

Cross Disciplinary Effects of Text Factors and Language of Recall on Reading Comprehension

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Dedication

To my wife, Sukartiningsih, my son, Arya Bangbang Puja Suastika and my daughter, Putri Bangbang Indira Savitri.

They have tremendously motivated me with love, care and patience behind my steps forward.

Declaration

I, Bambang Arya Wija Putra, declare that the PhD thesis entitled *Cross-Disciplinary Effects of Text Factors and Language of Recall on Reading Comprehension* is no more than 100,000 words in length, exclusive of table, figures, appendices and references. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work.

Signed

29 March 2012

Date

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Abstract

Reading theory provides a potentially powerful means of addressing English reading deficiencies and enhancing the reading performance of English as Foreign Language (EFL) students, including those studying at tertiary level in Indonesia. One influential psycholinguistically focused reading theory is the Schema Theory model of reading. Whilst there have been a range of research studies undertaken that draw on Schema Theory, including in the context of foreign/second language reading, to date no study has provided a complete understanding of both the main and the interaction effects of text structure and a rhetorically-oriented framework, both of which are identified as *text factors* that impact on L2 reading comprehension, comparing recall assessment in students' native and target languages, and taking into consideration readers from across a range of different, discipline-specific backgrounds.

In order to address this gap in knowledge, an experimental study was designed and conducted to investigate effects of the two identified text factors and recall, with the overarching research question: 'How do text factors and recall affect EFL tertiary reading comprehension outcomes across three discipline-specific backgrounds?' as well as a number of related specific questions dealing with the main effects, interaction effects and the effects among the levels of each of the variables.

The research design employed in this experiment was a multiple-treatment, $3 \times 3 \times 3 \times 2$ full factorial design. The accessible population is represented by 54 experimental groups, each of which consisted of 18 participants (Total participants = 972 Indonesian tertiary students). The research treatments were in the forms of 18 passages of text to be recalled by the participants. The 18 passages were identical in content with different text types achieved by modifying the top level structure of the passage. The

participants' recall outcomes were then scored by two raters and analysed for their reliability.

To determine the empirical findings from this research, data were statistically analysed using two methods of analysis – Logistic Regression and Analysis of Variance (ANOVA) – and interpreted to provide answers to the research questions. The results showed that all interaction effects were insignificant, whilst all the main effects were significant. The results of the different effects among levels of the four factors on reading comprehension were also significant, indicating that the role of the levels within each factor is important in facilitating reading comprehension. In relation to the relative importance of the factors in explaining reading comprehension, the language of recall was found to be the most influential of all the factors, followed by, in descending rank order of importance, text structure, discipline-specific background and rhetorically-oriented framework. Suggestions and recommendations are also provided for English for Academic Purposes (EAP) reading instructors, for the developers of material for EAP, and for future researchers.

CHAPTER 1

Introduction

1.1 English in the Indonesian context

For Indonesians, as for many other peoples around the world, English is considered the most important of all foreign languages, being seen as a global or international language, and being utilised widely in many areas of human activity (Crystal 2003; Jenkins 2003; Lysandrou & Lysandrou 2003). Crystal traces the use of English worldwide to British colonial expansion into many countries around the globe and to the rising influence of the United States as an economic superpower. Command of the English language, then, has come to play a very important role for anyone wishing to participate in global free trade and its contingent worldwide communication (Wood 2001); and the demand for mastery of the English language has accelerated further due to modernisation and the need for nations to exercise stronger international engagement. As Indonesia tries to develop itself at the same pace as the rest of the world, the role played by English in establishing cultural, political and economic relationships worldwide (Crystal 2003; Lauder 2008) is, and will continue to be, important. When relating the importance of English for Indonesia, Dardjowidjoyo (2002) observes that in order to improve the quality of English learning the government of Indonesia has been promoting the increased use of English as a medium of instruction at *all* educational levels, from kindergarten to university.

Despite the acknowledged importance of English language competence, the teaching of English in Indonesia continues to be challenging, chiefly

because its status as a foreign language (English as Foreign Language: EFL) results in English being little used within learners' local communities, particularly in comparison to what appears to be the case where English is employed as a second language (English as Second Language: ESL) (Oxford & Shearin 1994; Cumming 2001). The use of English in Singapore, Malaysia and the Philippines, for example, provides a contrast to Indonesia, having benefited these countries by its function as a second language that is used widely within local communities (Lauder 2008). Thus, the present Indonesian situation, where students rely primarily on the English classroom to provide them with input and motivation to learn English, is comparatively inadequate, and results in difficulties maximising the quality of outcomes for Indonesian English language learners.

Alisjahbana (1990) attributes the comparatively adverse situation for English learning in Indonesia mainly to its long history of colonization by Holland. As Lauder (2008, p. 9) points out:

The Dutch, who occupied Indonesia for over 350 years, from 1595, were loath to provide any education at all to the Indonesian population. During the Dutch colonial period, few Indonesians received any education, even at primary level and the majority were illiterate. This policy of keeping the colonized people in the dark was quite different to that of the British in their colonial territories.

He specifically asserts that 'the use of English in Indonesia has developed in the context of post-colonial competency building' (p. 9), whereas for countries such as Malaysia, Singapore and the Philippines, English usage and competency (Dardjowidjojo 2003; Lauder 2008) developed as a natural outcome of the colonization process.

Since achieving independence from Dutch rule in 1945, Indonesia has seen the English language increasingly employed in many sectors worldwide, and has introduced its instruction as a compulsory subject (Lauder 2008) in Indonesian schools. Contemporary English teaching is delivered across all Indonesian school curricula, from junior high school to university.

The primary focus of English language teaching in secondary school, based on the earliest curriculum of 1946 and continuing through to the 1994 curriculum, has remained the same: to give secondary school students a working knowledge of English in the four language skills, with an emphasis, in this set curriculum, on the development of reading skills (Komaria 1998), followed by listening, speaking and writing. This emphasis was affirmed by the 2002 Indonesian school curriculum's stated expectation that, after three years of English learning in junior high school, students should have developed a vocabulary of 1000 English words, growing to about 2500 English words at completion of senior high school (Depdiknas 2002). It is further expected that these senior high school graduates will be sufficiently proficient in English so as to support their own study in higher education.

English learning at university level in Indonesia tends to be instrumental in function. Lauder (2008) states that, while English is a compulsory subject at all levels of the Indonesian educational institution, at the university level further emphasis is placed on developing student reading skills in order to assist students to enhance their opportunities of success in their chosen disciplinary area or specialisation. The need to understand textbooks written in English means that reading skills remain the most important aspect of English language development for students in higher education; they are also seen to be the most easily realised.

This particular prioritisation is common worldwide according to Carrell (1988, p. 1): 'If we consider the study of English as a Foreign Language around the world – the situation in which most English learners find themselves – reading is the main reason why students learn the language'. There has been a growing and justified concern about reading for this reason in Indonesia, too, especially with the increasing amount of printed English materials becoming available. Proficient readers of English are in high demand across the country, and it is a high priority in the tertiary education system to develop graduates who have the capacity to access current knowledge, information and technology printed in English. English is highly

prized for its powerfully instrumental value as a tool for the successful learning of science and technology from advanced industrialised Western nations.

Despite the expectation that Indonesian university students will acquire the ability to read a variety of printed English materials reasonably fluently and so support their study with a good understanding of the language, over many decades most have been identified as having low reading proficiency. In the 1970s, Sadtono (1976) found that a majority of Indonesian learners graduating from secondary school and those studying in university were unable to read and comprehend English texts adequately. Some fifteen years later, Alisjahbana (1990) reported that a majority of senior secondary school graduates displayed inadequate English language skills to progress to university level studies. Nurweni and Read (1999) found First Year Indonesian university students to possess a vocabulary of only 1226 English words, vastly below the threshold, ranging between 3000 and 5000 words, deemed necessary to indicate the capacity to read authentic texts in English unassisted.

There is little evidence that the situation has improved over the last decade. For example, Kweldju's (2000) survey of 1776 students from 21 graduate schools across Indonesia revealed that graduate students who were not majoring in English were challenged by their attempts to understand English texts (Kweldju 2001). Kweldju (2001) attributes this deficiency to a lack of vocabulary (52%), of background knowledge (27%) and of grammar knowledge (21%) and found that even post-graduate students displayed a vocabulary of, on average, only 2861 words, not sufficient to enable them to properly understand written texts in English; even those texts within their own discipline specialisation. Significantly, Kweldju found that graduate students in the Sciences displayed a low-level reading proficiency caused by the lack of learned lexico-grammatical and vocabulary components (Kweldju 2001).

Whilst evidence for these deficiencies can be traced back several decades, they continue to the present day. An international survey conducted by the Organisation for Economic Co-operation and Development (OECD 2004; Saniscalco 2004) in 2004, reports that the majority of Indonesian students have difficulties in reading English texts and that their reading proficiency in English is not at a satisfactory standard. The most recent reports (OECD 2010) indicate that the achievement of reading proficiency for Indonesian secondary school students is still comparatively low, although progress has been made since the previous study. Results of the most recent OECD *Program for International Student Assessment* (PISA), a three-year program to assess the extent to which school students nearing the end of their secondary school education have acquired 'some of the knowledge and skills essential for full participation in society', indicate that Indonesian secondary students' mean test score in English reading proficiency had increased from 393 in 2006, to 402 in 2009; nevertheless, Indonesia was placed in the lowly position of 57th place among 65 countries (Asrianti, 2011). Such a ranking indicates that Indonesia remains far behind most other OECD countries; reading proficiency levels remain comparatively very low.

One possible way of addressing this deficiency is to draw on knowledge from reading theories to improve the quality of the teaching and learning of reading in English. The Schema Theory model of reading, which has been developed using psycholinguistics as a foundation, is a potential source of knowledge. Schema Theory, as employed in this study, is aligned with the definition formulated by Carrell and Eisterhold (1998 p. 76) which considers the comprehension of a text to be 'an interactive process between the reader's background knowledge and the text'. The theory predicts that comprehension can efficiently and effectively occur if the textual information is designed to match the reader's knowledge of the world. It is a theory that provides the basis from which to explain the effect of, what it terms, *schematic factors*, such as the readers' use of their knowledge of the linguistic content and formal structural properties of texts, and has generated considerable research

since the 1970s. Research began into L1 (native speaker of English) reading and continues, to the present time, with research having extended into L2 (non-native speaker of English) reading. The Schema Theory model of reading forms an important theoretical basis for the current study, which ultimately aims to enhance the teaching and learning of reading in English to and for Indonesian university students.

1.2 Theoretical framework

Two theoretical frameworks are applied within this study: 1) the Schema Theory model of reading and 2) content-structure analysis of discourse. The schema theoretical model of reading is adopted to assess the reading process, while the content-structure analysis of discourse is adopted as the foundation of the method and procedures employed in analysing the rhetorical structure of the reading texts.

The Schema Theory model of reading adopted here is that proposed by Carrell and Eisterhold (1998), who, as has been noted, regard the process of comprehension for both L1 and L2 readers as involving interactions between the background knowledge of the reader and the text. According to Eskey (1998, p. 96):

The interactive process refers to the interaction between information obtained by means of bottom-up decoding and information provided using top-down analysis, both of which depend on certain kinds of prior knowledge and certain kinds of information-processing skills.

Rumelhart (1980, pp. 3-5) sees schemata as ‘the building blocks of cognition’, placing particular emphasis on word meanings (bottom-up decoding) and knowledge expectations (top-down analysis) associated with reading.

A schema and its related individual units of schemata are best understood as ‘an abstract knowledge structure’ according to Anderson and Pearson (1984, p. 259; 1998, p. 42), or as ‘a data structure for representing

the generic concepts stored in memory' according to Rumelhart (1980, p. 34). Schemata have been categorised into three kinds (Carrell 1988; James 1987; Omaggio 1986):

1. **Linguistic schemata** are the background knowledge of the language used in the text.
2. **Formal schemata** are the background knowledge of the text structures.
3. **Content schemata** are the background knowledge of the text content.

The model of content-structure analysis of discourse adopted here is that proposed by Meyer (1975, 1985) where the procedure for text analysis yields hierarchically arranged tree structures, called content-structure. These structures show the relations among propositions (idea units) in the text. Each proposition contains a predicate which expresses the semantic relation among arguments. This will be discussed in detail later in the study. In essence, according to Meyer (1975), content-structure is differentiated into top level, middle level and bottom level. The interactions in the top-level and middle level are described by rhetorical relations, while those in the bottom levels are described by case grammar relations. The type of a text is then determined by the type of rhetorical predicate in the top-level structure that binds the ideas in the text together.

1.3 Definition of terms

For this study a number of key terms, consistent with their original usage, are defined as such:

- **Adjunct:** An adjunct is an initial pre-reading activity designed to enhance the reading process. It comes in the form of a short text or a diagram designed to raise the reader's awareness of the feature or features of the forthcoming reading comprehension text. This study deals with an adjunct in the form of text.

- **Discipline-specific background:** Discipline-specific background is the discipline of the university degree of the English as Foreign Language (EFL) readers who participated in this study: economics, agriculture, and pure sciences; all had successfully completed a course of Basic Cultural Sciences (BCS) and English for Academic Purposes (EAP).
- **Expository text:** An expository text is a text genre whose content consists of factual information (Scarcella 1984).
- **Reading:** Reading is an interactive process of generating meaning from text.
- **Reading comprehension:** Reading comprehension in the context of this study is the ability of the economics, agriculture, and pure sciences students to respond accurately to the required reading comprehension tests in the forms of passages to be recalled
- **Recall:** Recall is a response format deployed to assess reading comprehension that enables one to determine what to understand from a text, and how the process of understanding comes to mind (Harris & Smith 1986). In the present study, the recall method used for the assessment of reading comprehension consists of free written recall techniques performed either in the learner's target language (English) or in their native language (Indonesian).
- **Response format:** Response format refers to the type of test used to assess a reader's comprehension. This can take the form of, for example, recall, multiple choice and/or cloze test.
- **Rhetorical structure:** Rhetorical structure is a branched hierarchical structure produced through textual analysis that shows the relation among idea units (**propositions**) in the text under examination. Each **proposition** contains a **predicate** that expresses a **semantic relation** among **arguments** (ideas); and these may themselves be propositions.

Rhetorical structure is referred to as Content Organisation by Grimes (1975), as Content Structure by Meyer (1975) and as Text Structure by, among others Carrell (1984), James (1987) and Pearson and Camperell (1985).

- **Rhetorically-oriented framework:** A rhetorically-oriented framework is a type of **adjunct** which contains a description of the text topic and indicates the text structure type used in the organisation of the text (Lee & Riley 1990).
- **Text:** In its widest definition, the term ‘text’ refers to ‘a stretch, an extract or complete piece of writing or speech [in order to] adhere to broad conventions and rules which determine the language and structure used in a particular text types’ (Cornbleet and Carter 2001, p. 3). In a narrower definition, according to Grimes (1975), text is the written record of a discourse, which is well-formed and meaningful with a beginning and an end. In this study an even narrower operational definition is employed in that the ‘text/s’ referred to and used are for a reading comprehension task and are in the form of written variants derived from one specific written text that has had its structure modified into different text structure types. In this study, the terms ‘text’ and (reading) ‘passage’ are used interchangeably.
- **Text factors:** Text factors are those aspects of the presentation of the text that may affect its comprehension, such as the text structure types and adjunct formats. The three text structure types investigated in this study are: a) problem-solution, b) causation and c) collection of description; and the rhetorically-oriented framework as an adjunct type involves three different forms: a) without a rhetorically-oriented framework, b) with an L1 rhetorically-oriented framework and c) with an L2 rhetorically-oriented framework.

These definitions are discussed in detail and expanded upon in Chapter 2.

1.4 Introductory overview of research based on schemata and other related factors in L2 reading

A considerable number of studies have investigated the effects of schematic factors on reading comprehension, in both L1 and in L2 readers, by including either a single type of schemata (as a *main schematic effect*) or multiple schemata types, as factors affecting reading comprehension. These latter effects are referred to as *interaction schematic effects* in that they are incorporated to determine whether the effect of a factor depends on another factor. Studies into the interaction effects of schemata have considered not only those interactions that take place within schematic factors (for example, between formal and content schemata), but also those that occur on schemata in combination with other factors and associated with schema activation, such as an adjunct, the reader's background and/or the means of assessing their reading through the choice of response format.

In the present study, the investigation focuses chiefly on one of the schematic types – formal schemata. An overview of the reading studies literature has provided a basis for the present study with research dealing with the effects of formal schemata under a number of circumstances: as a single effect; as the interaction effect of formal schemata in combination with the other two types of schemata; and as the interaction effect in combination with related factors, such as response format, the readers' discipline-specific background and the use of adjuncts.

The single effect of formal schemata on reading comprehension has been found to be consistently conclusive both in L1 (Meyer, Brandt & Bluth 1980; Meyer and Freedle 1984) and in L2 (Sharp 2004; Zhang 2008). In contrast, when formal schemata have been considered in interaction with the other two types of schemata – that is, linguistic and content schemata – the findings have been less conclusive. Studies of formal and linguistic schemata indicate that it is the formal schemata which facilitate reading comprehension (Caillies, Denhiere & Jhean-Larose 1999; Francis & Hallams 2000; Linderholm *et al.* 2000; Kobayashi 2002; Sharp 2002), whereas those

examinations of formal schemata's interaction with content schemata indicate that formal schemata do not independently affect reading comprehension (McNamara & Kintsch 1996; Wylie & McGuiness 2004; Cekik 2007; Kendeou & Van den Broek 2007).

The literature also identifies composite studies concerning formal schemata and their interaction with either an adjunct, or with particular types of response format to determine their efficacy in facilitating readers' comprehension. When combined with formal schemata, adjuncts (in whatever form they may appear) seem to play a significant role in facilitating reading comprehension (see Karakas 2009; Rawson & Kintsch 2002; Slater, Graves & Piche 1984), although the effect of a rhetorically-oriented framework (as a form of adjunct) on reading comprehension was found to be insignificant in one study (Lee & Riley, 1990). When using recall as a response format, as opposed to other measures used for assessing reading comprehension of any schematic types, contrasting findings of the utility of formal schemata in facilitating reading comprehension have been the result (Brantmeier 2006; Chang 2006; Fecteau 1999; Lee 1986; Sharp 2004). In addition, when the effect of formal schemata on reading comprehension was assessed using different response formats, contradictory results were found between what are termed loosely-structured and tightly-structured reading texts (Foo 1989; Kobayashi 2002; Lee & Riley 1990; Sharp 2004; Zhang 2008).

No study of the composite effect of formal schemata and discipline-specific background has been located, although a number of composite studies of the effects of discipline-specific background and content schemata (content-relevance) in reading comprehension were uncovered. These studies have shown somewhat contradictory findings (Alderson & Urquhart 1985; Peretz & Shoham 1990; Tan 1990; Uso-Juan 2006).

This brief summary of past research findings makes it evident that the roles of text structures or formal schemata, adjuncts, discipline-specific background and recall vary. Further details of this research and findings are

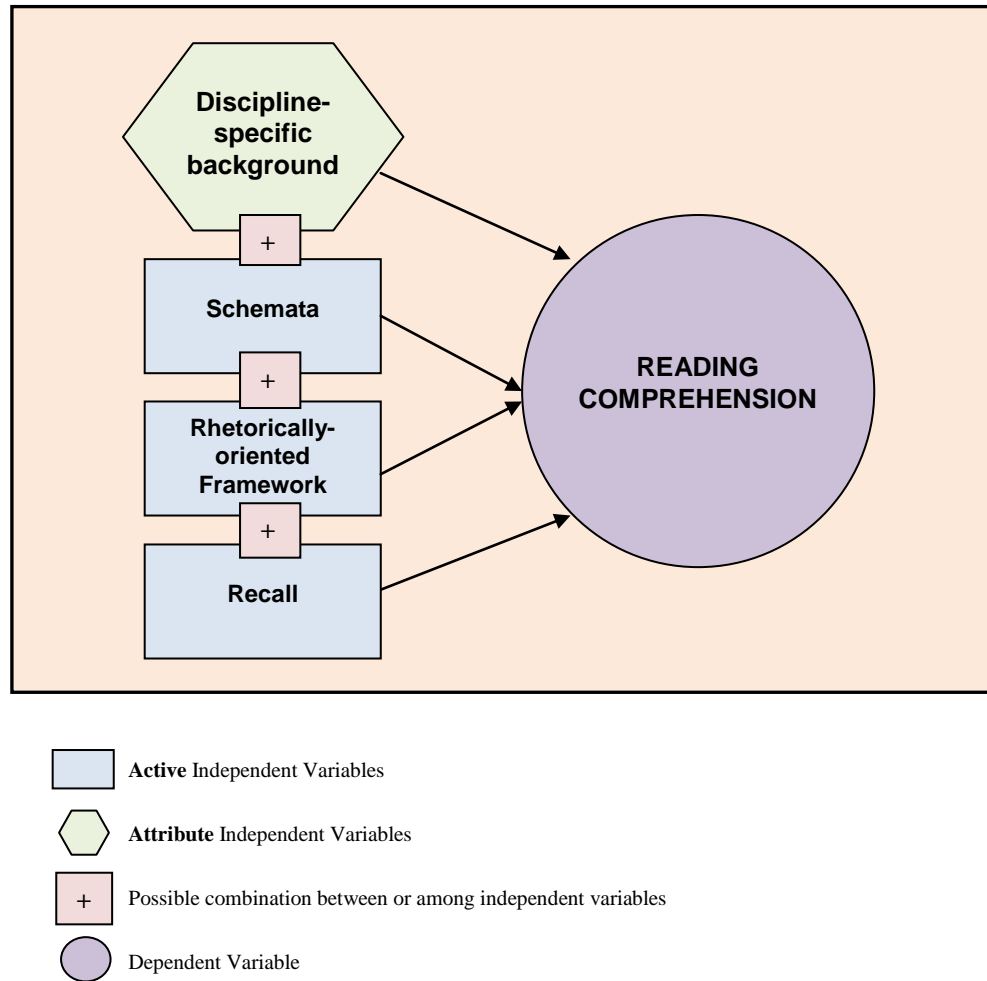
presented and discussed in Chapter 2. Under these circumstances, there continues to be uncertainty as to how these factors impact upon reading comprehension. To date no study has provided a complete understanding of the main and interaction effects of formal schemata (through text structure) in combination with the form of a rhetorically-oriented framework. Each of these is identified as a text factor that can be expected to impact on L2 reading comprehension of readers across different discipline-specific backgrounds using recall assessment in a student's native and target languages.

This study is concerned with four independent variables, and one dependent variable; of the four independent variables, three are active variables – text structure, rhetorically-oriented framework and recall, and all are manipulated through the design of test instruments; the single attribute independent variable is discipline-specific background. Reading comprehension is the study's dependent variable. The *purpose* of this research, then, is to examine the set of independent variables in relation to the single dependent variable of reading comprehension. The relationship among these variables is illustrated in Figure 1.1.

1.5 Research aim

The ultimate aim of this research is to assess the employment of facets of reading theory towards the enhancement of reading task design and thereby better activate the individual reader's inherent capacity to read. By so doing, it is hoped that the research, and its design, may contribute to improving the pedagogical processes related to reading. The investigation herein aims to build systematic knowledge of the role played by two important text factors in affecting reading comprehension for EFL readers. More specifically, this study aims to provide an exploration of the role played by interactions between formal schemata, rhetorically-oriented framework and recall as a

Figure 1.1 **Variables in the present study**



measure the outcomes of tertiary students' English language reading comprehension of expository texts outcomes across a variety of disciplines.

The research questions for the current study that result from these aims are presented in the following section.

1.6 Research question

The overarching research question of this study is: 'How do text factors and recall affect EFL tertiary reading comprehension outcomes across three discipline-specific backgrounds?' This research question can be

operationalised into more technically-enunciated research questions as follows:

1. What are the interaction effects of discipline-specific background, text structure, rhetorically-oriented framework and/or recall on the EFL reading comprehension of expository texts?
2. What are the main effects of discipline-specific background, text structure, rhetorically-oriented framework or recall on the EFL reading comprehension of expository texts?
3. What are the different effects among levels of the factors of discipline-specific background, text structure, rhetorically-oriented framework, or recall on reading comprehension of expository texts?

1.7 Scope of the study

Many theoretical models of reading are identified in the literature; examples being Dual Coding Theory, Rauding Theory and Schema Theory. In this study, the theoretical framework applied to the reading comprehension process is the Schema Theory model of reading as enunciated by, among others, Carrell and Eisterhold (1998), Eskey (1998) and Rumelhart (1980), as indicated above.

Of the three schema types – linguistic, formal and content (Carrell 1988; James 1987; Omagio 1986) – the investigation here is limited to an examination of the formal schema or text structures of expository text, achieved by holding the linguistic and content elements constant. Although expository text comprises several categories (this is further discussed in Chapter 2), not all of the categories are included in this study. Indeed, only one category is to be found here, that of Meyer (1975) which was modified by Carrell (1984), and which consists of four text types: causation, problem-solution, comparison and collection of description, as they are considered to be common in various contexts and have been closely related to academic materials (Carrell 1984; McNeil 1984). Three of these four text types –

problem-solution, causation and collection of description – have been selected. The exclusion of the ‘comparison’ text structure type is made chiefly because this particular text type is regarded in some quarters (Kobayashi 2002, p. 196) as an elaboration of the ‘description’ text type, but also for practical reasons in relation to a feasible sample size for the study.

As has been noted, in addition to the variable of text structure, there are three other variables involved in this study: discipline-specific background, the rhetorically-oriented framework and recall.

The students’ disciplinary studies varied within the single university where the collection of research data was conducted. In this study discipline-specific background is limited to students in three disciplines: economics, agriculture, and pure sciences. The research data have been collected from students in these disciplines in one state university in Malang, Indonesia. Therefore, the results of this study can only be generalised for students within that university from these disciplines.

The terms used to describe types of pre-reading are many and varied; consequently, it is necessary that they be distinguished specifically for the purposes of this research. Adjunct, as noted above, is an initial pre-reading activity in the form of a short text that is designed to enhance reading comprehension. The investigation of this study focuses on one particular adjunct type called a ‘rhetorically-oriented framework’, and readers were presented with this adjunct in one of three different forms: without a rhetorically-oriented framework, with an L1 rhetorically-oriented framework and with an L2 rhetorically-oriented framework. The choice to focus on only this type of adjunct was made because of its close relation to the *text structure types* being investigated: a rhetorically-oriented framework *is a description of the text topic that indicates the text structure type used to organise the text*. Additionally, the literature indicates that this is the only type of adjunct where studies have shown contrasting findings in terms of its capacity to facilitate reading comprehension.

There are many types of response formats that may be used for reading comprehension assessment, including, multiple choice, cloze test and recall assessment. Recall assessment may itself take many different forms: immediate versus delayed recall, spoken versus written, and cued versus free recall. This study is restricted to the immediate free written recall in two different languages: English, the ‘target language’ (L2) and Indonesian, the ‘native language’ (L1). The reasons for limiting responses to recall of only this type are as follows:

1. Recall has been commonly and successfully used, specifically, as a measure of reading comprehension when reading assessment is performed with a short text for research purposes.
2. No study to date has investigated the effect of the language of recall (English and Indonesian) on reading comprehension in combination with text structure and rhetorically-oriented framework for students in a range of disciplines. Therefore this approach can broaden the theoretical base of research into reading comprehension.

One limitation of this study relates to the model used for text structure analysis. There are several models identified in the literature for dealing with text structure analysis; those of Meyer, Kintsch and Frederiksen are three that have been used regularly. Meyer’s model of content structure analysis of discourse is the single model adopted for this study. According to Meyer (1975), the procedure for text analysis yields hierarchically arranged tree structures – called content structures – that show the relations among propositions (idea units) in the text. The justification for the choice of this model is discussed in Chapter 2.

1.8 Significance of the study

The results of this study are contributing to our understanding of the relative importance of the roles of text factors and recall techniques in facilitating reading comprehension. The results of this study also provide an additional

theoretical basis upon which reading practitioners may base their choices of the most effective expository text types, rhetorically-oriented framework and recall assessment techniques for the delivery of written instructional materials; particularly for university students across different disciplines. For designers of instructional reading materials, for instance, the results of this study can provide a perspective on the choice of expository texts that relates to the texts' rhetorical structure and to the use of a rhetorically-oriented framework; this is applicable to the design of materials for EAP and EFL courses undertaken by Indonesian tertiary students to facilitate their development and improvement in their reading skills. For designers of reading comprehension tests, the study provides insights for further consideration into the use of recall as a means of reading comprehension in various disciplines.

1.9 The structure of the thesis

The organisation of the thesis proceeds as follows:

Chapter 1, the present chapter, introduces the general concern of the study, referring specifically to the lack of reading proficiency of Indonesian tertiary students. One of the options to help overcome this problem is by drawing on reading theory to enhance both the design of reading texts and the opportunities for readers demonstrate their comprehension. This chapter introduces the basic concepts of reading in L2 circumstances and defines key terms, before the overall goals for the research and associated research questions are introduced. The chapter concludes with a brief initial consideration of the limitations of the research and the significance of its proposed contribution to reading and reading comprehension in L2.

Chapter 2 presents a detailed Literature Review focussing on a discussion of the theoretical concepts and empirical evidence that support the role of a variety of factors in reading comprehension. The discussion pays close attention to key concepts associated with the Schema Theory of

reading: the various models of reading comprehension processes, the schema model of reading, and empirical research findings based on Schema Theory. Additionally, in relation to factors affecting reading comprehension, theoretical perspectives and empirical evidence for each of the factors of discipline-specific background, text structure, rhetorically-oriented framework and recall, are provided and discussed.

Chapter 3 presents discussion of the research design and of the methodological considerations associated with the present study – the methods and procedures applied and the reasoning behind their application – and reports the results of the pilot study. The discussion ranges over the following: an overview of the methodological context, experimental research design, the instruments for reading comprehension, validity and reliability, the pilot study, research procedures and, finally, data analysis.

Chapter 4 presents the empirical findings of the research. The data are statistically analysed and interpreted and applied to provide answers to the research questions. The results of the testing of the hypotheses are reported.

Chapter 5 discusses the findings of the experiment by relating them to the theory and to the findings of previous research. Discussion specifically focuses on the effect of each of the factors affecting reading comprehension. Prior to the discussion, a summary of the hypotheses testing is provided.

Chapter 6 concludes the study by drawing out some of the key points that the research has highlighted, and further extends discussion it sees as arising from these findings. Finally, recommendations are addressed to: teachers of English for Academic Purposes (EAP) classes; to the developers of English teaching/learning materials for EAP classes; and to researchers who are interested in the further exploration of these aspects of reading comprehension.

CHAPTER 2

Literature review

This chapter primarily reviews both the theoretical and the empirical perspectives that inform the current study, focusing on some of the debates and chief findings from previous research. The chapter includes consideration of: 1) models of reading comprehension processes; 2) the Schema Theory model of reading; 3) reading research findings based on Schema Theory application; 4) the rhetorical structure of expository text; 5) pre-reading in the form of a rhetorically-oriented framework; 6) discipline-specific backgrounds; and 7) recall as a means of assessing reading comprehension assessment. This review chapter closes with a presentation of the hypotheses underlying this project.

2.1 Models of reading comprehension processes

The reading process has become an important concern among educators, psycholinguists, structural linguists and behaviourists, and has generated the development of a great many theories of reading. Reading is a complex process and there is, as yet, no universally accepted theory to account for its intricacies. The various extant theories have been grouped into three categories according to their general perspectives on reading process: ‘bottom-up, top-down and interactive’ processes (Raynner & Pollatsek 1989, p. 25). These three categories are valuable in distinguishing the fundamentals of the competing models for teaching in both L1 and in L2 reading.

2.1.1 Bottom-up model of reading

The bottom-up model of reading reflects a definition of reading as a decoding process. Decoding in this sense means that during the reading process, readers try to recognise graphic symbols, from the very smallest component, such as a letter, to the recognition of larger units – words – and in so doing attempt to identify the sounds from which the meaning will be formed (Carrell 1998b; Marzano 1987). The proponents of this view, which is influenced by structural linguistics and thus behavioural psychology (Silberstein 1987), posit that understanding can occur through accurate recognition of graphic symbols, such as words, and by approximating their translation into oral language (Harris & Sipay 1980). This view is sometimes termed ‘data-driven’ (Carrell & Eisterhold 1998, p. 77; Lieberman 2004, p. 372) because the process of reading comprehension is based on linguistic input from the text (Carrell & Eisterhold 1998; Silberstein 1987), with the reader positioned as a processor of every word, and performing an intensive analysis of their possible meaning.

The principles underlying the bottom-up view have been widely criticised among applied psycholinguists, since it is the reading process which becomes the focus of interest. The reader’s problem is regarded simplistically as one of mere symbol-recognition and decoding in order to derive meaning contained in the text (Plaister 1968; River 1968); the criticism rests on the fact that the reader’s role falls largely out of consideration (Goodman 1968; Smith 1982).

2.1.2 Top-down model of reading

A number of concepts underlie the top-down model of reading. Drawing on psycholinguistics and cognitive psychology, proponents of the top-down approach believe that the learning of language – and of reading in particular – depends on the active contribution of readers to an understanding of a text and the author’s intentions within that text (Goodman 1967, 1985). Theorists working with this model also suppose that the process of becoming a

proficient reader is fundamentally a process of progressing from dependence on the text to the use of prior linguistic and conceptual knowledge to construct the whole text's meaning (Eskey 1986; Smith 1971, among others). Thus, a top-down process is a process that flows from the reader's high level expectations or hypotheses about incoming data, which are then refined by the analysis within the context of the text (Hudson 1988).

This view, which is also called 'conceptually-driven processing' (Bruder & Henderson 1986, p. 6; Lieberman 2004, p. 372), is considered the primary approach employed by skilled readers, since they can maximise the use of their background knowledge to predict meaning. Goodman (1970, p. 260) describes the fluent reading process as a smooth and rapid 'psycholinguistic guessing game', where a reader uses strategies such as sampling language cues on the printed page, predicting, confirming or correcting the meaning of the text, and integrating the outcomes with previous knowledge. The reading process is considered to be efficient if readers can make accurate guesses through the minimal use of the most productive cues (Goodman 1967). For Rumelhart (1980), too, skilled readers comprehend a text by actively constructing meaning, integrating information from the text with relevant contextual information from their background knowledge.

Just as the bottom-up model has limitations, so too have shortcomings been ascribed to top-down explanations. Samuels & Kamil (1988, p. 32) highlight the core problem:

That for many texts, the reader has little knowledge of the topic and cannot generate predictions, the amount of time necessary to generate a prediction may be greater than the amount of time the skilled reader needs to simply recognize words in a text than to try to generate predictions.

The weaknesses of top-down view are also identified by Stanovich (1980), who holds that readers with little knowledge will have a correspondingly limited access to the text's expected meaning and that skilled readers will spend more time than just simply getting meaning through the printed page.

These observations are supported by Paran's (1996, p. 2) English as a Foreign Language (EFL) research that highlights the importance of strengthening a bottom-up view of processing to augment reading because 'good readers do not rely on hypothesis formation and prediction as much as is commonly thought'. Visual input and bottom-up processing are considered to be of great importance during reading. Paran (1996, p. 29) argues for the value of each model and contends that 'one of the goals of L2 reading instruction is to make readers less reliant on top-down processing, and help them progress towards greater reliance on bottom-up strategies as they become more proficient'.

This is also in line with Eskey's (1988, p. 94) position:

Good readers know the language: They can decode, with occasional exceptions, both the lexical units and syntactic structures they encounter in text, and they do so, for the most part, not by guessing from context of prior knowledge of the world, but by the kind of automatic identification that requires no conscious cognitive effort.

Paran (1996) and Eskey (1998) argue, then, that the top-down model is less descriptive of (and even inapplicable to) the less proficient, developing reader; in effect, most second and foreign language readers. This argument seems to support Bruder and Henderson's observation (1986) that most of the research with top-down processing has been carried out with L1 English speakers, who have been fluent orally before they are confronted with reading activities. With L2 or EFL learners of English, however, the capability to predict English meaning by drawing on prior knowledge would naturally be far below that of those learners proficient in English to L1.

2.1.3 Interactive model of reading

According to the interactive model, reading is a combined and simultaneous process involving bottom-up decoding and top-down analysis: an interactive process between the reader's background knowledge and the graphic

symbols on the printed page (Carrell 1987; McCarthy 1991). It is a bottom-up process insofar as readers must take in the linguistic cues of the text and integrate them into their ongoing hypotheses about the content and form of the text; but it is top-down in that readers simultaneously formulate hypotheses, expectations and anticipations based on their background knowledge of content and form (Rumelhart 1977, 1980). Thus, readers perform a two-fold task simultaneously, drawing on their background knowledge through the utilisation of higher level text processes, as well as processing the information in the text automatically, by decoding the printed page through lower level processes (Eskey 1998).

Some argue that the concept of 'interactivity' is unclear and can be open to various interpretations. For example, Samuel and Kamil (1998), in their evaluation of interactive models of reading over three decades, note many changes since the emergence of the first interactive model proposed by Rumelhart 1977, which emphasised the requirement of 'flexible processing and multiple information for reading' (Samuel & Kamil 1998, p. 24).

A good model of the reading process, according to Samuel and Kamil (1998) fulfils three criteria: by enabling the reader to summarise the past, by helping them to understand the present, and by informing their predictions of the future. It seems, however, that none of the existing models that appear in the literature can meet perfectly these requirements in explaining the reading process. Grabe (1998, p. 60) underlines this point:

There is no single interactive model. Rather interactive models include any model that minimally tries to account for more than serial processing and that does so assuming that any parallel or array processing will interact. A key issue for all interactive models is how to account for numerous word recognition studies in the literature that run counter to top-down assertions.

