	14.019	.68	.66	.00	
		3	.010	16.843	.31	.34	1.00	
	3	1	3.952	1.000	.00	.00	.00	.00
		2	.024	12.835	.24	.02	.01	.82
		3	.015	16.507	.43	.84	.00	.09
		4	.010	19.918	.33	.14	.99	.09
Female	1	1	1.975	1.000	.01	.01		
		2	.025	8.939	.99	.99		
	2	1	2.967	1.000	.00	.00	.00	
		2	.025	10.908	.37	.63	.00	
		3	.008	19.016	.62	.36	.99	
	3	1	3.942	1.000	.00	.00	.00	.00
		2	.032	11.144	.34	.05	.01	.37
		3	.019	14.305	.04	.81	.00	.49
		4	.007	22.982	.62	.13	.99	.14

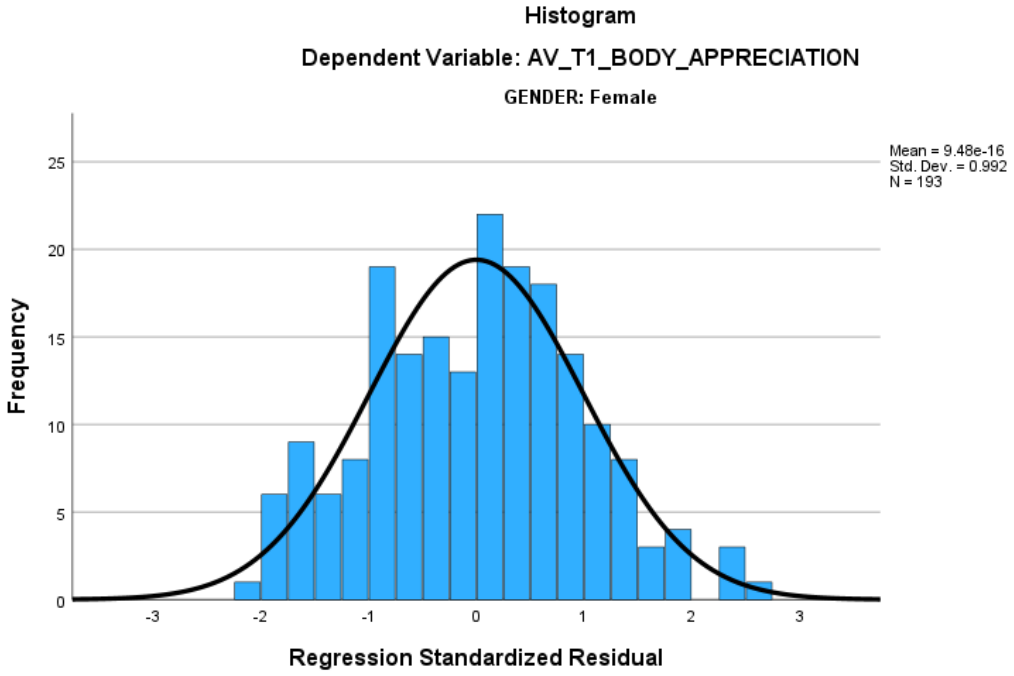
a. Dependent Variable: AV_T1_BODY_APPRECIATION

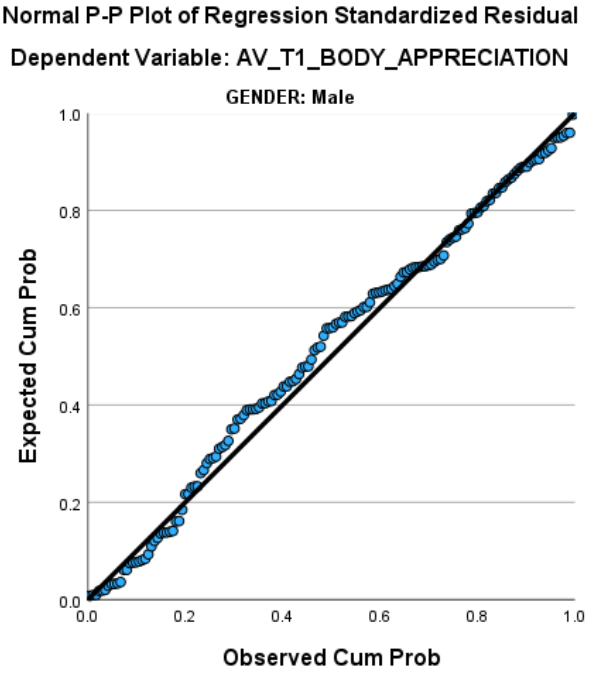
Residuals Statistics[a]

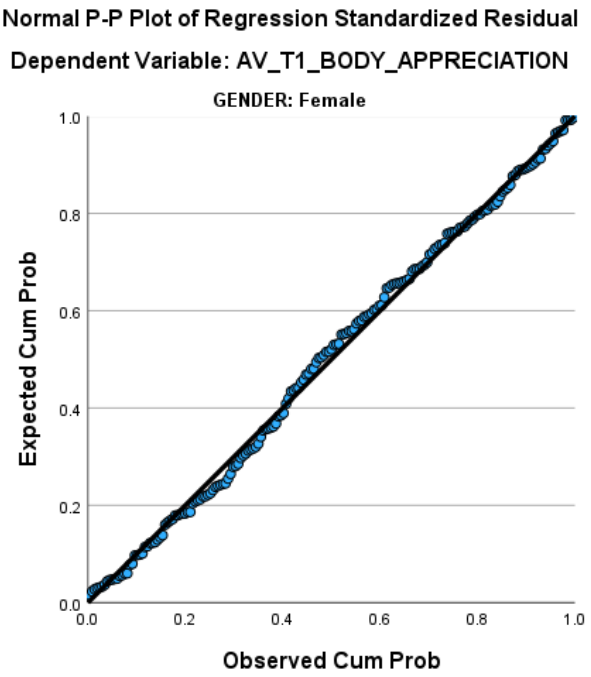
GENDER		Minimum	Maximum	Mean	Std. Deviation	N
Male	Predicted Value	2.2045	5.1565	3.8494	.60517	158
	Std. Predicted Value	-2.718	2.160	.000	1.000	158
	Standard Error of Predicted Value	.051	.182	.097	.030	158
	Adjusted Predicted Value	2.2633	5.1624	3.8503	.60430	158
	Residual	-1.54936	1.74806	.00000	.63214	158
	Std. Residual	-2.427	2.739	.000	.990	158
	Stud. Residual	-2.460	2.772	-.001	1.005	158
	Deleted Residual	-1.63810	1.79125	-.00093	.65100	158
	Stud. Deleted Residual	-2.501	2.835	-.002	1.011	158
	Mahal. Distance	.013	11.811	2.981	2.553	158
	Cook's Distance	.000	.134	.008	.015	158
	Centered Leverage Value	.000	.075	.019	.016	158
Female	Predicted Value	1.5160	5.1986	3.5503	.79031	193
	Std. Predicted Value	-2.574	2.086	.000	1.000	193
	Standard Error of Predicted Value	.040	.131	.075	.021	193
	Adjusted Predicted Value	1.5339	5.2274	3.5509	.79054	193
	Residual	-1.17610	1.46601	.00000	.53833	193
	Std. Residual	-2.168	2.702	.000	.992	193
	Stud. Residual	-2.215	2.753	-.001	1.004	193
	Deleted Residual	-1.22774	1.52219	-.00068	.55097	193
	Stud. Deleted Residual	-2.238	2.803	.000	1.008	193
	Mahal. Distance	.070	10.282	2.984	2.251	193
	Cook's Distance	.000	.083	.006	.011	193
	Centered Leverage Value	.000	.054	.016	.012	193

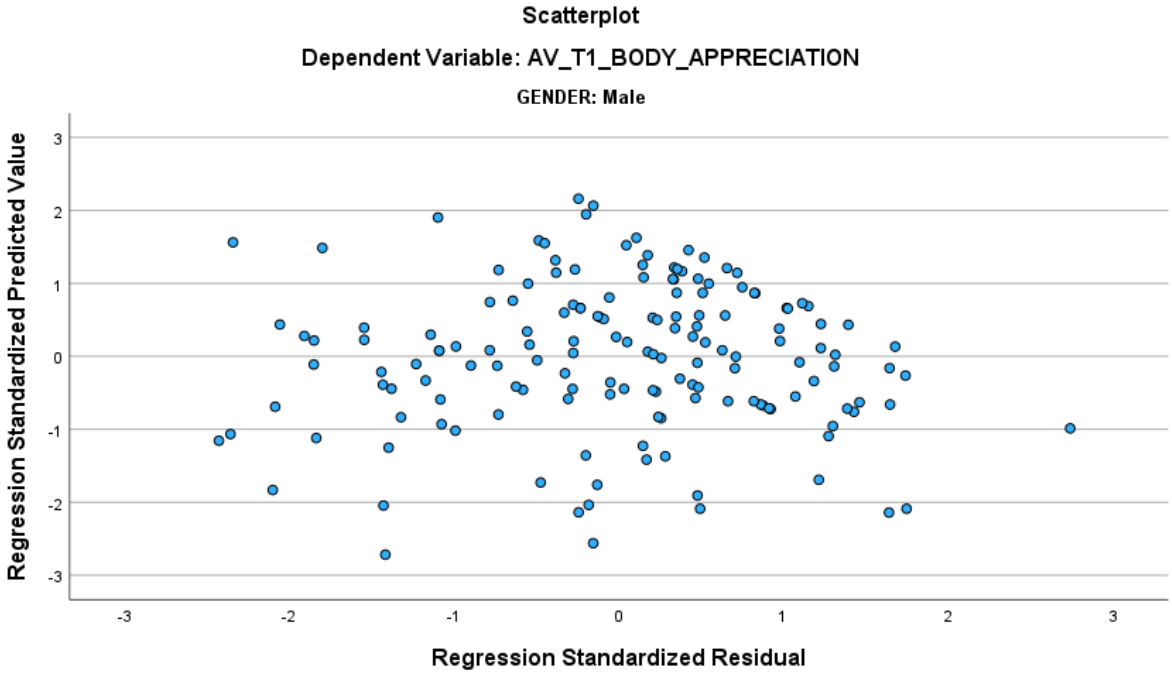
a. Dependent Variable: AV_T1_BODY_APPRECIATION