Grabe (1998, pp. 60-63), identifies five well-known models in support of the concept of an interactive reading process: the *Interactive Activation Model*, the *Interactive Compensatory Model*, the *Bilateral Cooperative Model*, the *Automatic Processing Model* and the *Verbal Efficiency Model*. The processes

in each of these varies, the difference being in the perspectives and focuses of the models' builders (Grabe 1998; Samuel & Kamil 1998) and in the particular language aspect upon which the model is established (Samuel & Kamil 1998). Each particular model, however, contains valuable information about the reading process that is not to be found in the others (Samuel & Kamil 1998). So, these five models provide a point of reference for L2 reading practitioners, particularly, with regard to an understanding of the individual concepts of interaction in the reading process.

According to Grabe (1998, pp. 63-64), five 'implications' flow from the use of an interactive model in second language reading:

1. Reading as an interactive process remains an important part of overall reading models.
2. Interactive models strongly imply that many lower-level processing skills are basic to good reading.
3. The need for a massive receptive vocabulary that is rapidly, accurately, and automatically accessed – a fact that may be the greatest single impediment to fluent reading by ESL students.
4. The apparent overreliance on text or on context noted by Carrell might best be explained by Stanovich's interactive compensatory approach.
5. The development of reading abilities may be viewed more profitably if seen in terms of stages of skills development.

2.2 Schema Theory model of reading

As noted in Chapter 1, and in agreement with these latter theorists, this study defines reading as a process of interaction between the reader and the text, that is, the reading process is the combined interaction between bottom-up and top-down processes. An interactive model of the reading process draws on the underlying concept of Schema Theory, and this section examines this. The discussion deals with the generic concepts of Schema Theory, with schemata and reading comprehension and with the limitations of the Schema Theory Model of Reading.

2.2.1 The generic concept of schema

Schemata have a historical background that stretches back long before their contemporary and widespread use as a theoretical framework for many reading studies. In reviewing the history of the development of Schema Theory, Anderson and Pearson (1984) trace its origin to Bartlett's (1932) popular book *Remembering*, which describes schemata as general impressions of a whole body, with details built around the notion of a schema. Anderson and Pearson (1984) also note that emphasis on the whole rather than on an individual part is a reflection of the philosophical notion of *gestalt*, which is in turn a reflection of the focus of psychologists who studied mental organisation during the 1930s.

Viewed from this discussion of schema, relationships among components and the role of inferencing are considered as the key concepts of schema. A schema has been defined as 'an abstract knowledge structure': abstract in that it is a summary of what is known about a variety of cases which are different amongst themselves in many particulars; and 'structured' in the sense that among its component parts are related representations (Anderson & Pearson 1984, p. 259; 1998, p. 42). Similarly, Rumelhart (1980, p. 34) defines a schema, as 'a data structure for representing the generic concepts stored in memory'. He considers a schema to be a model of particular mental concepts that may correspond to various kinds of objects, animals, people, abstract ideas, events or actions, that encompasses a network of knowledge related to a particular concept, and which may comprise additional schemata. Further, he states that Schema Theory deals with knowledge of how a schema is represented and how such representation makes knowledge possible.

Schema Theory is based partly on the understanding that the 'language of comprehension involves one's knowledge of the world' (Anderson *et al.* 1977, p. 378). Schemata are considered to be the key units of the process for comprehension (Rumelhart & Ortony 1977). The component parts of a schema, and the relationship of these parts to each other, are essential in

reading comprehension processes. These component parts of information which enable a schema to be meaningful to the reader are referred to as nodes, variables, or slots (Anderson & Pearson 1998). The ship christening schema as proposed by Anderson and Pearson (1984, 1998) serves as an example. For these authors, a schema that represents the concept of 'ship christening' has six components namely 1) a new ship, that 2) requires a blessing to be 3) done by celebrity, 4) in dry dock, 5) just before its launching by 6) breaking a bottle on the bow. Each of these component parts is either a node, a variable or a slot. A node of a schema may also have sub-nodes. For instance, the node that represents the 'bottle broken on bow' in this particular schema has two sub-nodes: 1) suspension from a rope and 2) contains champagne.

During the process of comprehension, a schema and its nodes can activate the reader's mind in different ways. Anderson and Pearson (1984) argue, for example, that their ship christening schema is better able to draw the reader's mind to a comprehension of the component 'celebrity' than a mere mentioning of the word 'celebrity'. The reason for this, they claim, is that mentioning of the word 'celebrity' in isolation requires a more generalised concept that belongs to many schemata and as such might be interpreted as relating to other things rather than activating ship christening. The component that can most effectively activate the reader's mind is called 'salient'; salient components are cumulative in effect, and it is posited that to create better activation of a schema in a reader's mind two or more component parts of a schema should be mentioned. Thus, the schema may be triggered by the nodes or the nodes may be inferred through activation of the schema (Anderson & Pearson 1984).

Inference, according to Anderson and Pearson (1984), is a key concept in cognitive processing; when it is viewed from the perspective of Schema Theory, inference is also a key concept in reading comprehension. They identify at least four kinds of inference in reading comprehension (Anderson & Pearson 1984). The first, schema-selection inference is involved in the

process of deciding which schema among many should be activated in order to comprehend a text. Second, an instantiating inference is involved in the process of accounting for slots within the selected schema. Third, default inference is the inference involved in the process of assigning default values in the absence of any specifically substantiating information. Lastly, a concluding inference which is involved in the process of drawing a conclusion based on lack of knowledge.

An understanding of any general or specific concepts of schema is important for readers in that such understanding enables the more effective acquisition and retention of new information. Anderson and Pearson (1984) indicate that knowledge of abstract and general schemata as well as knowledge of particular schema benefits reading for comprehension. For example, the schema for an animal, such as *bird*, may include variables of both a general concept and of a particular concept: a general concept of *bird* that includes ‘to have wings’, ‘to be able to fly’ and ‘to lay eggs’ that differentiate it from other animals or things that cannot be classified as bird. It is accessing the node of a particular concept when we talk about any particular bird, like ‘robin’. For example, when we include the information that the bird has red breast feathers, it distinguishes robin as a bird from other members of *birds*. Schema can function to facilitate perception and the gaining of understanding. Rumelhart (1980) argues that more word recognition as a whole facilitates perception and benefits comprehension.

2.2.2 Schemata and reading comprehension

Viewed from the reading definition, as stated in Chapter 1, both bottom-up and top-down work interactively in the process of comprehension. As Carrell and Eisterhold (1998, p. 76) have indicated:

The process of interpretation is guided by the principle that every input is mapped against some existing schema, all aspects of which must be compatible with the input information, and as a result this principle

involves two basic modes of information processing: bottom-up and top-down processing.

Schemata are categorised into three major types: linguistic, formal and content schemata. 'Linguistic schemata' relate to reader's knowledge of the language used in the text, 'content schemata' to the reader's knowledge of the text's content and 'formal schemata' to the reader's knowledge of the rhetorical organisation of the text (Carrell 1998a, p. 4; James 1987, pp. 178-80; Omaggio 1986, p. 97). Thus, the language utilised in the text, the text's rhetorical structures and the content of the text, constitute three text factors that will affect the reader's capacity to comprehend that given text.

Schemata are the key units of the comprehension process. They are the cognitive constructs through which information is organised in long term memory (Widdowson 1983), and constitute 'the experiences, conceptual understanding, attitudes, values, skills, and strategies that can be brought to a text situation' (Vacca & Vacca 1999, p. 15), with language ability constituting part of one's total background knowledge (Carrell 1983). The reader activates schemata when they are reading. The content schemata represent the knowledge of the actual and imagined world of things, events, people and ideas, and are applied to top-down schema to derive meaning. Textual schema are posited to be applied bottom-up and involve the knowledge of individual segments that indicate the form of the text, such as textbook, and news article (Anderson, Pichert & Shirey 1983).

Students who cannot grasp a text's meaning by reading it can be characterised as lacking the relevant schemata. Rumelhart (1980) argues that, to deal with gaining understanding, misinterpretation by a reader may occur as a result of an inadequate schema to cue what the passage is all about, and identifies at least three schema-related causes that bring readers to fail to comprehend text. The first is that there is no appropriate schema to aid interpretation of the entire concept. Secondly, there might be appropriate schema, but there is the lack of a text clue provided by the text. Thirdly, there might be conflicting perception between what the writer intended the reader

to understand from the text and the readers' perceptions, and this may arise when the background information of the text content delivered by the writer is culturally-specific and lacking in the reader (Carrell & Eisterhold 1983; Stott 2011).

Carrell (1998b, pp. 103-110) extends this further, arguing that overreliance on either bottom-up or top-down processing (bi-directional processing) becomes the main cause of readers' failure to understand text. She hypothesises five causes for the breakdown of bi-directional processing:

- Schema availability. This notion refers to the absence of relevant schemata required to utilize in top-down processing. To comprehend a technical text, for example, a reader should acquire relevant technical knowledge.
- Schema activation. This refers to a breakdown in bi-directional processing that may occur if available relevant schemata are not activated. A text of a familiar topic, for example, should have sufficient textual cues to signal the appropriate schemata to be activated.
- Skill deficiencies. This notion refers to the reader's linguistic and reading skill deficiencies. Bottom-up processing obviously cannot be used if one has linguistic deficiencies, that is one cannot decode syntactic structures or recognize content vocabulary. Similarly, in relation to reading skill deficiencies one may be, for example, an inefficient bottom-up processor such that the decoding of language takes great effort. This deficiency may lead either to over-reliance on decoding or to avoidance of the same and reliance solely on top-down processing.
- Conception about reading. Readers may not know that they are allowed to use information not stated in the text in order to interpret it and may over-rely on bottom-up processing, as a result.
- Cognitive style. This notion refers to the situation where a reader may simply treat the text as independent of all prior knowledge he/she possesses, and thus fail to draw on potentially relevant schema.

Schemata are also closely linked with eye-movement in the reading comprehension process, in that the eyes are used to pick up information from the text as they move, and it is the brain that tells the eyes to move through the text to search for information, that tells them whenever it has got the information required and directs them very precisely in where to move next (Smith 1971). Frenck-Mestre (2005) reported that the role played by the eye-movement is very useful for its functions to record syntactic processing while reading. According to Rayner and Pollatsek (1989), eye movements play two main roles in reading process, i.e., by picking up data from the text and by cognitively deducing the reading process. Linguistic, formal and content schemata are needed to guide the eyes in moving precisely to where they are required in order to pick up information (Rumelhart & Ortony 1977). Thus, it appears that these three types of schemata can assist readers to predict, select information and to reduce vagueness and thereby may raise reading speed.

Comprehension, memory and remembering are three interrelated components in the reading process. Memory, which is ‘a mental record of our experiences’ (Lieberman 2004, p. 37) or ‘the processes of encoding, storing, retrieving information’ (Thorne 2011, p. 2), can be divided into at least three major kinds: sensory store, short term memory and long term memory (Smith 1971; Thorne 2011). Clark and Clark (1977) indicate:

Memory plays an integral part in reading from the moment the first visual information is picked up to the recollection of what was read years later... It is the place where new information is stored, asked for information is sought, and where facts and general knowledge to infer indirect meanings are stored.

Short term and long term memory differ in many respects, as identified by Smith (1971, pp. 42-44):

1. New information can be stored in long term memory without any risk of destroying the old information already stored in it. Long term memory can store vast amount of information indefinitely.
2. The contents of long term memory seem to persist indefinitely, while

those of short term memory slip away the moment the reader's attention is distracted.

3. Short term memory holds unrelated items, while long term memory is a network, a structure of knowledge, and it is coherent.

Eskey (1986) describes what happens with these three kinds of memory during reading. First, the visual image is picked up from the print on the page or screen and is briefly retained in sensory store. During this phase, the print is converted into linguistic information, that is, into meaningful segments of language. Next, this linguistic information is transformed into short term memory. Since short term memory can hold only four or five units of information at once, the only way of making this process more efficient is to increase the size of what constitutes a unit: to read in whole phrases or sentences as opposed to individual words or sequences of letters. Ultimately, the identified language forms must be simultaneously converted into the kind of information, proposition or ideas that can be stored in the long term memory.

A schema affects not only understanding, but also remembering of what is being read. In relation to the effects of a schema on remembering, three hypotheses are formulated by Anderson (1984). The first hypothesis is the *retrieval-plan* hypothesis, which proposes that a schema provides the framework for a top-down search of memory. This means that the search proceeds from the general concepts incorporated in the schema to the particular information in a text, especially important information and that related information to the schema. The second hypothesis is the *output-editing* hypothesis, which explains that a schema provides the basis and the motivation for output editing by selecting or rejecting information depending on how relevant the information is. The third hypothesis is the *inferential-reconstruction* hypothesis, which addresses how the schema facilitates reconstruction: a reader generates inferences of the text based on the schema possessed by the reader and the features of the text.

2.2.3 Limitations and the influence of Schema Theory

In spite of being widely accepted, Schema Theory has not been inseparable from criticisms. Most of the criticisms come from the cognitive psychology perspectives from which the theory has derived and developed (Anderson, Spiro & Anderson 1978; Brewer & Treyens 1981; Brown 1979; Sadoski, Paipio & Goetz 1991; Taylor & Crocker 1981). The following discussion of the drawbacks of a schema results in some proposed theoretical models as alternatives.

The definition of Schema Theory has been criticised in the literature for not providing a clear concept, with the utilisation of the notion of schema appearing to include a range of different approaches and concepts. The concept of a schema, for instance, can take the form of either a 'Frame' (Minsky 1975) or of a 'Plan' (Schank 1977) to indicate the structure of knowledge, or be conceptualised as either symbolic schemata (Oller 1995) or story schemata (Johnson & Mandler, 1980) to describe something relating to linguistics and discourse. In addition, the concept of a schema has been widely used to mean something similar to background knowledge, especially in L2 reading studies (Nassaji 2002).

Schema Theory has also been criticised from its supporting empirical grounds, with Sadoski, Paipio and Goetz (1991) contending that research has failed to explain the effect of imagery on reading comprehension. Schema activation is still under debate among researchers, and its limitations, according to McVee, Dunsmore and Gavelek (2005), have been noted by both the supporters and critics of the theory. The popularity of Schema Theory in contributing to the reading process was initially influenced by studies using bizarre texts, which resulted in the acceptability of the findings from such texts being contested (Alba & Hasher 1983; Sadoski 1981; Nassaji 2002). The reader's reactions towards a bizarre text being read cannot be extrapolated to explain the complexity of knowledge to be stored in the mind when they are being confronted with other types of texts (Alba & Hasher 1983; Nasajii 2002). Alba and Hasher (1983), in their discussion to

the five main processes of mind representation, infer that the memory load and information represented in the mind is far more complex than that which Schema Theory has proposed.

Schema Theory, which is powerfully supported by evidence resulting from the use of bizarre texts, is considered to lack an informative rationalisation for any type of common reading processes. Carver (1992) argues that Schema Theory is more suitable for understanding special comprehension processes rather than for regular ones. Carver (1992) contends that in Schema Theory, comprehension is seen as being facilitated by three important components: prediction activities, prior knowledge, and text type, and that these are problematic in the ordinary reading process. In contrast, these three schematic components related to learning and memorising processes seem to be more closely related and appropriate to higher level students, such as university level students, than to lower level students, such as elementary or secondary students, because their importance and use tend to be related to comprehension of the more difficult reading material common to university students (Carver 1992).

From the perspective of sociocultural theorists, Schema Theory has insufficiently considered the existence and contribution of sociocultural theory. Whilst sociocultural theory is considered to have the capacity to expand and enhance the basic perception of the origin and the improvement of Schema Theory, McVee, Dunsmore and Gavelek (2005) argue that the position of sociocultural theory in support of the development of Schema Theory prevented attention to it as an essentially-related component of Schema Theory. In line with this, Saito (2000) indicates that mental process and the socio-cultural world are both contributing concepts of thinking for schemata. From a socio-cultural perspective, there are three considerations that Schema Theory has not taken into account: 1) the origin and development of schemata have not been clearly established 2) the known and knower are not divided, 3) the role of mediational devices is not successfully considered (McVee, Dunsmore & Gavelek 2005).

There are several alternatives of theoretical perspectives proposed by scholars in response to the weaknesses of Schema Theory. Nassaji (2002) considers a Construction-Integration (CI) model of text comprehension developed by Kinsch and Van Dijk who commenced as far back as 1978 and has been revised and further developed since, with this development being derived from and inspired by studies into human memory and recall, especially in relation to knowledge activation (Nassaji 2002). This is a model which assimilates conventional Schema Theory and features more intricate and wider perspectives, which are more flexible to the knowledge used (McVee, Dunsmore & Gavelek 2005; Nassaji 2002). According to Sadoski (1999) and Sanford and Garrod (1998), this model is a well-known model among researchers in reading, but it is not well recognised among L2 reading scholars (Nassaji 2002). Nassaji argues that the concepts underlying the CI model are more explicable, in terms of accounting for the outcomes of knowledge-based processes than Schema Theory, especially in L2 reading.

Dual coding theory (DCT), which developed from the theory of cognition and proposed by Sadoski, Paipio and Goetz (1991, pp. 472-3), is another theoretical alternative to Schema Theory. Like Schema Theory, it is not particularly a reading theory:

The development of the theory has included the systematic investigation of these relations at the word, phrase, sentence, and text levels, and prediction from it has been tested against the predictions of competing theories [...]
The theory holds that cognition consists of the activity of two separate mental subsystems, one specialized for the representation and processing of the information concerning non verbal objects and event, and the other specialized for dealing with language.

Therefore, DCT is considered by some researchers to be more valuable in providing a cognitive perspective in reading research than Schema Theory (Sadoski, Paipio & Goetz 1991).

Another alternative theoretical perspective is Rauding Theory proposed by Carver (1992), which like Schema Theory is best considered as a partial

theory (Carver 1992). This theory was developed to be appropriate with 'normal, typical or ordinary reading' and is based on five reading processes which are not valid for Schema Theory (Carver 1992, p. 165). Furthermore, Carver indicates that the three assumptions of Schema Theory – prediction activities, prior knowledge and text type – are outside the purview of Rauding Theory because they include processes not included with normal reading in all situations (1992). In Rauding Theory, the prediction of the amount to which a passage has been comprehended is measured mathematically and specifically to the aspects of the reader's ability, the allotted time, their reading speed, and level of difficulty of the materials. According to Carver (1992, p. 172), Rauding Theory

predicts that under normal reading conditions where students use their rauding process on a passage, then (a) their general reading ability has a large effect upon amount comprehended and (b) their prior knowledge, specifically to that passage, has a very small and unimportant unique effect that can be safely disregarded. If students are given relatively hard material and are forced to shift out their rauding process down to a learning process or a memorizing process, then the predictions made from Schema Theory are much more likely to be substantiated.

Despite the criticisms and alternative conceptualisations briefly discussed here, the widespread respect for, and reference to the role played by Schema Theory in reading research and teaching cannot be denied. Many researchers and practitioners in education have made use the schema construct because they see its value in explaining the process of reading (McVee, Dunsmore & Gavelek 2005), including in accounting for some related concepts in L2 reading (Fitzgerald 1995; Gaffney & Anderson 2000). The proof that Schema Theory is still as influential as McVee, Dunsmore and Gavelek (2005, p. 534) have argued, is its inclusion in all '25 reading/language arts texts published between 1989 and 2004, ... to help explain the reading process, especially comprehension', suggesting that it continues to be seen as a useful device in teaching about comprehension for

both in-service and pre-service teachers (McVee, Dunsmore & Gavelek 2005). Nassaji (2002) has argued that in L2, in particular, whilst reading involves multi-dimensional aspects of knowledge, including background knowledge, Schema Theory provides a valuable facilitating concept to background knowledge. In an earlier work Alba and Asher (1983, p. 224) similarly emphasise the positive impact of Schema Theory on understanding memory:

Although the present article has in large part questioned the specifics of schema theory, there can be no denying its generally beneficial impact on the field of memory. Schema theory has revitalized the area and moved researchers to consider a number of new issues about the nature of memory as well as about the parameters of the comprehension process.

More recent work continues to recognise its value, whilst also recognising that it may be only a partial theory of reading (McVee, Dunsmore & Gavelek 2005; Nassaji 2002).

2.3 Reading research findings based on Schema Theory application

A considerable amount of reading research based on schemata has been undertaken to investigate the effects of various schema types. This section will deal with the findings of studies on the effects of schematic types, commencing with single effects studies and given their focus in this research project on studies that include formal schemata. The discussion of the research findings will be focused on the schematic types in relation to many different research designs adopted.

2.3.1 Single effects of Formal schemata on reading comprehension

Formal schemata, the knowledge of text rhetorical structures, have been identified in many different categorizations. The focus of this sub-section is

on the study findings of the single effects of text structures on reading comprehension for several categorisations.

Consistently conclusive findings of the effects of formal schemata on reading comprehension with L1 participants have been made. Among the studies, for example, are those carried out by Meyer, Brandt and Bluth (1980) and by Meyer and Freedle (1984). Meyer, Brandt and Bluth (1980) examined two well-structured texts of problem/solution and comparison as comprehended by ninth grade English native speaking school students. They found that readers using top level of both text structure types recalled more information from the texts. Similar results were also found in the study by Meyer and Freedle (1984) which investigated the effects of four types of text structures (collection of description, causation, problem/solution and comparison) of L1 college students. The study found that students could recall more information from the three more tightly-organised texts of the comparison, causation, and problem-solution type than the less tightly-organised text (collection of description). This suggests that for native speakers, using top level of well organised text structures enhances reading comprehension. Meyer and Freedle (1984) also found that the use of immediate recall yielded better results for the effects of the four text structure on reading comprehension than the use of delayed recall. The rank order of text structure affecting reading comprehension was also altered according to whether immediate or delayed recall was employed. In immediate recall, the effect of causation was superior; then, in sequence, it is followed by comparison, problem-solution and collection of description. In delayed recall comparison was superior followed by causation, problem-solution and collection of description.

Text rhetorical structures also appear to influence L2 reading comprehension. Using a recall response format as a measure of reading comprehension, Carrell (1984) indicates that each structure type yielded a statistically significant difference in facilitating reading comprehension, with L2 readers better recalling the three more organised texts. Goh (1990) re-

examined Carrell's (1984) study by conducting experimental research among L2 university students in Singapore, and concludes that contrasting text structure types affected recall differently, and that more information from the text was recalled when L2 readers were aware of, and used their text structures recognition capacities. Similarly, Foo (1989) investigating the effects of two text structure types – problem/solution and collection of description – in the L2 of O-level students and second year undergraduate students in Hong Kong, found text structures facilitated L2 reading comprehension, and that problem-solution text structures were better recalled than collection of description. The most recent studies conducted by Sharp (2004) and Zhang (2008), who investigated the effects of text rhetorical structures on L2 reading comprehension, also confirm that text rhetorical structures do affect reading comprehension.

Using different response formats as measures of L2 reading comprehension has resulted in contrasting findings between loosely- and tightly-structured texts in facilitating reading comprehension. Foo (1989), Lee and Riley (1990) and Zhang (2008), in their studies using recall as a measure for reading comprehension, report very similar findings. Based on their research of two structurally different expository texts, collection of description and problem-solution, Lee and Riley (1990) concluded that the more tightly-organised text was more easily understood by non-native readers of English. Similarly, Foo (1989) found that a problem-solution text was better recalled than one of collection of description. Zhang (2008) also found that the more tightly-organised text was better recalled. In contrast, however, using recall of two different types and a cloze test as measures of reading comprehension, Sharp (2004) found that, using quantitative recall, there was no significant difference among text structures, suggesting that quantitative recall is irrelevant in assessing text structures. Using qualitative recall and cloze tests, the most loosely organised texts (listing and description) of the four text structure types were the most easily understood,

whereas the causation text, which is considered as a tightly-structured text type, was the most difficult to comprehend.

2.3.2 Interaction effects of schemata on reading comprehension

One of the issues in reading research into the effects of combined schema types concerns the main effects and interaction effects of a combination of schemata. The combined effects of schemata on reading comprehension found thus far are of linguistic-formal or linguistic-content or formal-content, or combinations of pairs of these three, but no study has been identified that considers the effects of all three simultaneously.

2.3.2.1 Effects of formal and linguistic schemata on reading comprehension

Studies of reading comprehension for formal and linguistic schemata reflect consistent findings. Francis and Hallams' (2000) study examining the importance of text extracts in different genres to mature students' linguistic ability for understanding concludes that post-graduate students doing Masters found difficulties in understanding text extracts, and that their difficulties were due to an adequate knowledge of the language and the structure of the genre. Thus, linguistic and formal schemata have been determined to be initially facilitating factors for reading comprehension. Similarly, Kobayashi (2002) has found that text structures, regardless of the response formats used as measures, significantly affect the reading comprehension of learners of various proficiency levels.

Readers' proficiency levels appear to impact differently in relation to text structures supporting an interaction effect between formal and linguistic schemata. Caillies, Denhiere and Jhean-Larose (1999) found advanced readers performed better in the hierarchically-organised text version than they did in the causally-organised text version, whereas intermediate and beginner learners performed better in the causally-organised version. The performance of the advanced learners was more similar to that of intermediate learners than the beginner learners in the causally-organised

version. Linderholm et al. (2000), who investigated the effect of causally-repaired easy and difficult texts on more- and less-skilled readers, found that not only the more-, but also the less-skilled readers were affected by the causally-repaired difficult text but not by the causally-repaired easy text. Kobayashi (2002) and Sharp (2002) found that text structure types contributed significant difference to students' proficiency grouping (more- and less-skilled readers) in facilitating reading comprehension.

Divergent findings on the interaction effects between formal and linguistic schemata can be largely accounted for by the utilisation of different research designs, particularly in relation to the various response formats used as measures of reading comprehension. For example, Sharp (2002) found, using cloze test and qualitative recall, that the four types of text structure contributed a significant difference in the reading comprehension of students at all proficiency levels, whereas when using quantitative recall, there was no significant difference. In addition, by using a cloze test, it was found that the loosely-organised text, description, was easier to understand across all proficiency groups. Similarly, Kobayashi (2002) found, when using an open-ended response format that association text, which is considered as the loosely-organised association text was better understood by the two higher proficiency groups than was the more tightly-organised text. Using a cloze test and summary writing, it was found that the three proficiency groups performed differently across the text structure types, especially the high and low proficiency levels.

2.3.2.2 Effects of formal and content schemata on reading comprehension

A number of studies have considered whether formal and content schemata affect reading comprehension, either as main effects or interaction effects when considered together. Kendeou and Van den Broek (2007) found main effects on reading comprehension for both content and formal schemata. Wylie and McGuiness (2004) found no interaction effects on reading comprehension with content and text structure, but there was a main effect of

text structure although no main effect of content. In contrast to the main effects of Wylie and McGuinness's study above, Cekik (2007) finds content schemata to be only a main effect, with no main effect for formal schemata. In contrast, McNamara and Kintsch (1996) conclude there is an interaction effect between content and formal schemata, but no main effect for either. In accounting for these somewhat diverse findings, the level of the readers' familiarity with content and form needs to be considered. Carrell (1987) shows that when participants are familiar with the content and the form, comprehension is good; content is the strongest predictor and is more facilitative than form. Conversely, Roller (1990) finds that text structure is more important than content, when the content is fairly unfamiliar to the reader. In relation to the different types of recall as measures, different rank order of text structure types has been deserved (Wylie & McGuinness 2004), with those readers employing delayed recall for tightly-organised text performing better than for loosely-organised texts, whereas immediate recall generated better performance for the loosely-organised texts than for the tightly-organised texts.

2.3.2.3 Effects of linguistic and content schemata on reading comprehension

It has been found in studies of the combined effects of content and linguistic schemata, that both content and linguistic schemata play a significant function in facilitating reading comprehension. Carrell and Wise (1998) explore the interaction effects of topic interest and background knowledge on ESL reading comprehension and find that language proficiency level significantly affects reading comprehension of content familiarity. Pulido (2003) examines the role of topic familiarity, reading proficiency and passage sight vocabulary in facilitating incidental vocabulary acquisition, finding a strong effect for reading proficiency, contrastive effect for topic familiarity and no effect for passage sight vocabulary.

Which is the more dominant, content or linguistic schemata, in facilitating reading comprehension is a contentious issue. Johnson (1982)

finds that content schemata play a greater role than linguistic schemata in facilitating reading comprehension of cultural origin prose. Ahmadi, Keshavarz and Atai (2007) support Johnson's conclusion that content schemata has a greater effect than linguistic schemata on reading comprehension; however, Nodoushan's (2007) study shows that language proficiency has the greatest effect on the participants overall and upon their differential test and task performance, with content familiarity being the least influential variable.

The effect of text content familiarity appears to interact with linguistic factors, such as proficiency level. Johnson (1982) finds that a text that is familiar for the reader of any proficiency levels is better recalled than the one that is not familiar. According to Voss and Silfies (1996), more topically-developed text content is easier to comprehend than non-topically developed text. In contrast to the above findings, however, Carrell's (1983) study shows higher proficiency students better recall of content unfamiliar texts than content-familiar texts, a finding supported by Lee (1986). Koh (1985) and Peretz and Shoham (1990) similarly support the notion that participants do not necessarily perform their best on texts with familiar content. Carrell's (1983) study demonstrates that all the three types of background knowledge significantly contribute to the readers' recall for a native speaker, and for those familiar with content area who were advanced ESL students, but not for Level 4 ESL students. This suggests that reading research based on schemata needs to consider the readers' proficiency levels as well as their language background status as factors in the facilitation of reading comprehension.

2.4 Text structures

There are two text genres that a reader commonly deals with in literature: narrative texts and expository texts. Each kind organises text differently. This section of the review deals only with expository text structure in relation to

readers' comprehension, since it is expository texts that are the focus of this research project. The discussion is divided into four areas, addressing: expository text structures, the interconnectedness of rhetorical structure of expository text, the importance of expository text structures in reading comprehension; Meyer's system and procedures for the rhetorical analysis of expository text.

2.4.1 Expository text structures

Exposition, the content of which is factual information, is essential to students learning in a university setting (Scarcella 1984). Moss (2004), identifies at least two main purposes of understanding expository text, the first being for surviving in the information age, and the second for improving performance in standardised tests. Exposition can thus be seen as very important in any academic context in order that students may gain required knowledge. Wood (2001) has remarks that English has become increasingly important, and Daniels (2002) demonstrates that 70%-80% of standardised test content has been designed with exposition. Taking all these reasons into account, skills in reading expository text are essential for university students, especially for the sustainability and relevance of their study and for their future careers (Carrell & Grabe 2002; Grabe & Stoller 2002).

In the same way that exposition has been viewed from many different perspectives, various types of expository text have been delineated. Graesser, Leon and Otero (2002) argue that the emergence of different text structure classifications is due to writers' different concepts of organising their ideas when composing expository text. Inman and Gardner (1979) proposed eleven types of expository texts: exemplification, analysis of entities, analysis of classes, analysis of processes, analysis of sequences, comparison in kind, comparison in degree, comparison of relationship or analogy, definition, causal argument, and judgmental argument. At the other extreme, Brewer (1980) proposes just two types: informational and persuasive. Meyer (1975) and others have proposed a classificatory framework intermediate to these

with Meyer (1975) and Smalley and Routten (1982) each proposing five categories, though with some manner differences in terminology. So, Meyer categorises expository into collection, description, comparison, causation, and problem-solution, whereas Smalley and Routten categorise into cause-effect, examples, process analysis, classifications and comparison and contrast. Meyer and Freedle (1984) propose six types similar to Meyer's classification with an additional type they call 'collection of description' as the results of combination of the collection and description types.

Among the classification of text structure types proposed in the literature thus far, the most common and representative clustering groups in reading research are those proposed by Meyer (1975) and Meyer and Freedle (1984), which were used initially in L1 (see, for example, Meyer, Brandt & Bluth 1980; Meyer & Freedle 1984). Carrell (1984, p. 449) has been the pioneering scholar in conducting reading research with L2 participants using Meyer's and Meyer and Freedle's classification of the text structure types claiming:

To my knowledge, no one has investigated the effects of such differences in the organization of English expository prose to reading comprehension of ESL readers of varying linguistic (and therefore also cultural and possibly also rhetorical) background.

Carrell (1984) uses only four of the six text types proposed by Meyer and Freedle (1984): collection of description, causation, problem-solution and comparison. Since that time, Meyer's and Meyer and Freedle's classification has been favoured in L2 reading research, and many researchers have conducted reading studies in readers' L2 using this classification (Kobayashi 2002; Lee & Riley 1990; Sharp 2004).

2.4.2 Interconnectedness of the rhetorical structure of expository text

In order to consider the interconnectedness between expository text and structure, six expository text types relevant to this study are summarised here.

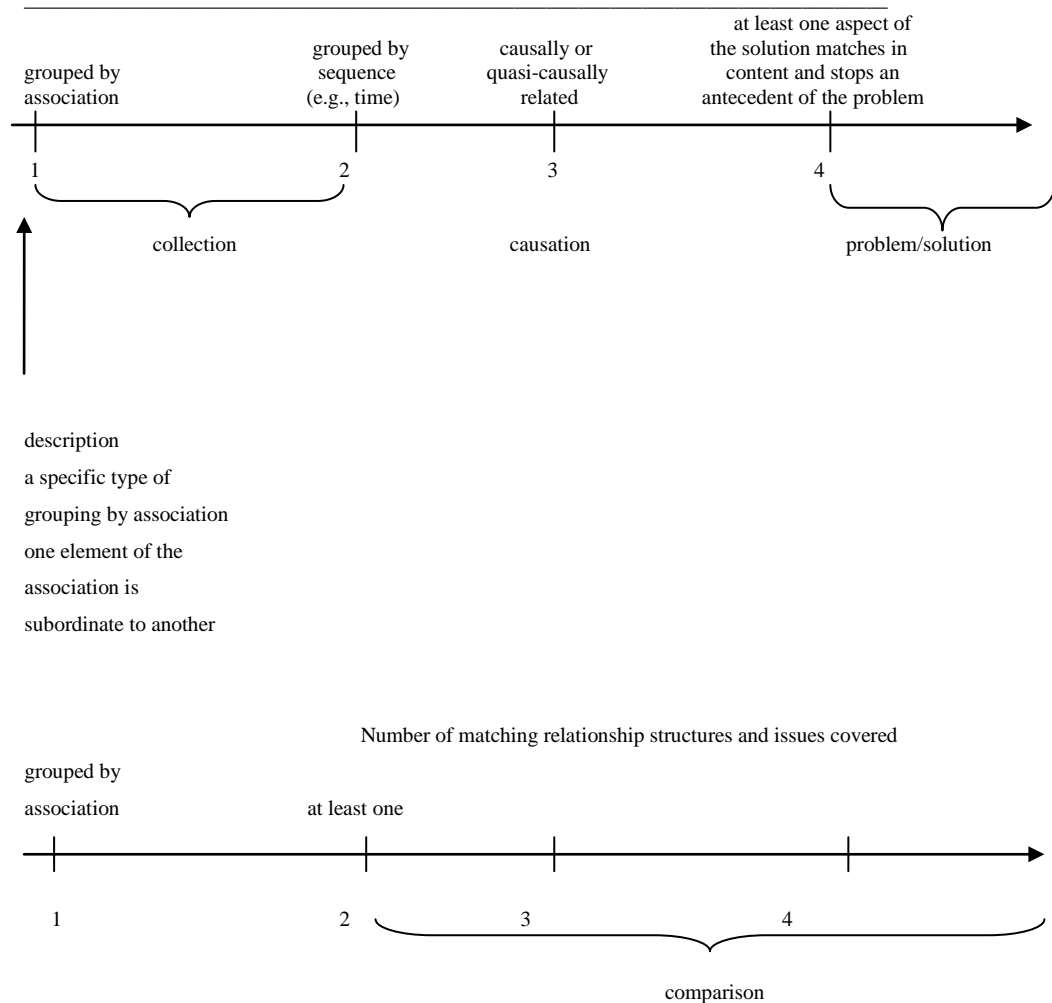
2.4.2.1 Characteristics of expository text

The characteristics of each of the six expository text structure types according to Meyer and Freedle (1984) are: collection, description, causation, problem-solution, comparison and collection of description.

1. Collection: This type is the loosest organisational type, where the concept of ideas is presented by listing or associating.
2. Description: This type is similar to that of the collection, except that in description each element of association is related one to another.
3. Comparison: This type is in a different scale as compared to either problem-solution or causation type. It is characterised by a focus on similarities and differences.
4. Causation: This type is characterised by causally or quasi-causally related ideas that are chronologically grouped. The result is a type of text commonly known as 'cause-effect'.
5. Problem-solution: This type contains all the attributes of the causation type, with the additional feature of overlapping content between the propositions in the problem and in the solution. One or more propositional elements of the solution can neutralise a causal antecedent of the problem.
6. Collection of description: This type is considered the sixth text structure type and contains both collection and description.

The six types of text structures can be seen to represent a continuum of interconnectedness, ranging from loosely-organised to tightly-organised ideas, as presented in Figure 2.1.

Figure 2.1 Type and number of specified organisational components required for the different discourse types



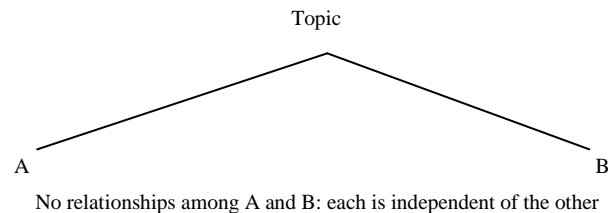
Source: Meyer and Freedle (1984, p. 123)

Structural differences in the organisation of the four text structure types adopted by Carrell (1984) in her research in an L2 reading result in two possible groupings: those with no relationship between topics and those with an antecedent-consequent link between topics. These groupings are represented in Figure 2.2.

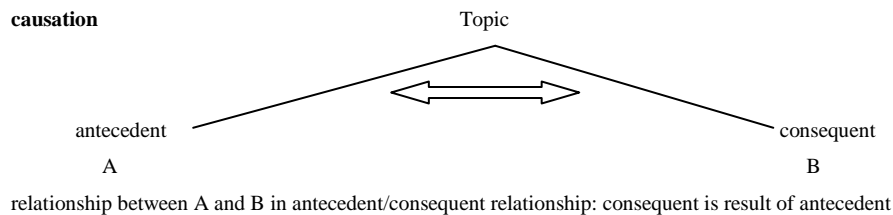
Figure 2.2 Possible structural types

Relationships between nodes in four top level structures

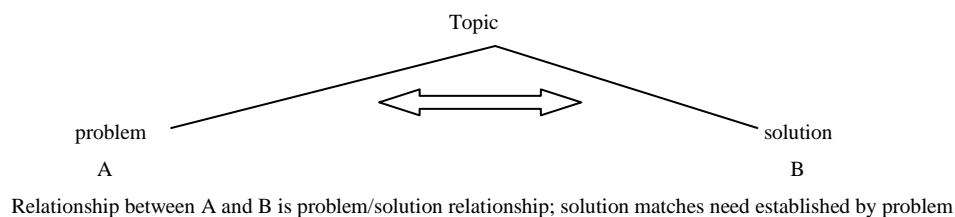
collection of descriptions



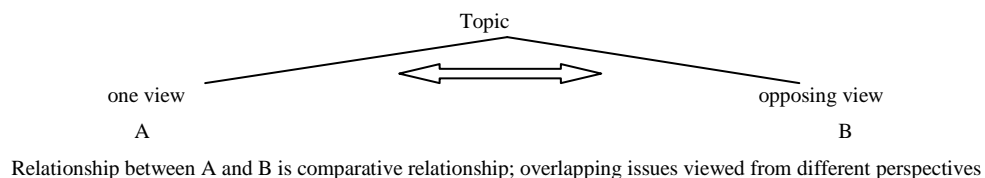
causation



problem-solution



comparison



Source: Carrell, (1984, p. 448)

In a collection of descriptions text structure, there is no relationship between two different clusters (shown as Nodes A and B in the diagram). In the causation, problem-solution and comparison text structures, which belong to the more highly-organised text structures, node A and node B are highly connected (Carrell 1984; Meyer & Freedle 1984). In the causation, problem-solution and comparison text structure types, the information is organised into two major components and is related to the general topic, and to each

other, in particular ways. Further, it is asserted that tightly-organised text structures, where the ideas in such texts are closely related, will be able to increase readers' comprehension (Meyer 1975; Meyer, Brandt & Bluth 1980; Meyer & Freedle 1984; Meyer, Marsiske & Willis 1993). Meyer and Freedle (1984, p. 125) maintain that this 'overlap in ideas covered may lead to more efficient storage in memory with more retrieval paths and resultant superior retention over time rather than retention of unrelated descriptions about a topic'.

For the purposes of this study, the organisation of expository texts will be limited to the three of the four text types used by Carrell (1984) in L2 reading research relating schemata: causation, problem-solution and collection of description types.

2.4.3 Importance of expository text structures in reading comprehension

The reading of expository text involves complex bottom-up and top-down processes. In reading expository text, readers are expected to have the ability and skills for decoding and using their background knowledge to understand the texts with which they are confronted (Snow 2002; Vellutino, Scanlon & Tanzman 1994). So decoding skills and background knowledge are equally important and without such abilities and skills, reading comprehension will be very challenging. For that reason, it seems that having only decoding skills, especially for younger readers, is not enough (Sweet & Snow 2003). In addition to decoding skills, text structures or formal schemata, are an essentially influential factor for the reader in understanding the message conveyed by the text (Meyer & Freedle 1984). The following elements of text structure in expository texts are considered below: strategic text awareness, rhetorical structures and reading comprehension, and text structures and L1 and L2 readers.

2.4.4 Strategic text awareness

The possession of a strategic awareness of formal schemata will facilitate the reader's ability to distinguish the informational organisation of the text, particularly in differentiating between important and unimportant information within the text (Leon & Carretero 1995). As far back as 1991, Dole et al. (1991) showed that having awareness of formal schemata is an important element for effective comprehension, is supported by numerous studies (Block 1993; Goldman & Rakistraw 2000; McGee & Richgels 1985; Pearson & Duke 2000). Awareness of formal schemata is a better predictor in the facilitation of reading comprehension than decoding skills (O'Reilly & McNamara 2002).

The knowledge of text structure (also known as 'formal schemata') plays, according to Carrell (1998b), an important role in ESL reading comprehension. Sharp (2002) indicates that this type of schemata is an element of the macrostructure of a text which aids the reader in comprehending the intended message of the writer. Knowledge of text structure is an important predictor of reading comprehension (Bodycott 1997; Peregoy & Boyle 2000). Thus, a consideration of text awareness and text structure are significant concepts in the approach taken by this study.

2.4.5 Rhetorical structures and reading comprehension

Research into the influence of text rhetorical structures on reading comprehension has been widely conducted both in L1 by, for example, Urquhart (1984) and Meyer and Freedle (1984) and in L2 by, for example, Carrell (1984, 1985) and Leon and Carretero (1995). McGee and Richgels (1985, p. 739) state that 'the structure of the text and how adeptly a reader recognises that structure affect the amount of information the student remembers'.

2.4.6 Text structure in L1 and L2 readers

Research into the effects of text structures on reading comprehension, either with L1 or with L2 readers showed, to some extent, similar findings. Thus, ample evidence from studies conducted by Meyer and her associates (e.g., Meyer & Freedle 1984; Meyer, Brandt & Bluth 1980; Meyer, Marsiske & Willis 1993) and the support of other studies (e.g., Lomax & Sheard 1987; McGee 1982; Richgels 1985) have led Meyer and her colleagues to assert and conclude that ideas presented in tightly-organised texts are better remembered due to the interrelatedness of the ideas being presented. Similarly, among the studies conducted by Carrell (1984), Foo (1989), Goh (1990), Sharp (2002) and by Talbot, Ng and Alan (1991) there is agreement that text structure positively affects reading comprehension – except that the level of the tightness of the text yielded contradictory results to those of Meyer and her colleagues. It seems that the differences are likely due to diverse response formats used to measure readers' comprehension.

In summary, strategic text awareness, rhetorical structures and their impact on reading comprehension, and text structures for L2 readers are elements deemed necessary to be considered in this study – both to confirm the earlier findings on the former two, and to resolve the differences associated with different response formats – cloze test versus recall format – in consideration of the difficulty of looser versus more highly-structured text.

2.4.7 Meyer's system and procedures of rhetorical analysis of expository text

Meyer and Rice (1984) identify three approaches to text structure analysis which have been extensively used in educational research: Meyer's, Kinsch's and Fredricson's. The identification of idea units for the three text versions investigated in this study has adopted Meyer's content structure analysis for several reasons:

1. Meyer's content-structure analysis has been widely used by scholars as a model for text-content analysis in reading research (see, for example,

Brantmeier 2005; Carrell 1984; Goh 1990; Kobayashi 2004; McGee 1982; Meyer & Poon 2001).

2. This type of content-structure analysis enables one to classify many of the basic organisational text structures found in texts (Winograd and Bridge 1986, p. 23).
3. Meyer's model of prose analysis seems to provide the most promising basis for research because it makes it possible to produce a content structure diagram showing the rhetorical relationships among the different parts of a text. The model helps show how these relationships account for the coherence of the text (Kobayashi 2002, p. 195).
4. Meyer's text analysis has the capacity to elucidate differences in recall performance (Schnotz 1983, pp. 160-172), which is imparted for this study's proposed research design.

In this part of the chapter, Meyer's system and procedures of rhetorical analysis of expository text are examined closely. Text structure analysis, propositions, rhetorical predicates, role relationships, signaling and bottom-up and top-down parsing, are all considered in the light of Meyer's work.

2.4.8 Text structure analysis

Meyer's system appears to provide a method that enables operationalisation of text structure by creating a content structure diagram showing the rhetorical relationships. Meyer (1975, p. 23) mentions that 'the procedure for text analysis yields hierarchically arranged tree structures' which procedure is also called 'content organisation' (Grimes 1975, p. 112). Meyer holds that this structure shows the relations among propositions (idea units) in the text. Propositions are units of information in the text consisting of: a single clause, an infinitival construction, gerundive, a nominalised verb phrase or a prepositional phrase. Each proposition contains a predicate (a semantic relation among arguments) that may itself be a proposition. The predicate can be articulated via a lexical predicate or rhetorical relationship, resulting in a rhetorical predicate: 'Arguments are dummy variables that are replaced by

content words or content words and their relationship with other content words' (Meyer 1975, p. 24). For this reason, there is no label stating the arguments in the content structure.

2.4.8.1 Propositions

According to Meyer (1975), propositions are of two types: rhetorical propositions and lexical propositions. Rhetorical propositions refer to the unrelated arguments and their predicates through role or case relations. Rhetorical propositions aid in the merging of rhetorical propositions and lexical proposition to a more complex proposition. The predicate of a rhetorical proposition is called the rhetorical predicate that orders the text into hierarchical relationships (Meyer 1975). Lexical propositions refer to the role relationship between words within simple sentences and clauses, in which the relationships are always directly under certain types of content words in the content structure dominating them; this is also called the lexical predicate (Meyer 1975).

According to Meyer (1975), ideas in a passage of text can be found in all levels of the content structure: top level, middle level and bottom level. Pearson and Camperell (1985, pp. 324-6) use slightly different terms for the same levels of content structure: top level structures, macrostructures and microstructures. Top level structures bind the entire text together; macrostructures occur within the top level; and microstructures fall at the lowest level, between or among rather small units of discourse – sentence components or sentences. The relation in the top level and macrostructures are described by case grammar relations. The type of text is then determined by the type of rhetorical predicate in the top level structure that binds the entire ideas in the text together. It is for this reason that content structure is also referred to as rhetorical structure, or text structure (Carrell 1985; James 1987; Pearson & Camperell 1985).

2.4.8.2 Rhetorical predicates

Meyer (1975, pp. 31-35) groups rhetorical predicates into three general types, each of which dominates several rhetorical predicates:

- ***Paratactic rhetorical predicates*** dominate all of their arguments in a co-ordinated fashion. The paratactic rhetorical predicates can be divided into two kinds: alternative and response. Alternative is also known as comparison. It is used to show similarities, differences, advantages, or to offer equally weighted alternative options. Response is of three types: ‘(a) equally weighted question(s) and answer(s), (b) remark and reply, (c) problem(s) and solution(s)’ (p. 33). Obviously types (a) and (b) of the response rhetorical predicate are found in dialogue, while type (c), the problem-solution type may exist either in dialogue or monologue (Longacre 1983).
- ***Hypotactic rhetorical predicates*** dominate their argument in a subordinate fashion: one argument is superordinate to the other arguments that describe or give further information about it. Hypotactic rhetorical predicates can be of many types as shown in the Table 2.1 below.
- ***Neutral rhetorical predicates*** can take either paratactic or hypotactic forms depending on the emphasis given to them by the author. In accordance with alternative and adversative rhetorical predicates, it is important to note that the adversative rhetorical predicate is actually the hypotactic form of the alternative rhetorical predicate (Grimes 1975). ‘Collection [is a] list of elements which is related in some unspecified manner; Covariance [refers to] relation [which] often referred to as condition, result, or purpose with one argument serving as the antecedent and the other as the consequence or result of the antecedent’ (Meyer 1975, p. 34).

Table 2.1 Hypotactic rhetorical predicates

HYPOTACTIC RHETORICAL PREDICATES	DESCRIPTION
Attribution	Describes qualities of a proposition.
Equivalent	Relates same information in the different way.
Specific.	Gives more specific information about something that was started in a general manner
Explanation	Previously stated information in a more abstract manner for example: relating the information to a general principle) or more concrete manner.
Evidence	Evidence through perception of a situation to support some ideas.
Analogy	Analogy given to support an idea.
Manner	Way an event or event complex is performed (example: slowly, carefully).
Adversative	Relates what did not happen to what did happen.
Setting Time	Gives time of setting in which information being related occurs (often used in narratives).
Setting Location	Gives location in which information being related occurs (used particularly in narratives).
Setting Trajectory	Gives changing background of location and time that occurs in a narrative when characters travel through various places.
Representative Identification	Single out one element of a group and makes it stand for a group as a whole.
Replacement Identification	One thing standing for something else.
Consistency Identification	Identifies a part in relation to some whole.

Source: Meyer (1975, p. 33)

2.4.8.3 Role relationships

According to Meyer (1975, p. 28), various role relationships can be described as follows:

Agent [refers to the] instigator of an action – previously also called agent;

Instrument [refers] to something used inanimately by an agent to perform an action – previously also called an instrument;

Force [is used to show] a causal relation devoid of responsibility – previously called noninvestigated cause;

Vehicle [refers to] something that conveys a patient or moves along with it – previously called noninvestigative cause;

Patient [refers to that or who which] is directly affected by an action or what is in particular state – includes previous patient, experiences and essive roles;

Benefactive [is used to label] someone or something upon whom an action has a secondary effect, good or bad – previously also called benefactive;

Latter [is used to refer to] where the patient is headed and where it ends up – including previous goal and factitive roles;

Former [is used to refer to] where the patient begins a motion – previously called source and material;

Range [is used to indicate the] path or area traversed, a static location, or the limitation of a process to a specified field or object – previously also called range.

In relation to the types of the role relationship, it is important to mention that agent, instrument, and force are similar in that they deal with the cause of an action.

2.4.8.4 Signaling

Prior to analysing a text, it is important to notice signaling, as Meyer (1975, p. 77) explains that:

Signaling is a non-content aspect of prose which gives emphasis to certain aspects of semantic content or points out aspects of the structure of the content. Words of signaling are not included in the content structure since they do not add new content and relations, but simply accent information already contained in the content structure. Signaling is used by an author to highlight the points in the text which he believed to be particularly important. Thus signaling in the passages shows an author's perspective in the content related in his passage.

Meyer (1975, pp. 77-81) differentiates four major types of signaling. These types are presented below:

1. **The specification of the structure of relations in the content structure.** This type of signaling includes explicitly stated- rhetorical predicates and other information contained in the rhetorical structure that can be used to trace the type of rhetorical predicate in the top level structure. This signaling is often found in the introductory sentences of a paragraph, or in the introductory paragraph of a text.

2. **Prematurely revealed information abstracted from the content occurring later in the text.** This type of signaling presents toward the beginning of a text or paragraph information that is stated later in the text in the same words or paraphrased wording. It can be further divided into two types:
 - prior enumeration of topics to be discussed later in the text,
 - [statement] of ideas or interrelationships among content that are pointed out later in the text. Signaling of this type is used to abstract out the top nodes of information to be later presented in the text in detailed discussion. This type of signaling can often be found in titles and introductory sentences of texts and paragraphs.
3. **Summary statements.** The nature of this signaling is similar to prematurely revealed information abstracted from content occurring later in the text as stated above, except that the same words or paraphrased wording of information already presented and located in the rhetorical structure are stated again at the end of a paragraph or a text. It is often seen in summary statements at the end of paragraphs or texts.
4. **Pointer words.** This type of signaling informs the reader of the author's perspective of a particular idea. This type of signaling is often used to state explicitly that a certain idea is an important point.

As has been mentioned previously, words or phrases of signaling are not included in the rhetorical structure; thus, they are deleted from the text structure analysis. The deletion of signaling from the text, according to Meyer (1975), involves the following procedures:

1. Dropping sentences and phrases of signalling from the text.
2. When an entire sentence contained signalling, this sentence is deleted from the text.
3. When there are only some segments of a sentence that constitute signalling, the sentence is rewritten by using only the non-signalled information.

Thus the deletion of signaling from the text should not result in distortion of the meaning of the information in the text.

2.4.8.5 Bottom-to-top and top-to-bottom parsing

The rhetorical structure of text can be analysed following one of the two procedures: bottom-to-top parsing and top-to-bottom parsing (Meyer 1975, pp. 44-53). Analysis of text structure according to bottom-to-top parsing is carried out in six ways:

1. Diagramming each sentence. Beginning with writing down the first sentence in the text. If it is a complex or compound sentence, write it again in the forms of simple sentence. Each simple sentence is then diagrammed into its predicate and arguments.
2. Further analysis of arguments. Analyse the rhetorical proposition arguments to the degree of specificity desired.
3. Identifying rhetorical predicates in complex and compound sentences. If the sentence in the text needs to be broken down into simple sentences, look for the words that relate one clause to another.
4. These words tell how two or more lexical propositions are related. Make the sentences the arguments of the rhetorical predicate that relates them.
5. Identifying other rhetorical predicates among sentences. Look for words such as therefore, due to, and problem answer that can be used to determine the rhetorical predicates among lexical propositions and rhetorical propositions.
6. The identification and use of top-level rhetorical structure. Look at the rhetorical predicates that have been identified and see if there are lexical propositions that describe or give further information about their arguments. Combine all lexical propositions and rhetorical propositions with the appropriate rhetorical predicates.

In top-to-bottom parsing, according to Meyer (1975, pp. 53-56), the procedures taken in rhetorical structure analysis are as follows:

1. The first step of top-to-bottom parsing procedure identifying the topic sentence of the paragraph. In this procedure,

the chunking information into paragraph usually conforms to the organisation of the information at the top level of the text rhetorical structure. [This is based on the idea that] a paragraph consists of a top node

from the rhetorical structure and discussion of all nodes in a direct, downward path from it in the structure. When these lower level nodes have been encoded into language and an author is ready to jump up the tree structure to the higher level nodes where a new topic or sub-topic is situated, ...a new paragraph is developed to discuss the next topic.

2. Identification of the topic sentence of each paragraph. This step is best to take when top-to-bottom parsing is desired for a single paragraph and paraphrasing guides are not available.
3. Further analysis of the complex propositions. This step is done by identifying the interrelationships between predicates and arguments, and continues until the text is analysed into arguments of desired specificity.

In the present study, the procedure used for analysing text into idea units was that of the top-to-bottom parsing. The text structure analysis using Meyer's system is presented in Chapter 3.

2.5 Pre-reading: rhetorically-oriented framework as adjunct

A rhetorically-oriented framework is known as a form of adjunct. It is a framework that functions as an introductory reading instruction containing a description of the text topic. It indicates the text structure type used to organise the passages and the name of the text structure type used to organise the respective passage. The following discussion reviews a number of related aspects of adjuncts including: the general notion of the term adjunct and some types of pre-reading; some basic concepts underlying any types of pre-reading; and the effects of such adjuncts as pre-reading on reading comprehension.

2.5.1 General notion and types of pre-reading

The key concept of pre-reading depends on the availability of activating prior knowledge to the new concept of knowledge. Schema availability and

schema activation are two of the prerequisites for reading comprehension. This kind of activity is also called an enabling activity (Ringler & Weber 1984) as it elicits prior knowledge, builds background and focuses attention thereby, assisting in activating the relevant schema – formal, content and linguistic. The strategy of introductory instruction is regarded as a prerequisite to the process of gaining new, meaningful knowledge, in that when the process takes place the role of activated prior knowledge becomes very dominant (Ausubel 1978). The availability of schema alone is not sufficient unless they are activated. This is logical in the sense that readers are not moving from words to meaning, but rather they are moving from meaning to words (Smith 1971). Pre-reading is believed to be a good practical strategy to encourage readers towards better understanding. The primary goal of a pre-reading task is to form a state of mind before actual reading, so promoting students to read and organising their thoughts towards reading for better understanding (Chastain 1988). To enable the reader to link their prior knowledge to the new knowledge, Schema Theory-based pre-reading strategies can bridge the past and present.

There are a number of key ways of pre-reading which have been empirically proved and are recommended for reading instruction. These key approaches to pre-reading include the use of advance organisers, adjunct aids or adjunct displays and background information. The advance organiser is used to enable new information to be understood, learnt, retained and recalled more easily (Ausubel 1960), and thus new concepts and new events will be more easily understood and recalled (Anderson 2004). Robinson (2002) asserts that adjunct displays play a very important role in the visualisation of an event presented for the reader in the text and enables them to make a quick response (Kiewra et al. 1999). Background information is defined as those introductory materials which supply externally related information prior to the text (Rowson and Kintsch, 2002).

Each pre-reading type previously mentioned comprises several different forms. Firstly, there are advance organisers which take two common forms:

linear, or textual advance organisers, and graphic advance organisers (Langan-Fox, Waycott & Albert 2000). Secondly, background information as another type of pre-reading can consist of: text titles (e.g. Dooling & Mullet 1973); factual information (Mayer, Cook & Dyck 1984; Slater, Graves & Piché 1984); informational outlines (Glynn, Britton & Muth 1985; Mannes & Kintsch 1987); advance organisers (Mayer 1983); diagram and a taped lecture (Mayer 1983); sentential displays and diagrammatic displays symbols and their spatial arrangements (McCrudden *et al.* 2007). Finally, adjunct displays are of two forms: inside-the-text (internal), in the forms of bold typing or underlining of keywords and outside-the-text (external) adjunct aids, which may take the form of pictures, geographic maps, concept maps, graphic organisers (GOs), outlines, advance organisers and the like (Robinson, Robinson & Katayama 1999).

2.5.2 Some basic concepts underlying any types of pre-reading

The following describes the basic concepts underlying any of these types of pre-reading, with a focus on the types of pre-reading most commonly referred to in the literature: adjunct displays and advance organisers, each of which is a type of adjunct.

2.5.2.1 Adjunct displays

Adjunct displays are ways of preconditioning the reader to reading comprehension-related text rhetorical structures, thereby aiming to enhance the learning process. Adjunct displays show great promise for supporting relational information processing and facilitating comprehension and memory for the related text (Kester et al. 2006). Graphic organisers (GOs), as one of the shapes of adjunct displays may take ‘a variety of form from hierarchical listings of vocabulary terms to elaborate visual-spatial displays with accompanying descriptors and phrases’ (Griffin & Tulbert 1995, p. 86). Graphic organisers are said to be very effective because ‘a good graphic representation can show at a glance the key parts of a whole and their

relations, thereby allowing a holistic understanding that words alone cannot convey' (Jones, Pierce & Hunter 1988-1989, p. 21). As GOs are frequently used to represent expository text in order to build concept relations, this can help readers create a logical description and ease their comprehension of the text with which they are confronted (Pretorius 2006).

Although some authors disagree about whether or not text structure awareness facilitates reading comprehension and retention (e.g., Grabe 1991; Koda 2005), most consider readers' awareness of text structure to be an absolute priority in the text comprehension pre-reading process. Text structures are known as 'knowledge structures or basic rhetorical patterns in texts' (Grabe 2003, p. 1), and the awareness of how they are organised can significantly support the readers' comprehension abilities (Trabasso & Bouchard 2002). Text structure awareness that is acquired through training facilitates and enhances comprehension (Carrell 1992; Meyer & Poon 2001; Tang 1992) and such awareness, according to Carrell (1985), can be accomplished through training during regular class hours, indirectly influencing reading comprehension development. Reading for information from the reading text requires of the reader the abilities to differentiate main ideas and details, to make use of background knowledge to the corresponding texts and to construct concept relations within the text rhetorical structures (Grabe & Stoller 2002). Robinson (1994) asserts that learning through concept relations can be slowed down due to the text not being well-organised text.

It has been postulated that the better understanding is to be gained under appropriate teaching techniques available for prior knowledge activation. According to Chia (2001), the effective acquisition of reading comprehension skills depends deeply on how suitable the teaching techniques are in activating students' prior knowledge. Unavailability of cognitive resources due to the lack of the ability to make inferences across sentences, and of content unfamiliarity, can be raised by activating prior knowledge (Bjorklund & Harnishfege 1990). For example, students who have no problem with

understanding linguistic problems, such as words, may still have a problem understanding text (Chia 2001). Graphic organisers, one of the types of adjuncts representing the discourse structures of a text, can be very helpful for readers to improve their awareness of text structure and thus their comprehension (Armbruster, Anderson & Meyer 1991; Meyer & Poon 2001). Graphic organisers have generally been used in studies as one of the reading strategies where 'expository text was used almost exclusively' (Swafford & Alvermann 1989, p. 168).

Some studies on the effect of adjuncts, which correspond to discourse structures of a text, have been carried out and the results have been conclusive. Geva (1983) finds that flowcharting training supports more thorough reading of expository texts by less skilled readers. Armbruster, Anderson & Meyer's (1991) study proves that students in a framing condition that involves a visual representation of the organisation of important ideas by reflecting the top-level text structure of the text achieve better results than those in a control group. This finding is also supported by Tang (1992) using a recall test.

2.5.2.2 Advance organisers

Advance organisers are considered to be a good pre-reading strategy for the linking of readers' prior knowledge with the new information in the text. Advance organisers encourage learning because they provide a cognitive prompt to possibly connect the learners' old information to the new information (Ausubel 1963; Kloster & Winne 1989). The employment of some types of advance organiser, as suggested by Caverly (1997), might be useful in enabling readers to link their existing knowledge with their new knowledge, and such new exposure can be beneficial to both expository and narrative text. Paik (2003) indicates that advance organisers can increase the growth of readers' higher order thinking by assisting them to quickly organise their thoughts by relating the new material to what has been known previously. Ajideh (2003) further suggests that it is the best means to provide

learners with suitable schemata activation prior to reading. Joyce and Weil (1986, p. 225) suggest a three-phase advance organiser model of teaching that includes ‘the presentation of the advance organiser, the presentation of the learning task or material, and the strengthening of cognitive organisation’.

Success in making use of an advance organiser, however, depends on a number of plausible conditions. The conditions are associated with ‘the nature of the learning material, the age of the learner, and his [*sic*] degree of prior familiarity with the learning passage’ (Ausubel 1978, p. 251). Determining the effective utilisation of any suitable types of advance organisers depends on the characteristics of materials to be presented and the types of learners to whom the materials is to be addressed (Kiewra et al. 1997; Story 1998). Advance organisers should also be presented in an uncomplicated manner so that they will be clearly and effectively applied (Boyle & Yeager 1997). Clarity and effectiveness mean that advance organisers can be successfully applied if they are ‘free of distracting information or visuals’ (Baxendell, 2003, p. 47) in order to avoid them being confused or chaotic (Robinson 1998). Advance organisers that are clearly applied will be able to activate students’ prior knowledge so as to assist them in arranging their ideas for the new concepts they expect to acquire (Baxendell 2003). Being familiar with content and context is the condition that should be fulfilled to enable readers to build good communication with the text (Wallace 1992). Advance organisers should be ‘consistent, coherent, and creative’ in their application if they are to achieve the best results (Baxendell, 2003, p. 46).

Whilst Baxendell (2003) argues that advance organisers benefit readers with a learning disability, the results of numerous studies suggest that advance organisers of many different types can significantly improve reading comprehension for other readers, too. Evans (2003) finds that generated GOs facilitate various learner styles, guide them to important learning, and improve reading comprehension. Kiewra et al. (1997) consider the effects of

conventional, linear, and matrix advance organisers on recall and conclude that some types of advance organisers work better than others. Chun and Plass (1996) show that a dynamic visual advance organiser is useful for the macro level of the reading process. Hanley, Herron and Cole (1995) found that the video advance organiser improved comprehension of the foreign text.

2.5.3 Effects of adjuncts as pre-reading on reading comprehension

In this section, the review will focus on the evidence for the effects of the many different types of pre-reading, as mentioned above, on reading comprehension. Specifically the effects of adjuncts in conjunction with text content on reading comprehension, and the effects of adjuncts in conjunction with text organisation on reading comprehension will be discussed. The discussion will be based upon the works of Alvermann (2001), Hudson (1988), Karakas (2009), Lee and Riley (1990), Marefat and Gahari (2009), Rawson and Kintsch (2002), and Slater, Graves and Piche (1984).

Adjuncts appear to facilitate reading comprehension in relation to text content. Rawson and Kintsch's (2002) investigation of the effects of background information on memory of text content was conducted by influencing the amount and organisation of the encoded content. Two experiments were conducted for their investigation; the second extended from the first to include a high and low semantic relationship. Results of the first experiment showed that using free recall, text provided with issue information is better recalled by all readers than text without issue information. Using cued recall, it was found that background information did not affect encoding of more text content. The second experiment found that background information about text sources was effective if there was a relationship between the background information of the text sources and the text content.

Research into the effects of adjuncts in conjunction with text organisation on reading comprehension has resulted in contrasting findings

from one study to another. For example, a study conducted by Lee and Riley (1990) exploring the effects of rhetorically-oriented framework on the recall of collection of description and problem-solution text structure types, finds the frameworks to have no significant effect on reading comprehension. It was also found that 1) the problem-solution text was better recalled than was the collection of description; 2) an expended rhetorically-oriented framework was superior among other types of rhetorically-oriented framework investigated; 3) there was no significant difference of recall provided either by no rhetorically-oriented framework or minimum rhetorically-oriented framework; 4) recall was better using the organisation of the text structures; 5) the loosely-organised text structure was more facilitated by the use of rhetorically-oriented framework; 6) top level idea units of both text organisations were not facilitated by the rhetorically-oriented framework. Slater, Graves and Piche (1984), on the other hand, explore the effects of structural organisers on readers' comprehension and recall using four patterns of expository text (claim-counterclaim, cause-effect, support-conclusion, and problem-solution). The results of their study show that recall and comprehension are facilitated both by the structural organiser with outline grid and by note-taking alone; comprehension was facilitated by organisers without an outline grid, but recall was not.

Both an adjunct display and a previewing/brainstorming condition play a significant role in facilitating the reading comprehension of readers at different proficiency levels. Marefat and Ghahari (2009) compare the effects of adjunct display with text display in facilitating L2 reading comprehension for Iranian EFL learners. It was found that adjunct displays play a more significant role in L2 reading comprehension than did the text material. It was also found that adjunct display is more facilitative for low-proficiency than for high-proficiency learners. The findings also show no significant difference between the two adjunct types in facilitating L2 reading comprehension. Karakas (2009) investigate the effective use of previewing/brainstorming condition and a brainstorming only condition on

L2 reading comprehension of ELT Turkish trainees from the Education Faculty of Cannakkale Onsekis Mart. The proficiency levels of the research participants were upper intermediate and advanced levels. The experimental group was given pre-reading activities using previewing /brainstorming, while the control group was given pre-reading using brainstorming only. The results show that previewing activities significantly affect readers' comprehension of the short story, given that previewing/brainstorming results in better achievement than the brainstorming-only condition.

The effects of many different forms of adjunct on reading comprehension have, for the most part, been shown to be conclusively positive, except in relation to the effects of an adjunct in the form of a rhetorically-oriented framework. Studies in support of the conclusive effects of adjunct forms on reading comprehension include, among others, Karakas (2009) on a previewing condition for brainstorming as the adjunct, Marefat and Gahari (2009) on adjunct display, Rawson and Kintsch (2002) on background information and Slater, Graves and Piche (1984) on a structural organiser with outline and note-taking alone. In each case, these studies have found that content-based pre-reading schemata enhance reading comprehension. The only study with contrary findings is Lee and Riley (1990) which investigates the effect of an adjunct in the form of a rhetorically-oriented framework on reading comprehension, and finds that rhetorically-oriented framework does not significantly affect reading comprehension.

2.6 Discipline-specific backgrounds

This section deals with some of the concepts underlying English language learning in the context of specialist disciplines, as well as considering some empirical studies in this area. This section discusses two main points: 1) the nature of academic disciplines in reading, and 2) effects of discipline-specific backgrounds on reading comprehension.

2.6.1 The nature of academic disciplines in reading

In the era of communication and information, reading in English for specific purposes (ESP) has become very important for university students in Indonesia as discussed in detail in Chapter 1. This type of English Study is closely linked to the content area of the students' specialism and as Douglas (2000, p. 2) has noted 'background knowledge is a necessary, integral part of the concept of specific purpose language ability'.

As long as content area reading instruction is expected to build up readers to become functioning and self-determining (Forget & Bottoms 2000), the process is not just a matter of a good learning as viewed from the students' perspective. It is also, according to Vacca and Vacca (2002, p. 184), that 'content area reading is a matter of good teaching', where teachers join together 'reading and subject matter learning in seamless fashion, using language and literacy to scaffold student learning'. Teachers in content area instruction tend to be facilitators of the process (Bean 1997; McKenna & Robinson 2002) with the emphasis on relevance, reading to learn and content area materials (Baer & Nourie 1993).

Success at becoming a proficient university student in the content area of a discipline cannot be separated from a number of quality elements. The major purpose of tertiary ESL academic programs, according to Shih (1992) is to assist students to develop thinking and reading strategies to enable them to read academic texts in their specialisation. Instruction is the most effective means of increasing student comprehension and of developing skilled readers (Snow 2002), and such instruction towards the development and utilisation of reading strategies needs 'explanation, modelling, practice, and application' (Vacca & Vacca 2002 p. 194).

The reading of academic texts for content classes is often identified as the reading of English for Special Purposes (ESP). For Hutchinson and Waters (1987, p. 19), 'ESP is an approach to language teaching in which all decisions as to content and method are based on the learner's reason for learning'. A question arises as to what is the difference between English for

General Purposes (EGP) and ESP. Hutchinson and Waters (1987, p. 53) answer this quite simply: 'in theory nothing, in practice a great deal'. Historically, the emergence of ESP was motivated by changing trends in language learning and the development of educational psychology. Its emergence was identified at the same time as the trend of linguistic studies which, according to Widdowson (1978), moved from exploration of traditional language structure to the language as it is used for real communication. This movement was supported by many linguists and resulted in a new concept of English according to the particular needs of particular groups of learners (Hutchinson & Waters 1987).

The term ESP, however, has been interpreted in many different ways among practitioners. ESP studied by students at the tertiary levels can be interpreted as having many types depending on the characteristics of the learners, and thus both English for Academic Purposes (EAP) and English for Occupational Purposes (EOP) are considered branches of ESP (Robinson 1991). In relation to the texts used in scientific English and general English courses, some methodological distinctions have been identified (Hutchinson & Waters 1987). According to Trimble (1985) and Widdowson (1979), there were different characteristics between English for Science and Technology (EST) texts and non-EST texts. Douglas (2000), who proposes Language for Specific Purposes (LSP), modifies Bachman and Palmer's (1996) reformulation of Communicative Language Ability (CLA) to make it appropriate for explaining ESP competence. According to this position, what is required in LSP testing is an understanding of how specific-purpose background knowledge works together with language knowledge to construct a communicative performance in the contexts of specific purposes.

Furthermore, ESP, EAP and EGP are not clearly distinguishable. Academically, EGP can be understood as a preceding instructional stage of ESP, if the ESP results are satisfactory (Hutchinson & Waters 1987). Dudley-Evans (1998) claims that the language used by disciplines or occupations is not always consistent with the focus of ESP. For instance, the

term EAP, as it is used to introduce the common features of academic discourse in the sciences or humanities, is also called ESP. In relation to ESP, the assumption that text patterns of any rhetorical organisations vary significantly between specialist areas of use has never been clearly investigated (Swales 1985), but vague results have been used to generalise the discourse (Widdowson 1978).

2.6.2 Effects of discipline-specific backgrounds on reading comprehension

A number of reading studies investigate discipline-specific background, in conjunction with proficiency level and content area, as an influence on reading comprehension. Among the studies reviewed in support of this section are the works of Alderson and Ulqurhart (1985), Hale (1988), Koh (1985), Tan (1990) and Uso-Juan (2006).

Many researches have concluded that whether students are reading within or outside their discipline significantly impact on their reading comprehension. Alderson and Urquhart's (1985) three studies, find that readers' background knowledge advantageously affects test performance. Similarly, Hale (1988) investigates the influence of students' major fields and text content on their EFL reading performance, finding there to be significant impacts. Uso-Juan (2006) investigates the contribution of discipline-related knowledge and English language proficiency to EAP reading comprehension; and considers the compensatory effects between discipline-related knowledge and language proficiency to the successful EAP reading, concluding that there are significant effects of discipline-related knowledge as well as of English language proficiency, on EFL reading performance.

Although in general the role of major disciplines in facilitating reading comprehension has been positive and conclusive, there have been inconsistencies in the effect of academic disciplines on test performance – texts whose topic or content related to readers' field was not always better

comprehended. For example, the engineers in Alderson and Urquhart's (1985) second study found the engineering texts were difficult for them to read. Similarly, in their third study with students in Development Administration Finance and Economics (DAFE) they found that students were not advantaged by the text in their specialisation. There is no convincing evidence to date to explain these inconsistent results. Peretz and Shoham (1990) found that students in the biological and physical sciences perform better at scientific texts, whereas the humanities and social science students are not more advantaged by a test from their own subject area. Contrasting to Peretz and Shoham (1990), Hale's (1988) humanities/social sciences students performed better on their discipline-related texts than did biology/physics students on texts from within their specialisation. Significant effects of the four test forms on readers' performance were found. On the other hand, Koh's (1985) study found that readers better comprehended text belonging to another specialization: business students, for example, had their highest scores on science texts.

Some studies suggest that the factors of content and language proficiency in the EAP context play significantly different roles in facilitating reading comprehension, and that language proficiency is a better predictor of comprehension than the factor of content. Uso-Juan's (2006) study found that there were significant effects of discipline-related knowledge and English language proficiency on EFL reading performance. The higher the proficiency level of the readers, the better the performance in the reading comprehension test, with English language proficiency being a stronger predictor than discipline-related knowledge. The study findings support the earlier results of Tan's (1990) investigation of whether the role of content or of language proficiency level is better predictor of ability in reading comprehension among Malaysian undergraduate students who are given prior knowledge tests in conjunction with discipline-related cloze reading tests and a form of a general proficiency test. The results show that comprehension of discipline-related texts in Medicine, Law and Economics can be predicted by

the subject's area knowledge and by the students' already achieved language proficiency level. Tan also identifies language proficiency level as the better predictor over subject area knowledge.

Despite the important role it plays in facilitating EAP/ESP reading comprehension, it seems the effectiveness of language proficiency in interaction with field-based knowledge is, to some extent, still questionable. In their third study, Alderson and Urquhart (1985) required groups of students from three different disciplines – business and economics, science and engineering, and liberal arts – with different language proficiency levels to undertake the social studies and technology modules of the IELTS test. Although the language proficiency level of the science and engineering students was lower than that of the business and economics and liberal arts students, in taking the technology module and the social studies module, the science and engineering students did better than the business and economics students, and the liberal arts students who took the same test.