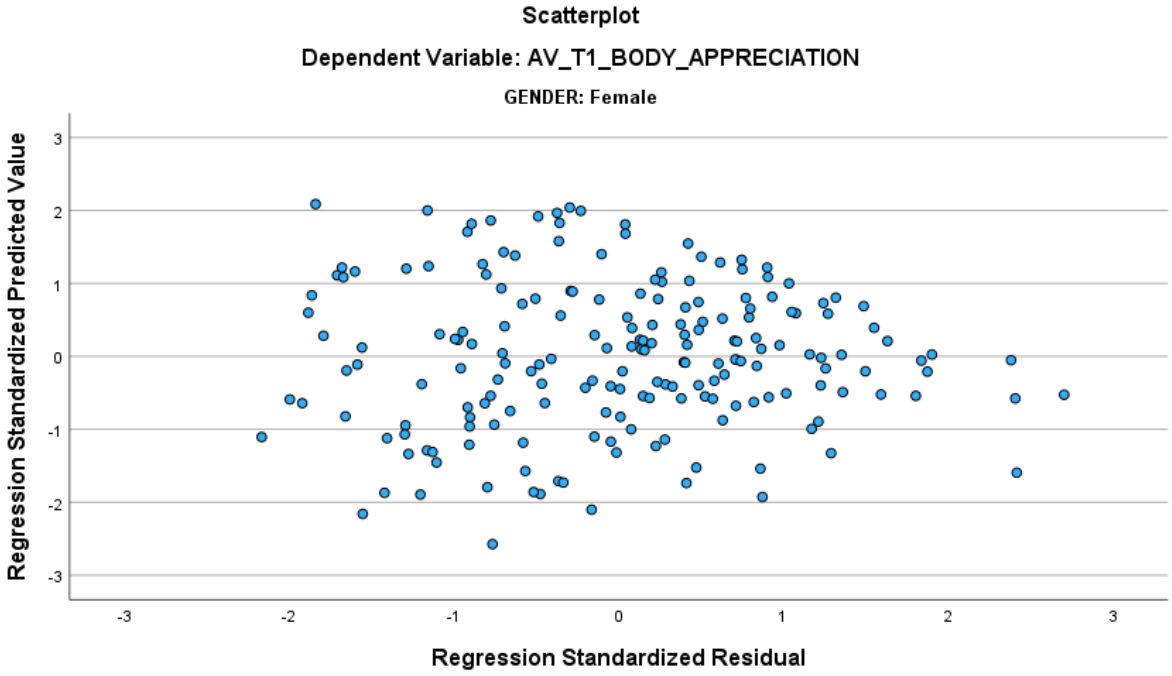

Histogram
Dependent Variable: AV_T1_BODY_APPRECIATION
GENDER: Male
Mean = -2.69e-15
Std. Dev. = 0.990
N = 158
Frequency
Regression Standardized Residual


Histogram
Dependent Variable: AV_T1_BODY_APPRECIATION
GENDER: Female
Mean = 9.48e-16
Std. Dev. = 0.992
N = 193
Frequency
Regression Standardized Residual


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: AV_T1_BODY_APPRECIATION
GENDER: Male
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Normal P-P Plot of Regression Standardized Residual
Dependent Variable: AV_T1_BODY_APPRECIATION
GENDER: Female
Expected Cum Prob
Observed Cum Prob
0.0
0.2
0.4
0.6
0.8
1.0


Scatterplot
Dependent Variable: AV_T1_BODY_APPRECIATION
GENDER: Male
Regression Standardized Predicted Value
Regression Standardized Residual
3
2
1
0
-1
-2
-3


Scatterplot
Dependent Variable: AV_T1_BODY_APPRECIATION
GENDER: Female
Regression Standardized Predicted Value
Regression Standardized Residual
3
2
1
0
-1
-2
-3

Group Statistics

	GENDER	N	Mean	Std. Deviation	Std. Error Mean
AV_T1_BODY_APPRECIATION	Male	160	3.8488	.87026	.06880
	Female	193	3.5503	.95624	.06883
AV_T1_RESILIENCE	Male	160	3.8990	.59972	.04741
	Female	193	3.9927	.59498	.04283
AV_T1_POSTIVE_AFFECT	Male	159	3.6767	.80404	.06376
	Female	193	3.6145	.90703	.06529
AV_T1_SELFESTEEM	Male	159	2.9428	.51784	.04107
	Female	193	2.7352	.62132	.04472

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
						Significance				95% Confidence Interval of the Difference
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
AV_T1_BODY_APPRECIATION	Equal variances assumed	1.879	.171	3.040	351	.001	.003	.29849	.09818	.10539	.49159
	Equal variances not assumed			3.067	347.927	.001	.002	.29849	.09732	.10708	.48990
AV_T1_RESILIENCE	Equal variances assumed	.025	.874	-1.468	351	.072	.143	-.09370	.06384	-.21927	.03186
	Equal variances not assumed			-1.467	337.987	.072	.143	-.09370	.06389	-.21938	.03197
AV_T1_POSTIVE_AFFECT	Equal variances assumed	3.207	.074	.674	350	.250	.501	.06222	.09233	-.11937	.24381
	Equal variances not assumed			.682	348.101	.248	.496	.06222	.09126	-.11727	.24171
AV_T1_SELFESTEEM	Equal variances assumed	5.983	.015	3.359	350	<.001	<.001	.20753	.06179	.08601	.32906
	Equal variances not assumed			3.418	349.949	<.001	<.001	.20753	.06072	.08811	.32695

Independent Samples Effect Sizes

			95% Confidence Interval	
		Standardizer[a]	Point Estimate	Lower	Upper
AV_T1_BODY_APPRECIATION	Cohen's d	.91829	.325	.114	.536
	Hedges' correction	.92026	.324	.114	.535
	Glass's delta	.95624	.312	.100	.524
AV_T1_RESILIENCE	Cohen's d	.59713	-.157	-.367	.053
	Hedges' correction	.59841	-.157	-.366	.053
	Glass's delta	.59498	-.157	-.367	.053
AV_T1_POSTIVE_AFFECT	Cohen's d	.86206	.072	-.138	.282
	Hedges' correction	.86392	.072	-.138	.282
	Glass's delta	.90703	.069	-.142	.279
AV_T1_SELFESTEEM	Cohen's d	.57691	.360	.148	.571
	Hedges' correction	.57815	.359	.148	.570
	Glass's delta	.62132	.334	.121	.546

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control (i.e., the second) group.

Appendix K. Study 3 Syntax and Output

Final 7-Item EFA: Syntax and Output

```
FACTOR
  /VARIABLES ARSI_1 ARSI_2 SQRT_ARSI_3 SQRT_ARSI_5 ARSI_6 SQRT_ARSI_7
SQRT_ARSI_8
  /MISSING LISTWISE
  /ANALYSIS ARSI_1 ARSI_2 SQRT_ARSI_3 SQRT_ARSI_5 ARSI_6 SQRT_ARSI_7
SQRT_ARSI_8
  /PRINT UNIVARIATE INITIAL CORRELATION SIG DET KMO INV REPR AIC
EXTRACTION ROTATION
  /FORMAT SORT
  /PLOT EIGEN ROTATION
  /CRITERIA MINEIGEN(1) ITERATE(25)
  /EXTRACTION PAF
  /CRITERIA ITERATE(25)
  /ROTATION PROMAX(4)
  /METHOD=CORRELATION.
```

Descriptive Statistics

	Mean	Std. Deviation	Analysis N
ARSI_1	1.70	.910	186
ARSI_2	1.94	1.173	186
SQRT_ARSI_3	1.2203	.31853	186
SQRT_ARSI_5	1.2192	.34500	186
ARSI_6	1.58	.933	186
SQRT_ARSI_7	1.1694	.29184	186
SQRT_ARSI_8	1.1532	.27091	186

Correlation Matrix[a]

		ARSI_1	ARSI_2	SQRT_ARSI_3	SQRT_ARSI_5	ARSI_6	SQRT_ARSI_7	SQRT_ARSI_8
Correlation	ARSI_1	1.000	.537	.598	.472	.504	.532	.526
	ARSI_2	.537	1.000	.608	.628	.648	.536	.477
	SQRT_ARSI_3	.598	.608	1.000	.637	.621	.695	.670
	SQRT_ARSI_5	.472	.628	.637	1.000	.664	.645	.677
	ARSI_6	.504	.648	.621	.664	1.000	.713	.658
	SQRT_ARSI_7	.532	.536	.695	.645	.713	1.000	.735
	SQRT_ARSI_8	.526	.477	.670	.677	.658	.735	1.000
Sig. (1-tailed)	ARSI_1		<.001	<.001	<.001	<.001	<.001	<.001
	ARSI_2	.000		.000	.000	.000	.000	.000
	SQRT_ARSI_3	.000	.000		.000	.000	.000	.000
	SQRT_ARSI_5	.000	.000	.000		.000	.000	.000
	ARSI_6	.000	.000	.000	.000		.000	.000
	SQRT_ARSI_7	.000	.000	.000	.000	.000		.000
	SQRT_ARSI_8	.000	.000	.000	.000	.000	.000	

a. Determinant = .011

KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.901
Bartlett's Test of Sphericity	Approx. Chi-Square	826.951
	df	21
	Sig.	<.001

Communalities

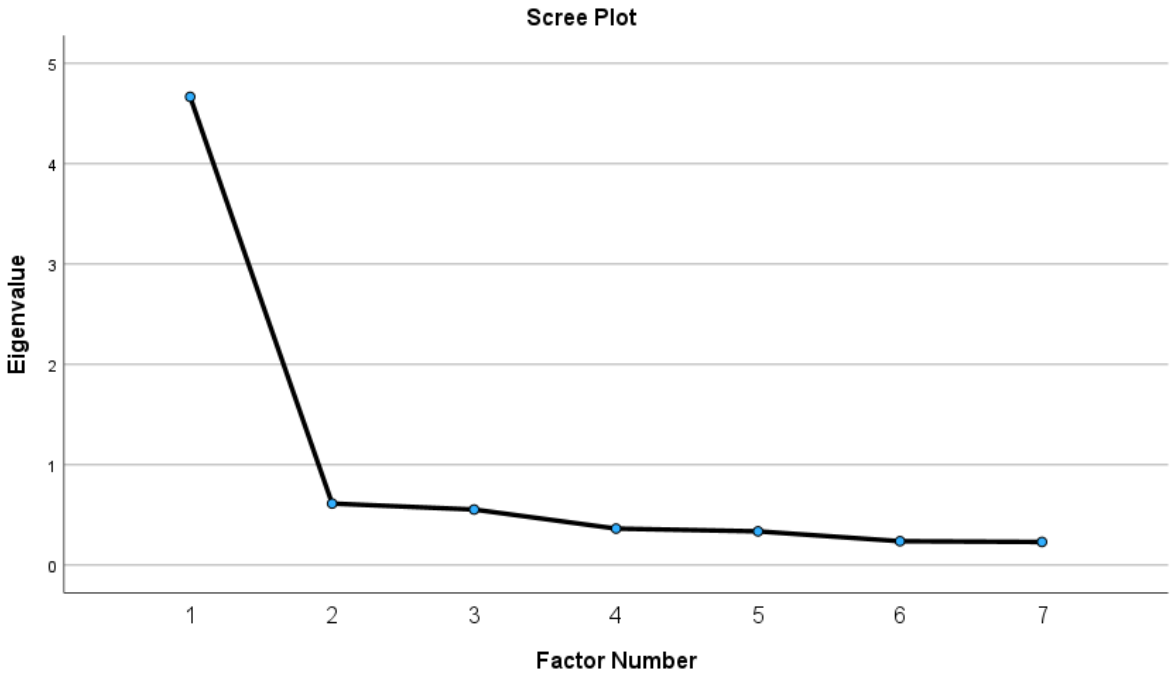
	Initial	Extraction
ARSI_1	.431	.433
ARSI_2	.558	.521
SQRT_ARSI_3	.627	.676
SQRT_ARSI_5	.608	.638
ARSI_6	.640	.673
SQRT_ARSI_7	.671	.698
SQRT_ARSI_8	.650	.651

Extraction Method: Principal Axis Factoring.

Total Variance Explained

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.666	66.656	66.656	4.291	61.294	61.294
2	.613	8.757	75.413			
3	.553	7.907	83.320			
4	.363	5.193	88.512			
5	.336	4.799	93.312			
6	.238	3.398	96.710			
7	.230	3.290	100.000			

Extraction Method: Principal Axis Factoring.



EFA – Males

Descriptive Statistics[a]

	Mean	Std. Deviation	Analysis N
ARSI_1	1.62	.877	91
ARSI_2	1.75	1.028	91
SQRT_ARSI_3	1.2287	.31694	91
SQRT_ARSI_5	1.2202	.34072	91
ARSI_6	1.58	.932	91
SQRT_ARSI_7	1.1882	.30984	91
SQRT_ARSI_8	1.1663	.26951	91

a. GENDER = Male

Correlation Matrix[a,b]

		ARSI_1	ARSI_2	SQRT_ARSI_3	SQRT_ARSI_5	ARSI_6	SQRT_ARSI_7	SQRT_ARSI_8
Correlation	ARSI_1	1.000	.485	.471	.457	.448	.463	.457
	ARSI_2	.485	1.000	.589	.642	.538	.548	.511
	SQRT_ARSI_3	.471	.589	1.000	.639	.548	.610	.648
	SQRT_ARSI_5	.457	.642	.639	1.000	.682	.607	.651
	ARSI_6	.448	.538	.548	.682	1.000	.666	.657
	SQRT_ARSI_7	.463	.548	.610	.607	.666	1.000	.698
	SQRT_ARSI_8	.457	.511	.648	.651	.657	.698	1.000
Sig. (1-tailed)	ARSI_1		<.001	<.001	<.001	<.001	<.001	<.001
	ARSI_2	.000		.000	.000	.000	.000	.000
	SQRT_ARSI_3	.000	.000		.000	.000	.000	.000
	SQRT_ARSI_5	.000	.000	.000		.000	.000	.000
	ARSI_6	.000	.000	.000	.000		.000	.000
	SQRT_ARSI_7	.000	.000	.000	.000	.000		.000
	SQRT_ARSI_8	.000	.000	.000	.000	.000	.000	

a. GENDER = Male

b. Determinant = .019

KMO and Bartlett's Test[a]

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.909
Bartlett's Test of Sphericity	Approx. Chi-Square	345.333
	df	21
	Sig.	<.001

a. GENDER = Male

Communalities[a]

	Initial	Extraction
ARSI_1	.324	.347
ARSI_2	.503	.518
SQRT_ARSI_3	.555	.598
SQRT_ARSI_5	.627	.675
ARSI_6	.590	.619
SQRT_ARSI_7	.598	.639
SQRT_ARSI_8	.619	.655

Extraction Method: Principal Axis Factoring.

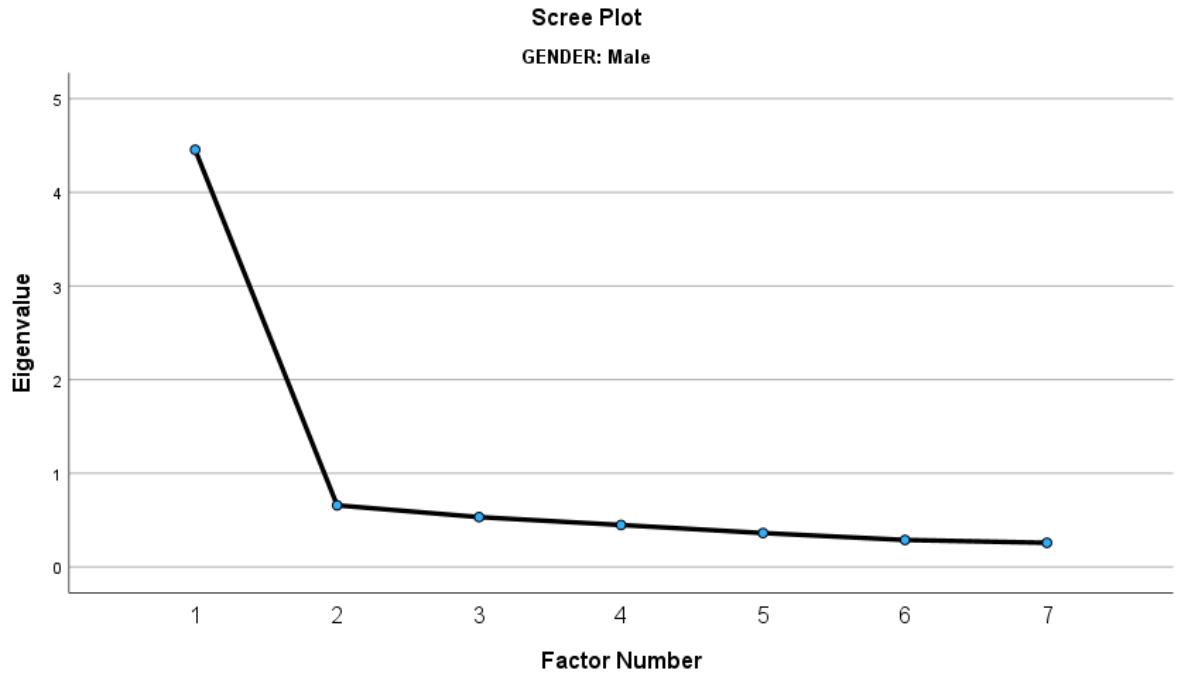
a. GENDER = Male

Total Variance Explained[a]

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.455	63.641	63.641	4.051	57.865	57.865
2	.658	9.396	73.037			
3	.532	7.604	80.640			
4	.448	6.398	87.038			
5	.362	5.168	92.207			
6	.288	4.113	96.319			
7	.258	3.681	100.000			

Extraction Method: Principal Axis Factoring.

a. GENDER = Male



Factor Matrix[a,b]

	Factor 1
SQRT_ARSI_5	.822
SQRT_ARSI_8	.809
SQRT_ARSI_7	.799
ARSI_6	.787
SQRT_ARSI_3	.773
ARSI_2	.720
ARSI_1	.589

Extraction Method: Principal Axis Factoring.

a. GENDER = Male

b. 1 factors extracted. 4 iterations required.

Reproduced Correlations[a]

		ARSI_1	ARSI_2	SQRT_ARSI_3	SQRT_ARSI_5	ARSI_6	SQRT_ARSI_7	SQRT_ARSI_8
Reproduced Correlation	ARSI_1	.347[b]	.424	.455	.484	.463	.471	.476
	ARSI_2	.424	.518[b]	.557	.592	.566	.575	.583
	SQRT_ARSI_3	.455	.557	.598[b]	.635	.608	.618	.626
	SQRT_ARSI_5	.484	.592	.635	.675[b]	.646	.657	.665
	ARSI_6	.463	.566	.608	.646	.619[b]	.629	.637
	SQRT_ARSI_7	.471	.575	.618	.657	.629	.639[b]	.647
	SQRT_ARSI_8	.476	.583	.626	.665	.637	.647	.655[b]
Residual[c]	ARSI_1		.061	.015	-.026	-.015	-.008	-.019
	ARSI_2	.061		.032	.050	-.028	-.028	-.072
	SQRT_ARSI_3	.015	.032		.003	-.060	-.008	.023
	SQRT_ARSI_5	-.026	.050	.003		.035	-.049	-.014
	ARSI_6	-.015	-.028	-.060	.035		.038	.021
	SQRT_ARSI_7	-.008	-.028	-.008	-.049	.038		.051
	SQRT_ARSI_8	-.019	-.072	.023	-.014	.021	.051	

Extraction Method: Principal Axis Factoring.

a. GENDER = Male

b. Reproduced communalities

c. Residuals are computed between observed and reproduced correlations. There are 5 (23.0%) nonredundant residuals with absolute values greater than 0.05.