From the above discussion, it is evident that the role of knowledge of major disciplines is yet to be fully understood. The reading comprehension of readers from various disciplines is not always better in their subject area of specialisation, and such readers' language proficiency is a critical factor for reading comprehension across disciplines.

2.7 Recall as a means of reading comprehension assessment

Recall has been widely used by researchers to measure the comprehension abilities of both L1 and L2 readers. The following discussion reviews a number of aspects related to recall including the concepts underlying a recall protocol and the effects of recall on reading comprehension.

2.7.1 Concepts underlying recall as a means of reading comprehension assessment

The procedure for the administration of a recall protocol is simple, and has proved to be a very useful tool to assess readers' comprehension. Recall can take either a spoken or written form, each of which can be divided into immediate and delayed recall, depending upon the time interval between the completion of the reading task and the administration of the writing recall task. Recall can be further classified as cued or free recall depending on whether the task is with or without cues. Hayes (1989, p. 69) claims that recall protocol analysis becomes 'cognitive psychology's most powerful tool for tracking psychological processes', and its use is based on the assumption that readers can retain information on the basis of their understanding (Apple & Lantolf 1994). In line with this, Berkemeyer (1989, p. 131) states that 'the immediate recall reveals the interaction between the reader and the text, forcing the reader to comprehend the text well enough to be able to reproduce it in a coherent and logical manner'.

When administering a recall task, it is important to make sure that the instruction for doing so is clear, otherwise students may inadvertently perform a summary task instead. When a recall task is administered, readers should be simply asked to read the passage for a certain length of time or until they are quite sure they understand. When they have finished reading, they are asked to write down as much information as they can recall from what they have just read from the text without looking back at it (Bernhardt 1983). Further, Bernhardt (1991, pp. 187-188) suggests the following steps when using students' recall as an L2 reading instructional tool:

1. Choose an unglossed text (perhaps 200 words)
2. Let students know that they may read the text as often as they like and that when they are finished you will ask them to write down everything that they remember from the text.
3. Provide students with sufficient time to read the text several times.
4. Ask the students to put the text out of sight and to write down everything that they remember.

5. Collect the protocols written by the students.
6. Use these generated data as the basis for a future lesson plan that addresses: cultural features; conceptual features; grammatical features that seem to interfere with comprehension.'

The recall protocol is regarded as one of the alternative measurements for assessing both L1 and L2 readers' comprehension, as evidenced by its widespread use both in L1 research (Fitzgerald & Spiegel 1983; Pearson & Camperell 1981; Snyder & Downey 1983) and in L2 research (Bernhardt 1983; Brantmeier 2002). Additionally, in L2 reading studies, there has been growing interest in using assessment of recall across range of areas of research interest. For example, there have been studies comparing recall with other testing methods (Lee 1987; Lee & Riley 1996; Shohamy 1984; Wolf 1993); into how factors such as background knowledge influenced L2 readers' recall (Mohammed & Swales 1984); into how text structure influences reading comprehension (e.g. Carrell 1984; Lee & Riley 1990); and into the efficacy of training in the identification of the rhetorical organisation of a text and its effect on reading comprehension (e.g. Carrell 1985; Raymond 1993).

It is important to consider the use of the readers' native language when assessing their comprehension when recall is utilised. It is recommended that the recall task should be written in the readers' native language, rather than in the readers' target language (Alderson 2000; Bernhardt 1991) because if it is written in the task takers' L2, it will be a test of writing rather than reading (Alderson 2000). Bernhardt (1991) indicates that the immediate written recall protocol in learners' native language is regarded as a valid assessment for reading comprehension because it can avoid miscomprehension due to readers' lack of grammar, etc., without focusing the reader's attention on the linguistic elements of the texts. Additionally, immediate written recall provides qualitative information, which critically benefits the assessment procedure and is thus vital for L2 comprehension processes, as well as for language instruction purposes (Bernhardt 1991). Berkermeier (1989)

investigates the use of qualitative analysis for recall in order to develop reading instruction, suggesting that metacognitive strategies are regarded as a diagnostically useful pedagogical implication for learners to enable them to monitor their comprehension.

This preference is also confirmed by Shohamy (1984) who argues that questions, not only for a recall task, but also for other fixed test methods, such as comprehension and open-ended questions, which are written in the readers' native language are much easier than those written in the readers' target language, because, by doing so, readers will feel comfortable and less nervous. Similarly, Lee (1986) recommends, especially for L2 readers with an intermediate level of language proficiency, the use of readers' native language to avoid underestimating and distorting the second language comprehension.

There are some characteristics of the recall protocol to compare with other reading comprehension assessment methods. According to Harris and Smith (1986), free written recall is a method of assessing reading comprehension that allows one to know what and how comprehension occurs. Written recall is considered as the 'most straightforward assessment of the result of the text-reader interaction' (Johnston 1983, p. 50), and Bernhardt (1991, p. 200) maintains that 'a free recall provides a pure measure of comprehension, uncomplicated by linguistic performance and tester's interference'. In comparison with comprehension questions, for example, Dehn (1984, p. 97) states that 'free recall can reveal many of the inferences a reader has made, and also the structures in terms of which the reader understands the text'. Recall is different from other comprehension questions as it allows readers to construct what has been comprehended according to what seems to be logically right to them (Harris & Smith 1986).

Reading research findings in first-language reading research has been generalised to be useful for reading research in the second language (Alderson & Urquhart 1984; Chun & Plass 1997; Grabe 1991). Since L1 and L2 show different characteristics in many different ways, it seems

unreasonable to oversimplify the situation by directly adopting L1 reading research findings for the L2 reading process. Despite this, immediate written recall has been increasingly utilised as a means of assessing second language reading comprehension research (Bernhardt 1991; Deville & Chalhoub-Deville 1993; Kobayashi 1995; Lee 1986). The increasing interest in L2 reading research is likely to have been motivated by concerns about the complexity of L2 potential factors involved, such as language of assessment variability (Bernhardt 2005). Such a generalisation is still questionable since there are some possibly different conditions possessed by L1 versus L2; Grabe (1991, p. 389) concurs: 'L1 research findings cannot always be applied to L2 contexts'.

Although reading, as Goodman (1973, p. 27) claims, is 'much the same for all languages', the transfer of L1 to L2 seems to be empirically conditional, due to some other potentially influencing factors that should be taken into consideration. As L1 reading ability is comprehensively constructed by linguistic knowledge and general reading skills, it is claimed that only L1 reading skills are transferable to L2 reading, while L1 linguistic knowledge is not (Schoonen, Hulstijn & Bossers 1998). The same conclusions have also been reached by Yamashita (2002) who indicates that L1 reading proficiency and L2 linguistic knowledge show complex interaction. Ulijn and Slager-Meyer (1998) add that L2 reading is a matter of not only linguistic knowledge, but also a matter of the reading strategies, and according to Block (1986), Alderson (2000) and Bernhardt and Kamil (1995), both are factors for reading comprehension. Upton and Thompson (2001) found that L1 for both intermediate and advanced learners plays a significant role in L2 reading tasks, but for L1 post ESL learners the L1's role is almost insignificant. Furthermore, Bernhardt's (2005) synthesis of the many studies indicates that the contribution of L1 reading to L2 reading is around 14% and 21% (Bernhardt & Kamil 1995; Bossers 1991; Brisbois 1995; Carrell 1991; Cook 1992; Cohen 1995). A translation strategy may be effective for L2 reading and in overcoming L2 language obstacles (Kern

1994), although L2 readers with lower L2 proficiency use their L1 more frequently (Upton 1997, 1998).

2.7.2 Effects of recall on reading comprehension

The preceding section's discussion on recall as an assessment of reading comprehension, shows that it has been widely used and is well known in reading research, and especially since reading research based on schemata has attracted attention. The following section of this literature review focuses on the use of recall as opposed to some different and more conventional measures, on the use of language of recall as a measure of reading comprehension, and on some related findings that deal with language transfer from L1 to L2; it includes a consideration of studies by Brantmeier (2006), Chang (2008), Fecteau (1999), Kong (2006), Sharp (2002, 2004); Walter (2004), Wylie and McGuinness (2004) and Yamashita (2002).

The effectiveness of different recall formats varies when they are used to measure the role of text structures in facilitating reading comprehension. For example, Wylie and McGuinness' (2004) investigation into comprehension across five text structure types using an immediate recall versus a delayed recall finds that when using immediate recall as opposed to a delayed recall, the rank order of the text structure types affects reading comprehension differently. Sharp (2002) examines the effects of rhetorical pattern in four text structure types using quantitative recall as opposed to qualitative recall. The results of the study show that the use of either format of recall role or text structure types, in terms of their order, affects reading comprehension differently.

Recall, in comparison with other more conventional response formats for assessing reading comprehension of any schemata types, yields contrasting findings. Chang (2006) compares an immediate recall task with a translation task as measures for reading comprehension, and the latter is found to be more effective than the former. Fecteau (1999), using recall as opposed to multiple choice questions in investigating English and French reading

comprehension, found no significant difference in the use of the two response formats in reading comprehension. Sharp (2004) compares the use of a cloze test and recall as measures of reading comprehension to find a significant effect of text structures on reading comprehension when cloze test is used as a measure format, whereas, the effect of text structures is not significant on reading comprehension when using quantitative recall.

Recall in a different language, used as a measure and variable in L2 on reading comprehension, has attracted less attention. Only three experimental studies have been located (Brantmeier 2006, Fecteau 1999 and Lee 1986). Brantmeier (2006) investigates the effects of different language of written immediate recall for advanced L2 instruction and the effects of L2 reading performance viewed from L1 reading achievement. The participants were advanced native speaker of English enrolling in an advanced level course of Spanish. The results show no significant main effect for the language of recall on their performance; however, there is a main effect for L2 reading achievement on the overall performance based on OPLE score division for the participants. The contribution of the language of recall on the students' performance was found to be 3%, while the contribution of participants' status as advanced learners and their prior L2 reading achievement was 16 %. Brantmeier (2006) reveals a significant main effect for L2 reading achievement on recall score in Spanish and a significant main effect of L1 reading achievement on recall in English. The contribution of L2 reading performance was 16% in L2 written recall and 28% in L1 written recall. Fecteau (1999) investigated the English and French reading comprehension and inferencing skills of native English speakers considering versions of text and language combination used, to find a better recall of text in L1 (65%) than in L2 (33%). Multiple choice questions provide a significant predictor of L1 to L2 recall and response on L2. There is no significant relation between recall and multiple choice questions or between L2 proficiency and L2 recall scores. The L1 score contributes more to L2 performance than to L2

proficiency. Lee (1986), using two different languages of recall, finds similar results in the two studies: that texts are better recalled in L1 than in L2.

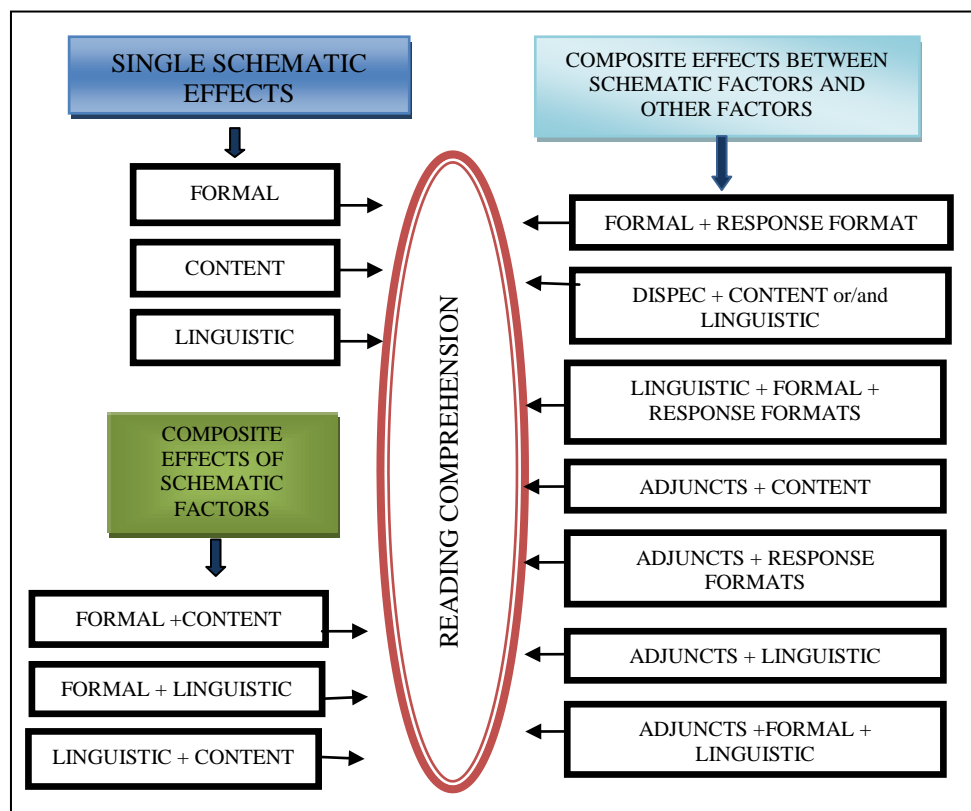
In relation to assessing L2 reading comprehension using a different language of recall, it is worth reviewing some studies investigating the transfer of L2 readers' language proficiency, L1 reading ability and the strategy used for L1 to L2 reading. Proficiency group levels affect the transfer of reading ability and strategy from L1 to L2 reading. Yamashita (2002) indicates that the effects of L1 reading ability are weaker than L2 language proficiency on L2 reading, but there is a mutual relationship between L1 reading ability and L2 language proficiency. Thus, though L1 language ability is weaker, it compensated for and helped raise low L2 language proficiency. Walter (2004) reveals that the ability to build well-structured mental representation is not transferable to L2 by a lower-intermediate group; but it is by an upper-intermediate group; in addition the development of working memory in L2 is closely related to structure-building ability. Kong (2006) found that moderate to high L2 proficiency level readers frequently transfer their strategy use from L1 to L2 reading.

In contrast, low L2 proficiency level readers seldom transfer strategy use from L1 to L2 reading and the use of higher level strategies is not predicted by L2 proficiency. The strategy used in L2 reading is affected by the contribution of the readers' prior L1 reading, the prior L2 learning and the readers' exposure to the L2 culture. Upton and Thomson (2001) reveal that the lesser proficient L2 readers use their L1 more frequently than more proficient L2 readers. In their study, when L1 readers read L2 text, the intermediate L2 readers used 61% of the allotted time, the advanced L2 readers used 43% of the allotted time, and the post-ESL L2 readers used 15% of the time (Upton & Thomson 2001).

The factors affecting reading comprehension reviewed from the previous related studies are presented in Figure 2.3 which shows a compilation of the previous study reviews with regards to the possible factors affecting reading comprehension. The figure shows that, among the various factors affecting

reading comprehension, there are generally two groups of effects under investigation: the main effect and the interaction effects over and above the main effect. It is evident that in most of the previously reviewed studies the main effects were dominant while the interaction effects were not consistently observed.

Figure 2.3 Factors affecting reading comprehension of previous related studies



The forms of the hypotheses for this study are based on the synthesis of previous research (Tuckman 1999) leading to the choice between a formulation as either an alternative or null hypothesis, with the alternative hypothesis format being considered best suited to the main effects, whereas the null hypothesis is most appropriate for the interaction effects. In terms of the testing the hypotheses statistically, as Ary, Jacob & Sorensen (2010) highlight, both the alternative and the null hypotheses are tested using a null hypothesis. In accordance with the evidence from the previously related

studies and with the problems to be investigated in the present study, as stated in Chapter 1, the hypotheses to be tested are formulated as alternative hypotheses for both the main effects and for the different effects among levels of the factors under investigation, but as null hypotheses for the interaction effects.

2.8 Hypotheses

In the hypotheses that follow, the only assertion is that the population parameters are different or not different from the ones hypothesised, i.e., they are bidirectional.

2.8.1 Hypothesis 1

‘There are no significant interaction effects of discipline-specific background, text structure, rhetorically-oriented framework, and recall on reading comprehension of expository texts’.

Hypothesis 1 is formulated using the following null hypotheses:

- H₀ 1.1 There is no significant interaction effect of discipline-specific background, text structure, rhetorically-oriented framework, and recall on reading comprehension of expository texts.
- H₀ 1.2 There is no significant interaction effect of discipline-specific background, text structure, and rhetorically-oriented framework on reading comprehension of expository texts.
- H₀ 1.3 There is no significant interaction effect of discipline-specific background, text structure, and recall on reading comprehension of expository texts.
- H₀ 1.4 There is no significant interaction effect of discipline-specific background, rhetorically-oriented framework, and recall on reading comprehension of expository texts.

- Ho 1.5 There is no significant interaction effect of text structure, rhetorically-oriented framework, and recall on reading comprehension of expository texts.
- Ho 1.6 There is no significant interaction effect of discipline-specific background and text structure on reading comprehension of expository texts.
- Ho 1.7 There is no significant interaction effect of discipline-specific background and rhetorically-oriented framework on reading comprehension of expository texts.
- Ho 1.8 There is no significant interaction effect of discipline-specific background and recall on reading comprehension of expository texts.
- Ho 1.9 There is no significant interaction effect of text structure and rhetorically-oriented framework on reading comprehension of expository texts.
- Ho 1.10 There is no significant interaction effect of text structure and recall on reading comprehension of expository texts.
- Ho 1.11 There is no significant interaction effect of rhetorically-oriented framework and recall on reading comprehension of expository texts.

2.8.2 Hypothesis 2

‘There are significant main effects of discipline-specific background, text structure, rhetorically-oriented framework, or recall on the EFL reading comprehension of expository texts’.

Hypothesis 2 is formulated by using the following alternative hypotheses:

- H₁ 2.1 There is a significant main effect of discipline-specific background on reading comprehension of expository texts.
- H₁ 2.2 There is a significant main effect of text structure on reading comprehension of expository texts.

H₁ 2.3 There is a significant main effect of rhetorically-oriented framework on reading comprehension of expository texts.

H₁ 2.4 There is a significant main effect of recall on reading comprehension of expository texts.

2.8.3 Hypothesis 3

‘There are significant different effects among the levels of discipline-specific background, text structure, rhetorically-oriented framework, and recall on reading comprehension of expository texts’.

Hypothesis 3 is formulated by using the following alternative hypotheses:

H₁ 3.1 There are significant different effects of the discipline-specific background levels (economics, agriculture, and pure sciences) on reading comprehension of expository texts.

H₁ 3.2 There are significant different effects of text structure levels (problem-solution, causation, comparison, and collection of description) on reading comprehension of expository texts.

H₁ 3.3 There are significant different effects of rhetorically-oriented framework levels (no, with-L1, and with-L2) on reading comprehension of expository texts.

H₁ 3.4 There are significant different effects of recall levels (English and Indonesian) on reading comprehension of expository texts.

CHAPTER 3

Methodology

To answer the research questions and thus to attain the main objective of this study, a quantitative research methodology has been adopted. The study employs an experimental research design that considers the characteristics of the problem to be investigated, and has been designed to build up systematic knowledge of the role of text factors in facilitating EFL reading comprehension.

3.1 Overview of methodological context

Quantitative and qualitative are two widely known and recognised methodological orientations to research (Gall, Gall & Borg 2007) that differ in many ways. Quantitative research uses data transformed into numbers and numerical formats for statistical data analysis (Boudah 2011) in order to identify trends and relationships observable within a particular phenomenon. Qualitative research, on the other hand, tends to be holistically analytic towards the generation of in-depth understandings (Ary, Jacob & Sorensen 2010), and generally works with data in the form of words and images (Boudah 2011). Each method differs in its purpose: quantitative research methodology continuously engages with facts by focusing on statistical truths, whereas the qualitative research approach places the researcher's perspective at the centre of the study to reveal the researcher's and the researched subjective viewpoint (Ary, Jacob & Razavieh 2002; Boudah

2011). Whilst qualitatively-grounded methodologies are underpinned by the notion of human experience as being subjective and contextualised, quantitatively-grounded methodologies are underpinned by assumptions of scientific rigour and objectivity and adopt a positivist stance towards the phenomenon that is being investigated (Ary, Jacob & Razavieh 2002). These two methodological orientations reflect different research needs (Ary, Jacob & Sorensen 2010; Gall, Gall & Borg 2007), underlying beliefs (ontologies) and systems of knowing (epistemologies).

In educational research both qualitative and quantitative methods are adopted depending on the researcher and the focus and aims of the particular research (Ary, Jacob & Razavieh 2002). Quantitative research methodologies have been widely used in education since the 20th century (Ary, Jacob & Sorensen 2010), having originally developed according to the precepts of positivist philosophical thought (Ary, Jacob & Sorensen 2010; Gall, Gall & Borg 2007), and have been grouped into several distinctive categories, such as correlational, quasi-experimental and experimental research. The categorisation of educational research as quantitative is based on at least two factors: the objectives of the research and research method (Hasan 1992) and the use of quantitative methods in the analysis of data (Lehmann & Mehrens 1979).

As one of the quantitative categories, experimental research refers to a postulated cause-effect relationship or relationships between an independent variable or variables and a dependent variable or variables in a phenomenon (Ary, Jacob & Sorensen 2010; Boudah 2011). The general procedure for performing an experiment is that one or more independent variables is/are manipulated to determine the effect on a dependent variable (Gall, Gall & Borg 2003).

3.1.1 Experimental research design

Viewed from its objective, the present study may be categorised as a basic scientific investigation that is content relevant (Gage 1963; Lehmann &

Mehrens 1979). It is basic research in that the aim of the investigation is to build up systematic knowledge about the role of text factors in facilitating EFL reading comprehension. It has not been restricted by the requirements of the educational system, for the controls and methods used in this study would be inappropriate under regular classroom teaching and learning conditions. The research approach can be considered as content relevant because the problems explored are pertinent to the university educational context: the content of the instrument was part of the curriculum with which all students, irrespective of faculty, were familiar, as all participants had been taught and completed the subject of Basic Cultural Science (BCS).

In addition, this study has been designed as a piece of explanatory research, because efforts have been made to investigate a cause-effect relation between the independent variables and the dependent variable (Dane 1990; Ary, Jacob & Sorensen 2010). The present study can be considered as a true experiment in that it makes a comparison among experimental groups, which are believed to be equal in regards to variability because of their random assignment to the experimental treatments (Campbell & Stanley 1963; Dane 1990; Vockell & Asher 1995). In order to observe the testing of the hypotheses and variables that form the basis of this study, the experiment utilises a multiple treatment four-factor, full factorial design (Borg & Gall 1989; Boudah 2011).

According to Ary, Jacob & Razavieh (2002), three essential elements typify an experimental study:

- Control – referring to the experimental processes for maximising internal and external validity of the experiment;
- Manipulation – referring to an endeavour of manipulating (an) active variable(s) to be a set of varied experimental conditions exposed to the experimental groups of participants.
- Observation – referring to the comparison of the effects of the manipulation of the active variable(s) on the dependent variable.

Based on these three elements, this study could be classified as having an experimental research design for several reasons. Firstly, efforts were made to reduce the risks to the internal and external validity of the study (discussed in detail in section 3.3.1.4). Secondly, the variables of the study were controlled as a set of experimental treatments, as follows:

1. **In the case of the text structure variable**, the manipulation resulted in two passages written with three distinct types of text structure but with the same content – problem-solution, causation and collection of description.
2. **In the case of the rhetorically-oriented framework variable**, the manipulation resulted in three types of rhetorically-oriented framework – without a framework (without), with L1 framework (with-L1) and with L2 framework (with-L2).
3. **In the case of the recall variable**, the manipulation resulted in two different languages of recall – English and Indonesian.

The comparable groups of participants of the study, consisting of students across three disciplines, were exposed to the manipulation factors (1, 2 and 3 above) to elicit the effects of the four factors: text structure, rhetorically-oriented framework, recall and discipline-specific background – economics, agriculture and pure science – on the dependent variable, reading comprehension. The effects on the dependent variable are measured by the number of idea units recalled by the experimental groups of participants.

The effects of the experimental treatments on the dependent variable, as dictated by the hypotheses to be tested in this study, were observed through comparison between and among the groups of participants who were exposed to the various experimental treatments. With a factorial design, there is no need for a control group. This step is in line with the idea that the inclusion of control groups requires unnecessary comparison between groups of participants who received the treatment and those who did not or those who receive placebo treatments (Sax 1979).

The experimental research of the present study can be categorised as using a Multiple Treatment four-factor, full factorial design, given its method of analysis and the factors involved in the study (Best & Kahn 2006; Boudah; Gall, Gall & Borg 2007; Lehmann & Mehrens 1979; Tuckman 1978). The factorial design employed in this study specifically can be referred to as a 3x3x3x2 Factorial Design (Best & Kahn 2006; Boudah 2011; Dane 1990; Gall, Gall & Borg 2007; Isaac & Michael 1971; Larsen-Freeman & Long 1991; Sax 1979) and is shown in Table 3.1.

3.1.2 Variables of the experiment

Four independent variables and one dependent variable are involved in this study. The four independent variables are as follows:

1. The **text structure of expository text**, comprising three levels: problem-solution, causation, and collection of description;
2. The **rationally-oriented framework** comprising three levels: without a framework, with-L1 framework, and with-L2 framework;
3. The **discipline-specific background** comprising three levels: economics, agriculture, and pure sciences; recall comprising two levels: Indonesian and English.
4. **Recall** comprising two levels: English and Indonesian.

The dependent variable of this study is reading comprehension – the ability of EFL readers to recall the idea units of the reading comprehension tests. The relationship between the independent variables and the dependent variable is shown in Figure 3.1.

Table 3.1 Multiple treatment four-factor design

ECONOMICS			AGRICULTURE			PURE SCIENCES		
T1	ECO-PROSOL-WITHOUT-RENG	G.01	T19	AGRI-PROSOL-WITHOUT-RENG	G.19	T37	PS-PROSOL-WITHOUT-RENG	G.37
T2	ECO-PROSOL-WITHOUT-RIND	G.02	T20	AGRI-PROSOL-WITHOUT-RIND	G.20	T38	PS-PROSOL-WITHOUT-RIND	G.38
T3	ECO-PROSOL-WITHL2-RENG	G.03	T21	AGRI-PROSOL-WITHL2-RENG	G.21	T39	PS-PROSOL-WITHL2-RENG	G.39
T4	ECO-PROSOL-WITHL2-RIND	G.04	T22	AGRI-PROSOL-WITHL2-RIND	G.22	T40	PS-PROSOL-WITHL2-RIND	G.40
T5	ECO-PROSOL-WITHL1-RENG	G.05	T23	AGRI-PROSOL-WITHL1-RENG	G.23	T41	PS-PROSOL-WITHL1-RENG	G.41
T6	ECO-PROSOL-WITHL1-RIND	G.06	T24	AGRI-PROSOL-WITHL1-RIND	G.24	T42	PS-PROSOL-WITHL1-RIND	G.42
T7	ECO-CAU-WITHOUT-RENG	G.07	T25	AGRI-CAU-WITHOUT-RENG	G.25	T43	PS-CAU-WITHOUT-RENG	G.43
T8	ECO-CAU-WITHOUT-RIND	G.08	T26	AGRI-CAU-WITHOUT-RIND	G.26	T44	PS-CAU-WITHOUT-RIND	G.44
T9	ECO-CAU-WITHL2-RENG	G.09	T27	AGRI-CAU-WITHL2-RENG	G.27	T45	PS-CAU-WITHL2-RENG	G.45
T10	ECO-CAU-WITHL2-RIND	G.10	T28	AGRI-CAU-WITHL2-RIND	G.28	T46	PS-CAU-WITHL2-RIND	G.46
T11	ECO-CAU-WITHL1-RENG	G.11	T29	AGRI-CAU-WITHL1-RENG	G.29	T47	PS-CAU-WITHL1-RENG	G.47
T12	ECO-CAU-WITHL1-RIND	G.12	T30	AGRI-CAU-WITHL1-RIND	G.30	T48	PS-CAU-WITHL1-RIND	G.48
T13	ECO-COLDES-WITHOUT-RENG	G.13	T31	AGRI-COLDES-WITHOUT-RENG	G.31	T49	PS-COLDES-WITHOUT-RENG	G.49
T14	ECO-COLDES-WITHOUT-RIND	G.14	T32	AGRI-COLDES-WITHOUT-RIND	G.32	T50	PS-COLDES-WITHOUT-RIND	G.50
T15	ECO-COLDES-WITHL2-RENG	G.15	T33	AGRI-COLDES-WITHL2-RENG	G.33	T51	PS-COLDES-WITHL2-RENG	G.51
T16	ECO-COLDES-WITHL2-RIND	G.16	T34	AGRI-COLDES-WITHL2-RIND	G.34	T52	PS-COLDES-WITHL2-RIND	G.52
T17	ECO-COLDES-WITHL1-RENG	G.17	T35	AGRI-COLDES-WITHL1-RENG	G.35	T53	PS-COLDES-WITHL1-RENG	G.53
T18	ECO-COLDES-WITHL1-RIND	G.18	T36	AGRI-COLDES-WITHL1-RIND	G.36	T54	PS-COLDES-WITHL1-RIND	G.54

KEY:

T = treatment	RENG = recall in English
F = rhetorically-oriented framework	RIND = recall in Indonesian
ECO = economics	PROSOL = problem-solution
AGRI = agriculture	CAU = causation
PS = pure sciences	COLDES = collection of description
L1 = native language (Indonesian)	NO = without
L2 = target language (English)	G = group of observation

3.1.3 Participants of the experiment

In Indonesian schools, English is taught as a compulsory subject and delivered across all Indonesian school curricula, from junior high school to university. The primary focus of English language teaching in secondary school curriculum is to give secondary school students a working knowledge

of English in the four language skills, with an emphasis on the development of reading skills followed by listening, speaking and writing. After three years of English learning in junior high school and another three years in senior high school, it is expected that the graduates will be sufficiently proficient in English so as to support their own study in higher education. At the university level further emphasis of English learning is also placed on developing student reading skills in order to assist students to enhance their opportunities of success in their chosen disciplinary area or specialisation.

The participants of this study were Indonesian university EFL students from three different disciplines: economics, agriculture, and pure sciences. The target population was those who had completed: 1) a tertiary level course of English for Academic Purposes (EAP), and 2) a tertiary level course of Basic Cultural Sciences (BCS). The participants of the study are students of the second year and above, in which EAP and BCS are compulsory subjects taught for the students for once a week for one semester. The reason for choosing the participants based on these two criteria relates mainly to the theoretical framework adopted for this study, the Schema Theory model of reading as stated in Chapter 1. In addition, and consistent with its factorial design the study involves the comparison of 54 experimental groups. Eighteen groups were composed of students of economics, 18 groups were of students of agriculture and the remaining 18 groups were of students of pure sciences. Each experimental group consisted of 18 participants. Students were randomly selected from the assigned population from these three faculties.

The research participants passing from the subject of English for academic purposes, with the average score of B, does not intend to infer that this average score reflects the students' English proficiency or reading proficiency level of either pre-intermediate, intermediate or advance since no attempt was carried out to measure the participants' English or reading proficiency test. From the study limitation, it is clearly stated that this study does not supposed to measure the participants' proficiency level because the

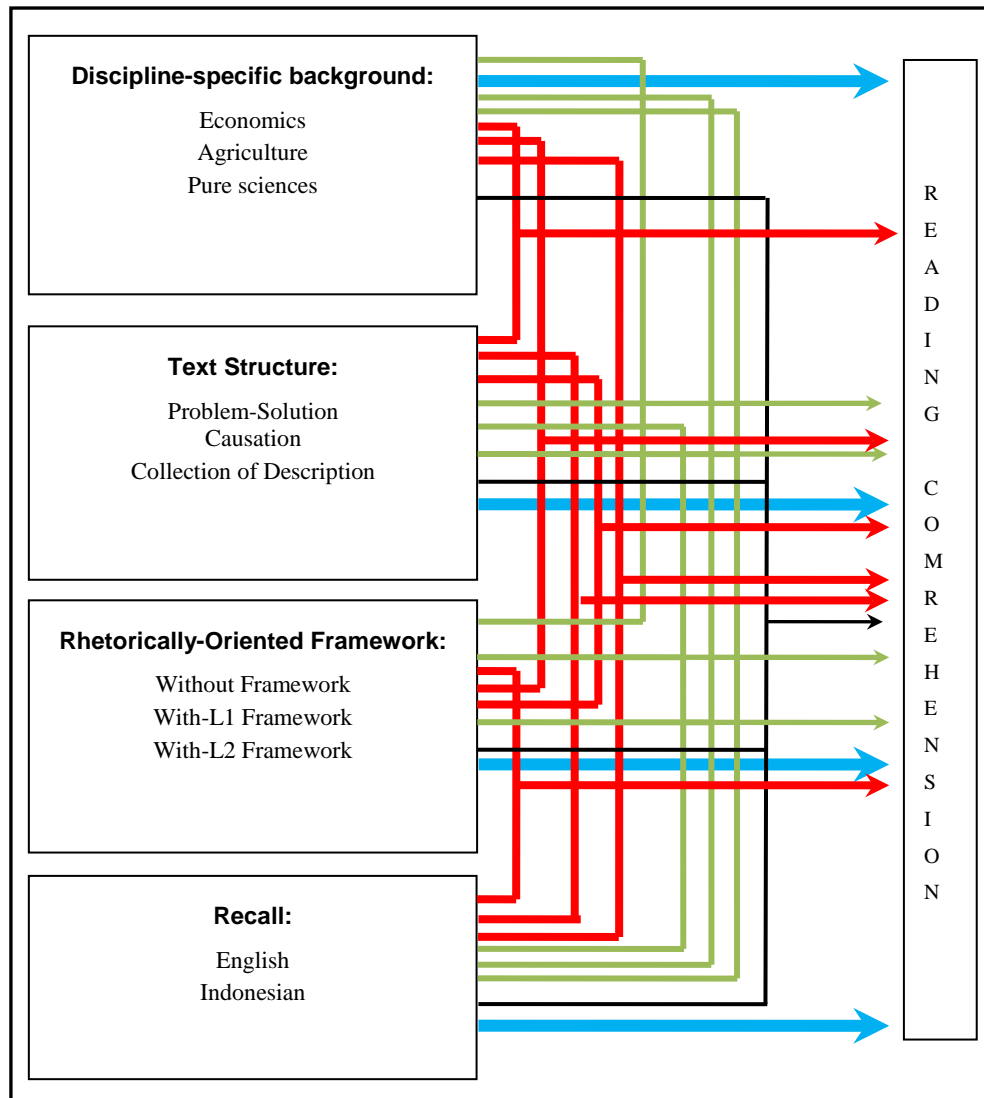
inclusion of linguistic schemata, the English proficiency level was due to the research design adopted for this study, especially to deal with the inaccessible number of research participants to be involved.

Based on my personal observation and other teaching practitioners, most of the undergraduate students in Indonesia still belong to roughly pre-intermediate to intermediate levels. This interpretation is best supported by Floris (2008) surveying as many as 1450 of a private university of non-English department students in east Java and found 58% of the students acquired 453-550 TOEFL score, which was assumed that their English proficiency fall into an intermediate level. From this finding, it can also be inferred that 42% of the students' level of proficiency was below the intermediate level.

3.1.4 Treatments of the experiment

The instrument used for assessing participants' reading comprehension was in the form of reading comprehension tests (as presented in Appendix 2) using the free written recall technique. The test consisted of 18 reading comprehension task versions, each written in one of three different types of text structure: causation, problem-solution and collection of description. The 18 treatment passages were identical in content; three of them were without framework, three with-L1 framework, and three passages with-L2 framework. In relation to the language of recall, each of the text structure types was presented with an adjunct (rhetorically-oriented framework) in the form with of an L1 framework, an L2 framework and without a framework, each to be recalled in either English (L2) or Indonesian (L1). The participants were scored on the basis of the amount of information (idea units) recalled from the texts, with the number of idea units constituting the dependent variable of reading comprehension.

Figure 3.1 Relationships between the independent variables and the dependent variable



Given that exposure to the treatment was judged to be intense enough to detect differences in text factor effects among the experimental groups, the exposure of the participants to a single treatment was considered sufficient. Lehmann and Mehrens (1979) maintain that in experimental research, the practice of exposing the participants to the research treatment on a single occasion is the norm. Sax (1979) contrasts treatments in medical research, which imply improvement leading to a cure, as different from educational research in which participants are exposed to experimental treatment in order

to generate a change in educational performance as a result of that exposure, but not necessarily to improve an overall condition. Thus, one exposure to the experimental treatment in this study was considered reasonable.

3.2 Instrument for the reading comprehension test

This section provides information on how the reading comprehension tests were developed, validated and analysed, in order to produce the idea units common to the three text structure types used within the scoring tool for the research of participants' recall.

3.2.1 The development of the reading comprehension test

The criterion for selecting texts used for the reading comprehension test aligned with the theoretical framework of the Schema Theory model of reading, as noted in Chapter 1. Thus, the selected texts used for the reading comprehension tests needed to be appropriate for the participants in terms of language difficulty (vocabulary and syntactic complexity) and text content familiarity (background knowledge required). In terms of text content appropriateness, Scott et al. (1984) state that there should be an informational mismatch between the readers' background knowledge and what is being conveyed by the text. The text is considered to be appropriate if the content and the language of the text moderately match with any particular reader's profile. In other words, attempts should be made to maintain the appropriate information gap between the participants' background knowledge, the language difficulty and content of the text.