EFA – Females

Descriptive Statistics[a]

	Mean	Std. Deviation	Analysis N
ARSI_1	1.77	.939	95
ARSI_2	2.12	1.275	95
SQRT_ARSI_3	1.2123	.32153	95
SQRT_ARSI_5	1.2182	.35085	95
ARSI_6	1.57	.940	95
SQRT_ARSI_7	1.1514	.27394	95
SQRT_ARSI_8	1.1406	.27309	95

a. GENDER = Female

Correlation Matrix[a,b]

		ARSI_1	ARSI_2	SQRT_ARSI_3	SQRT_ARSI_5	ARSI_6	SQRT_ARSI_7	SQRT_ARSI_8
Correlation	ARSI_1	1.000	.570	.719	.489	.557	.623	.599
	ARSI_2	.570	1.000	.650	.638	.755	.575	.481
	SQRT_ARSI_3	.719	.650	1.000	.635	.690	.789	.690
	SQRT_ARSI_5	.489	.638	.635	1.000	.647	.691	.703
	ARSI_6	.557	.755	.690	.647	1.000	.769	.660
	SQRT_ARSI_7	.623	.575	.789	.691	.769	1.000	.776
	SQRT_ARSI_8	.599	.481	.690	.703	.660	.776	1.000
Sig. (1-tailed)	ARSI_1		<.001	<.001	<.001	<.001	<.001	<.001
	ARSI_2	.000		.000	.000	.000	.000	.000
	SQRT_ARSI_3	.000	.000		.000	.000	.000	.000
	SQRT_ARSI_5	.000	.000	.000		.000	.000	.000
	ARSI_6	.000	.000	.000	.000		.000	.000
	SQRT_ARSI_7	.000	.000	.000	.000	.000		.000
	SQRT_ARSI_8	.000	.000	.000	.000	.000	.000	

a. GENDER = Female

b. Determinant = .003

KMO and Bartlett's Test[a]

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.858
Bartlett's Test of Sphericity	Approx. Chi-Square	515.771
	df	21
	Sig.	<.001

a. GENDER = Female

Communalities[a]

	Initial	Extraction
ARSI_1	.564	.520
ARSI_2	.686	.556
SQRT_ARSI_3	.734	.756
SQRT_ARSI_5	.632	.608
ARSI_6	.747	.717
SQRT_ARSI_7	.783	.788
SQRT_ARSI_8	.693	.652

Extraction Method: Principal Axis Factoring.

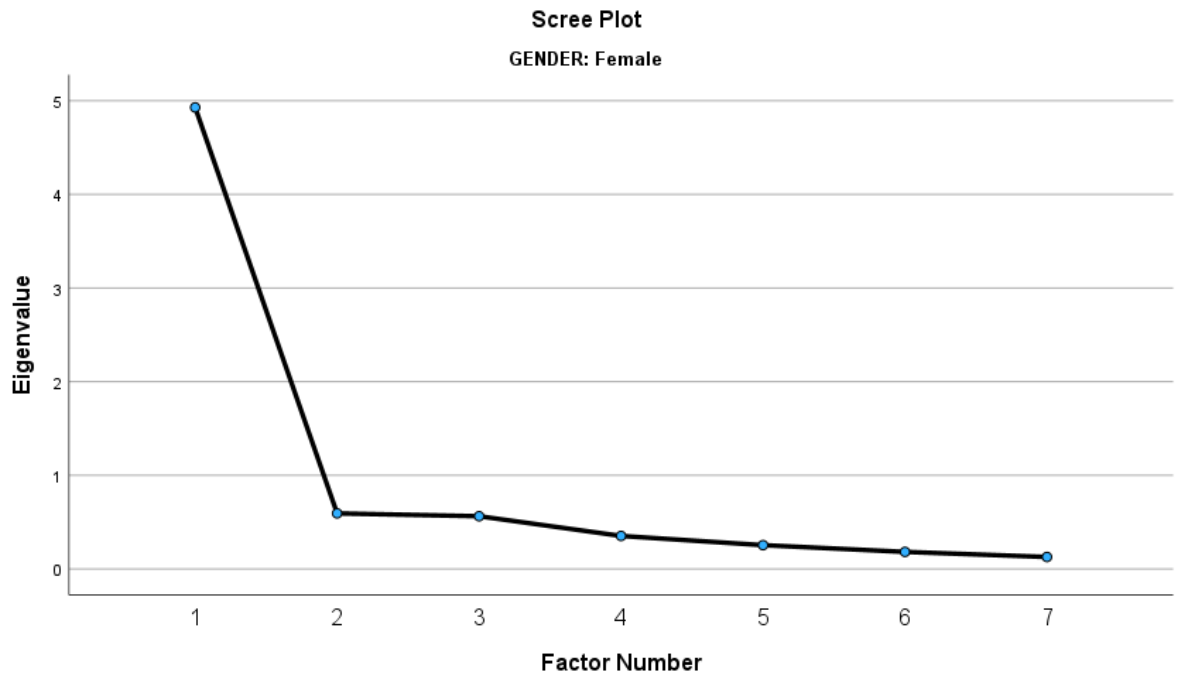
a. GENDER = Female

Total Variance Explained[a]

	Initial Eigenvalues			Extraction Sums of Squared Loadings		
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.928	70.402	70.402	4.596	65.663	65.663
2	.593	8.473	78.876			
3	.563	8.040	86.916			
4	.352	5.033	91.949			
5	.254	3.627	95.576			
6	.182	2.599	98.176			
7	.128	1.824	100.000			

Extraction Method: Principal Axis Factoring.

a. GENDER = Female



Factor Matrix[a,b]

	Factor 1
SQRT_ARSI_7	.888
SQRT_ARSI_3	.870
ARSI_6	.847
SQRT_ARSI_8	.808
SQRT_ARSI_5	.780
ARSI_2	.745
ARSI_1	.721

Extraction Method: Principal Axis Factoring.

a. GENDER = Female

b. 1 factors extracted. 5 iterations required.

Reproduced Correlations[a]

		ARSI_1	ARSI_2	SQRT_ARSI_3	SQRT_ARSI_5	ARSI_6	SQRT_ARSI_7	SQRT_ARSI_8
Reproduced Correlation	ARSI_1	.520[b]	.537	.627	.562	.610	.640	.582
	ARSI_2	.537	.556[b]	.648	.581	.631	.662	.602
	SQRT_ARSI_3	.627	.648	.756[b]	.678	.736	.772	.702
	SQRT_ARSI_5	.562	.581	.678	.608[b]	.660	.692	.630
	ARSI_6	.610	.631	.736	.660	.717[b]	.752	.684
	SQRT_ARSI_7	.640	.662	.772	.692	.752	.788[b]	.717
	SQRT_ARSI_8	.582	.602	.702	.630	.684	.717	.652[b]
Residual[c]	ARSI_1		.032	.092	-.073	-.053	-.017	.017
	ARSI_2	.032		.002	.057	.124	-.086	-.121
	SQRT_ARSI_3	.092	.002		-.042	-.047	.017	-.012
	SQRT_ARSI_5	-.073	.057	-.042		-.013	-.001	.073
	ARSI_6	-.053	.124	-.047	-.013		.018	-.024
	SQRT_ARSI_7	-.017	-.086	.017	-.001	.018		.059
	SQRT_ARSI_8	.017	-.121	-.012	.073	-.024	.059	

Extraction Method: Principal Axis Factoring.

a. GENDER = Female

b. Reproduced communalities

c. Residuals are computed between observed and reproduced correlations. There are 9 (42.0%) nonredundant residuals with absolute values greater than 0.05.

T-Test: Syntax and Output

```
DESCRIPTIVES VARIABLES=AV_TOTAL_ARSI_7ITEM
  /STATISTICS=MEAN STDDEV MIN MAX KURTOSIS SKEWNESS.
T-TEST GROUPS=Gender(1 2)
  /MISSING=ANALYSIS
  /VARIABLES=AV_TOTAL_ARSI_7ITEM
  /ES DISPLAY(TRUE)
  /CRITERIA=CI(.95).
```

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
TOTAL_ARSI_7ITEM	186	.97	2.96	1.4250	.49421	1.183	.178	.631	.355
Valid N (listwise)	186								

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
TOTAL_ARSI_7ITEM	91	1.00	2.88	1.3938	.46047	1.102	.253	.384	.500
Valid N (listwise)	91								

a. GENDER = Male

Descriptive Statistics[a]

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
TOTAL_ARSI_7ITEM	95	.97	2.96	1.4549	.52520	1.210	.247	.647	.490
Valid N (listwise)	95								

a. GENDER = Female

Group Statistics

	GENDER	N	Mean	Std. Deviation	Std. Error Mean
TOTAL_ARSI_7ITEM	Male	91	1.3938	.46047	.04827
	Female	95	1.4549	.52520	.05388

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
TOTAL_ARSI_7ITEM	Equal variances assumed	1.039	.309	-.842	184	.201	.401	-.06106	.07255	-.20419	.08208
	Equal variances not assumed			-.844	182.591	.200	.400	-.06106	.07234	-.20379	.08168

CFA

Descriptives

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
ARSI_TOTAL_AV	153	1.00	2.00	1.2219	.27967	1.204	.196	.233	.390
Valid N (listwise)	153								

T-Test

Group Statistics

	GENDER	N	Mean	Std. Deviation	Std. Error Mean
ARSI_TOTAL_AV	Male	66	1.1755	.27902	.03435
	Female	87	1.2571	.27656	.02965

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
ARSI_TOTAL_AV	Equal variances assumed	.219	.640	-1.802	151	.037	.074	-.08166	.04532	-.17120	.00787
	Equal variances not assumed			-1.800	139.449	.037	.074	-.08166	.04537	-.17137	.00804

Independent Samples Effect Sizes

		Standardizer[a]	Point Estimate	95% Confidence Interval	
				Lower	Upper
ARSI_TOTAL_AV	Cohen's d	.27762	-.294	-.615	.028
	Hedges' correction	.27901	-.293	-.612	.028
	Glass's delta	.27656	-.295	-.617	.029

a. The denominator used in estimating the effect sizes.
Cohen's d uses the pooled standard deviation.
Hedges' correction uses the pooled standard deviation, plus a correction factor.
Glass's delta uses the sample standard deviation of the control (i.e., the second) group.