Two texts on the topic of the 'nature of culture' were chosen as the raw material, being considered familiar to the participants of the study because the reader participants had all successfully completed the subject of Basic Cultural Science (BCS). From a number of observable texts on culture, it was decided by the researcher to select two texts considered to be the most appropriate and comparable ones for the research participants. The first text,

entitled *Multiculturalism*, was adapted from *Thinking Through Process* (Collard & Clinch 1980, p. 115-117), and the second text, entitled *Some Aspects of Culture*, was taken from *Introducing Culture* (Schusky & Culbert 1973, pp. 75-76). The decision was made under the consideration that the topic of these two texts were the most closely related to the content taught in the subject of BCS as informed by the lecturers of that subject. Each of the chosen texts was then adapted and presented in three comparable versions featuring different text structure types: causation, problem-solution and collection of description. The comparable versions were developed by modifying the top-level structure of the original passages without changing their content and language. The resulting texts were coded as 1A, 1B, 1C and 2A, 2B, 2C. The adapted texts are presented in Appendix 1 (Appendices 1A – 1F).

3.2.2 Text appropriateness

The two adapted texts which were presented in three text structure types and were then rated for their appropriateness for the target group of students by eight lecturers of English for Specific Purposes (ESP) from Jember University in Indonesia (see Appendix 1G); and for their text structure by three lecturers in ESL from Victoria University, Melbourne, Australia (see Appendix 1H). The data for the text appropriateness were collected by asking eight Indonesian ESP lecturers to circle either 4, 3, 2, or 1 to indicate their individual judgment on the appropriateness (level of difficulty for language and level of familiarity for background knowledge) of each component of text types. The judges were asked to rate the texts in terms of the of vocabulary difficulty, text structure, syntactic complexity and background knowledge, also by using a four-point ordinal scale from appropriate (4) to inappropriate (1) as shown in Table 3.2.

Table 3.2 **Scale of appropriateness**

SCORE	DESCRIPTION OF APPROPRIATENESS
4	Appropriate
3	Fairly Appropriate
2	Less Appropriate
1	Inappropriate

The scores of the degree of appropriateness of the two passages according to the various judgments of the lecturers, as presented in Table 3.3, were analysed using a non-parametric technique, Kruskal-Wallis one-way ANOVA, in order to determine which of the two texts – the *Some Aspects of Culture* excerpt or the excerpt from *Multiculturalism* – was more appropriate for use in the reading comprehension tests. The analysis results of the Kruskal-Wallis one-way ANOVA (Table 3.3) show the probability value of the Chi-Square test was .9164. Since $.9164 > .05$, it is reasonable to decide that the means of the scores given by the eight judges were not significantly different from each other. In other words, texts 1A, 1B, and 1C are as appropriate as texts 2A, 2B, and 2C. In addition, since the grand means of the ratings of the passages range from 3.09 to 3.32, the degree of appropriateness each judged passage can be classified as fairly appropriate, applying the criteria listed in Table 3.2.

Comparatively, the texts 1A, 1B and 1C were as appropriate as texts 2A, 2B and 2C. The only difference was that the grand means of texts 1A, 1B and 1C were higher than those of texts 2A, 2B and 2C. Since the grand means of *Some Aspects of Culture* texts 1A, 1B, 1C rated higher than the *Multiculturalism* texts 2A, 2B, and 2C and so the former texts, having been judged to be more appropriate, were adopted for the reading comprehension tests of the present study.

Table 3.3 Scores of the components of text types given by 8 judges

TEXT		SCORES GIVEN BY THE JUDGES								
TYPE	COMPONENT	A	B	C	D	E	F	G	H	COLUMN MEAN
1A	VOCABULARY DIFFICULTY	3.00	4.00	4.00	3.00	3.00	4.00	4.00	3.00	3.50
	SYNTACTIC COMPLEXITY	2.00	3.00	4.00	3.00	3.00	3.00	4.00	3.00	3.13
	BACKGROUND KNOWLEDGE	3.00	4.00	4.00	2.00	3.00	4.00	2.00	4.00	3.25
	TEXT STRUCTURE	3.00	3.00	3.00	3.00	4.00	4.00	4.00	3.00	3.38
RAW MEAN		2.75	3.50	3.75	2.75	3.25	3.75	3.50	3.25	GRAND MEAN= 3.32
1B	VOCABULARY DIFFICULTY	3.00	4.00	3.00	3.00	3.00	4.00	4.00	3.00	3.38
	SYNTACTIC COMPLEXITY	2.00	3.00	3.00	3.00	3.00	4.00	4.00	3.00	3.13
	BACKGROUND KNOWLEDGE	3.00	4.00	4.00	2.00	3.00	4.00	2.00	4.00	3.25
	TEXT STRUCTURE	3.00	4.00	3.00	3.00	3.00	4.00	4.00	3.00	3.38
RAW MEAN		2.75	3.75	3.25	2.75	3.00	4.00	3.50	3.25	GRAND MEAN= 3.28
1C	VOCABULARY DIFFICULTY	3.00	4.00	4.00	3.00	3.00	4.00	4.00	3.00	3.50
	SYNTACTIC COMPLEXITY	2.00	4.00	3.00	3.00	3.00	4.00	4.00	3.00	3.25
	BACKGROUND KNOWLEDGE	3.00	4.00	4.00	2.00	3.00	4.00	2.00	4.00	3.25
	TEXT STRUCTURE	2.00	3.00	4.00	4.00	2.00	4.00	4.00	3.00	3.25
RAW MEAN		2.50	3.75	3.75	3.00	2.75	4.00	3.50	3.25	GRAND MEAN= 3.31
2A	VOCABULARY DIFFICULTY	2.00	4.00	4.00	3.00	4.00	4.00	4.00	3.00	3.50
	SYNTACTIC COMPLEXITY	3.00	3.00	3.00	3.00	3.00	3.00	4.00	3.00	3.13
	BACKGROUND KNOWLEDGE	3.00	2.00	3.00	2.00	2.00	4.00	2.00	2.00	2.50
	TEXT STRUCTURE	4.00	3.00	4.00	3.00	3.00	4.00	4.00	4.00	3.63
RAW MEAN		3.00	3.00	3.50	2.75	3.00	3.75	3.50	3.00	GRAND MEAN=3.19
2B	VOCABULARY DIFFICULTY	2.00	4.00	4.00	3.00	4.00	4.00	4.00	3.00	3.50
	SYNTACTIC COMPLEXITY	3.00	4.00	3.00	3.00	3.00	3.00	4.00	3.00	3.25
	BACKGROUND KNOWLEDGE	3.00	2.00	4.00	2.00	2.00	4.00	2.00	2.00	3.63
	TEXT STRUCTURE	3.00	4.00	3.00	3.00	4.00	4.00	4.00	3.00	3.50
RAW MEAN		2.75	3.50	3.50	2.75	3.25	3.75	3.50	2.75	GRAND MEAN= 3.22
2C	VOCABULARY DIFFICULTY	2.00	4.00	4.00	3.00	4.00	4.00	4.00	3.00	3.50
	SYNTACTIC COMPLEXITY	2.00	3.00	4.00	3.00	2.00	3.00	4.00	3.00	3.00
	BACKGROUND KNOWLEDGE	3.00	2.00	3.00	2.00	3.00	3.00	2.00	2.00	3.50
	TEXT STRUCTURE	3.00	3.00	3.00	4.00	3.00	4.00	4.00	3.00	3.38
RAW MEAN		2.50	3.00	3.50	3.00	3.00	3.50	3.50	2.75	GRAND MEAN= 3.09

Where:

1A = A version of text *Some Aspects of Culture* written in problem-solution text structure

1B = A version of text *Some Aspects of Culture* written in causation text structure

1C = A version of text *Some Aspects of Culture* written in collection of description text structure

2A = A version of text *Multiculturalism* written in problem-solution text structure

2B = A version of text *Multiculturalism* written in causation text structure

2C = A version of text *Multiculturalism* written in collection of description text structure

A – G = the judges.

To validate the text rhetorical structure types, three native English speaking teaching academics from Victoria University kindly agreed to identify and assess the three different text types and to consider the acceptability of both the texts themselves and their rhetorical frameworks. The first task that they were asked to undertake was the identification of the three texts' respective rhetorical structures by choosing (A) problem-solution, (B) causation or (C) collection of description. All three academics were in agreement as to the structure that each of the three texts represented.

The teaching academics' second task was to rate the acceptability of the text in representing the targeted text structure type. In doing so, the academics were once again asked to rate each text structure type according to a scale of (1) not acceptable to (4) acceptable. It was found that their assessment corresponded to the level 'fairly acceptable' with an average mean score of 3.35. The acceptability of the text structure types is presented in Table 3.4.

Table 3.4 The acceptability of text structure types

JUDGES	TEXT STRUCTURE	SCORES
1	problem-solution	4
	causation	4
	collection of description	3
2	problem-solution	3
	causation	3
	collection of description	3
3	problem-solution	4
	causation	4
	collection of description	4
Average Mean Score		3.35

The academics' third task was to rate the acceptability of the rhetorically-oriented framework in indicating the content and structure of the text to which it refers by rating each on a scale of (1) 'not acceptable' to (4) 'acceptable'. The mean acceptability score of the rhetorically-oriented

framework for each text structure type was found to be 3.44 which corresponds to a level of ‘fairly acceptable’ as presented in Table 3.5.

Table 3.5 The acceptability of rhetorically-oriented framework for each text structure

JUDGES	RHETORICALLY-ORIENTED FRAMEWORK	SCORES
1	Rhetorically-oriented framework for collection of description	3
	Rhetorically-oriented framework problem-solution	3
	Rhetorically-oriented framework causation	3
2	Rhetorically-oriented framework for collection of description	3
	Rhetorically-oriented framework problem-solution	4
	Rhetorically-oriented framework causation	3
3	Rhetorically-oriented framework for collection of description	4
	Rhetorically-oriented framework problem-solution	4
	Rhetorically-oriented framework causation	4
AVERAGE MEAN SCORE		3.44

Following these verifications, texts 1A, 1B, and 1C, were analysed according to Meyer’s content structure analysis in order to determine the list of idea units common to the three text versions.

3.2.3 Analysis of the rhetorical structure of the three text versions

To demonstrate the procedures used in analysing the text structure, a sample analysis of one of the three text versions used in this study – the *problem-solution* – is presented here. The analyses of the other two variants: *causation* and the *collection of description* are contained in Appendices 3A and 3B respectively.

The first step in analysing text, based on content structure analysis, is to identify the signaling words of the text. Meyer (1975) indicates that signalling words are non-content aspects of the text and are not included in the content structure as they do not add any new information to the content structure. According to Meyer there are four major types of signaling:

1. pecification of the structure of relations in the content structure;
2. prematurely revealed information abstracted from content occurring later in the text;
3. summary statement; and
4. pointer words.

The underlined words in Figure 3.2 are identified as signaling. In the first sentences of the second and the third paragraphs, this signaling indicates that the discussion is presented with the form of a *problem and solution* rhetorical structure concerning ideal and real cultures. In this case, the first sentence of the second paragraph represents the *problem* of the discrepancies between ideal and real cultures. The first sentence of the third paragraph, on the other hand, represents a *solution* of the discrepancies of ideal and real cultures. These two sentences represent a type of signaling known as *prematurely revealed information abstracted from content occurring later in the text*.

The underlined words on the other hand in the first and second paragraphs signal that the information will be presented in a comparison text structure. The words: in some instances and for example in the second paragraph signal that the information will be presented in an ‘explanation’ text structure. Therefore, this signaling type can be classified as *specification of the structure of relation in the content structure*. The words: it seems inherent in the second paragraph, and it would seem that in the third paragraph are signaling words that explicitly point the reader to the author’s perspective of particular ideas. Therefore, these signaling words can be classified as *Pointer Words*. The word thus appearing at the beginning of the last sentence of the second paragraph seems to be a signaling of a *Summary Statement* type.

Figure 3.2 The with-signalling version of the problem-solution text structure type

Culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists. The problem with this taxonomy is that in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high of living standard affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognise that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behaviour will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

The solution to the problem of the discrepancies between ideal culture and real culture is the idea of norm which combines the concepts of both aspects. It would seem that what man does becomes fixed as norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behaviour. Even when the real behaviour begins to differ from the ideal, the norm may operate at a psychological level causing shame or guilt when there is deviation from them.

Because it does not add new content or relations to the text, all of the signaling was deleted from the rhetorical structure; however, the signaling in the first sentence in a paragraph cannot be omitted, because their deletion will result in the distortion of the meaning of the information in the text. To address this issue, the sentences require rewriting using the non-signaling information.

The second step was the rewriting of the without-signaling version using the non-signaled information as discussed above. After doing so, the without-signaling version of the problem-solution text was produced as shown in Figure 3.3.

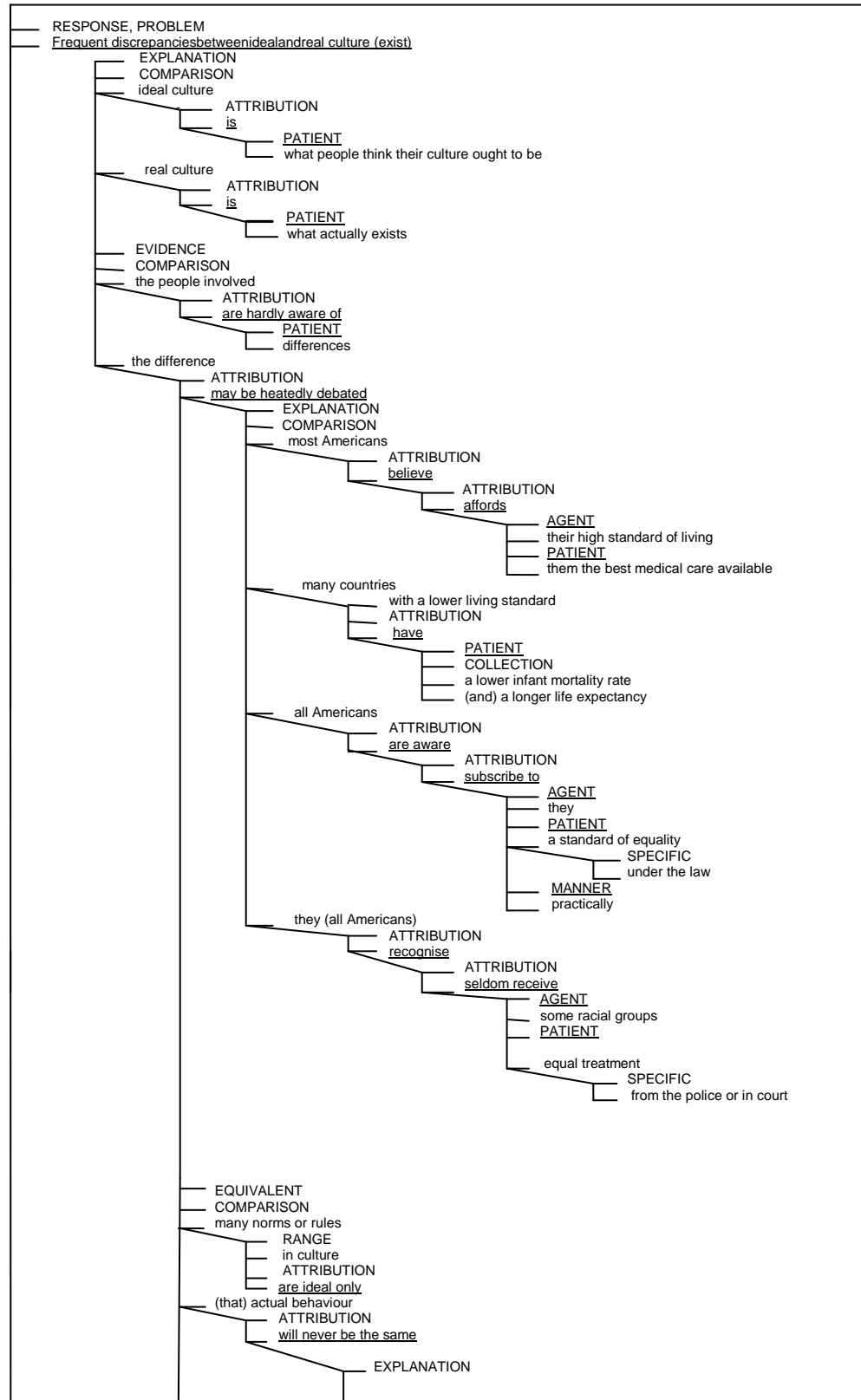
Figure 3.3 The without-signaling version of the problem-solution text structure type

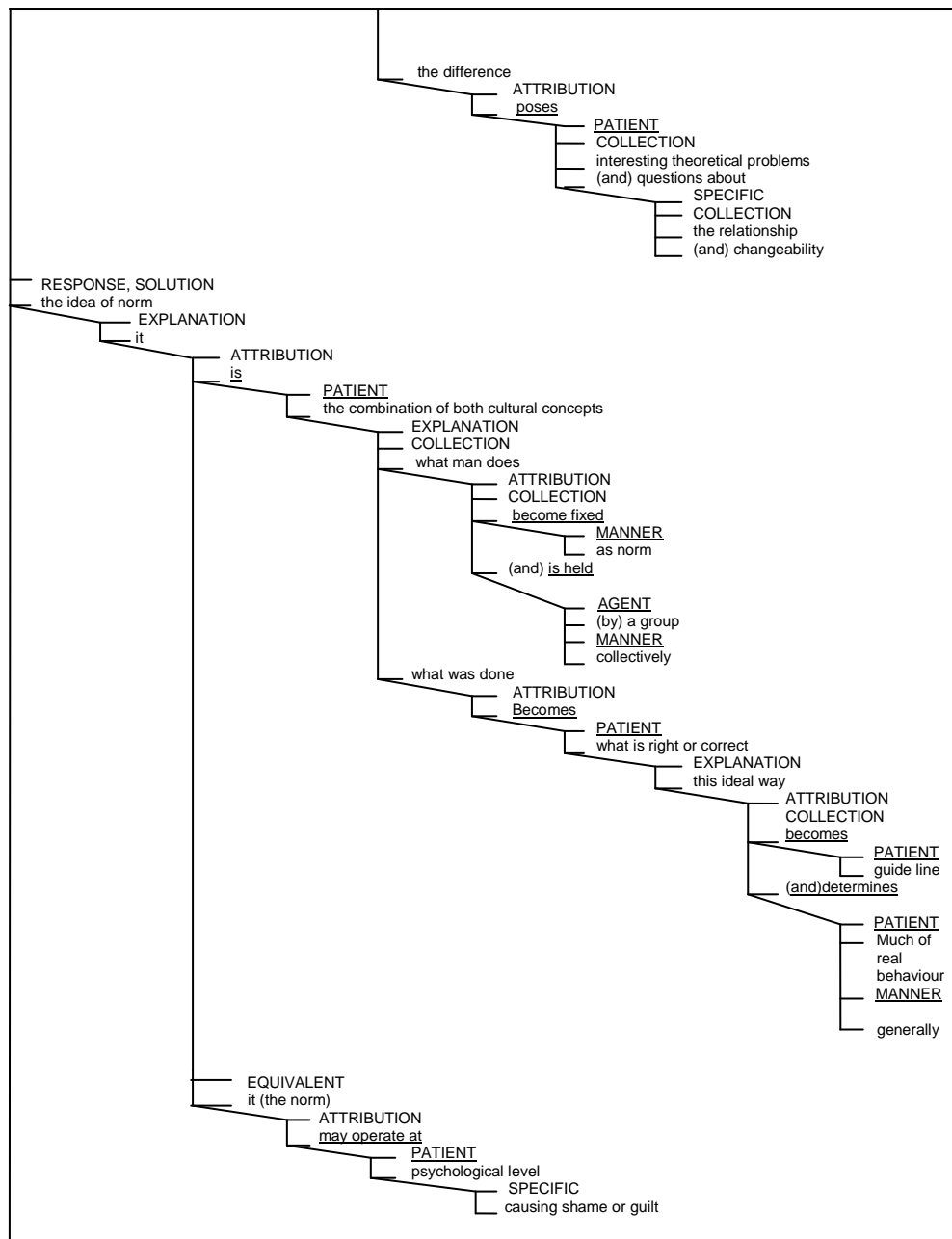
Frequent discrepancies between ideal and real culture (exist). Ideal culture is what people think their culture ought to be. Real culture is what actually exists. The people involved are hardly aware of differences, the difference may be heatedly debated. Most Americans believe their high standard of living affords them the best medical care available. Many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. Practically all Americans are aware that they subscribe to a standard of equality under the law although they recognise that some racial groups seldom receive equal treatment from the police or in court. In culture, many norms or rules are ideal only, the actual behaviour will never be the same. The difference poses interesting theoretical problems and questions about the relationship and changeability.

The idea of norm (exists). It (the idea of norm) is the combination of both cultural concepts. What man does becomes fixed as a norm and is held by a group collectively. What was done becomes what is right or correct. This ideal way becomes a guideline and generally determines much of real behaviour. It (the norm) may operate at psychological level causing shame or guilt.

The third step encompassed an analysis of the information within the without-signaling version of the *problem-solution* text structure type as shown in Figure 3.3. The text was analysed following top-bottom parsing procedures as shown in the tree diagram shown in Figure 3.4, below. The analyses of the other two text structure types are presented as Appendix 3A for *causation* and Appendix 3B for *collection of description*.

Figure 3.4 The rhetorical structure analysis of the problem-solution text structure type





Key:

Words in lower case	= content words from the text
<u>Underlined words in lower case</u>	= <u>lexical predicates</u>
<u>Underlined, small-capitalised</u>	= Roles
Small-capitalised words	= Rhetorical Predicates

Finally, based on the rhetorical structure analysis shown above, the idea units of the without-signaling *problem-solution* text structure type were identified and are depicted in Table 3.6. The idea units of the other two text structure types are presented as Appendix 4A for *causation* and as Appendix 4B for *collection of description*.

Table 3.6 The idea units of the without-signaling version of the problem-solution text

SERIAL	LEVEL	IDEA UNIT
1	1	frequent discrepancies between ideal and real culture
2	2	ideal culture
3	3	is
4	4	what people think their culture ought to be
5	2	real culture
6	3	is
7	4	what actually exists
8	2	the people involved
9	3	are hardly aware of
10	4	differences
11	2	the difference
12	3	may be heatedly debated
13	4	most Americans
14	5	believe
15	7	their high standard of living
16	6	affords
17	7	them the best medical care available
18	4	many countries
19	5	with a lower living standard
20	5	have
21	6	a lower infant mortality rate
22	6	(and) a longer life expectancy
23	7	practically
24	4	all Americans
25	5	are aware
26	7	(that) they
27	6	subscribe to
28	7	a standard of equality
29	8	under the law
30	4	they (all Americans)
31	5	recognise
32	7	(that) some racial groups
33	6	seldom perceive
34	7	equal treatment
35	8	from the police or in court
36	4	in culture

SERIAL	LEVEL	IDEA UNIT
37	3	many norms or rules
38	4	are ideal only
39	3	(that) actual behavior
40	4	Will never be the same
41	5	the difference
42	6	poses
43	7	interesting theoretical problems
44	7	(and) questions about
45	8	the relationship
46	8	(and) changeability
47	1	the idea of norm (exists)
48	2	it (the idea of norm)
49	3	is
50	4	the combination of both cultural concepts
51	5	what men does
52	6	becomes fixed
53	7	as norm
54	6	(and) is held
55	7	(by) a group
56	7	collectively
57	5	what was done
58	6	becomes
59	7	what is right or correct
60	8	this ideal way
61	9	becomes
62	10	guide line
63	10	(and) generally
64	9	determines
65	10	much of real behavior
66	3	it (the norm)
67	4	may operate at
68	5	psychological level
69	6	causing shame or guilt

3.2.4 Scoring the idea units recalled

As stated in Chapter 1, the idea units were scored following Meyer's (1975) content-structure analysis according to the reasons discussed in detail in Chapter 2.

The analysis considered the arguments of propositions and the extent to which these represented the substance of the ideas and their relationships, with each idea unit being categorised as either top level, high level, middle

level, or low level. The participants' recall of the information in the texts was to be scored for the presence of the units listed in Table 3.7. Distortions in and embellishments of the original text content were not allowed, because they would mean that either the information would be recalled incorrectly or would not be in the text itself. The idea units recalled by the participants were scored by two raters and so the participants' final scores were the average of the scores obtained from Rater 1 and Rater 2. As the recall was not only in English, but also in Indonesian, a list of idea units written in Indonesian was also developed based on the list of idea units common to the three text structure types written in English, as presented in Table 3.7. The Indonesian equivalent to this list of idea units common to the three text structure types is contained in Appendix 5.

Table 3.7 The idea units common to the three text structure types

SERIAL	PROSOL	CAU	COLDES	IDEA UNIT
1	H	H	T	ideal culture
2	M	M	H	Is
3	L	L	M	what people think their culture ought to be
4	H	H	T	real culture
5	M	M	H	is
6	L	L	M	what actually exists
7	H	H	H	the people involved
8	M	M	M	are hardly aware of
9	L	L	L	differences
10	H	H	H	the difference
11	M	M	M	may be heatedly debated
12	L	L	L	most Americans
13	L	L	L	believe
14	L	L	L	their high standard of living
15	L	L	L	affords
16	L	L	L	them the best medical care available
17	L	L	L	many countries
18	L	L	L	with a lower living standard
19	L	L	L	have
20	L	L	L	a lower infant mortality rate
21	L	L	L	(and) a longer life expectancy
22	L	L	L	practically
23	L	L	L	all Americans
24	L	L	L	are aware
25	L	L	L	(that) they

SERIAL	PROSOL	CAU	COLDES	IDEA UNIT
26	L	L	L	subscribe to
27	L	L	L	a standard of equality
28	L	L	L	under the law
29	L	L	L	they (all Americans)
30	L	L	L	recognise
31	L	L	L	(that) some racial groups
32	L	L	L	seldom receive
33	L	L	L	equal treatment
34	L	L	L	from the police or in court
35	L	L	M	in culture
36	M	M	H	many norms or rules
37	L	L	M	are ideal only
38	M	M	H	(that) actual behavior
39	L	L	M	will never be the same
40	L	L	L	the difference
41	L	L	L	poses
42	L	L	L	interesting theoretical problems
43	L	L	L	(and) questions about
44	L	L	L	the relationship
45	L	L	L	(and) changeability
46	T	T	T	the idea of norm
47	L	L	L	what man does
48	L	L	L	becomes fixed
49	L	L	L	as norm
50	L	L	L	(and) is held
51	L	L	L	(by) a group
52	L	L	L	collectively
53	L	L	L	what was done
54	L	L	L	becomes
55	L	L	L	what is right or correct
56	L	L	L	this ideal way
57	L	L	L	becomes
58	L	L	L	guide line
59	L	L	L	(and) generally
60	L	L	L	determines
61	L	L	L	much of real behavior
62	M	M	H	it (the norm)
63	L	L	M	may operate at
64	L	L	L	psychological level
65	L	L	L	causing shame or guilty

Where:

CAU = causation
PROSOL= Problem-Solution
COLDES= collection of description

T = top level
H = high level
M = mid level
L = low level

3.3 Validity and reliability

The following discussion relates to a trial conducted as a component of the pilot study to gather evidence to support the validity and reliability of these English reading comprehension tests.

3.3.1 Validity

3.3.1.1 Type of validity

The term validity refers to ‘the extent to which a test actually measures what it is intended to measure’ (Carter & Porter 2000, p. 29), and primarily focuses on three aspects of validity: content, criterion, and construct (Palmer & Bachman 1981, p. 135; Carter & Porter 2000, p. 31).

According to Carter and Porter (2000, p. 31), content validity is concerned with the extent to which the measurement adequately covers the various dimensions of the concept under investigation, and ‘can be enhanced by asking for expert opinion and/or searching the literature for information against which to compare the content of the instrument’. Criterion validity can be divided into two types: concurrent and predictive validity. Carter and Porter argue that this type of validity is based on ‘pragmatic consideration’ (p. 32), whereas construct validity is based on the theoretical considerations, as the measure needs to validly reflect the theoretical constructs. They argue that this type of validity is ‘the most important form as it provides a test of a measure and of the theory upon which is based’ (p. 32). The validity evidence to be gathered in this study was that of construct validity, and content validity.

3.3.1.2 Construct validity of the study

The reading comprehension test developed for this study was considered to have construct validity since the test was developed based on the theoretical basis of a Schema Theory of Reading as noted in Chapter 1. Thus, the reading comprehension test should fulfil the characteristics of this theory: the

first of these characteristics is that the test should acknowledge the readers' background knowledge; the second is that readers are an intrinsic element in the reading processes.

To fulfil these requirements, attempts were made to ensure that the free written recall test used was compatible with the readers' background knowledge. The free written recall tests used in this study were integrated in nature, since it was not possible for the participants of the study to recall the passages they had read without using their schemata to interact with the text – through both bottom-up decoding, and top-down analysis. Nassaji (2002) claims that bottom-up and top-down processes are sometimes separated in their application to L1 or L2 reading comprehension processes. Since the reading comprehension tests (free written recall) used in this study were not contradictory with the theory adopted, it is reasonable to argue that they meet the test of construct validity.

3.3.1.3 Content validity of the study

The reading comprehension tests of this present study were designed to accommodate the readers' reading comprehension via an immediate free written recall and so can be considered to have content validity for at least two reasons. First, the tests had been assessed by raters to ensure that they accurately measured that which was intended to be measured. Secondly, since it was based on the results of the text structure analyses of the three text versions to be investigated, the scoring system developed using the idea units common to the three text types was considered to be a valid test guide.

3.3.1.4 Internal and external validity

Validation can be performed either 'externally, by relating the scores of participants on a new test to their scores on an existing, highly-valid test, or internally, by studying the test in its own terms' (Carroll & Hall 1985, p. 123). Additionally, validity estimation can be performed either 'judgmentally

(using verbal description) or quantitatively (using statistical formula)' (p. 123).

Attempts were made to control several factors possibly affecting the internal validity of this study. Invalidity due to subject history, maturation, and mortality effects were limited by ensuring the experiment had a short duration: because the participants of this study were measured once, testing and statistical regression effects were able to be eliminated. An inter-rater scoring technique was employed to eliminate invalidity resulting from instrumentation effects. This involved *random assignment*, *equalising individuals* belonging to each of the experimental groups and *controlling the participants' prior knowledge* of the language and the topic of the reading texts to which they were to be exposed:

- Random assignment involves assigning the experimental treatments randomly to each subject of the study in accordance with the research design of the study.
- Equalising the participants belonging to each experimental group involved the grouping of participants according to their disciplines: Economics, Agriculture, and Pure Sciences.
- Controlling the participants' prior knowledge of the language and the topic of the exposed texts involved adopting and developing the respective texts on the basis of their appropriateness for the subject of the study.

To avoid interaction effects due to selection biases, participants were randomly assigned to the experimental treatment. Finally, experimental procedure effects were controlled by conducting the experiments during regular class hours, and having them administered by lecturers familiar with the participants.

3.3.2 Reliability

Reliability, which is concerned with the use of a measure to yield constant results, is considered to be a prerequisite of validity (Carter & Porter 2000).

Reliability test results can be measured through the stability, consistency and equivalence of the testing upon they are based on (Carter & Porter 2000). Since the reading comprehension tests (free written recall tests) were subjective in nature, reliability was determined using a rater consistency procedure (Bachman 1990); specifically, the reliability to be determined was the inter-rater reliability. In the reliability analysis associated with this research, the participants' reading comprehension responses were independently scored by two raters – Rater 1 (the Researcher) and Rater 2 (an English Language lecturer in Indonesia) – and the two scores were correlated.

3.4 Pilot study

Prior to conducting the main study, a pilot study of the instrument to be employed in the main study – the reading comprehension tests – was conducted. The aims of the pilot study were to try-out the instrument of the study and to estimate an appropriate sample size for the experiment.

3.4.1 Participants of the pilot study

The participants of this pilot study were students of Economics and Agriculture at the University of Jember, East Java, Indonesia. The target population numbered those students who had completed both the course of English for Specific Purposes (ESP) and the course of Basic Cultural Sciences (BCS).

The reason for choosing the participants according to these two criteria concerned what was considered to be the appropriate information gap between the participants and the language difficulty and the familiarity with the content of the texts. Twelve experimental groups were involved: six groups were the students of economics; six groups were students of agriculture. Each group had eighteen participants providing a total number of 216 participants, 108 from each faculty. The participants were chosen by

random assignment from the combined population from both faculties of 702 students.

3.4.2 Instrument try-out

The data collection for the pilot study was performed at the Faculty of Economics and Agriculture of the University of Jember, East Java, Indonesia. The procedure for the pilot study was intended to provide guidelines for the general procedure of the experiment.

The pilot study was conducted during regular class hours, and was administered by lecturers familiar with and to the participants. Before the participants performed the recall tasks, the lecturers were informed of the administrative procedures, but not of the nature of the study, and were asked not to provide help to the participants. Each student participant was given a sheet of writing paper and the reading comprehension test by calling the participant name as written down in the paper (prepared by the researcher following the assigned procedure). Before undertaking the recall task, the students were first asked to read the test instructions carefully, after which their lecturer allowed them to ask questions concerning those instructions that might have been difficult for them to understand, especially regarding the notion of writing down what they could recall from the text.

The reading comprehension test instructions for the pilot study, in Indonesian, were as follows:

Petunjuk mengerjakan test

1. Bacalah teks dibawah ini dengan seksama sampai saudara benar-benar dapat menyerap informasi yang ada dalam teks tersebut.
2. Setelah selesai membaca, baliklah lembar teks ini, sehingga anda tidak dapat melihat teks pada lembar teks tersebut.
3. Pada kertas bergaris yang telah saudara terima, tulislah identitas saudara dan jenis teks yang saudara baca.
4. Dengan menggunakan bahasa Indonesia, tulislah informasi apapun yang saudara ingat dari teks yang telah saudara baca dalam kalimat-kalimat yang lengkap, sehingga informasi yang saudara tulis akan membentuk sebuah wacana.

The above test instruction can be translated as follows:

Test instruction:

1. Read the following text carefully and try to retain as much information from it as possible.
2. When you have finished reading the passage, turn the page over and do not refer to the text again.
3. On the blank paper provided, please write your identity and text structure type.
4. In Indonesian, write in complete sentences as much information as you can remember from the text you have read, so as to form a short discourse.

Following the characteristic of immediate written recall and the use of Meyer's system of text analysis, an emphasis for recall was placed on the students' writing in complete sentences (and not just points in note form) as much as they could remember of the text they had read. The recall tasks were written in Indonesian. The time allocated for the task of recalling the information in the text was forty minutes for the completion. The test instruction concerning the students' identity and the text seemed difficult for them to understand: of the 216 students, 12 did not write the faculty to which they belonged, 7 did not write their names and 11 participants did not write the text type with which they were confronted. It was concluded that the instructions needed to be revised; hence, a set of amended instructions was developed, as follows:

1. Sebelum membaca teks, pada kertas bergaris yang telah disediakan tuliskan:
 - Nama:
 - Fakultas:
 - Jenis Teks yang dibaca:
2. Bacalah teks dibawah ini dengan seksama sampai saudara benar-benar dapat menyerap informasi yang ada dalam teks tersebut.
3. Setelah selesai membaca, baliklah lembar teks ini, sehingga anda tidak dapat melihat teks pada lembar teks tersebut.
4. Dalam waktu kurang lebih dua puluh menit, dengan menggunakan bahasa Indonesia/Inggris, tulislah informasi apapun yang saudara ingat dari teks yang telah saudara baca dalam kalimat-kalimat yang lengkap, sehingga informasi yang saudara tulis akan membentuk sebuah wacana.
5. Setelah selesai mengerjakan test, tinggalkan pekerjaan diatas meja anda sendiri.

If it is translated into English, the revised instructions read as follows:

Test instruction

1. Before you read the text please write down on the blank paper provided your:

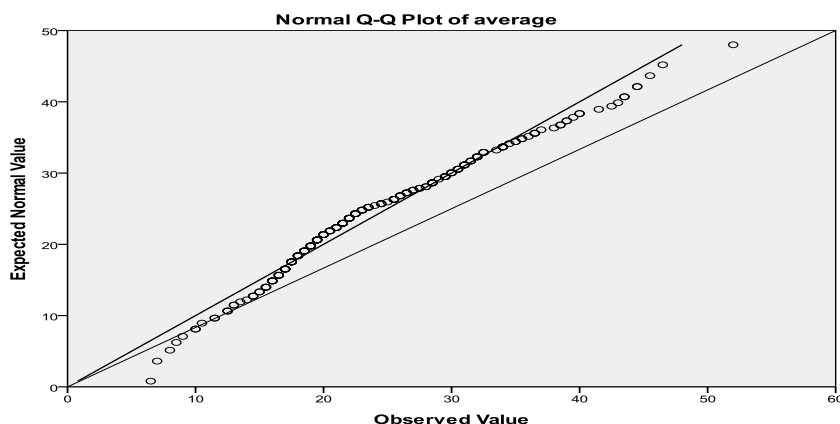
- Name:
 - Faculty:
 - Text being read:
2. Please read the following text carefully and try to retain as much information from it as possible in about 20 minutes. During reading you are not allowed to take notes.
 3. When you have finished reading the passage, please turn the page over and do not refer to it again.
 4. About 20 minutes from now, using Indonesian/English and in your own words, please write, in complete sentences, as much information as you can remember from the text you have just read.
 5. When you have finished doing the test, please leave your work on your desk.

3.4.3 Preliminary results of the pilot study data analyses

Three independent variables were involved in this pilot study: discipline-specific background, text structure and the rhetorically-oriented framework. Discipline-specific background comprised two levels of the factor: Economics and Agriculture. Text structure comprised three levels of the factor: problem-solution, causation and collection of description. The rhetorically-oriented framework consisted of three levels of the factor: with-L1, with-L2 and without a rhetorically-oriented framework. The dependent variable of reading comprehension was scored by obtaining the participants' responses to the research treatments applied which assessed their recall in English and in Indonesian.

The data of the pilot study were statistically analysed using a three-way ANOVA. Prior to the computation of the data using this three-way ANOVA, the assumption of normality and homogeneity of variances needs to be addressed. To satisfy the ANOVA assumption of normality of scores distribution for each experimental group, two tests of normality i.e., Shapiro-Wilks and Lilliefors Tests, were performed. The summarised result of the normality of scores distribution for each experimental group is shown in Figure 3.5 which displays a normal probability plot of the residuals after fitting a full factorial model to the data. The residuals form a roughly straight line indicating that the assumption of normality is not violated to any great extent.

Figure 3.5 Normality of scores distribution for each experimental group



To test the homogeneity of variance across the experimental groups' scores, the Levene's Test was applied. The result of the test can be seen in Table 3.8. The p values resulting from the application of the Levene's Test of Homogeneity of Variance are larger than the value of the predetermined $\alpha = .05$. This means that the assumption of the Levene's Test of Homogeneity of Variance is met as presented in Table 3.8. Since the assumption of the normality and homogeneity of variances were met, the use of a three-way ANOVA for hypotheses testing in the experiment was statistically appropriate and justifiable.

Table 3.8 Test of the homogeneity of variance across the experimental groups' scores

HOMOGENEITY TEST	DF	P
LEVENE	204	0.099

The results of a three way-ANOVA computation of the pilot study are contained in Table 3.9 and reveal that the parameters for p indicate the significant main effects for discipline-specific background, text structures or rhetorically-oriented framework on reading comprehension at $p < .05$. The

parameters under p , however, indicate no significant interaction effects for discipline-specific background by text structure on reading comprehension at $p > .582$; for discipline-specific background by rhetorically-oriented framework on reading comprehension at $p > .316$; for text structure by rhetorically-oriented framework on reading comprehension at $p > .124$; and neither for discipline-specific background by text structure by rhetorically-oriented framework on reading comprehension at $p > .946$.

Table 3.9 Three-way ANOVA

SOURCE OF VARIATION	SS	DF	MS	F	P
Dispec by Text by Frame	6.81	2	3.41	.06	.945
Dispec by Text	66.36	2	33.18	.54	.580
Dispec by Frame	61.76	1	61.76	1.01	.319
Text by Frame	89.38	2	44.69	2.16	.625
Dispec	1597.95	1	1597.95	26.10	.000
Text	938.43	2	469.22	7.66	.001
Frame	493.53	1	493.53	8.06	.005
R-Squared					.205
Adjusted R-Squared					.162

3.4.4 Sample size determination

The ability to discover the effects of an experimental treatment influences the appropriateness of a sample size (Hinkle, Wiersma & Jurs 1988). For this reason, the computation of power on the basis of the pilot study data performed in accordance with the effect size that could be estimated from each independent variable on the dependent variable, and thus to determine the appropriate sample size necessary to detect the specified effect size. A general guideline suggested by Borg and Gall (1989) was adopted suggesting that the minimum number of participants belonging to each cell of a factorial experimental design should be at least 15. The use of a sample size of 18 participants per experimental group in the pilot study was considered to be a

moderate but adequate selection. It was deemed probable that having 18 participants per experimental group participating in the experimental study could produce an accurate estimation of effect size and statistical power, or the performed F tests would be successful to reject the null hypotheses. Such a condition was closely related to the capacity to reject the null hypotheses that might be caused by (1) the accurate effect of the independent variable on the dependent variable, and (2) the experiment being sufficiently sensitive to detect the differences (Keppel 1973).

The power calculations for the main study were performed on the basis of the results of the pilot study data analysis. Both the data and the ANOVA analysis of pilot study are presented in Appendix 6, respectively in Appendix 6A and 6B.

The sample size was a function of the significance level, set at $\alpha = .05$, the standard deviation, set at $\hat{\sigma} = \sqrt{61.23} = 7.82$ from the data of the pilot study. The design of the experiment for this study is a $3 \times 3 \times 3 \times 2$ full factorial design. In each of the cells there are n observations. The question is how large n should be for high power. The answer depends on the difference that is required in order to be detected as statistically significant. The simplest situation is for a main effect with l levels defined:

$$\Delta = \text{Largest Mean} - \text{Smallest Mean}$$

Then under the null hypothesis that there is no difference between the means the F Statistic has $l-1$ and $54(n-1)$ degrees of freedom. Under the alternative hypothesis the non-centrality parameter (see Friendly 2011) is

$$\frac{27}{l} \left(\frac{\Delta}{7.82} \right)^2$$

For two factor interactions, considering the case when one factor has l_1 level and other factor has l_2 levels, under the null hypothesis the F statistic has $(l_1 - 1)(l_2 - 1)$ and $54(n-1)$ degrees of freedom and the non-centrality parameter is:

$$\frac{27n}{l_1 l_2} \left(\frac{\Delta}{7.82} \right)^2$$

In this case:

= most positive deviation from the additive model – most negative additive deviation from the model. It is important to note here that interactions have smaller power than main effects. No power calculation has been done for statistical tests that were to be undertaken for higher-order interactions. The reasons for this are two-fold: the main effects and two-factor interactions usually dominate and, in any case, the power to detect them will be very low (see Cohen 1977).

For the two factor interactions, it was felt that a value of $\Delta = 4$ for the most positive deviation from the additive model – the most negative deviation from the additive model, would be scientifically interesting and practically important. With a power of 0.8, this leads to a sample size of 16 participants per cell; however to be conservative, a sample size of 18 participants per cell was chosen.

Based on the discussion so far, the aims of the pilot study were deemed to have been successfully completed, and the results provided sufficient evidence for proceeding to conduct the research as a full experiment. The reading comprehension instrument was successfully validated before it is used; the time allocation of 40 minutes for the students to perform the task of reading and then recalling the information from the text was appropriate and could be performed within 40 minutes. The reading comprehension test instructions were tried out and some valuable revisions had been made. Finally, the pilot study data analysis was able to provide sufficient information to address the determination of the sample size most appropriate to the research.

3.5 Research procedure

The participants of main experimental study, as described earlier, were university students of economics, agriculture, and sciences, who had completed the subject of English for Academic Purposes (EAP) and of Basic Cultural Sciences (BCS). The accessible population consisted of the students in courses operating in the second, fourth, sixth and eighth semester of a four-year undergraduate degree program. The study involved fifty four experimental groups, in which the first eighteen groups comprised students of economics, the second 18 groups comprised students of agriculture, and the remaining 18 groups comprised students of pure science. The research procedures followed to identify the population and allocate students to the treatment groups are outlined below.

1. **Identifying the accessible population.** In this stage, the researcher made contact with the administration staff of the target university in order to get information about the possible number of classes available for observation. From this preliminary information, the researcher decided to access 14 classes from each faculty to elicit further information about students' completion of the subjects of EAP and BCS, as 14 classes was expected to generate the number of participants required for the research (324 participants). The 14 classes in each faculty were chosen based on the consideration that the students attending the class had for the most part completed both EAP and BCS subjects.
2. **Getting information from students.** The researcher asked the lecturers of the observable classes for their assistance to distribute inquiry forms for students to complete in Indonesian (see Appendix 1I for the Indonesian version and Appendix 1J for the English version). The form asked for identifying information regarding individual students (name, faculty, year level and confirmation of their completion of the subjects of EAP and BCS). The researcher suggested to the lecturer that students fill in the form before the main class activity began, as it took no longer than 3 minutes for each student to complete. Students then handed in

completed forms to their lecturer. The forms were collected by the researcher from the lecturers before the class was dismissed. From these inquiry forms, it was found that 402 economic students had completed the subjects of EAP and BCS, 383 for agriculture students and 364 for pure sciences students.

3. **Randomly transferring the names on collected inquiry forms into a list of participants.** The forms from each were collected from the students via their lecturers and a list of names was randomly generated on a disciplinary basis whereby each name was assigned a number (from 1 to 402, for example for the economics students).
4. **Grouping participants based on the list of participants to form the sampling frames.** The procedure of grouping was accomplished by simply dividing the number on the list by 18. For example, the first 18 participants belonged to Group 1, the second 18 was Group 2 and so on, until Group 18 had been reached. Eighteen groups from each of the sampling frames (disciplines) meant that the total number of participants required was only 324. The rest of the students were supposed to be an anticipating number if some participants under the sampling frames could not take part for some reasons when the recall task (reading comprehension test) was administered.
5. **Exposing treatments to the groups across sampling frames.** Once the groups had been allocated across the sampling frames, the next step was to expose each of the participants to the treatment. Since the number of each group within the sampling frame was 18 participants (participants 1 to 18) and the treatment numbered 18 texts (text A – text R), the groups' exposure to the groups were performed by simply directly matching the participant's numbers with the text letters respectively. For instance, Participant number 1 within group 1 received text A, participant number 2 within group 1 received Text B, and so on until participant 18 received the text R) (see Table 3.10).

Table 3.10 Exposed treatments of readers across sampling frame

ECONOMICS			AGRICULTURE			PURE SCIENCE		
(1A-18R) 1	(1A-18R) 2	(1A-18R) 3	(1A-18R) 1	(1A-18R) 2	(1A-18R) 3	(1A-18R) 1	(1A-18R) 2	(1A-18R) 3
(1A-18R) 4	(1A-18R) 5	(1A-18R) 6	(1A-18R) 4	(1A-18R) 5	(1A-18R) 6	(1A-18R) 4	(1A-18R) 5	(1A-18R) 6
(1A-18R) 7	(1A-18R) 8	(1A-18R) 9	(1A-18R) 7	(1A-18R) 8	(1A-18R) 9	(1A-18R) 7	(1A-18R) 8	(1A-18R) 9
(1A-18R) 10	(1A-18R) 11	(1A-18R) 12	(1A-18R) 10	(1A-18R) 11	(1A-18R) 12	(1A-18R) 10	(1A-18R) 11	(1A-18R) 12
(1A-18R) 13	(1A-18R) 14	(1A-18R) 15	(1A-18R) 13	(1A-18R) 14	(1A-18R) 15	(1A-18R) 13	(1A-18R) 14	(1A-18R) 15
(1A-18R) 16	(1A-18R) 17	(1A-18R) 18	(1A-18R) 16	(1A-18R) 17	(1A-18R) 18	(1A-18R) 16	(1A-18R) 17	(1A-18R) 18

Where:

1 - 18 = groups

1A-18R = the number of participants withing each group with different treatments

6. **Naming the treatment based on the number it belonged to prior to administering the recall task.** The participants' names for each experimental group were written down in order to ease the administration of the experiment. The test was distributed by the lecturer by calling the participant's name as listed on the test paper.

7. **Administering recall tasks.** The recall tasks were conducted during regular class hours by lecturers familiar with the participants. Since the test was administered during the regular class hour, there might be a number of students who did not belong to the sample of the experiment were also present in the class. Those students were allowed to stay or leave the class during the test administration as they desired. Before conducting the test, the lecturers informed the participants of the administrative procedures but not the nature of the study. In addition, the lecturers were not allowed to provide help to the participants. Guided by the planned exposed treatments across sampling frames (Table 3.10), each participant was given a reading comprehension test and a sheet of writing paper, and was asked to:

- read the reading comprehension test instructions;

- write in complete sentences as much as they could remember from the text they had read without looking back to the text in the blank paper provided;
 - perform the recall task either in Indonesian or in English, depending on the test instruction given in the reading test.
8. **Assigning the experimental groups into comparison groups.** In order to have equal number, the accessible population was represented by 54 experimental groups, each of which totalled 18 participants. Each of the 18 experimental groups belonging to the Economics subpopulation was then randomly assigned to perform each of the 18 research treatments. The same procedures were also applied to experimental groups belonging to the Agriculture and pure sciences subpopulation. The group comparison across the sample is represented in Table 3.11.
9. The participants' recall protocols were then scored and analysed in order to determine the effects of the factor under investigation on the participants' reading comprehension.

Table 3.11 Groups comparison across the sample

ECONOMICS						AGRICULTURE						PURE SCIENCE					
A 1	B 2	C 3	D 4	E 5	F 6	A 1	B 2	C 3	D 4	E 5	F 6	A 1	B 2	C 3	D 4	E 5	F 6
G 7	H 8	I 9	J 10	K 11	L 12	G 7	H 8	I 9	J 10	K 11	L 12	G 7	H 8	I 9	J 10	K 11	L 12
M 13	N 14	O 15	P 16	Q 17	R 18	M 13	N 14	O 15	P 16	Q 17	R 18	M 13	N 14	O 15	P 16	Q 17	R 18

Where:

A-R = Experimental Treatment

1-18 = Experimental groups

3.6 Data analysis

The research data constituted the amount of idea units recalled by the participants of the study and were statistically analysed using a four-way Logistic Regression and ANOVA on a transformed response. The

interpretation of the interaction effects in the present study follows the general rule highlighted by May, Mason and Hunter (1990, p. 401) in relation to factorial designs:

As a general rule it is wise to begin the interpretation of the results from a two-factor design by starting with the interaction, it is significant, because the nature of the interaction will qualify the interpretation of the main effects. Frequently, detailed examination of the interaction leaves little to say about the main effects of the variables involved in that interaction. When an interaction is not significant, the meaning of the significant main effects may be interpreted directly.

Based on this general guideline the interpretation of the interaction results in this four-way factor design has been undertaken following these four principles:

1. If the four-way interaction is significant, the nature of the four-way interaction will qualify the interpretation of the three-way interaction effects, two-way interaction effects, and the main effects.
2. If the four-way interaction is not significant, but the three-way interaction is significant, the nature of the three-way interaction will qualify the interpretation of the two-way interaction effects and the main effects.
3. If the three-way interaction is not significant, but the two-way interaction is significant, the nature of the two-way interaction will qualify the interpretation of the main effects.
4. If all interaction effects are not significant, the meaning of the significant main effects may be interpreted directly.

It was necessary to follow up each of the factors with significant individual effects using one-way Logistic Regression and ANOVA, and by using MS error of the original Logistic Regression and ANOVA (see among others, Welkowitz, Ewen & Cohen 1982; Kiess 1989). The statistical analyses applied in this study were performed with SPSS version 19.

The hypotheses of this study were statistically tested using a four-way

ANOVA and prior to the use of ANOVA test, some formal requirements or assumptions required addressing. The assumptions were as follows:

1. the individual observations were independent;
2. the distribution of observations on the dependent variable was normal within each group;
3. the variances of observations on the dependent variable were equal across groups.

The Shapiro-Wilks and Kolmogorov-Smirnov Tests were employed to ensure that the assumption of normality of distributions of observations in each experimental group was met, and Levene's Test was employed in order to evaluate the assumption that all experimental groups came from populations with equal variances. The four-way ANOVA employed in this study was a 3 (levels of discipline-specific background factor) x 3 (levels of text structure factor) x 3 (levels of rhetorically-oriented framework factor) x 2 (levels of recall factor) ANOVA. The hypotheses of this study could be classified as uni-directional or 2-tailed (Haber & Runyon 1973) because they only asserted that the population parameters were different or not different from those hypothesised.

The results of the test of statistics employed in this study were concluded on the basis of p (probability) value with $\alpha = .05$ significant level. In relation to the predetermined value of $\alpha = .05$, by definition, the p value was the actual level of significance based on the sample value of the test statistic: the smallest α such that the observed sample results in rejecting the null hypothesis (Byrkit 1987). Thus, the p value was the actual or observed probability calculated from the sample statistic value, while the value of α was a predetermined theoretical probability used as the criterion to test the value of p . To accept or reject the null hypothesis, the value of p was then compared to that of the predetermined value $\alpha = .05$. The null hypothesis was accepted when the value of p was $\geq .05$; however, when the value of $p < .05$, the null hypothesis was rejected.

The computation of the statistical power was made twice: before and

after the experiment was performed. The first computation was aimed at computing the power in accordance with the estimated effect size of each independent variable on the dependent variable, and thus to determine the appropriate sample size to be used to detect the specified effect size. The second computation of the statistical power was also important, because, according to Tversky and Kahnman (in Brewer 1972, pp. 391):

1. Such computations can lead the researcher to the conclusion that there is no point in running the study unless the sample size is materially increased;
2. The computation is essential to the interpretation of negative results, that is, failures to reject the null hypothesis; and
3. Computed power gives the researcher an indication of the level of the probability of a valid rejection of the null hypothesis.

The first computation of the statistical power was based on the pilot study conducted under relatively standard conditions, with participants drawn from roughly the same population. There were 18 participants in each of 12 experimental groups. Thus, it was probable that such a sample size would produce an accurate estimation of effect size and statistical power. The use of data provided by previous experiment was justifiable because such data could help improve the program of the estimation of the error variance and therefore assist in making the power calculation and thus the effect size more accurate (Keppel 1973, Hinkle, Wiersma & Jurs 1988).

In relation to ANOVA design, several indices are recommended as measures of the magnitude of the separate as well as joint effects of the independent variables on the dependent variable. Such indices are the correlation ratio of a population treatment variance to an estimate of the population total variance, and they reflected the proportional amount of the variability accounted for by the experimental treatment (Guilford & Fruchter 1978; Keppel 1973). Thus, the stronger the experimental effect the larger the magnitude of the treatment. Performing such a measure of treatment effect magnitude is important, because with a large enough sample, even a trivial

difference may prove statistically significant (Guilford & Fruchter 1978). Furthermore, they also emphasise that even where the outcome of an experiment is statistically significant, if the proportion of variance accounted for by the treatments is small, it may not be sensible to deal with the matter further (Guilford & Fruchter 1978).

Two treatment effect magnitude indices are commonly used: ETA square (η^2) and Omega Square (ω^2). Of the two, many authors prefer omega square (Guilford & Fruchter 1978; Hinkle, Wiersma & Jurs 1988; Keppel 1973; May, Masson & Hunter 1990; Myers & Well 1991; Wampold & Drew 1990) and are in favour of its use as a measure of magnitude of the experimental effect in an ANOVA design. In consideration of this preference, the index used to measure the magnitude of the experimental effect in the present study was ω^2 , and any negative value of ω^2 was set equal to zero (Guilford & Fruchter 1978). The formula for omega square is given in Chapter 4. An analogue of omega square was used for Logistic Regression.

As previously mentioned, the statistical analyses applied in this study were performed with SPSS version 19. By default, the p value computed by this statistical package is in the form of 2-tailed (bidirectional) hypothesis testing. The design used for data analyses is presented in Table 3.12.

Two key issues drove the pilot study: the first concerned the necessity to undertake a trial of the instrument to be used in the main study; the second was pertinent to the establishment of the sample size. The pilot study proved to be successful in evaluating the instrument: the instrument to measure reading comprehension was established and applied; it was validated by the collection and analysis of trial experimental data, and was shown to be reliable. As a consequence, the instrument was deemed to be appropriate for this study. Secondly, using the results of power analysis was extended from 16 to 18 in order to more conservatively address the issue; hence the total sample size was 18 x 54 for a total of 972 participants in the study. In the next chapter, the data are analysed using Logistic Regression and ANOVA

and the hypotheses are tested for interaction effects, main effects, and different effects among levels of each factor.

Table 3.12 Factorial design used for data analysis

DISCIPLINE-SPECIFIC BACKGROUND: ECONOMICS				
RHETORICALLY -ORIENTED FRAMEWORK	RECALL	TEXT STRUCTURE		
		PROBLEM-SOLUTION	CAUSATION	COLLECTION OF DESCRIPTION
WITHOUT	ENGLISH	1	3	5
	INDONESIAN	2	4	6
WITH-L2	ENGLISH	7	9	11
	INDONESIAN	8	10	12
WITH-L1	ENGLISH	13	15	17
	INDONESIAN	14	16	18
DISCIPLINE-SPECIFIC BACKGROUND: AGRICULTURE				
RHETORICALLY -ORIENTED FRAMEWORK	RECALL	TEXT STRUCTURE		
		PROBLEM-SOLUTION	CAUSATION	COMPARATIVE
WITHOUT	ENGLISH	19	21	23
	INDONESIAN	20	22	24
WITH-L2	ENGLISH	25	27	29
	INDONESIAN	26	28	30
WITH-L1	ENGLISH	31	33	35
	INDONESIAN	32	34	36
DISCIPLINE-SPECIFIC BACKGROUND: PURE SCIENCES				
RHETORICALLY -ORIENTED FRAMEWORK	RECALL	TEXT STRUCTURE		
		PROBLEM-SOLUTION	CAUSATION	COMPARATIVE
WITHOUT	ENGLISH	37	39	41
	INDONESIAN	38	40	42
WITH-L2	ENGLISH	43	45	47
	INDONESIAN	44	46	48
WITH-L1	ENGLISH	49	51	53
	INDONESIAN	50	52	54

NOTE:

1-54 = EXPERIMENTAL GROUPS

CHAPTER 4

Results of data analysis

This chapter presents the results of the statistical analyses undertaken to examine the hypotheses of this study. Two comparative statistical test models are employed to analyse the data of the experiment: Logistic Regression (an example of a Generalised Linear Model) and Analysis of Variance (ANOVA).

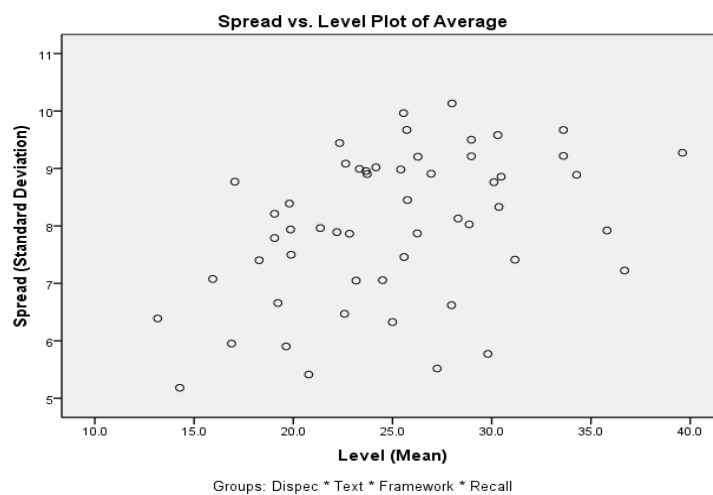
4.1 Methods used for data analysis

After considering the research design and the nature of the dependent variable of the present study, two options for data analysis were deemed most appropriate for utilisation. The first model being a Generalised Linear Model (see Appendix 7B), specifically Logistic Regression, and the second, Analysis of Variance (ANOVA) (see Appendix 7C). Both of these models are available in the SPSS analysis software package. In comparison to ANOVA, Logistic Regression is less rigid, for it does not require the assumption of normality that is required by ANOVA. Logical Regression allows the original data to be directly analysed without imposing strictly preliminary assumptions for its utilisation for data analysis. ANOVA, on the other hand requires that some parametric assumptions be met in order to gain meaningful ANOVA results.

The data of the experiment show a lack of homogeneity due to the link between the variability of the groups and the mean of the groups, i.e.,

heterogeneity. The relationship between the mean results of each of the experimental groups versus the standard deviation of each of the results of the original experimental data is presented in Figure 4.1. It is clear from the plot shown in the figure that the variability increases as the mean increases.

Figure 4.1 **The relationship between the mean results and standard deviation**



For Logistic Regression, this range in variabilities – heteroscedasticity – is taken into account; however, the lack of homogeneity is a problem which hampers the use of ANOVA for data analysis, unless the data are transformed to meet the ANOVA assumptions. The problem with heterogeneous data can be solved by transforming the dependent variable using a Box-Cox Transformation (Box, Hunter & Hunter 1978; Osborne 2010) to make the data approximately homogeneous and so comply with the ANOVA assumptions.

In the Box-Cox Transformation method, various power transformations

$$= \frac{1}{\lambda}$$

were applied and the best value of λ was determined. The best model was found to be $\lambda = -0.5$, indicating a square root transformation would be appropriate for this

data. An alternative, sometimes used for proportion data (see Box, Hunter & Hunter, 2005, p. 322), is the arcsin transformation $\sqrt{\frac{y}{n}}$ where n is the number of observations. The correlation between the square root and the arcsin transformation for the current data, however, is 0.998 and so the simpler square root transformation was used.

In this study, both ANOVA and the Logistic Regression were used for the data analysis. Data analysis using Logistic Regression was based on the original data, whereas, data analysis using ANOVA was based on the square root transformed data. Both the original and the square root transformed data of the experiment are presented in Appendix 7A; the means of the research data are presented in Table 4.1.

4.1.1 Data analysis using Logistic Regression

The Logistic Regression Model is a member of the set of Generalised Linear Models (McCullagh & Neelder 1989) and was used as a comparative method of data analysis in this study. The formula of the model is as follows.

$$E(y) = \mu$$

Where:

E = Expectation, Y = Reading variable, in this case reading comprehension score.

μ = Mean value of y .

The linear predictor depends on the discipline-specific background (dispec), etc (texts), etc (framework) and etc (recall). Also the model, $V(y) = \mu(65-\mu)$ where μ is an over-dispersion, that is $\mu \geq 1$, is common with such data. The source of the variation could be, for example, differences between students and differences between idea units – some being more difficult to recall than others i.e., the probability is not a constant.

Table 4.1 Means of the research data

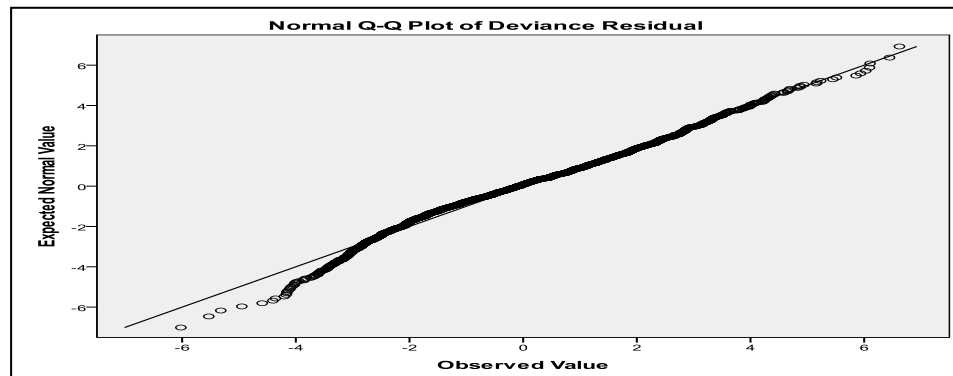
DISPEC	TEXT	FRAME	ORIGINAL DATA		COLUMN TOTAL	SQRT TRANSFORMED DATA		COLUMN TOTAL
			Recall			Recall		
			L2	L2		L1	L2	
ECO	PROSOL	WITHOUT	23.33	33.61	28.47	4.75	5.73	5.24
		WITH-L2	25.58	36.69	31.14	5.00	6.03	5.53
		WITH-L1	28.86	39.61	34.24	5.32	6.25	5.79
	CAU	WITHOUT	22.19	30.36	26.28	4.64	5.46	5.05
		WITH-L2	23.17	34.28	28.73	4.76	5.81	5.29
		WITH-L1	25.56	35.81	30.69	4.97	5.94	5.46
	COLDES	WITHOUT	19.06	28.00	23.53	4.26	5.21	4.74
		WITH-L2	19.64	30.11	24.88	4.38	5.43	4.91
		WITH-L1	21.36	30.47	25.92	4.54	5.46	5.00
Group total			25.33	32.24	28.21	4.74	5.70	5.22
AGRI	PROSOL	WITHOUT	22.33	28.97	25.65	4.63	5.31	4.97
		WITH-L2	22.83	31.17	27.00	4.71	5.54	5.13
		WITH-L1	25.42	33.61	29.52	4.96	5.75	5.36
	CAU	WITHOUT	19.81	26.25	23.03	4.36	5.07	4.72
		WITH-L2	19.89	28.97	24.42	4.38	5.32	4.85
		WITH-L1	22.64	30.31	26.48	4.67	5.43	5.05
	COLDES	WITHOUT	14.28	24.50	19.39	3.72	4.90	4.31
		WITH-L2	16.89	25.75	21.31	4.06	5.00	4.53
		WITH-L1	19.86	27.97	23.91	4.37	5.25	4.81
Group total			20.44	28.61	24.52	4.43	5.29	4.86
ps	PROSOL	WITHOUT	19.22	26.94	23.08	4.32	5.12	4.72
		WITH-L2	20.78	28.31	24.55	4.52	5.27	4.90
		WITH-L1	24.17	29.81	26.99	4.83	5.43	5.13
	CAU	WITHOUT	18.28	25.00	21.64	4.19	4.96	4.58
		WITH-L2	19.06	27.25	23.16	4.28	5.19	4.74
		WITH-L1	22.58	26.28	24.43	4.70	5.05	4.88
	COLDES	WITHOUT	13.17	23.67	18.42	3.54	4.80	4.17
		WITH-L2	15.94	23.72	19.83	3.90	4.80	4.35
		WITH-L1	17.06	25.72	21.39	4.01	5.00	4.51
Group total			18.92	26.30	22.61	4.25	5.07	4.66
Raw total			21.56	26.05	25.11	4.47	5.35	4.91

Note:

ECO = economics, AGRI = agriculture, PS = pure sciences, PROSOL = problem-solution, CAU = causation, COLDES = collection of description

The overall experimental group distribution of observations on the dependent variable of the original data can be seen in the chart shown in Figure 4.2.

Figure 4.2 Normality of the original data



The model is fitted by the iteratively reweighted least square, using SPSS version 19. The tests of model effect, given in Table 4.2, show that while the main effects were significant ($p < .05$), no interaction effects were significant ($p > 0.05$). Details for interaction effects, main effects and different effects among levels, will be presented in their respective sections dealing with hypotheses testing below.

Table 4.2 Tests of model effects using Logistic Regression

SOURCE	WALD CHI-SQUARE	DF	SIG
(Intercept)	1500.186	1	.000
Dispec	155.636	2	.000
Text	167.931	2	.000
Framework	71.737	2	.000
Recall	526.931	1	.000
Dispec*Text	1.127	4	.890
Dispec*Framework	.556	4	.968
Dispec*recall	4.587	2	.101
Text*Framework	.937	4	.919
Text*Recall	4.905	2	.086
Framework*Recall	2.346	2	.309
Dispec*Text Framework	3.026	8	.933
Dispec*Text*Recall	3.896	4	.421
Dispec*Framework*Recall	2.811	4	.590
Text*Framework*Recall	2.765	4	.598
Dispec*Text*Framework*Recall	2.214	8	.976
Rater	.630	1	.427

The effect size magnitude using Logistic Regression is presented in Table 4.3.

Table 4.3 Effect size magnitude using Logistic Regression

Source of Variation	Relevant data for computation from Logistic Regression			Effect Size Magnitude
	Wald chi squared	df	Scale Pearson ChiSq	
D by T by F by R	2.214	8	1857.854	-.003
T by F by R	2.765	4		-.001
D by F by R	2.811	4		-.001
D by T by R	3.893	4		.000
D by T by F	3.026	8		-.003
F by R	2.346	2		.000
T by R	4.905	2		.002
T by F	0.937	4		-.002
D by R	4.587	2		.001
D by F	.556	4		-.002
D by T	1.127	4		-.002
D	155.636	2		.083
T	167.931	2		.089
F	71.737	2		.037
R	526.931	1		.283

* for Logistic Regression is based on the usual formula but with =Scaled Wald Chi-Square, =Scaled Pearson Chi-Square, and =1.

4.1.2 Data analysis using ANOVA

To meet the needs of ANOVA, as discussed above, two tests were used to satisfy the assumption of the normality of scores distribution for each experimental group: the Shapiro-Wilks and Kolmogorov-Smirnov Tests. The results are presented in Table 4.4, and show that the p values resulting from the application of the two tests exceed $\alpha = .05$ in almost all cases. Thus, the scores distribution of each experimental group were not different from a normal distribution. The two tests produced a similar result.

Table 4.4 Test of normality following square root transformation

EXPERIMENTAL GROUP	DF	KOLMOGOROV-SMIRNOV		SHAPIRO-WILKS	
		STATISTIC	p	STATISTIC	p
EC – G – 01	18	.115	.200 [*]	.963	.659
EC – G – 02	18	.229	.013	.892	.042
EC – G – 03	18	.150	.200 [*]	.924	.150
EC – G – 04	18	.156	.200 [*]	.932	.210
EC – G – 05	18	.193	.075	.935	.235
EC – G – 06	18	.108	.200 [*]	.948	.389
EC – G – 07	18	.080	.200 [*]	.984	.981
EC – G – 08	18	.125	.200 [*]	.961	.614
EC – G – 09	18	.153	.200 [*]	.934	.230
EC – G – 10	18	.139	.200 [*]	.944	.336
EC – G – 11	18	.129	.200 [*]	.947	.374
EC – G – 12	18	.206	.042	.879	.025
EC – G – 13	18	.096	.200 [*]	.965	.699
EC – G – 14	18	.180	.129	.951	.437
EC – G – 15	18	.143	.200 [*]	.956	.519
EC – G – 16	18	.119	.200 [*]	.967	.742
EC – G – 17	18	.150	.200 [*]	.937	.261
EC – G – 18	18	.136	.200 [*]	.926	.167
AG – G – 19	18	.139	.200 [*]	.952	.461
AG – G – 20	18	.120	.200 [*]	.961	.625
AG – G – 21	18	.177	.143	.941	.305
AG – G – 22	18	.182	.119	.917	.115
AG – G – 23	18	.136	.200 [*]	.920	.129
AG – G – 24	18	.176	.146	.943	.330
AG – G – 25	18	.124	.200 [*]	.949	.410
AG – G – 26	18	.149	.200 [*]	.937	.255
AG – G – 27	18	.124	.200 [*]	.974	.868
AG – G – 28	18	.133	.200 [*]	.931	.204
AG – G – 29	18	.126	.200 [*]	.922	.138
AG – G – 30	18	.169	.187	.915	.103
AG – G – 31	18	.144	.200 [*]	.925	.160
AG – G – 32	18	.134	.200 [*]	.926	.168
AG – G – 33	18	.114	.200 [*]	.934	.225
AG – G – 34	18	.132	.200 [*]	.926	.166
AG – G – 35	18	.094	.200 [*]	.974	.864
AG – G – 36	18	.170	.180	.888	.036
PS – G – 37	18	.134	.200 [*]	.937	.253
PS – G – 38	18	.122	.200 [*]	.940	.288
PS – G – 39	18	.107	.200 [*]	.965	.706
PS – G – 40	18	.152	.200 [*]	.938	.271
PS – G – 41	18	.151	.200 [*]	.939	.275
PS – G – 42	18	.165	.200 [*]	.952	.456
PS – G – 43	18	.142	.200 [*]	.905	.070
PS – G – 44	18	.135	.200 [*]	.941	.304
PS – G – 45	18	.155	.200 [*]	.941	.302
PS – G – 46	18	.148	.200 [*]	.938	.263

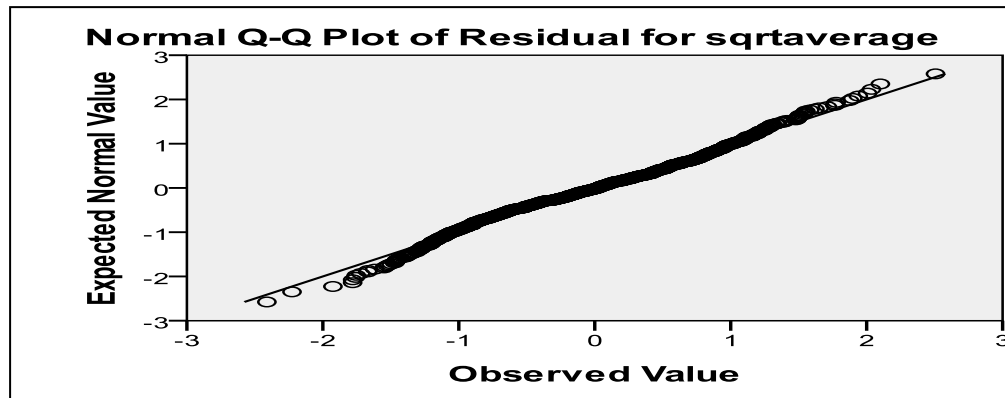
EXPERIMENTAL GROUP	DF	KOLMOGOROV-SMIRNOV		SHAPIRO-WILKS	
		STATISTIC	p	STATISTIC	p
PS – G – 47	18	.157	.200 [*]	.923	.144
PS – G – 48	18	.132	.200 [*]	.957	.548
PS – G – 49	18	.139	.200 [*]	.905	.071
PS – G – 50	18	.118	.200 [*]	.960	.602
PS – G – 51	18	.130	.200 [*]	.934	.230
PS – G – 52	18	.112	.200 [*]	.957	.538
PS – G – 53	18	.121	.200 [*]	.920	.129
PS – G – 54	18	.148	.200 [*]	.919	.124

Where:

EC = economics, AG = agriculture, PS = pure sciences

The distribution for the overall experimental group distribution of observations on the dependent variable of the square root transformed data can be seen in Figure 4.3, the chart of a normal Q-Q Plot (a standard test of normality) of the square root average (sqrtaverage).

Figure 4.3 Normal plot of residual



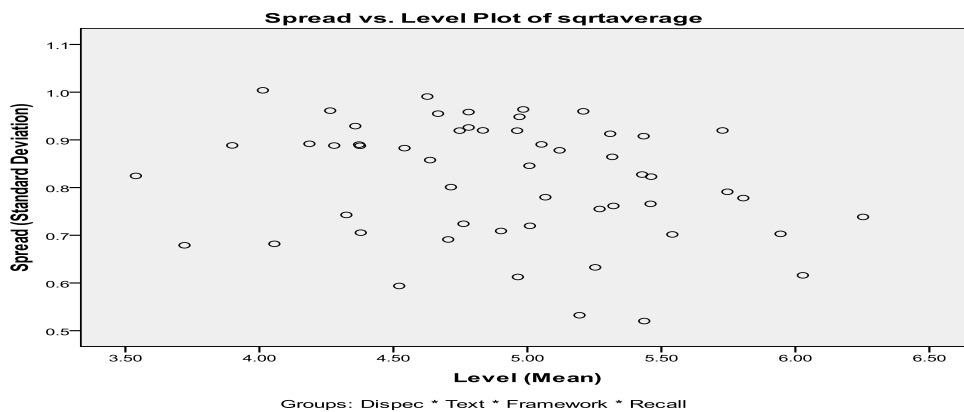
To test the homogeneity of variance across the experimental groups' scores of the square root data transformation, Levene's Test was used. The results of the test are presented in Table 4.5. The p value resulting from the application of Levene's Test indicated that the homogeneity of variance ($p=.282$) is larger than the value of the predetermined $\alpha = .05$ and so the assumption of homogeneity of variance is met.