Reliability: Syntax and Output

Reliability Analysis

```
RELIABILITY
  /VARIABLES=ARSI_1 ARSI_2 SQRT_ARSI_3 SQRT_ARSI_5 ARSI_6 SQRT_ARSI_7
SQRT_ARSI_8
  /SCALE('ALL VARIABLES') ALL
  /MODEL=ALPHA
  /STATISTICS=DESCRIPTIVE  SCALE CORR
  /SUMMARY=TOTAL MEANS CORR.
```

Case Processing Summary

		N	%
Cases	Valid	186	100.0
	Excluded[a]	0	.0
	Total	186	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.830	.916	7

Reliability Statistics[a]

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.821	.903	7

a. GENDER = Male

Reliability Statistics[a]

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.841	.929	7

a. GENDER = Female

Pearsons Correlations: Syntax and Output

```
  /VARIABLES=ARSI_7ITEM Resilience_av Positive_Affect_av Neg_Affect_av
Body_appreciation_av
    Self_esteem_av Appearance_conversations_av Thin_internalisation
Muscular_internalisation
    Social_comparison School_anxiety School_satisfaction
  /PRINT=TWOTAIL NOSIG LOWER
  /STATISTICS DESCRIPTIVES
  /MISSING=PAIRWISE.
```

Corrlations: Male

Correlations[a]

		SCHOOL INTERFERENCE	Resilience_av	Positive Affect	Negative Affect	Body_appreciation_av	Self_esteem_av	Appearance_conversations_av	Thin_internalisation	Muscular_internalisation	Social_comparison	School_anxiety	School_satisfaction
SCHOOL INTERFERENCE	Pearson Correlation	--											
	N	64											
Resilience_av	Pearson Correlation	-.199	--										
	Sig. (2-tailed)	.115											
	N	64	64										
Positive Affect	Pearson Correlation	-.108	.654**	--									
	Sig. (2-tailed)	.401	<.001										
	N	63	63	63									
Negative Affect	Pearson Correlation	.550**	-.473**	-.298*	--								
	Sig. (2-tailed)	<.001	<.001	.018									
	N	63	63	63	63								
Body_appreciation_av	Pearson Correlation	-.292*	.608**	.633**	-.424**	--							
	Sig. (2-tailed)	.019	<.001	<.001	<.001								
	N	64	64	63	63	64							
Self_esteem_av	Pearson Correlation	-.357**	.695**	.559**	-.654**	.692**	--						
	Sig. (2-tailed)	.004	<.001	<.001	<.001	<.001							
	N	63	63	62	62	63	63						
Appearance_conversations_av	Pearson Correlation	.497**	.112	.094	.224	-.015	-.038	--					
	Sig. (2-tailed)	<.001	.376	.465	.078	.908	.777						
	N	64	64	63	63	64	63	64					
Thin_internalisation	Pearson Correlation	.387**	-.275*	-.157	.369**	-.206	-.232	.416**	--				
	Sig. (2-tailed)	.002	.028	.220	.003	.102	.067	<.001					
	N	64	64	63	63	64	63	64	64				
Muscular_internalisation	Pearson Correlation	.315*	-.099	-.002	.163	-.054	-.024	.435**	.727**	--			
	Sig. (2-tailed)	.011	.436	.988	.201	.670	.849	<.001	<.001				
	N	64	64	63	63	64	63	64	64	64			
Social_comparison	Pearson Correlation	.544**	-.116	-.154	.383**	-.224	-.200	.633**	.489**	.557**	--		
	Sig. (2-tailed)	<.001	.361	.229	.002	.075	.115	<.001	<.001	<.001			
	N	64	64	63	63	64	63	64	64	64	64		
School_anxiety	Pearson Correlation	.253*	-.353**	-.367**	.348**	-.532**	-.438**	-.016	.150	-.026	.091	--	
	Sig. (2-tailed)	.044	.004	.003	.006	<.001	<.001	.901	.238	.837	.474		
	N	64	64	63	63	64	63	64	64	64	64	64	
School_satisfaction	Pearson Correlation	-.342**	.609**	.602**	-.425**	.594**	.493**	-.222	-.413**	-.263*	-.369**	-.382**	--
	Sig. (2-tailed)	.006	<.001	<.001	<.001	<.001	<.001	.081	<.001	.038	.003	.002	
	N	63	63	62	62	63	62	63	63	63	63	63	63

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
a. GENDER = Male

Correlations: Female

Correlations[a]

		SCHOOL INTERFERENCE	Resilience_av	Positive Affect	Negative Affect	Body_appreciation_av	Self_esteem_av	Appearance_conversations_av	Thin_internalisation	Muscular_internalisation	Social_comparison	School_anxiety	School_satisfaction
SCHOOL INTERFERENCE	Pearson Correlation	--											
	N	84											
Resilience_av	Pearson Correlation	-.469**	--										
	Sig. (2-tailed)	<.001											
	N	84	84										
Positive Affect	Pearson Correlation	-.332**	.681**	--									
	Sig. (2-tailed)	.002	<.001										
	N	84	84	84									
Negative Affect	Pearson Correlation	.374**	-.511**	-.565**	--								
	Sig. (2-tailed)	<.001	<.001	<.001									
	N	84	84	84	84								
Body_appreciation_av	Pearson Correlation	-.476**	.606**	.565**	-.579**	--							
	Sig. (2-tailed)	<.001	<.001	<.001	<.001								
	N	84	84	84	84	84							
Self_esteem_av	Pearson Correlation	-.485**	.688**	.599**	-.681**	.815**	--						
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001							
	N	84	84	84	84	84	84						
Appearance_conversations_av	Pearson Correlation	.419**	-.224*	-.116	.292**	-.289**	-.295**	--					
	Sig. (2-tailed)	<.001	.041	.295	.007	.008	.006						
	N	84	84	84	84	84	84	84					
Thin_internalisation	Pearson Correlation	.376**	-.156	-.155	.324**	-.427**	-.360**	.413**	--				
	Sig. (2-tailed)	<.001	.158	.160	.003	<.001	<.001	<.001					
	N	84	84	84	84	84	84	84	84				
Muscular_internalisation	Pearson Correlation	.129	-.007	-.002	.219*	-.060	-.148	.318**	.465**	--			
	Sig. (2-tailed)	.242	.950	.986	.046	.586	.178	.003	<.001				
	N	84	84	84	84	84	84	84	84	84			
Social_comparison	Pearson Correlation	.428**	-.326**	-.282**	.462**	-.542**	-.532**	.599**	.654**	.381**	--		
	Sig. (2-tailed)	<.001	.002	.009	<.001	<.001	<.001	<.001	<.001	<.001			
	N	84	84	84	84	84	84	84	84	84	84		
School_anxiety	Pearson Correlation	.553**	-.410**	-.447**	.316**	-.421**	-.491**	.105	.187	-.179	.263*	--	
	Sig. (2-tailed)	<.001	<.001	<.001	.003	<.001	<.001	.343	.088	.103	.016		
	N	84	84	84	84	84	84	84	84	84	84	84	
School_satisfaction	Pearson Correlation	-.462**	.649**	.565**	-.482**	.562**	.684**	-.221*	-.173	-.056	-.419**	-.381**	--
	Sig. (2-tailed)	<.001	<.001	<.001	<.001	<.001	<.001	.043	.116	.610	<.001	<.001	
	N	84	84	84	84	84	84	84	84	84	84	84	84

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).
a. GENDER = Female

CFA: Model 1

Z:\Desktop\Final PhD data and analyses\CFA Model.amw

Analysis Summary

Date and Time

Date: Friday, 27 December 2024

Time: 6:12:26 PM

Title

Cfa model: Friday, 27 December 2024 6:12 PM

Groups

Group number 1 (Group number 1)

Notes for Group (Group number 1)

The model is recursive.

Sample size = 152

Variable Summary (Group number 1)

Your model contains the following variables (Group number 1)

Observed, endogenous variables

ARSI_1

ARSI_2

ARSI_3

ARSI_4

ARSI_5

ARSI_6

ARSI_7

Unobserved, exogenous variables

Interference

e_1

e_2

e_3

e_4

e_5

e_6

e_7

Variable counts (Group number 1)

Number of variables in your model: 15

Number of observed variables: 7

Number of unobserved variables: 8

Number of exogenous variables: 8

Number of endogenous variables: 7

Parameter Summary (Group number 1)

	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	8	0	0	0	0	8
Labeled	0	0	0	0	0	0
Unlabeled	6	0	8	0	0	14
Total	14	0	8	0	0	22

Assessment of normality (Group number 1)

Variable	min	max	skew	c.r.	kurtosis	c.r.
ARSI_7	1.000	2.000	1.474	7.419	.821	2.066
ARSI_6	1.000	2.000	1.555	7.825	.906	2.280
ARSI_5	1.000	4.000	1.318	6.635	.467	1.174
ARSI_4	1.000	2.000	1.265	6.366	.133	.335
ARSI_3	1.000	4.000	1.372	6.907	.670	1.687
ARSI_2	1.000	5.000	1.377	6.932	.954	2.401
ARSI_1	1.000	5.000	1.283	6.459	1.085	2.729
Multivariate					63.772	35.022

Observations farthest from the centroid (Mahalanobis distance) (Group number 1)

Observation number	Mahalanobis d-squared	p1	p2
49	47.578	.000	.000
24	35.240	.000	.000
4	34.559	.000	.000
50	33.235	.000	.000

Observation number	Mahalanobis d-squared	p1	p2
7	33.089	.000	.000
62	31.482	.000	.000
60	26.289	.000	.000
6	24.501	.001	.000
61	24.450	.001	.000
28	23.924	.001	.000
23	23.299	.002	.000
2	23.096	.002	.000
18	22.527	.002	.000
27	22.063	.002	.000
48	20.546	.005	.000
70	19.886	.006	.000
25	19.727	.006	.000
42	17.010	.017	.000
5	16.740	.019	.000
54	15.847	.027	.000
26	15.379	.031	.000
9	14.032	.051	.000
3	13.808	.055	.000
10	13.312	.065	.000
37	13.262	.066	.000
63	13.217	.067	.000
44	13.067	.070	.000
36	12.867	.075	.000
31	12.643	.081	.000
19	12.049	.099	.000