Table 4.5 Univariate homogeneity of variance tests

VARIABLE	AVERAGE	p
Levene	918	.282

To show the improvement of the spread of variance across the experimental groups' scores between the original and the square root transformed data, the chart of homogeneity based on the square root transformed data is provided in Figure 4.4. It shows the relationship between the mean results of the experimental groups, and the standard deviation of the result of the experimental groups of the square root data transformation. Comparing Figure 4.4 to Figure 4.1, it is clear that with square root transformation, the relationship between the mean and standard deviation has been removed.

Figure 4.4 The relationship between the mean results and the standard deviation of the sqrt transformed data



Since the assumptions of normality and homogeneity of variances were met, the use of four-way ANOVA to analyse the experimental data was appropriate and justifiable. The results of this computation are presented in Table 4.6. The value of adjusted R-squared was accounted for by the following factors: discipline-specific background, text structure, rhetorically-oriented framework and recall. The adjusted R-squared value in this case,

approximately 31%, is the total sum of the effect size magnitude of the significant effects of the ANOVA.

Table 4.6 Four-way ANOVA and power analysis

SOURCE OF VARIATION	SS	DF	MS	F	SIG OF F	PAR. ETA SQ.	NONCENT. PARAMETER	OBSERVED POWER
Corrected Model	333.313	53	6.289	9.279	.000	.349	491.8000	1.000
Intercept	23454.021	1	23454.020	34606.155	.000	.974	34606.155	1.000
D	52.118	2	26.059	38.450	.000	.077	76.900	1.000
T	60.288	2	30.144	44.478	.000	.088	88.955	1.000
F	24.557	2	12.279	18.117	.000	.038	36.234	1.000
R	187.142	1	187.142	279.127	.000	.231	276.127	1.000
D by T	.338	4	.085	.125	.974	.001	.499	.076
D by F	.231	4	.058	.085	.987	.000	.341	.067
D by R	1.032	2	.516	.761	.467	.002	1.523	.180
T by F	.327	4	.082	.121	.975	.001	.483	.075
T by R	1.904	2	.952	1.405	.246	.003	2.810	.302
F by R	.801	2	.400	.591	.554	.001	1.181	.149
D by T by F	.806	8	.101	.149	.997	.001	1.189	.094
D by T by R	1.024	4	.256	.378	.825	.002	1.511	.138
D by F by R	.804	4	.201	.297	.880	.001	1.186	.117
T by F by R	.967	4	.242	.357	.839	.002	1.427	.132
D by T by F by R	.972	8	.122	.179	.994	.002	1.435	.105
Error	622.166	918	.678					
Total	24409.500	972						
Corrected Total	955.480	971						
R-SQUARED = .349								
ADJUSTED R-SQUARED = .311								

Where:

D = Discipline-specific background,
T = Text Structure,
F = Rhetorically-Oriented Framework,
R = Recall

To measure the magnitude of the separate as well as of the joint effects of the independent variables on the dependent variable in the ANOVA design, an Omega Squared computation was used as discussed in detail in section 3.6 (Myer & Well, 1991; May, Masson & Hunter 1990). Since the Omega Squared was not available in the SPSS Version 19 statistical package, the computation was done manually using the formula shown below:

--

(Source: Grace-Martin 2008-2011)

The Omega Squared analysis used the relevant data provided in the ANOVA analysis presented in Table 4.7. The relevant data for the Omega Squared analysis, as well as the results of the analysis, are presented in Table 4.8. Details for the main effects and the interaction effects using both the Logistic Regression and the ANOVA test models, are presented in the following sections of this chapter.

Table 4.7 Effect size magnitude using omega squared

BASED ON THE SQRT TRANSFORMED DATA					
SOURCE OF VARIATION	RELEVANT DATA FOR COMPUTATION FROM ANOVA				EFFECT SIZE MAGNITUDE (ω^2)
D by T by F by R	.972	2	.678	955.678	.004
T by F by R	.967	2	.678	955.678	.001
D by F by R	.804	2	.678	955.678	.001
D by T by R	.024	1	.678	955.678	.001
D by T by F	.806	4	.678	955.678	.004
F by R	.801	4	.678	955.678	.000
T by R	.904	2	.678	955.678	.000
T by F	.327	4	.678	955.678	.002
D by R	.032	2	.678	955.678	.000
D by F	.231	2	.678	955.678	.002
D by T	.338	8	.678	955.678	.002
D	52.118	4	.678	955.678	.053
T	60.288	4	.678	955.678	.061
F	24.557	4	.678	955.678	.024
R	187.142	2	.678	955.678	.195

4.2 Testing hypothesis 1

All three hypotheses in the study were tested based on the results of both Logistic Regression and ANOVA using the transformed responses. The followings are the results of the hypotheses testing.

The first hypothesis is as follows:

There are no significant interaction effects of discipline-specific background, text structure, rhetorically-oriented framework and recall on reading comprehension of expository texts.

Hypothesis 1 was tested using the following null hypotheses:

- Ho 1.1 There is no significant interaction effect of discipline-specific background, text structure, rhetorically-oriented framework and recall on reading comprehension of expository texts.
- Ho 1.2 There is no significant interaction effect of discipline-specific background, text structure and rhetorically-oriented framework on reading comprehension of expository texts.
- Ho 1.3 There is no significant interaction effect of discipline-specific background, text structure and recall on reading comprehension of expository texts.
- Ho 1.4 There is no significant interaction effect of discipline-specific background, rhetorically-oriented framework and recall on reading comprehension of expository texts.
- Ho 1.5 There is no significant interaction effect of text structure, rhetorically-oriented framework and recall on reading comprehension of expository texts.
- Ho 1.6 There is no significant interaction effect of discipline-specific background and text structure on reading comprehension of expository texts.
- Ho 1.7 There is no significant interaction effect of discipline-specific background and rhetorically-oriented framework on reading comprehension of expository texts.

- Ho 1.8 There is no significant interaction effect of discipline-specific background and recall on reading comprehension of expository texts.
- Ho 1.9 There is no significant interaction effect of text structure and rhetorically-oriented framework on reading comprehension of expository texts.
- Ho 1.10 There is no significant interaction effect of text structure and recall on reading comprehension of expository texts.
- Ho 1.11 There is no significant interaction effect of rhetorically-oriented framework and recall on reading comprehension of expository texts.

4.2.1 Testing of hypothesis 1.1

The null hypothesis 1.1 states: ‘There is no significant interaction effect of discipline-specific background, text structure, prefatory framework, and recall on reading comprehension of expository texts’. This null hypothesis was tested, using the values of cell mean, column total mean, and row total mean, for any possible combination of the levels of the factors of discipline-specific background, text structure, rhetorically-oriented framework and recall, as presented in Table 4.1.

Using both the Logistic Regression computation (Table 4.2) and ANOVA computation (4.6), it was found that a four-way interaction effect of discipline-specific background, text structure, rhetorically-oriented framework and recall on reading comprehension, was not significant. The parameters yielded by using Logistic Regression were Wald Chi-Square = 2.214, $df = 8$, $p = .974$, $\omega^2 = -.003$, and by using the ANOVA computation were: $F = .179$, $p = .994$, $\alpha = .05$, $\omega^2 = .004$. The parameters of both test models showed that the value of p is greater than $\alpha = .05$, and this means that the interaction effect of discipline-specific background, text structure, rhetorically-oriented framework and recall, was not significant. Additionally, both test models showed the effect size magnitude of $-.003$ for Logistic Regression and $.004$ for ANOVA. These values indicated that approximately

0% (Logistic Regression) and 0% (ANOVA) of the variability in reading comprehension was accounted for by discipline-specific background, text structure, rhetorically-oriented framework, and recall as shown in Table 4.3 and 4.7. In such a situation, the effect size magnitude of the four-way interaction is negligible.

Table 4.8 Reading comprehension as a function of discipline-specific background, text structure, rhetorically-oriented framework, and recall

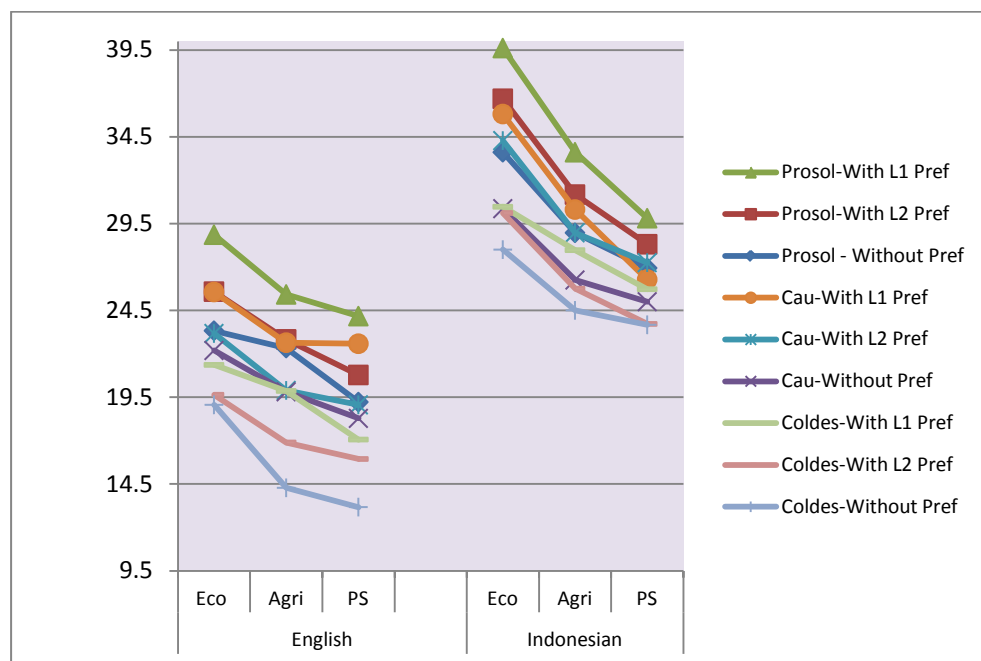
DISPEC	TEXT	FRAME	ORIGINAL DATA		SQRT TRANSFORMED DATA	
			LANGUAGE OF RECALL		LANGUAGE OF RECALL	
			L2	L1	L2	L1
ECONOMICS	PROBLEM-SOLUTION	WITHOUT	23.33	33.61	4.75	5.73
		WITH-L2	25.58	36.69	5.00	6.03
		WITH-L1	28.86	39.61	5.32	6.25
	CAUSATION	WITHOUT	22.19	30.36	4.64	5.46
		WITH-L2	23.17	34.28	4.76	5.81
		WITH-L1	25.56	35.81	4.97	5.94
	COLLECTION OF DESCRIPTION	WITHOUT	19.06	28.00	4.26	5.21
		WITH-L2	19.64	30.11	4.38	5.43
		WITH-L1	21.36	30.47	4.54	5.46
AGRICULTURE	PROBLEM-SOLUTION	WITHOUT	22.33	28.97	4.63	5.31
		WITH-L2	22.83	31.17	4.71	5.54
		WITH-L1	25.42	33.61	4.96	5.75
	CAUSATION	WITHOUT	19.81	26.25	4.36	5.07
		WITH-L2	19.89	28.97	4.38	5.32
		WITH-L1	22.64	30.31	4.67	5.43
	COLLECTION OF DESCRIPTION	WITHOUT	14.28	24.50	3.72	4.90
		WITH-L2	16.89	25.75	4.06	5.00
		WITH-L1	19.86	27.97	4.37	5.25
PURE SCIENCES	PROBLEM-SOLUTION	WITHOUT	19.22	26.94	4.32	5.12
		WITH-L2	20.78	28.31	4.52	5.27
		WITH-L1	24.17	29.81	4.83	5.43
	CAUSATION	WITHOUT	18.28	25.00	4.19	4.96
		WITH-L2	19.06	27.25	4.28	5.19
		WITH-L1	22.58	26.28	4.70	5.05
	COLLECTION OF DESCRIPTION	WITHOUT	13.17	23.67	3.54	4.80
		WITH-L2	15.94	23.72	3.90	4.80
		WITH-L1	17.06	25.72	4.01	5.00

To show the non-significance of the four-way interaction effect of the independent variables on the dependent variable, the mean scores of reading

comprehension as a function of discipline-specific background, text structure, rhetorically-oriented framework and recall, are depicted in Table 4.8.

Graphically, the non-significant interaction effect of discipline-specific background, text structure, rhetorically-oriented framework and recall on reading comprehension, is illustrated using joint means of levels of discipline-specific background, text structure, and rhetorically-oriented framework grouped by the levels of recall, as presented in Figure 4.5.

Figure 4.5 Joint means for the four-way interaction effect of discipline-specific background, text structure, rhetorically-oriented framework and recall on reading comprehension



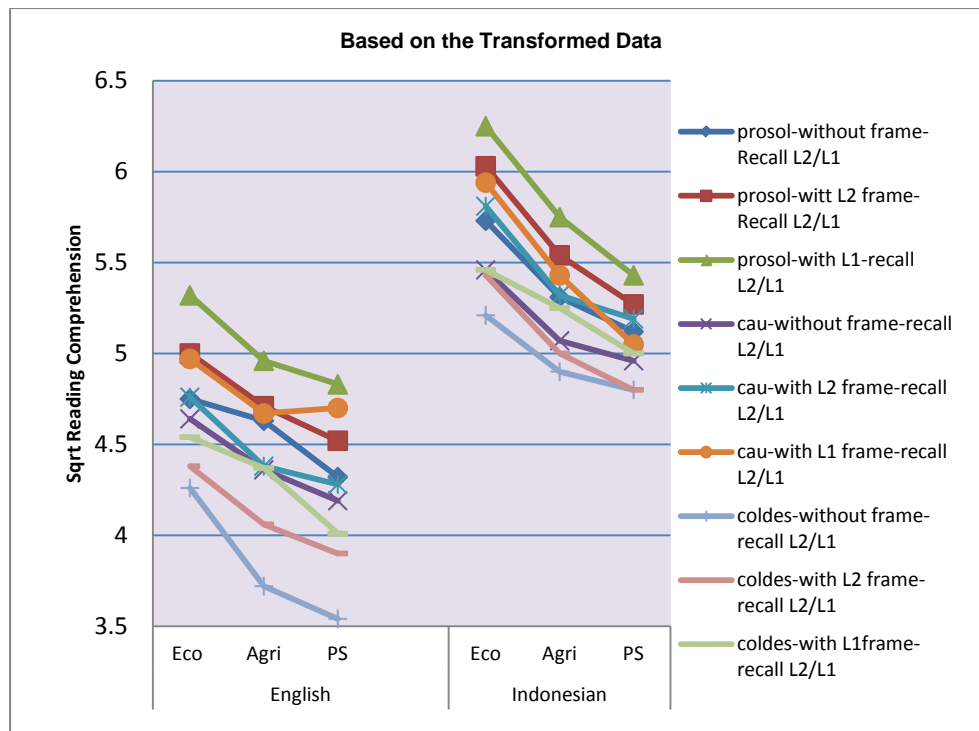


Figure 4.5 shows that, for economics, the mean values of text structure of problem-solution, causation, and collection of description characterised by either without framework, with-L2 framework or with-L1 framework – each of which was recalled in English – can be ordered from high to low as follows: problem-solution, causation and collection of description. The mean values of the levels of rhetorically-oriented framework can be ordered from high to low: with-L1, with-L2 and without. The same condition is also true for those recalled in Indonesian, except that the mean values are higher than those recalled in English.

For agriculture, the mean values of text structure of problem-solution, causation and collection of description characterised by either without framework, with-L2 framework or with-L1 framework – each of which was recalled in English – can be ordered from high to low as follows: problem-solution, causation and collection of description. The mean values of the levels of rhetorically-oriented framework can be ordered from high to low: with-L1, with-L2 and without. The same condition is also true for those

recalled in Indonesian, except that the mean values are higher than those recalled in English.

For pure sciences, the mean values of text structure of problem-solution, causation, and collection of description characterised by either without framework, with-L2 framework or with-L1 framework – each of which was recalled in English – can be ordered from high to low as follows: problem-solution, causation, and collection of description. The mean values of the levels of rhetorically-oriented framework can be ordered from high to low: with-L1, with-L2 and without. The same condition is also true for those recalled in Indonesian, except that the mean values are higher than those recalled in English.

Thus, the mean values for the four-way interaction effects of the levels of the factors of either discipline-specific background, text structure, rhetorically-oriented framework or recall can be ordered from high to low as follows: economics, agriculture, pure sciences (for the levels of discipline-specific background); problem-solution, causation, and collection of description (for the levels of text structure); with-L1 framework, with-L2 framework and without framework (for the levels of rhetorically-oriented framework); and recall L1, recall L1 (for the levels of recall) . These data clearly indicate the non-significance of the four-way interaction in the sense of an additive relationship among the factors.

4.2.2 Testing of hypothesis 1.2

The null scientific hypothesis H_0 1.2 states: ‘There is no significant interaction effect of discipline-specific background, text structure, rhetorically-oriented framework on reading comprehension of expository texts’. This null hypothesis was tested using the values of cell mean, column total mean and row total mean for any possible combination of the levels of the factors of discipline-specific background, text structure and rhetorically-oriented framework, as presented in Table 4.1

Using both the Logistic Regression (Table 4.2) and ANOVA computation (Table 4.6), it was found that a three-way interaction effect of discipline-specific background, text structure and rhetorically-oriented framework on reading comprehension was not significant. The parameters yielded by using Logistic Regression computation were: Wald Chi-Square = 3.026, $df = 8$, $p = .933$, $\omega^2 = .003$, and by using the ANOVA computation were: $F = .149$, $p = .997$, $\alpha = .05$, $\omega^2 = .004$. The parameters of both test models showed that the value of p is greater than $\alpha = .05$, and this means that the interaction effect of discipline-specific background, text structure and rhetorically-oriented framework, was not significant. Additionally, both test models showed the effect size magnitude of .003 for Logistic Regression and .004 for ANOVA. These values indicated that approximately 0% (Logistic Regression) and 0% (ANOVA) of the variability in reading comprehension was accounted for by discipline-specific background, text structure and rhetorically-oriented framework as shown in Tables 4.3 and 4.7. In such a situation, the effect size magnitude of the three-way interaction was negligible.

To show the non-significance of the three-way interaction effect of the independent variables on the dependent variable, the mean scores of reading comprehension as a function of discipline-specific background, text structure, and rhetorically-oriented framework are depicted in Table 4.9.

Graphically, the non-significant interaction effect of discipline-specific background, text structure and rhetorically-oriented framework on reading comprehension, is illustrated using joint means of levels of discipline-specific background, text structure and rhetorically-oriented framework, as presented in Figure 4.6.

Figure 4.6 shows that for economics, the mean values of text structure of problem-solution, causation and collection of description characterised by the feature of without framework, can be ordered from high to low as follows: problem-solution, causation, and collection of description. The same condition is also true for those characterised by the feature of with-L2 as well

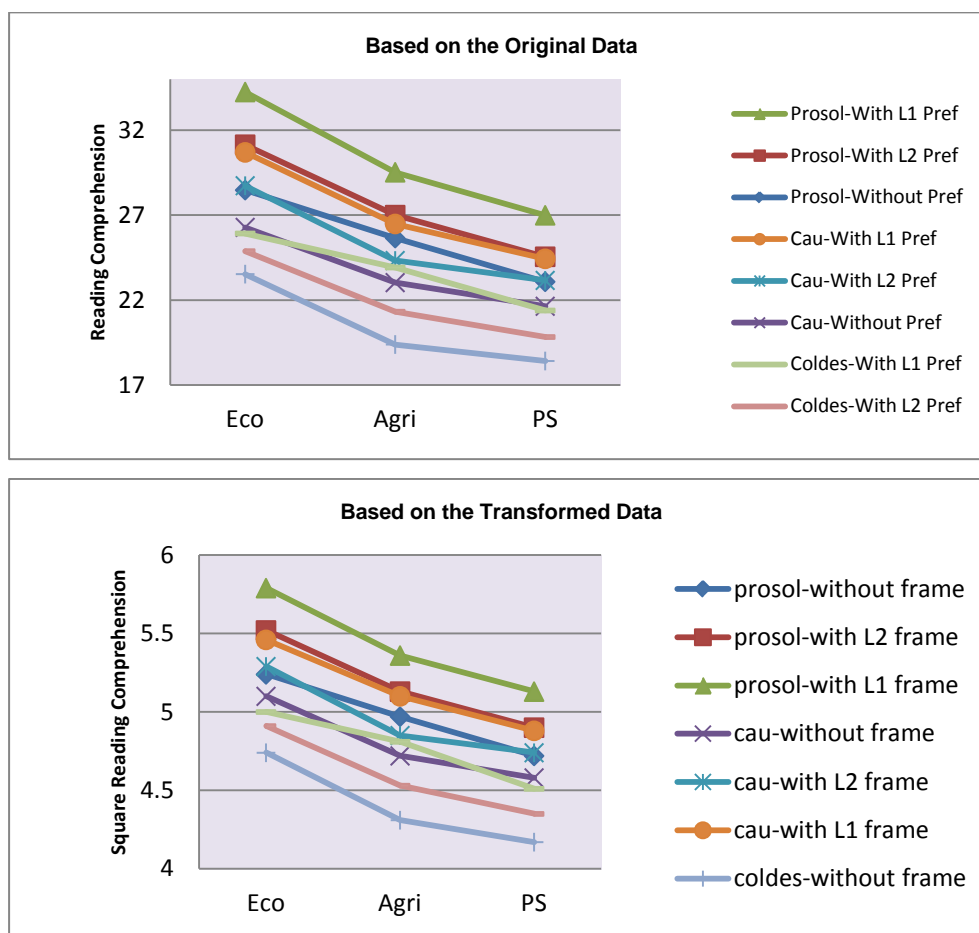
as with-L1 framework that the mean value can be ordered from high to low as follows: problem-solution, causation and collection of description.

Table 4.9 Reading comprehension as a function of discipline-specific background, text structure and rhetorically-oriented framework

DISPEC	TEXT	FRAMEWORK	ORIGINAL DATA	SQRT TRANSFORMED DATA
			MEAN	MEAN
ECONOMICS	PROBLEM-SOLUTION	WITHOUT	28.47	5.24
		WITH-L2	31.14	5.52
		WITH-L1	34.24	5.79
	CAUSATION	WITHOUT	26.28	5.10
		WITH-L2	28.73	5.29
		WITH-L1	30.69	5.46
	COLLECTION OF DESCRIPTION	WITHOUT	23.53	4.74
		WITH-L2	24.88	4.91
		WITH-L1	25.92	5.00
AGRICULTURE	PROBLEM-SOLUTION	WITHOUT	25.65	4.97
		WITH-L2	27.00	5.13
		WITH-L1	29.52	5.36
	CAUSATION	WITHOUT	23.03	4.72
		WITH-L2	24.33	4.85
		WITH-L1	26.48	5.10
	COLLECTION OF DESCRIPTION	WITHOUT	19.39	4.31
		WITH-L2	21.32	4.53
		WITH-L1	23.92	4.81
PURE SCIENCES	PROBLEM-SOLUTION	WITHOUT	23.08	4.72
		WITH-L2	24.55	4.90
		WITH-L1	26.99	5.13
	CAUSATION	WITHOUT	21.64	4.58
		WITH-L2	23.16	4.74
		WITH-L1	24.43	4.88
	COLLECTION OF DESCRIPTION	WITHOUT	18.42	4.17
		WITH-L2	19.83	4.35
		WITH-L1	21.39	4.51

For agriculture, the mean values of text structure of problem-solution, causation, and collection of description characterised by the feature of without framework can be ordered from high to low as follows: problem-solution, causation and collection of description. It is also true for those characterised by the feature of with-L2, as well as with-L1 framework, that the mean value can be ordered from high to low as follows: problem-solution, causation and collection of description.

Figure 4.6 Joint means for the three-way interaction effect of discipline-specific background, text structure, and rhetorically-oriented framework on reading comprehension



For pure sciences, the mean values of text structure of problem-solution, causation and collection of description characterised by the feature of without framework, can be ordered from high to low as follows: problem-solution, causation and collection of description. The same condition is also true for those characterised by the feature of with-L2 as well as with-L1 framework that the mean value can be ordered from high to low as follows: problem-solution, causation and collection of description.

Thus, the mean values for the three-way interaction effects of the levels of the factors of either discipline-specific background, text structure or

rationally-oriented framework, can be ordered from high to low as follows: economics, agriculture, pure sciences (for the levels of discipline-specific background); problem-solution, causation and collection of description (for the levels of text structure); with-L1 framework, with-L2 framework and without framework (for the levels of rationally-oriented framework). The data indicate the non-significance of the three-way interaction in the sense of an additive relationship among the factors.

4.2.3 Testing of hypothesis 1.3

Hypothesis 1.3 states: ‘There is no significant interaction effect of discipline-specific background, text structure, recall on reading comprehension of expository texts’. This scientific null hypothesis was tested using the values of cell mean, column total mean, and row total mean for any possible combination of the levels of the factors of discipline-specific background, text structure and recall. The mean scores of reading comprehension as a function of discipline-specific background, text structure and recall, as presented in Table 4.1.

Using both the Logistic Regression computation (Table 4.2) and ANOVA computation (Table 4.6), it was found that a three-way interaction effect of discipline-specific background, text structure and recall on reading comprehension was not significant. The parameters yielded by using Logistic Regression were: Wald Chi-Square = 3.893, $df = 4$, $p = .421$, $\omega^2 = .000$, and by using the ANOVA computation were: $F = .378$, $p = .825$, $\alpha = .05$, $\omega^2 = .001$. The parameters of both test models showed that the value of p is greater than $\alpha = .05$, and this means that the interaction effect of discipline-specific background, text structure and recall was not significant. Additionally, both test models showed the effect size magnitude of .000 for Logistic Regression and .001 for ANOVA. These values indicated that approximately 0% of the variability in reading comprehension was accounted for by discipline-specific background, text structure, and recall as shown in Tables 4.3 and 4.7. In such a situation, the effect size magnitude of the three-way interaction is

negligible.

To show the non-significance of the three-way interaction effect of the independent variables on the dependent variable, the mean scores of reading comprehension as a function of discipline-specific background, text structure and recall are depicted in Table 4.10

Table 4.10 Reading comprehension as a function of discipline- specific background, text structure, and recall

DISPEC	TEXT	RECALL	ORIGINAL DATA	SQRT TRANSFORMED DATA
			MEAN	MEAN
ECONOMICS	PROBLEM-SOLUTION	L2	25.92	5.02
		L1	36.64	6.00
	CAUSATION	L2	22.64	4.80
		L1	33.48	5.74
	COLLECTION OF DESCRIPTION	L2	20.02	4.40
		L1	29.53	5.37
AGRICULTURE	PROBLEM-SOLUTION	L2	23.52	4.77
		L1	31.25	5.53
	CAUSATION	L2	20.78	4.47
		L1	28.51	5.27
	COLLECTION OF DESCRIPTION	L2	17.01	4.05
		L1	26.07	5.05
PURE SCIENCES	PROBLEM-SOLUTION	L2	21.39	4.56
		L1	28.35	5.27
	CAUSATION	L2	19.97	4.39
		L1	26.18	5.07
	COLLECTION OF DESCRIPTION	L2	15.39	3.82
		L1	24.37	4.87

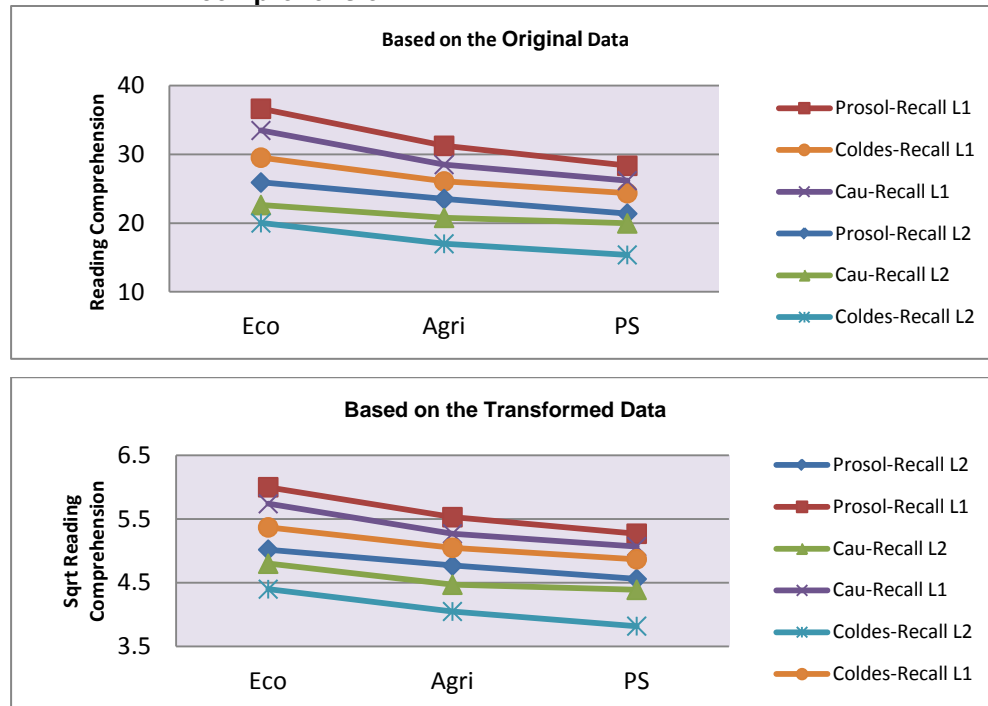
Graphically, the non-significant interaction effect of discipline-specific background, text structure and recall on reading comprehension is illustrated using joint means of levels of discipline-specific background, text structure and recall as presented in Figure 4.7.

Figure 4.7 shows that for economics, the mean values of text structure of problem-solution, causation, and collection of description recalled in English can be ordered from high to low as follows: problem-solution, causation and collection of description. The same condition is also true for those recalled in Indonesian, except that the mean values are higher than those recalled in English.

For agriculture, the mean values of text structure of problem-solution, causation and collection of description recalled in English, can be ordered

from high to low as follows: problem-solution, causation and collection of description. It is also true for those recalled in Indonesian, except that the mean values are higher than those recalled in English.

Figure 4.7 Joint means for the three-way interaction effect of discipline-specific background, text structure, and recall on reading comprehension



For pure sciences, the mean values of text structure of problem-solution, causation and collection of description, each of which was recalled in English, can be ordered from high to low as follows: problem-solution, causation and collection of description. The same condition is also true for those recalled in Indonesian, except that the mean values are higher than those recalled in English.

Thus, the mean values for the three-way interaction effects of the levels of the factors of either discipline-specific background, text structure or recall can be ordered from high to low as follows: economics, agriculture, pure sciences (for the levels of discipline-specific background); problem-solution, causation and collection of description (for the levels of text structure); and

Indonesian and English (for the levels of recall). The data indicate the non-significance of the three-way interaction of discipline-specific background, text structure and recall on reading comprehension in the sense of an additive relationship among the factors.

4.2.4 Testing of hypothesis 1.4

Hypothesis 1.4 states: ‘There is no significant interaction effect of discipline-specific background, rhetorically-oriented framework, and recall on reading comprehension of expository texts’. This scientific null hypothesis was tested using the values of cell mean, column total mean and row total mean for any possible combination of the levels of the factors of discipline-specific background, rhetorically-oriented framework and recall, as presented in Table 4.1.

Using both the Logistic Regression computation (Table 4.2) and ANOVA computation (Table 4.6), it was found that a three-way interaction effect of discipline-specific background, rhetorically-oriented framework and recall on reading comprehension was not significant. The parameters yielded by using Logistic Regression were: Wald Chi-Square = 2.811, $df = 4$, $p = .590$, $\omega^2 = -.001$, and by using ANOVA computation were: $F = .297$, $p = .880$, $\alpha = .05$, $\omega^2 = .001$. The parameters of both test models showed that the value of p value was greater than $\alpha = .05$, and this means that the interaction effect of discipline-specific background, rhetorically-oriented framework and recall was not significant. Additionally, both test models showed the effect size magnitude of $-.001$ for Logistic Regression and $.001$ for ANOVA. These values indicated that none of the variability in reading comprehension was accounted for by discipline-specific background, rhetorically-oriented framework and recall as shown in Tables 4.3 and 4.7. In such a situation, the effect size magnitude of the three-way interaction was negligible.

To show the non-significance of the three-way interaction effect of the independent variables on the dependent variable, the mean scores of reading

comprehension as a function of discipline-specific background, rhetorically-oriented framework and recall are depicted in Table 4.11

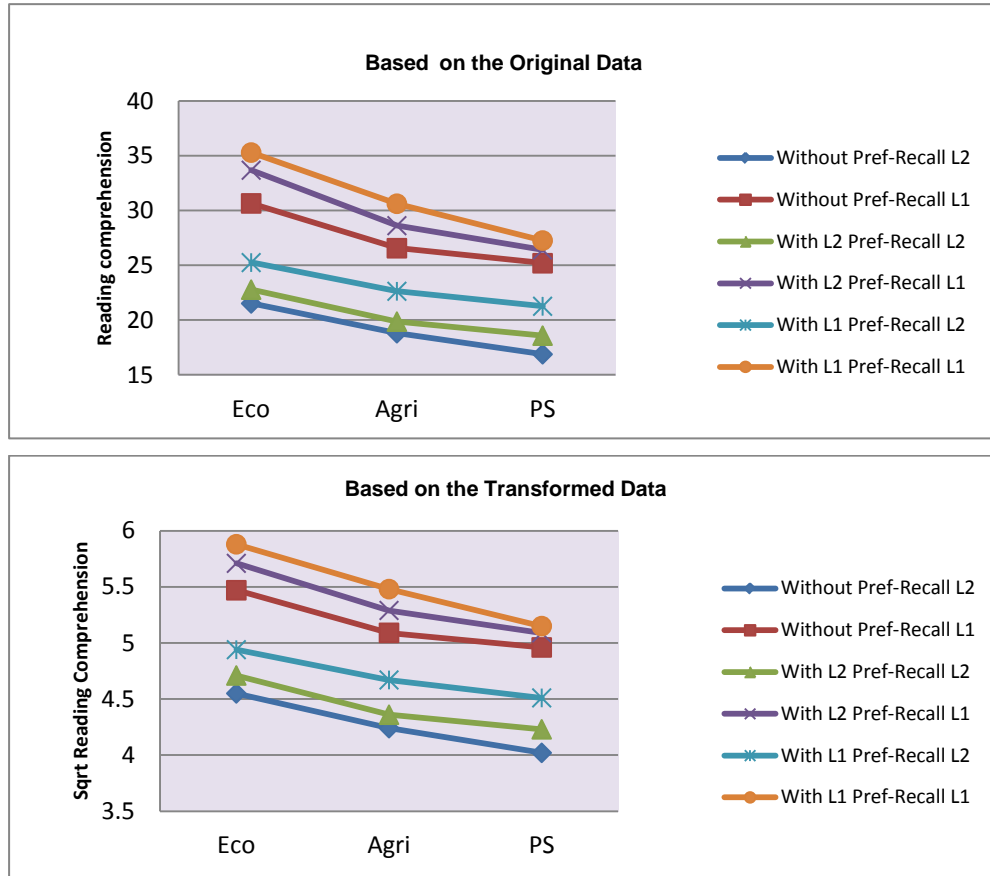
Graphically, the non-significant interaction effect of discipline-specific background, rhetorically-oriented framework and recall on reading comprehension, is illustrated using the joint means of levels of discipline-specific background, rhetorically-oriented framework and recall as presented in Figure 4.8.

Figure 4.8 shows that for economics, the mean values of rhetorically-oriented framework of without, with-L2 and with-L1 recalled in English can be ordered from high to low as follows: with-L1 framework, with L2 framework, without framework. L2 framework, without framework. The same condition is also true for those recalled in Indonesian, except that the mean values are higher than those recalled in English.

Table 4.11 Reading comprehension as a function of discipline-specific background, rhetorically-oriented framework, and recall

DISPEC	PREF	RECALL	ORIGINAL DATA	SQRT TRANSFORMED DATA
			MEAN	MEAN
ECONOMICS	WITHOUT	L2	21.53	4.55
		L1	30.66	5.47
	WITH-L2	L2	22.79	4.71
		L1	33.69	5.71
	WITH-L1	L2	25.26	4.94
		L1	35.30	5.88
AGRICULTURE	WITHOUT	L2	18.81	4.24
		L1	26.57	5.09
	WITH-L2	L2	19.87	4.36
		L1	28.63	5.29
	WITH-L1	L2	22.64	4.67
		L1	30.63	5.48
PURE SCIENCES	WITHOUT	L2	16.89	4.02
		L1	25.20	4.96
	WITH-L2	L2	18.59	4.23
		L1	26.42	5.09
	WITH-L1	L2	21.27	4.51
		L1	27.27	5.15

Figure 4.8 Joint means for the three-way interaction effect of discipline-specific background, rhetorically-oriented framework and recall on reading comprehension



For agriculture, the mean values of rhetorically-oriented framework of without, with-L2, and with-L1 recalled in English, can be ordered from high to low as follows: with-L1 framework, with-L2 framework, without framework. It is also true for those recalled in Indonesian, except that the mean values are higher than those recalled in English.

For pure sciences, the mean values of framework of without, with-L2, and with-L1 recalled in English can be ordered from high to low as follows: with-L1 framework, with-L2 framework, without framework. The same condition is also true for those recalled in Indonesian, except that the mean values are higher than those recalled in English.