Observation number	Mahalanobis d-squared	p1	p2
13	11.900	.104	.000
8	11.834	.106	.000
20	11.823	.107	.000
80	11.383	.123	.000
11	11.318	.125	.000
46	11.259	.128	.000
43	11.257	.128	.000
45	10.987	.139	.000
22	10.420	.166	.003
47	10.173	.179	.006
41	9.956	.191	.011
1	9.879	.196	.010
21	9.190	.239	.123
17	9.158	.242	.101
38	9.075	.247	.099
71	8.870	.262	.149
40	8.851	.264	.119
53	8.502	.290	.272
12	8.349	.303	.328
30	7.728	.357	.791
32	7.463	.382	.899
39	7.048	.424	.984
29	6.249	.511	1.000
58	6.137	.524	1.000
59	6.137	.524	1.000
64	5.860	.556	1.000

Observation number	Mahalanobis d-squared	p1	p2
16	5.853	.557	1.000
55	5.803	.563	1.000
56	5.803	.563	1.000
57	5.481	.602	1.000
51	5.144	.642	1.000
52	5.144	.642	1.000
69	4.904	.672	1.000
81	4.700	.697	1.000
82	4.700	.697	1.000
83	4.700	.697	1.000
84	4.700	.697	1.000
85	4.700	.697	1.000
86	4.700	.697	1.000
14	4.683	.699	1.000
15	4.683	.699	1.000
65	4.416	.731	1.000
66	4.416	.731	1.000
67	4.416	.731	1.000
68	4.416	.731	1.000
34	2.615	.918	1.000
72	2.596	.920	1.000
73	2.596	.920	1.000
33	2.567	.922	1.000
74	2.493	.928	1.000
75	2.493	.928	1.000
76	2.493	.928	1.000

Observation number	Mahalanobis d-squared	p1	p2
77	2.493	.928	1.000
78	2.493	.928	1.000
79	2.493	.928	1.000
35	1.443	.984	1.000
87	1.158	.992	1.000
88	1.158	.992	1.000
89	1.158	.992	1.000
90	1.158	.992	1.000
91	1.158	.992	1.000
92	1.158	.992	1.000
93	1.158	.992	1.000
94	1.158	.992	1.000
95	1.158	.992	1.000
96	1.158	.992	1.000
97	1.158	.992	1.000
98	.756	.998	1.000
99	.756	.998	1.000
100	.756	.998	1.000

Sample Moments (Group number 1)

Sample Covariances (Group number 1)

	ARSI_7	ARSI_6	ARSI_5	ARSI_4	ARSI_3	ARSI_2	ARSI_1
ARSI_7	.081						
ARSI_6	.069	.094					
ARSI_5	.207	.227	.882				
ARSI_4	.068	.073	.242	.096			
ARSI_3	.181	.205	.673	.217	.859		

	ARSI_7	ARSI_6	ARSI_5	ARSI_4	ARSI_3	ARSI_2	ARSI_1
ARSI_2	.204	.226	.775	.251	.798	1.253	
ARSI_1	.143	.181	.585	.167	.570	.626	1.089

Condition number = 188.162

Eigenvalues

3.226 .570 .281 .194 .045 .021 .017

Determinant of sample covariance matrix = .000

Sample Correlations (Group number 1)

	ARSI_7	ARSI_6	ARSI_5	ARSI_4	ARSI_3	ARSI_2	ARSI_1
ARSI_7	1.000						
ARSI_6	.794	1.000					
ARSI_5	.773	.789	1.000				
ARSI_4	.768	.761	.829	1.000			
ARSI_3	.685	.723	.773	.754	1.000		
ARSI_2	.641	.658	.737	.723	.770	1.000	
ARSI_1	.483	.565	.597	.515	.589	.536	1.000

Condition number = 31.892

Eigenvalues

5.162 .596 .426 .236 .223 .195 .162

Models

Default model (Default model)

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments: 28

Number of distinct parameters to be estimated: 14

Degrees of freedom (28 - 14): 14

Result (Default model)

Minimum was achieved

Chi-square = 35.735

Degrees of freedom = 14

Probability level = .001

Group number 1 (Group number 1 - Default model)

Estimates (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
ARSI_1	<---	Interference	1.000				
ARSI_2	<---	Interference	1.370	.163	8.401	***	par_1
ARSI_3	<---	Interference	1.197	.137	8.760	***	par_2
ARSI_4	<---	Interference	.420	.047	8.972	***	par_3
ARSI_5	<---	Interference	1.305	.142	9.202	***	par_4
ARSI_6	<---	Interference	.402	.046	8.816	***	par_5
ARSI_7	<---	Interference	.364	.042	8.632	***	par_6

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
ARSI_1	<---	Interference	.633
ARSI_2	<---	Interference	.808
ARSI_3	<---	Interference	.853
ARSI_4	<---	Interference	.892
ARSI_5	<---	Interference	.918
ARSI_6	<---	Interference	.864
ARSI_7	<---	Interference	.845

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
Interference	.436	.102	4.259	***	par_7
e_1	.653	.078	8.386	***	par_8

	Estimate	S.E.	C.R.	P	Label
e_2	.435	.056	7.804	***	par_9
e_3	.234	.031	7.433	***	par_10
e_4	.020	.003	6.948	***	par_11
e_5	.139	.022	6.298	***	par_12
e_6	.024	.003	7.316	***	par_13
e_7	.023	.003	7.522	***	par_14

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
ARSI_7	.715
ARSI_6	.747
ARSI_5	.842
ARSI_4	.796
ARSI_3	.728
ARSI_2	.653
ARSI_1	.400

Matrices (Group number 1 - Default model)

Implied Covariances (Group number 1 - Default model)

	ARSI_7	ARSI_6	ARSI_5	ARSI_4	ARSI_3	ARSI_2	ARSI_1
ARSI_7	.081						
ARSI_6	.064	.094					
ARSI_5	.207	.229	.882				
ARSI_4	.067	.073	.239	.096			
ARSI_3	.190	.210	.681	.219	.859		
ARSI_2	.217	.240	.780	.251	.715	1.253	
ARSI_1	.159	.175	.569	.183	.522	.597	1.089

Implied Correlations (Group number 1 - Default model)

	ARSI_7	ARSI_6	ARSI_5	ARSI_4	ARSI_3	ARSI_2	ARSI_1
ARSI_7	1.000						
ARSI_6	.730	1.000					
ARSI_5	.776	.793	1.000				
ARSI_4	.754	.771	.819	1.000			
ARSI_3	.721	.737	.783	.761	1.000		
ARSI_2	.683	.698	.742	.721	.689	1.000	
ARSI_1	.535	.547	.581	.564	.540	.511	1.000

Factor Score Weights (Group number 1 - Default model)

	ARSI_7	ARSI_6	ARSI_5	ARSI_4	ARSI_3	ARSI_2	ARSI_1
Interference	.329	.351	.195	.445	.107	.066	.032

Total Effects (Group number 1 - Default model)

	Interference
ARSI_7	.364
ARSI_6	.402
ARSI_5	1.305
ARSI_4	.420
ARSI_3	1.197
ARSI_2	1.370
ARSI_1	1.000

Standardized Total Effects (Group number 1 - Default model)

	Interference
ARSI_7	.845
ARSI_6	.864
ARSI_5	.918
ARSI_4	.892
ARSI_3	.853

	Interference
ARSI_2	.808
ARSI_1	.633

Direct Effects (Group number 1 - Default model)

	Interference
ARSI_7	.364
ARSI_6	.402
ARSI_5	1.305
ARSI_4	.420
ARSI_3	1.197
ARSI_2	1.370
ARSI_1	1.000

Standardized Direct Effects (Group number 1 - Default model)

	Interference
ARSI_7	.845
ARSI_6	.864
ARSI_5	.918
ARSI_4	.892
ARSI_3	.853
ARSI_2	.808
ARSI_1	.633

Indirect Effects (Group number 1 - Default model)

	Interference
ARSI_7	.000
ARSI_6	.000
ARSI_5	.000
ARSI_4	.000

	Interference
ARSI_3	.000
ARSI_2	.000
ARSI_1	.000

Standardized Indirect Effects (Group number 1 - Default model)

	Interference
ARSI_7	.000
ARSI_6	.000
ARSI_5	.000
ARSI_4	.000
ARSI_3	.000
ARSI_2	.000
ARSI_1	.000

Modification Indices (Group number 1 - Default model)

Covariances: (Group number 1 - Default model)

	M.I.	Par Change
e_6 <--> e_7	10.807	.007
e_2 <--> e_3	12.849	.104

Variances: (Group number 1 - Default model)

	M.I.	Par Change

Regression Weights: (Group number 1 - Default model)

	M.I.	Par Change
ARSI_3 <--- ARSI_2	4.115	.076

Minimization History (Default model)

Iteration		Negative eigenvalues	Condition #	Smallest eigenvalue	Diameter	F	NTries	Ratio
0	e	2		-1.226	9999.000	892.557	0	9999.000
1	e*	2		-.074	5.290	312.523	21	.087

Iteration		Negative eigenvalues	Condition #	Smallest eigenvalue	Diameter	F	NTries	Ratio
2	e	2		-.080	.234	280.616	7	.751
3	e*	1		-.121	2.082	57.638	9	1.032
4	e	0	813.109		.234	37.047	7	.837
5	e	0	213.701		.431	35.855	2	.000
6	e	0	216.708		.093	35.737	1	.935
7	e	0	214.658		.004	35.735	1	1.009
8	e	0	215.555		.000	35.735	1	1.000

Pairwise Parameter Comparisons (Default model)

Variance-covariance Matrix of Estimates (Default model)

	par_1	par_2	par_3	par_4	par_5	par_6	par_7	par_8	par_9	par_10	par_11	par_12	par_13	par_14
par_1	.027													
par_2	.017	.019												
par_3	.006	.005	.002											
par_4	.019	.016	.006	.020										
par_5	.006	.005	.002	.005	.002									
par_6	.005	.005	.002	.005	.002	.002								
par_7	-.012	-.011	-.004	-.012	-.004	-.003	.010							
par_8	.001	.001	.000	.001	.000	.000	.000	.006						
par_9	.000	.000	.000	.000	.000	.000	.000	.000	.003					

	par_1	par_2	par_3	par_4	par_5	par_6	par_7	par_8	par_9	par_10	par_11	par_12	par_13	par_14
par_10	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001				
par_11	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000			
par_12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000		
par_13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
par_14	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Correlations of Estimates (Default model)

	par_1	par_2	par_3	par_4	par_5	par_6	par_7	par_8	par_9	par_10	par_11	par_12	par_13	par_14
par_1	1.000													
par_2	.771	1.000												
par_3	.792	.823	1.000											
par_4	.806	.838	.869	1.000										
par_5	.770	.803	.831	.847	1.000									
par_6	.758	.790	.821	.835	.805	1.000								
par_7	-.748	-.778	-.805	-.820	-.786	-.775	1.000							
par_8	.049	.049	.062	.056	.054	.059	-.052	1.000						

	par_1	par_2	par_3	par_4	par_5	par_6	par_7	par_8	par_9	par_10	par_11	par_12	par_13	par_14
par_9	-.050	-.011	.009	.012	.019	.020	-.006	.007	1.000					
par_10	-.007	-.044	.023	.027	.026	.032	-.015	.019	.076	1.000				
par_11	-.024	-.021	-.092	-.029	-.020	-.031	.031	-.041	-.021	-.048	1.000			
par_12	.015	.020	.008	-.062	.017	.015	-.002	.003	-.044	-.079	-.033	1.000		
par_13	.020	.012	.011	.011	-.058	-.017	-.001	.001	-.065	-.051	-.058	-.073	1.000	
par_14	-.002	-.005	-.021	-.014	-.037	-.078	.020	-.027	-.062	-.073	-.004	-.057	.078	1.000

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	14	35.735	14	.001	2.553
Saturated model	28	.000	0		
Independence model	7	925.680	21	.000	44.080

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.020	.933	.867	.467
Saturated model	.000	1.000		
Independence model	.342	.256	.008	.192

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.961	.942	.976	.964	.976
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.667	.641	.651
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	21.735	7.800	43.337
Saturated model	.000	.000	.000
Independence model	904.680	808.820	1007.937

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.237	.144	.052	.287
Saturated model	.000	.000	.000	.000
Independence model	6.130	5.991	5.356	6.675

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.101	.061	.143	.022
Independence model	.534	.505	.564	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	63.735	65.301	106.069	120.069
Saturated model	56.000	59.133	140.669	168.669

Model	AIC	BCC	BIC	CAIC
Independence model	939.680	940.463	960.847	967.847

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.422	.330	.565	.432
Saturated model	.371	.371	.371	.392
Independence model	6.223	5.588	6.907	6.228

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	101	124
Independence model	6	7

Execution time summary

Minimization: .011

Miscellaneous: 2.158

Bootstrap: .000

Total: 2.169

SRMR = .0297

CFA: Model 2: Final Model

Z:\Desktop\Final PhD data and analyses\27.12.24. CFA covariance 2 and 3.amw

Analysis Summary

Date and Time

Date: Friday, 27 December 2024

Time: 6:21:37 PM

Title

27.12.24. cfa covariance 2 and 3: Friday, 27 December 2024 6:21 PM

Groups

Group number 1 (Group number 1)

Notes for Group (Group number 1)

The model is recursive.

Sample size = 152

Variable Summary (Group number 1)

Your model contains the following variables (Group number 1)

Observed, endogenous variables

ARSI_1

ARSI_2

ARSI_3

ARSI_4

ARSI_5

ARSI_6

ARSI_7

Unobserved, exogenous variables

Interference

e_1

e_2

e_3

e_4

e_5

e_6

e_7

Variable counts (Group number 1)

Number of variables in your model:	15
Number of observed variables:	7
Number of unobserved variables:	8
Number of exogenous variables:	8

Number of endogenous variables: 7

Parameter Summary (Group number 1)

	Weights	Covariances	Variances	Means	Intercepts	Total
Fixed	8	0	0	0	0	8
Labeled	0	0	0	0	0	0
Unlabeled	6	1	8	0	0	15
Total	14	1	8	0	0	23

Assessment of normality (Group number 1)

Variable	min	max	skew	c.r.	kurtosis	c.r.
ARSI_7	1.000	2.000	1.474	7.419	.821	2.066
ARSI_6	1.000	2.000	1.555	7.825	.906	2.280
ARSI_5	1.000	4.000	1.318	6.635	.467	1.174
ARSI_4	1.000	2.000	1.265	6.366	.133	.335
ARSI_3	1.000	4.000	1.372	6.907	.670	1.687
ARSI_2	1.000	5.000	1.377	6.932	.954	2.401
ARSI_1	1.000	5.000	1.283	6.459	1.085	2.729
Multivariate					63.772	35.022

Observations farthest from the centroid (Mahalanobis distance) (Group number 1)

Observation number	Mahalanobis d-squared	p1	p2
49	47.578	.000	.000
24	35.240	.000	.000
4	34.559	.000	.000
50	33.235	.000	.000
7	33.089	.000	.000
62	31.482	.000	.000
60	26.289	.000	.000
6	24.501	.001	.000

Observation number	Mahalanobis d-squared	p1	p2
61	24.450	.001	.000
28	23.924	.001	.000
23	23.299	.002	.000
2	23.096	.002	.000
18	22.527	.002	.000
27	22.063	.002	.000
48	20.546	.005	.000
70	19.886	.006	.000
25	19.727	.006	.000
42	17.010	.017	.000
5	16.740	.019	.000
54	15.847	.027	.000
26	15.379	.031	.000
9	14.032	.051	.000
3	13.808	.055	.000
10	13.312	.065	.000
37	13.262	.066	.000
63	13.217	.067	.000
44	13.067	.070	.000
36	12.867	.075	.000
31	12.643	.081	.000
19	12.049	.099	.000
13	11.900	.104	.000
8	11.834	.106	.000
20	11.823	.107	.000
80	11.383	.123	.000

Observation number	Mahalanobis d-squared	p1	p2
11	11.318	.125	.000
46	11.259	.128	.000
43	11.257	.128	.000
45	10.987	.139	.000
22	10.420	.166	.003
47	10.173	.179	.006
41	9.956	.191	.011
1	9.879	.196	.010
21	9.190	.239	.123
17	9.158	.242	.101
38	9.075	.247	.099
71	8.870	.262	.149
40	8.851	.264	.119
53	8.502	.290	.272
12	8.349	.303	.328
30	7.728	.357	.791
32	7.463	.382	.899
39	7.048	.424	.984
29	6.249	.511	1.000
58	6.137	.524	1.000
59	6.137	.524	1.000
64	5.860	.556	1.000
16	5.853	.557	1.000
55	5.803	.563	1.000
56	5.803	.563	1.000
57	5.481	.602	1.000

Observation number	Mahalanobis d-squared	p1	p2
51	5.144	.642	1.000
52	5.144	.642	1.000
69	4.904	.672	1.000
81	4.700	.697	1.000
82	4.700	.697	1.000
83	4.700	.697	1.000
84	4.700	.697	1.000
85	4.700	.697	1.000
86	4.700	.697	1.000
14	4.683	.699	1.000
15	4.683	.699	1.000
65	4.416	.731	1.000
66	4.416	.731	1.000
67	4.416	.731	1.000
68	4.416	.731	1.000
34	2.615	.918	1.000
72	2.596	.920	1.000
73	2.596	.920	1.000
33	2.567	.922	1.000
74	2.493	.928	1.000
75	2.493	.928	1.000
76	2.493	.928	1.000
77	2.493	.928	1.000
78	2.493	.928	1.000
79	2.493	.928	1.000
35	1.443	.984	1.000

Observation number	Mahalanobis d-squared	p1	p2
87	1.158	.992	1.000
88	1.158	.992	1.000
89	1.158	.992	1.000
90	1.158	.992	1.000
91	1.158	.992	1.000
92	1.158	.992	1.000
93	1.158	.992	1.000
94	1.158	.992	1.000
95	1.158	.992	1.000
96	1.158	.992	1.000
97	1.158	.992	1.000
98	.756	.998	1.000
99	.756	.998	1.000
100	.756	.998	1.000

Sample Moments (Group number 1)

Sample Covariances (Group number 1)

	ARSI_7	ARSI_6	ARSI_5	ARSI_4	ARSI_3	ARSI_2	ARSI_1
ARSI_7	.081						
ARSI_6	.069	.094					
ARSI_5	.207	.227	.882				
ARSI_4	.068	.073	.242	.096			
ARSI_3	.181	.205	.673	.217	.859		
ARSI_2	.204	.226	.775	.251	.798	1.253	
ARSI_1	.143	.181	.585	.167	.570	.626	1.089

Condition number = 188.162

Eigenvalues

3.226 .570 .281 .194 .045 .021 .017

Determinant of sample covariance matrix = .000

Sample Correlations (Group number 1)

	ARSI_7	ARSI_6	ARSI_5	ARSI_4	ARSI_3	ARSI_2	ARSI_1
ARSI_7	1.000						
ARSI_6	.794	1.000					
ARSI_5	.773	.789	1.000				
ARSI_4	.768	.761	.829	1.000			
ARSI_3	.685	.723	.773	.754	1.000		
ARSI_2	.641	.658	.737	.723	.770	1.000	
ARSI_1	.483	.565	.597	.515	.589	.536	1.000

Condition number = 31.892

Eigenvalues

5.162 .596 .426 .236 .223 .195 .162

Models

Default model (Default model)

Notes for Model (Default model)

Computation of degrees of freedom (Default model)

Number of distinct sample moments: 28

Number of distinct parameters to be estimated: 15

Degrees of freedom (28 - 15): 13

Result (Default model)

Minimum was achieved

Chi-square = 22.100

Degrees of freedom = 13

Probability level = .054

Group number 1 (Group number 1 - Default model)

Estimates (Group number 1 - Default model)

Scalar Estimates (Group number 1 - Default model)

Maximum Likelihood Estimates

Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
ARSI_1	<---	Interference	1.000				
ARSI_2	<---	Interference	1.345	.164	8.185	***	par_1
ARSI_3	<---	Interference	1.182	.138	8.574	***	par_2
ARSI_4	<---	Interference	.423	.048	8.892	***	par_3
ARSI_5	<---	Interference	1.316	.144	9.129	***	par_4
ARSI_6	<---	Interference	.406	.046	8.767	***	par_5
ARSI_7	<---	Interference	.369	.043	8.594	***	par_6

Standardized Regression Weights: (Group number 1 - Default model)

			Estimate
ARSI_1	<---	Interference	.629
ARSI_2	<---	Interference	.789
ARSI_3	<---	Interference	.838
ARSI_4	<---	Interference	.894
ARSI_5	<---	Interference	.920
ARSI_6	<---	Interference	.869
ARSI_7	<---	Interference	.852

Covariances: (Group number 1 - Default model)

			Estimate	S.E.	C.R.	P	Label
e_2	<-->	e_3	.113	.035	3.274	.001	par_7

Correlations: (Group number 1 - Default model)

			Estimate
e_2	<-->	e_3	.325

Variances: (Group number 1 - Default model)

	Estimate	S.E.	C.R.	P	Label
Interference	.431	.102	4.223	***	par_8

	Estimate	S.E.	C.R.	P	Label
e_1	.658	.079	8.374	***	par_9
e_2	.473	.060	7.847	***	par_10
e_3	.256	.034	7.531	***	par_11
e_4	.019	.003	6.811	***	par_12
e_5	.135	.022	6.047	***	par_13
e_6	.023	.003	7.142	***	par_14
e_7	.022	.003	7.379	***	par_15

Squared Multiple Correlations: (Group number 1 - Default model)

	Estimate
ARSI_7	.725
ARSI_6	.755
ARSI_5	.847
ARSI_4	.799
ARSI_3	.702
ARSI_2	.622
ARSI_1	.396

Matrices (Group number 1 - Default model)

Implied Covariances (Group number 1 - Default model)

	ARSI_7	ARSI_6	ARSI_5	ARSI_4	ARSI_3	ARSI_2	ARSI_1
ARSI_7	.081						
ARSI_6	.065	.094					
ARSI_5	.209	.231	.882				
ARSI_4	.067	.074	.240	.096			
ARSI_3	.188	.207	.671	.215	.859		
ARSI_2	.214	.235	.763	.245	.798	1.253	
ARSI_1	.159	.175	.567	.182	.510	.580	1.089

Implied Correlations (Group number 1 - Default model)

	ARSI_7	ARSI_6	ARSI_5	ARSI_4	ARSI_3	ARSI_2	ARSI_1
ARSI_7	1.000						
ARSI_6	.740	1.000					
ARSI_5	.784	.800	1.000				
ARSI_4	.761	.777	.822	1.000			
ARSI_3	.713	.728	.771	.749	1.000		
ARSI_2	.672	.685	.726	.705	.770	1.000	
ARSI_1	.536	.547	.579	.562	.527	.496	1.000

Factor Score Weights (Group number 1 - Default model)

	ARSI_7	ARSI_6	ARSI_5	ARSI_4	ARSI_3	ARSI_2	ARSI_1
Interference	.359	.382	.211	.471	.081	.042	.033

Total Effects (Group number 1 - Default model)

	Interference
ARSI_7	.369
ARSI_6	.406
ARSI_5	1.316
ARSI_4	.423
ARSI_3	1.182
ARSI_2	1.345
ARSI_1	1.000

Standardized Total Effects (Group number 1 - Default model)

	Interference
ARSI_7	.852
ARSI_6	.869
ARSI_5	.920
ARSI_4	.894
ARSI_3	.838

	Interference
ARSI_2	.789
ARSI_1	.629

Direct Effects (Group number 1 - Default model)

	Interference
ARSI_7	.369
ARSI_6	.406
ARSI_5	1.316
ARSI_4	.423
ARSI_3	1.182
ARSI_2	1.345
ARSI_1	1.000

Standardized Direct Effects (Group number 1 - Default model)

	Interference
ARSI_7	.852
ARSI_6	.869
ARSI_5	.920
ARSI_4	.894
ARSI_3	.838
ARSI_2	.789
ARSI_1	.629

Indirect Effects (Group number 1 - Default model)

	Interference
ARSI_7	.000
ARSI_6	.000
ARSI_5	.000
ARSI_4	.000

	Interference
ARSI_3	.000
ARSI_2	.000
ARSI_1	.000

Standardized Indirect Effects (Group number 1 - Default model)

	Interference
ARSI_7	.000
ARSI_6	.000
ARSI_5	.000
ARSI_4	.000
ARSI_3	.000
ARSI_2	.000
ARSI_1	.000

Modification Indices (Group number 1 - Default model)

Covariances: (Group number 1 - Default model)

	M.I.	Par Change
e_6 <--> e_7	8.572	.006

Variances: (Group number 1 - Default model)

	M.I.	Par Change

Regression Weights: (Group number 1 - Default model)

	M.I.	Par Change

Minimization History (Default model)

Iteration		Negative eigenvalues	Condition #	Smallest eigenvalue	Diameter	F	NTries	Ratio
0	e	3		-1.272	9999.000	892.557	0	9999.000
1	e	7		-.514	2.875	381.550	20	.218
2	e*	1		-.078	.772	125.480	5	.934
3	e	1		-.072	.301	79.009	4	.685

Iteration		Negative eigenvalues	Condition #	Smallest eigenvalue	Diameter	F	NTries	Ratio
4	e	0	108.198		.841	30.525	8	.802
5	e	0	143.230		.479	23.717	1	1.103
6	e	0	245.347		.220	22.214	1	1.128
7	e	0	288.567		.105	22.101	1	1.067
8	e	0	300.545		.012	22.100	1	1.010
9	e	0	307.636		.000	22.100	1	1.000

Pairwise Parameter Comparisons (Default model)

Variance-covariance Matrix of Estimates (Default model)

	par_1	par_2	par_3	par_4	par_5	par_6	par_7	par_8	par_9	par_10	par_11	par_12	par_13	par_14	par_15
par_1	.027														
par_2	.019	.019													
par_3	.006	.005	.002												
par_4	.019	.017	.006	.021											
par_5	.006	.005	.002	.006	.002										
par_6	.005	.005	.002	.005	.002	.002									
par_7	.000	.000	.000	.000	.000	.000	.001								
par_8	-.012	-.011	-.004	-.012	-.004	-.003	.000	.010							
par_9	.001	.001	.000	.001	.000	.000	.000	.000	.006						

	par_1	par_2	par_3	par_4	par_5	par_6	par_7	par_8	par_9	par_10	par_11	par_12	par_13	par_14	par_15
par_10	.000	.000	.000	.000	.000	.000	.001	.000	.000	.004					
par_11	.000	.000	.000	.000	.000	.000	.001	.000	.000	.000	.001				
par_12	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000			
par_13	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.001		
par_14	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
par_15	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000

Correlations of Estimates (Default model)

	par_1	par_2	par_3	par_4	par_5	par_6	par_7	par_8	par_9	par_10	par_11	par_12	par_13	par_14	par_15
par_1	1.000														
par_2	.828	1.000													
par_3	.782	.816	1.000												
par_4	.796	.831	.872	1.000											
par_5	.762	.798	.837	.852	1.000										
par_6	.751	.786	.828	.841	.815	1.000									

	par_1	par_2	par_3	par_4	par_5	par_6	par_7	par_8	par_9	par_10	par_11	par_12	par_13	par_14	par_15
par_7	-.044	-.033	.018	.021	.030	.033	1.000								
par_8	-.737	-.771	-.809	-.825	-.793	-.782	-.016	1.000							
par_9	.050	.050	.065	.058	.057	.062	.021	-.055	1.000						
par_10	-.050	-.011	.008	.010	.020	.020	.528	-.008	.011	1.000					
par_11	-.009	-.043	.021	.024	.026	.032	.529	-.017	.022	.165	1.000				
par_12	-.033	-.028	-.097	-.027	-.016	-.028	-.007	.032	-.042	.005	-.020	1.000			
par_13	.008	.016	.016	-.064	.031	.030	-.027	-.006	.008	-.006	-.039	-.059	1.000		
par_14	.019	.011	.015	.018	-.063	-.017	-.065	-.001	.002	-.056	-.039	-.085	-.125	1.000	
par_15	-.005	-.008	-.020	-.010	-.040	-.085	-.077	.023	-.030	-.054	-.063	-.023	-.107	.081	1.000

Model Fit Summary

CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	15	22.100	13	.054	1.700
Saturated model	28	.000	0		
Independence model	7	925.680	21	.000	44.080

RMR, GFI

Model	RMR	GFI	AGFI	PGFI
Default model	.016	.960	.913	.446
Saturated model	.000	1.000		
Independence model	.342	.256	.008	.192

Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.976	.961	.990	.984	.990
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.619	.604	.613
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

NCP

Model	NCP	LO 90	HI 90
Default model	9.100	.000	26.178
Saturated model	.000	.000	.000
Independence model	904.680	808.820	1007.937

FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	.146	.060	.000	.173
Saturated model	.000	.000	.000	.000
Independence model	6.130	5.991	5.356	6.675

RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.068	.000	.115	.243
Independence model	.534	.505	.564	.000

AIC

Model	AIC	BCC	BIC	CAIC
Default model	52.100	53.778	97.458	112.458
Saturated model	56.000	59.133	140.669	168.669
Independence model	939.680	940.463	960.847	967.847

ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	.345	.285	.458	.356
Saturated model	.371	.371	.371	.392
Independence model	6.223	5.588	6.907	6.228

HOELTER

Model	HOELTER .05	HOELTER .01
Default model	153	190
Independence model	6	7

Execution time summary

Minimization: .015

Miscellaneous: 2.238

Bootstrap: .000

Total: 2.253

SRMR = .0250