Thus, the mean values for the three-way interaction effects of the levels of the factors of either discipline-specific background, rhetorically-oriented

framework or recall can be ordered from high to low as follows: economics, agriculture, pure sciences (for the levels of discipline-specific background); with-L1, with-L2 and without (for the levels of rhetorically-oriented framework); and Indonesian and English (for the levels of recall). The data indicate the non-significance of the three-way interaction of discipline-specific background, rhetorically-oriented framework and recall on reading comprehension in the sense of an additive relationship among the factors.

4.2.5 Testing of hypothesis 1.5

Hypothesis 1.5 states: ‘There is no significant interaction effect of text structure, rhetorically-oriented framework and recall on reading comprehension of expository texts’. This scientific null hypothesis was tested using the values of cell mean, column total mean, and row total mean for any possible combination of the levels of the factors of text structure, rhetorically-oriented framework and recall as presented in Table 4.1.

Using both the Logistic Regression computation (Table 4.2) and the ANOVA computation (Table 4.6), it was found that a three-way interaction effect of text structure, rhetorically-oriented framework and recall on reading comprehension was not significant. The parameters yielded by using Logistic Regression were: Wald Chi-Square = 2.765, $df = 4$, $p = .598$, $\omega^2 = -.001$, and by using the ANOVA computation were: $F = .357$, $p = .839$, $\alpha = .05$, $\omega^2 = .001$. The parameters of both test models showed that the value of p value is greater than $\alpha = .05$, and this means that the interaction effect of text structure, rhetorically-oriented framework and recall on reading comprehension was not significant. The results of Logistic Regression and ANOVA computation are presented, respectively in Tables 4.2 and Table 4.6. Additionally, both test models showed the effect size magnitude of $-.001$ for Logistic Regression and $.001$ for ANOVA. These values indicated that approximately 0% of the variability in reading comprehension was accounted for by text structure, rhetorically-oriented framework and recall on reading

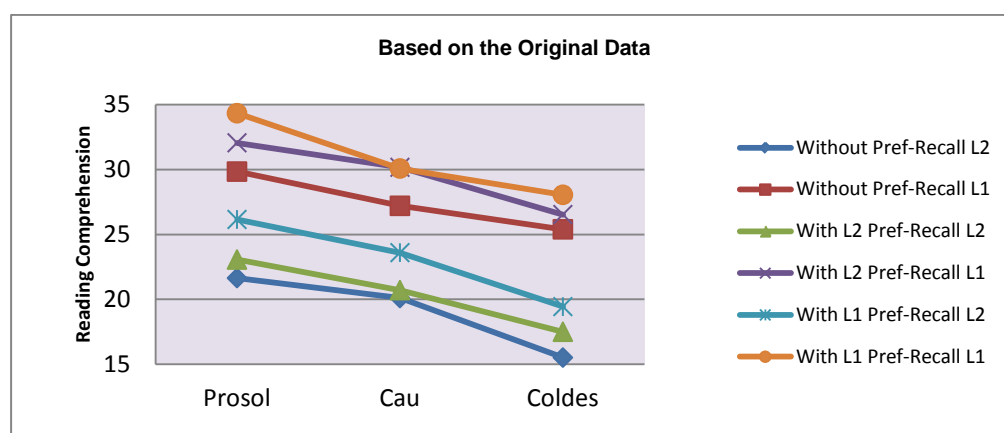
comprehension as shown in Tables 4.3 and 4.7. In such a situation, the effect size magnitude of the three-way interaction was negligible.

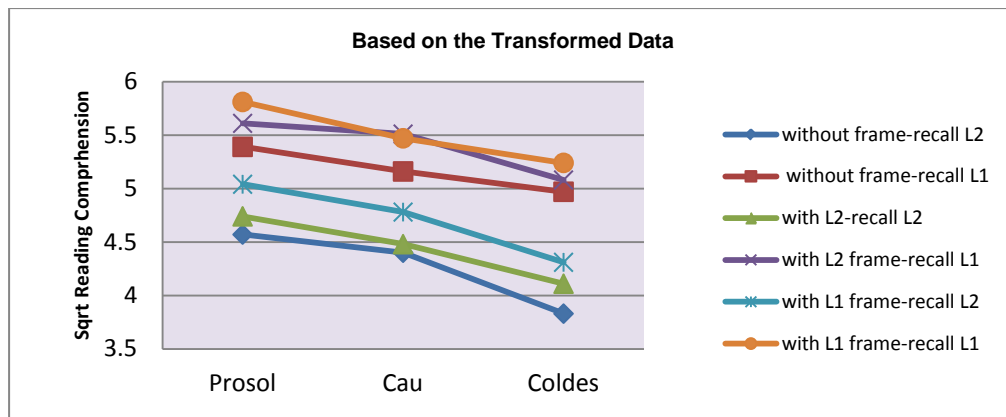
To show the non-significance of the three-way interaction effect of the independent variables on the dependent variable, the mean scores of reading comprehension as a function of text structure, rhetorically-oriented framework and recall on reading comprehension are depicted in Table 4.12.

Table 4.12 Reading comprehension as a function of text structure, rhetorically-oriented framework, and recall

DISPEC	FRAME	RECALL	ORIGINAL DATA	SQRT TRANSFORMED DATA
			MEAN	MEAN
PROBLEM-SOLUTION	WITHOUT	L2	21.63	4.57
		L1	29.84	5.39
	WITH-L2	L2	23.06	4.74
		L1	32.06	5.61
	WITH-L1	L2	26.15	5.04
		L1	34.34	5.81
CAUSATION	WITHOUT	L2	20.09	4.40
		L1	27.20	5.16
	WITH-L2	L2	20.70	4.48
		L1	30.17	5.51
	WITH-L1	L2	23.59	4.78
		L1	30.08	5.47
COLLECTION OF DESCRIPTION	WITHOUT	L2	15.50	3.83
		L1	25.39	4.97
	WITH-L2	L2	17.49	4.11
		L1	26.53	5.08
	WITH-L1	L2	19.43	4.31
		L1	28.05	5.24

Figure 4.9 Joint means of three-way interaction effect of text structure, rhetorically-oriented framework and recall on reading comprehension





Graphically, the non-significant interaction effect of text structure, rhetorically-oriented framework and recall on reading comprehension, is illustrated using joint means of levels of text structure, rhetorically-oriented framework and recall, as presented in Figure 4.9. Figure 4.9 shows that for problem-solution, the mean values of rhetorically-oriented framework of without, with-L2 and with-L1 recalled in English, can be ordered from high to low as follows: with-L1 framework, with-L2 framework, without framework. The same condition is also true for those recalled in Indonesian, except that the mean values are higher than those recalled in English.

For causation, the mean values of rhetorically-oriented framework of without, with-L2 and with-L1 recalled in English, can be ordered from high to low as follows: with-L1 framework, with-L2 framework, without framework. It is also true for those recalled in Indonesian, except that the mean values are higher than those recalled in English.

For collection of description, the mean values of rhetorically-oriented framework of without, with-L2 and with-L1 recalled in English can be ordered from high to low as follows: with-L1 framework, with-L2 framework, without framework. The same condition is also true for those recalled in Indonesian, except that the mean values are higher than those recalled in English.

Thus, the mean values of each level of rhetorically-oriented framework of either without, with-L2 or with-L1 recalled either in English or Indonesian, under the condition of text structure of either problem-solution,

causation, and collection of description can be ordered from high to low as follows: with-L1 framework, with-L2 framework, without framework. The only difference is that, under the text structure, those recalled either in English or Indonesian can be uniformly ordered from high to low as follows: problem-solution, causation and collection of description. This situation clearly indicates the non-significance of the three-way interaction in the sense of an additive relationship among the factors.

4.2.6 Testing of hypothesis 1.6

Hypothesis 1.6 states: ‘There is no significant interaction effect of discipline-specific background and text structure on reading comprehension of expository texts’. This scientific null hypothesis was tested using the values of cell mean, column total mean and row total mean for any possible combination of the levels of the factors of discipline-specific background and text structure as presented in Table 4.1.

Using both the Logistic Regression computation (Table 4.2) and ANOVA computation (Table 4.6), it was found that a two-way interaction effect of discipline-specific background and text structure on reading comprehension was not significant. The parameters yielded by using Logistic Regression were: Wald Chi-Square = 1.127, $df = 4$, $p = .890$, $\omega^2 = -.002$, and by using the ANOVA computation were: $F = .125$, $p = .974$, $\alpha = .05$, $\omega^2 = .002$. The parameters of both test models showed that the value of p value is greater than $\alpha = .05$, and means that the interaction effect of discipline-specific background and text structure on reading comprehension was not significant. Additionally, both test models showed the effect size magnitude of $-.002$ for and $.002$ for ANOVA. These values indicated that approximately 0% of the variability in reading comprehension was accounted for by discipline-specific background and text structure on reading comprehension as shown in Tables 4.3 and 4.7. In such a situation, the effect size magnitude of the two-way interaction is negligible.

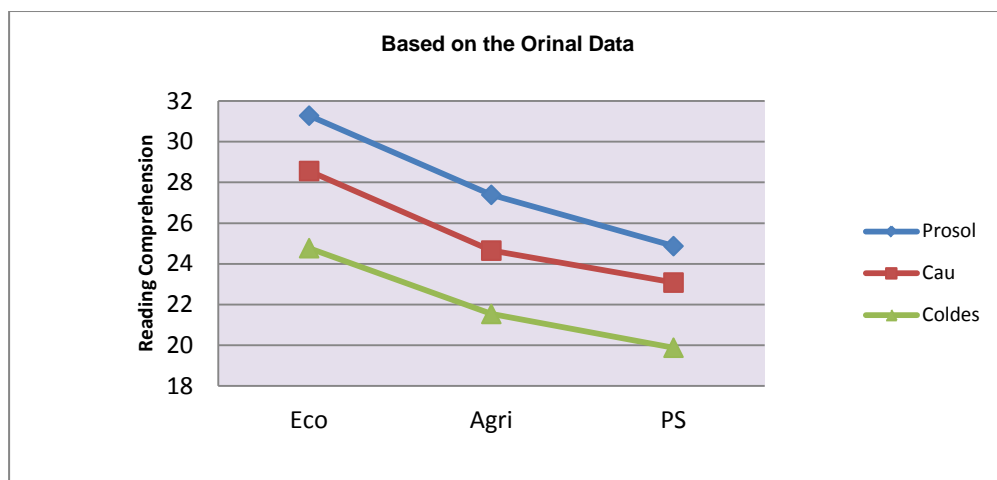
To show the non-significance of the two-way interaction effect of the independent variables on the dependent variable, the mean scores of reading comprehension as a function of discipline-specific background and text structure on reading comprehension are depicted in Table 4.13.

Graphically, the non-significant interaction effect of discipline-specific background and text structure on reading comprehension, is illustrated using joint means of levels of discipline-specific background and text structure and is presented in Figure 4.10.

Table 4.13 Reading comprehension as a function of discipline-specific background and text structure

DISPEC	RECALL	ORIGINAL DATA	SQRT TRANSFORMED DATA
		MEAN	MEAN
ECONOMICS	PROBLEM-SOLUTION	31.28	5.51
	CAUSATION	28.56	5.27
	COLLECTION OF DESCRIPTION	24.77	4.89
AGRICUTURE	PROBLEM-SOLUTION	27.39	5.15
	CAUSATION	24.65	4.87
	COLLECTION OF DESCRIPTION	21.54	4.55
PURE SCIENCES	PROBLEM-SOLUTION	24.87	4.92
	CAUSATION	23.08	4.70
	COLLECTION OF DESCRIPTION	19.88	4.35

Figure 4.10 Joint Means of two-way interaction effect of discipline-specific background and text structure on reading comprehension



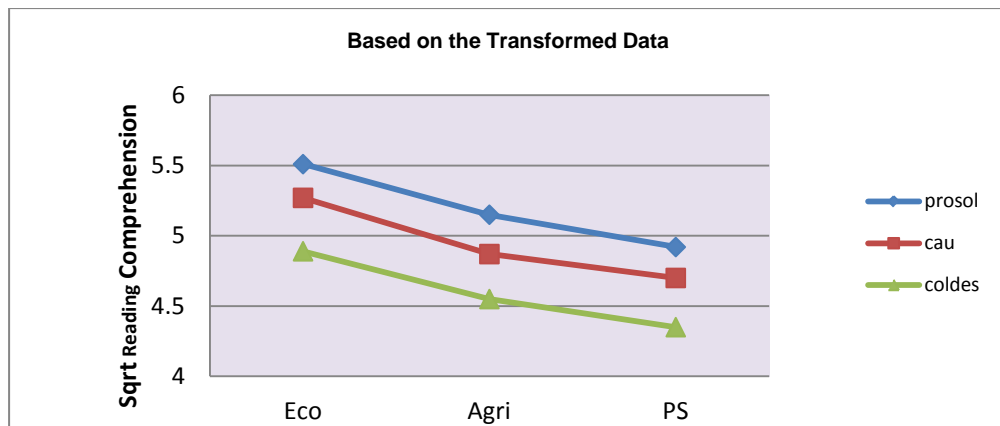


Figure 4.10 shows that for economics, the mean values of text structure of problem-solution, causation, and collection of description, can be ordered from high to low as follows: problem-solution, causation, and collection of description. The same condition is also true for those for agriculture as well as for pure sciences.

Thus, the mean values of all text structure characterised by economics are higher than those characterised by agriculture; and those characterised by pure sciences are lower than those characterised by agriculture. This situation clearly indicates the non-significance of the two-way interaction in the sense of an additive relationship among the factors.

4.2.7 Testing of hypothesis 1.7

Hypothesis 1.7 states: ‘There is no significant interaction effect of discipline-specific background and rhetorically-oriented framework on reading comprehension of expository texts’. This scientific null hypothesis was tested using the values of cell mean, column total mean and row total mean for any possible combination of the levels of the factors of discipline-specific background and rhetorically-oriented framework, as presented in Table 4.1.

Using both the Logistic Regression computation (Table 4.2) and the ANOVA computation (Table 4.6), it was found that a two-way interaction effect of discipline-specific background and rhetorically-oriented framework on reading comprehension was not significant. The parameters yielded by

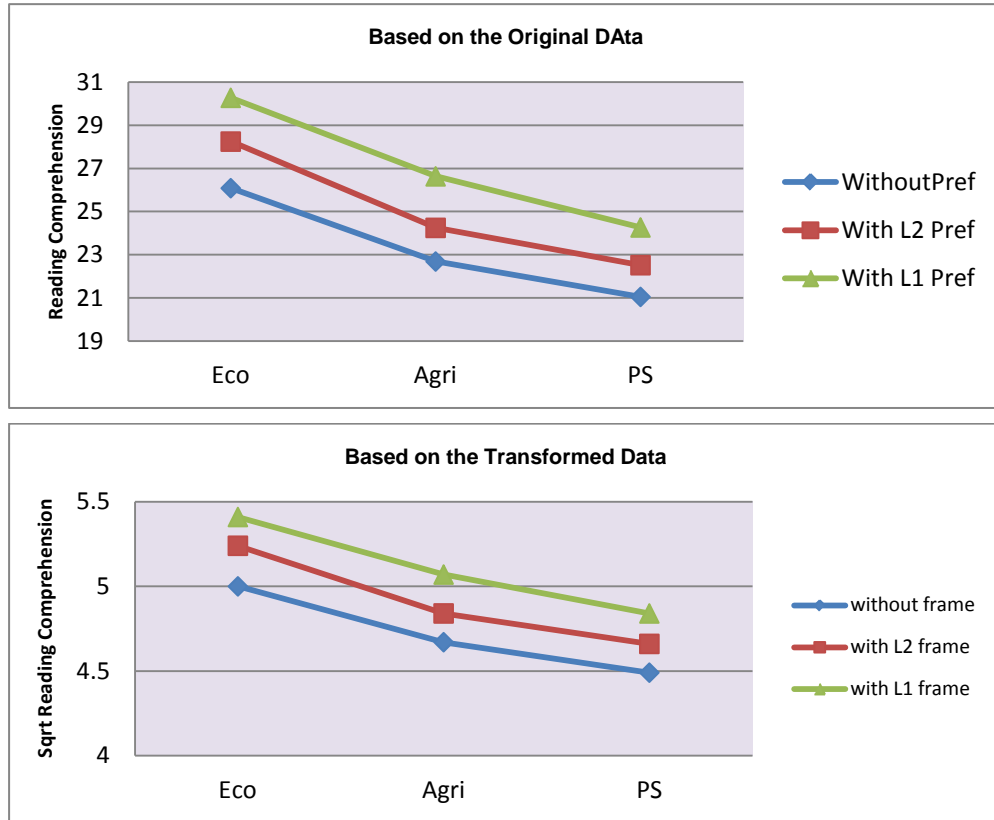
using Logistic Regression were: Wald Chi-Square = .556, df = 4, $p = .968$, $\omega^2 = -.002$, and by using the ANOVA computation were: $F = .085$, $p = .987$, $\alpha = .05$, $\omega^2 = .002$. The parameters of both test models showed that the value of p value is greater than $\alpha = .05$, and this means that the interaction effect of discipline-specific background and rhetorically-oriented framework on reading comprehension was not significant. Additionally, both test models showed the effect size magnitude of $-.002$ for Logistic Regression and $.002$ for ANOVA. These values indicated that approximately 0% of the variability in reading comprehension was accounted for by discipline-specific background and rhetorically-oriented framework on reading comprehension as shown in Table 4.3 and 4.7. In such a situation, the effect size magnitude of the two-way interaction is negligible.

To show the non-significance of the two-way interaction effect of the independent variables on the dependent variable, the mean scores of reading comprehension as a function of discipline-specific background and rhetorically-oriented framework on reading comprehension are depicted in Table 4.14.

Table 4.14 Reading comprehension as a function of discipline-specific background and rhetorically-oriented framework

DISPEC	PREF	ORIGINAL DATA	SQRT TRANSFORMED DATA
		MEAN	MEAN
ECONOMICS	WITHOUT	26.09	5.00
	WITH-L2	28.25	5.24
	WITH-L1	30.28	5.41
AGRICUTURE	WITHOUT	22.69	4.67
	WITH-L2	24.25	4.84
	WITH-L1	26.64	5.07
PURE SCIENCES	WITHOUT	21.05	4.49
	WITH-L2	22.52	4.66
	WITH-L1	24.27	4.84

Figure 4.11 Joint means of two-way interaction effect of discipline-specific background and rhetorically-oriented framework on reading comprehension



Graphically, the non-significant interaction effect of discipline-specific background and rhetorically-oriented framework on reading comprehension is illustrated using joint means of levels of discipline-specific background and rhetorically-oriented framework as presented in Figure 4.11.

Figure 4.11 shows that for economics, the mean values of p rhetorically-oriented framework of without, with-L2, and with-L1 can be ordered from high to low as follows: with-L1 framework, with-L2 framework, and without framework. The same condition is also true for agriculture as well as for pure sciences. Thus, the mean values of all rhetorically-oriented framework factor levels for economics are higher than those for agriculture; and those in the pure sciences are lower than for agriculture. This situation clearly indicates the non-significance of the two-way interaction.

4.2.8 Testing of hypothesis 1.8

Hypothesis 1.8 states: ‘There is no significant interaction effect of discipline-specific background and recall on reading comprehension of expository texts’. This scientific null hypothesis was tested using the values of cell mean, column total mean and row total mean for any possible combination of the levels of the factors of discipline-specific background and recall, as presented in Table 4.1.

Using both the Logistic Regression computation (Table 4.2) and the ANOVA computation (Table 4.6), it was found that a two-way interaction effect of discipline-specific background and recall on reading comprehension was not significant. The parameters yielded by using Logistic Regression were: Wald Chi-Square = 4.587, $df = 2$, $p = .101$, $\omega^2 = .001$, and by using the ANOVA computation were: $F = .761$, $p = .467$, $\alpha = .05$, $\omega^2 = .000$. The parameters of both test models showed that the value of p value is greater than $\alpha = .05$, and this means that the interaction effect of discipline-specific background and recall on reading comprehension was not significant. Additionally, both test models showed the effect size magnitude of .001 for Logistic Regression and .000 for ANOVA. These values indicated that approximately 0% of the variability in reading comprehension was accounted for by discipline-specific background and recall on reading comprehension as shown in Tables 4.3 and 4.7. In such a situation, the effect size magnitude of the two-way interaction is negligible.

To show the non-significance of the two-way interaction effect of the independent variables on the dependent variable, the mean scores of reading comprehension as a function of discipline-specific background and recall on reading comprehension are depicted in Table 4.15.

Table 4.15 Reading comprehension as a function of discipline-specific background, and recall

DISPEC	PREF	ORIGINAL DATA	SQRT TRANSFORMED DATA
		MEAN	MEAN
ECONOMICS	L2	23.19	4.74
	L1	33.21	5.70
AGRICULTURE	L2	20.44	4.43
	L1	28.61	5.29
PURE SCIENCES	L2	18.92	4.25
	L1	26.30	5.07

Graphically, the non-significant interaction effect of discipline-specific background and recall on reading comprehension is illustrated using joint means of levels of discipline-specific background and recall as presented in Figure 4.12.

Figure 4.12 Joint means of two-way interaction effect of discipline-specific background and recall on reading comprehension

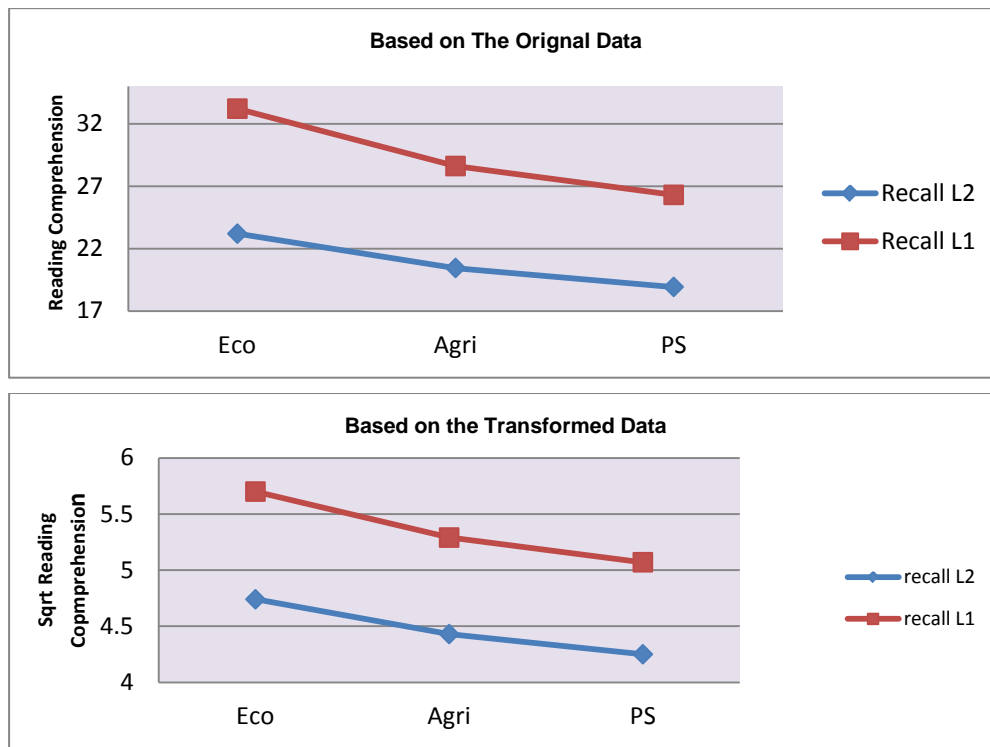


Figure 4.12 shows that for Economics, the mean values of recall L2 and recall L1 can be ordered from high to low as follows: recall L1, recall L2. The same condition is also true for agriculture as well as for pure sciences.

Thus, the mean values of all levels of recall for economics are higher than those for agriculture; and those in the pure sciences are lower than for agriculture. This situation clearly indicates the non-significance of the two-way interaction in the sense of additive relationship among the factors.

4.2.9 Testing of hypothesis 1.9

Hypothesis 1.9 states: ‘There is no significant interaction effect of text structure and rhetorically-oriented framework on reading comprehension of expository texts’. This scientific null hypothesis was tested using the values of cell mean, column total mean and row total mean for any possible combination of the levels of the factors of text structure and rhetorically-oriented framework, as presented in Table 4.1.

Using both the Logistic Regression computation (Table 4.2) and ANOVA computation (Table 4.6), it was found that a two-way interaction effect of text structure and rhetorically-oriented framework on reading comprehension was not significant. The parameters yielded by using Logistic Regression were: Wald Chi-Square = .937, $df = 4$, $p = .919$, $\omega^2 = -.002$, and by using the ANOVA computation were: $F = .121$, $p = .975$, $\alpha = .05$, $\omega^2 = .002$. The parameters of both test models showed that the value of p value is greater than $\alpha = .05$, and this means that the interaction effect of text structure and rhetorically-oriented framework on reading comprehension was not significant. Additionally, both test models showed the effect size magnitude of $-.002$ for Logistic Regression and $.002$ for ANOVA. These values indicated that approximately 0% of the variability in reading comprehension was accounted for by text structure and rhetorically-oriented framework on reading comprehension as shown in Tables 4.3 and 4.7. In such a situation, the effect size magnitude of the two-way interaction is negligible.

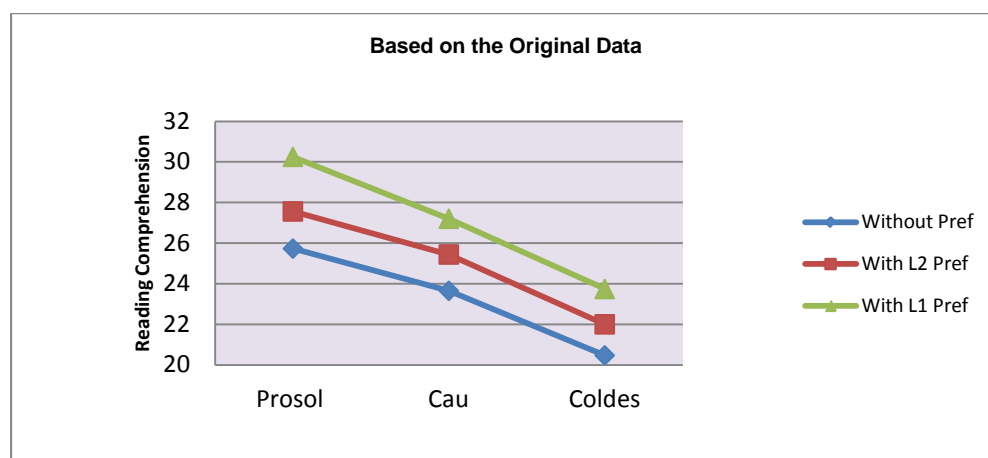
To show the non-significance of the two-way interaction effect of the independent variables on the dependent variable, the mean scores of reading comprehension as a function of text structure and rhetorically-oriented framework on reading comprehension are depicted in Table 4.16.

Graphically, the non-significant interaction effect of text structure and rhetorically-oriented framework on reading comprehension is illustrated using joint means of levels of text structure and rhetorically-oriented framework, as presented in Figure 4.13.

Table 4.16 Reading comprehension as a function of text structure and rhetorically-oriented framework

DISPEC	PREF	ORIGINAL DATA	SQRT TRANSFORMED DATA
		MEAN	MEAN
PROBLEM-SOLUTION	WITHOUT	25.73	4.98
	WITH-L2	27.56	5.18
	WITH-L1	30.25	5.42
CAUSATION	WITHOUT	23.65	4.78
	WITH-L2	25.44	4.96
	WITH-L1	27.20	5.13
COLLECTION OF DESCRIPTION	WITHOUT	20.47	4.41
	WITH-L2	22.00	4.60
	WITH-L1	23.74	4.77

Figure 4.13 Joint means of two-way interaction effect of text structure and rhetorically-oriented framework on reading comprehension



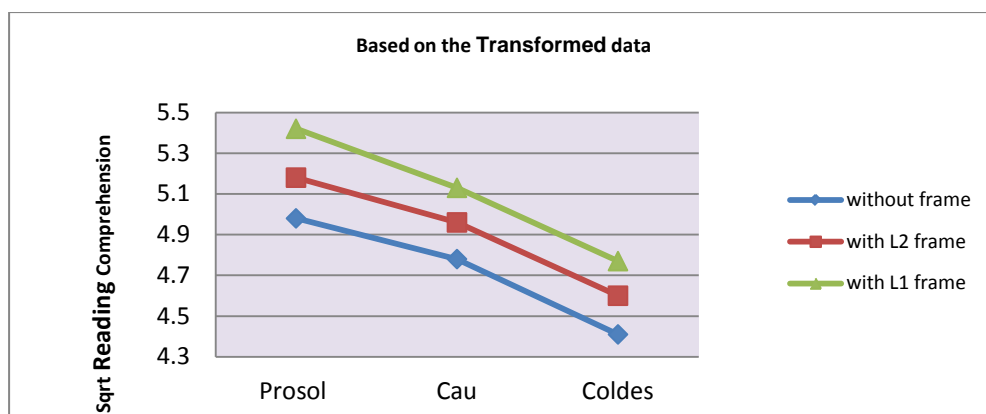


Figure 4.13 shows that for problem-solution, the mean values of rhetorically-oriented framework of without framework, with-L2 framework and with-L1 framework can be ordered from high to low as follows: with-L1 framework, with-L2 framework and without framework. The same condition is also true for causation as well as for collection of description.

Thus, the mean values of the levels of rhetorically-oriented framework for problem-solution are higher than those for causation; and those in the collection of description are lower than for causation. This situation clearly indicates the non-significance of the two-way interaction in the sense of additive relationship among the factors.

4.2.10 Testing of hypothesis 1.10

Hypothesis 1.10 states: 'There is no significant interaction effect of text structure and recall on reading comprehension of expository texts'. This scientific null hypothesis was tested using the values of cell mean, column total mean and row total mean for any possible combination of the levels of the factors of text structure and recall, as presented in Table 4.1.

Using both the Logistic Regression computation (Table 4.2) and ANOVA computation (Table 4.6), it was found that a two-way interaction effect of text structure and recall on reading comprehension was not significant. The parameters yielded by using Logistic Regression were: Wald Chi-Square = 4.905, df = 2, p = .086, $\omega^2 = .002$, and by using the ANOVA

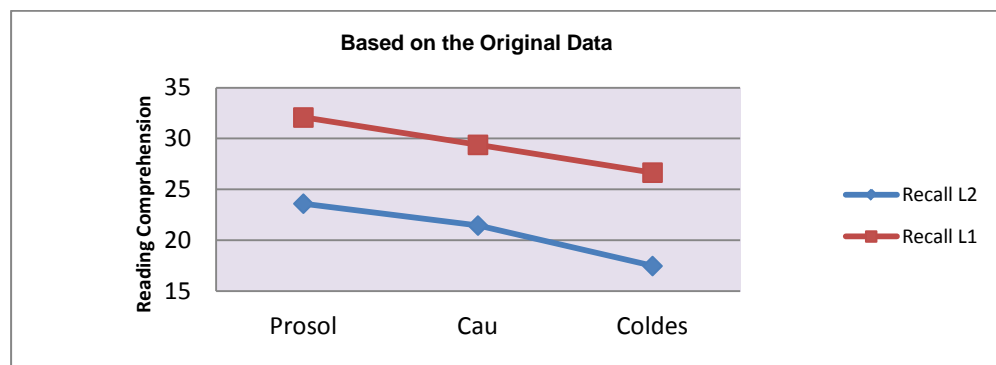
computation were: $F = 1.405$, $p = .246$, $\alpha = .05$, $\omega^2 = .000$. The parameters of both test models showed that the value of p was greater than $\alpha = .05$, and this means that the interaction effect of text structure and recall on reading comprehension was not significant. Additionally, both test models showed the effect size magnitude of .002 for Logistic Regression and .000 for ANOVA. These values indicated that approximately 0% of the variability in reading comprehension was accounted for by text structure and recall on reading comprehension as shown in Table 4.3 and 4.7. In such a situation, the effect size magnitude of the two-way interaction was negligible.

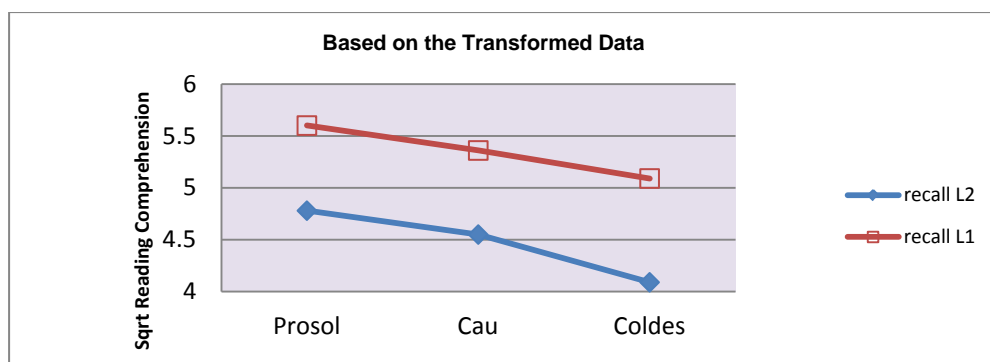
To show the non-significance of the two-way interaction effect of the independent variables on the dependent variable, the mean scores of reading comprehension as a function of text structure and recall on reading comprehension are depicted in Table 4.17.

Table 4.17 Reading comprehension as a function of text structure and recall

DISPEC	RECALL	ORIGINAL DATA	SQRT TRANSFORMED DATA
		MEAN	MEAN
PROBLEM-SOLUTION	L2	23.61	4.78
	L1	32.08	5.60
CAUSATION	L2	21.46	4.55
	L1	29.39	5.36
COLLECTION OF DESCRIPTION	L2	17.48	4.09
	L1	26.66	5.09

Figure 4.14 Joint means of two-way interaction effect of text structure and recall on reading comprehension





Graphically, the non-significant interaction effect of text structure and recall on reading comprehension is illustrated using joint means of levels of text structure and recall as presented in Figure 4.14. It shows that for problem-solution, the mean values of recall L2 and recall L1 can be ordered from high to low as follows: recall L1, recall L2. The same condition is also true for Agriculture as well as for Pure Sciences.

Thus, the mean values of all levels of recall for problem-solution are higher than those for causation; and in the collection of description are lower than for causation. This situation clearly indicates the non-significance of the two-way interaction in the sense of an additive relationship among the factors.

4.2.11 Testing of hypothesis 1.11

Hypothesis 1.11 states: 'There is no significant interaction effect of rhetorically-oriented framework and recall on reading comprehension of expository texts'. This scientific null hypothesis was tested using the values of cell mean, column total mean and row total mean for any possible combination of the levels of the factors of rhetorically-oriented framework and recall, as presented in Table 4.1.

Using both the Logistic Regression computation and ANOVA computation, it was found that a two-way interaction effect of rhetorically-oriented framework and recall was not significant. The parameters yielded by using Logistic Regression were: Wald Chi-Square = 2.346, df = 2, p = .309,

$\omega^2 = .000$, and by using the ANOVA computation were: $F = .591$, $p = .554$, $\alpha = .05$, $\omega^2 = .000$. The parameters of both test models showed that the value of p value is greater than $\alpha = .05$, and this means that the interaction effect of rhetorically-oriented framework and recall was not significant. Additionally, both test models showed the effect size magnitude of .000 for Logistic Regression and .000 for ANOVA. These values indicated that approximately 0% of the variability in reading comprehension was accounted for by rhetorically-oriented framework and recall as shown in Tables 4.3 and 4.7. In such a situation, the effect size magnitude of the two-way interaction is negligible.

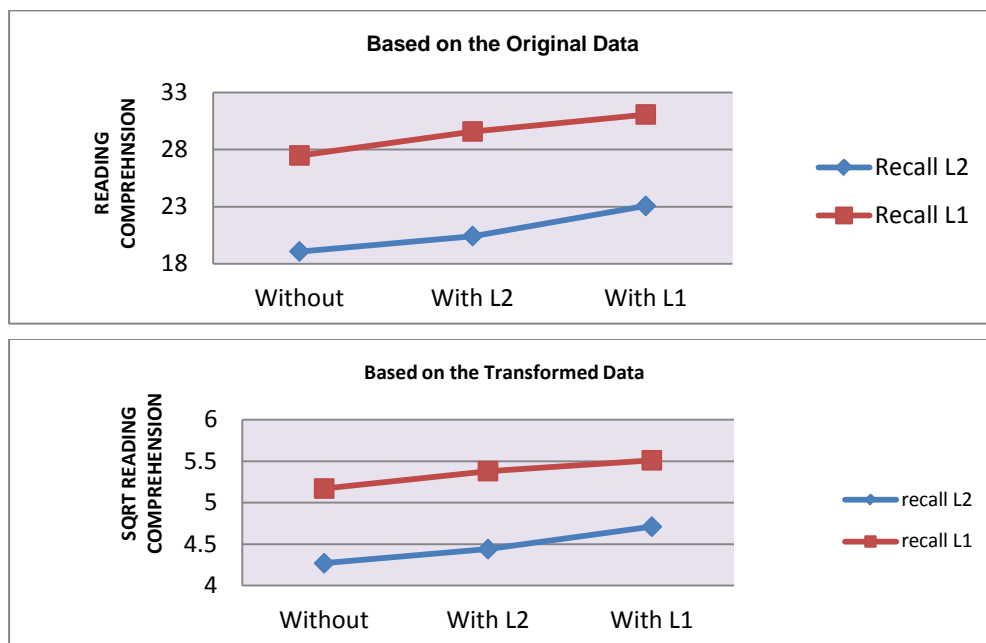
To show the non-significance of the two-way interaction effect of the independent variables on the dependent variable, the mean scores of reading comprehension as a function of rhetorically-oriented framework and recall are depicted in Table 4.18.

Table 4.18 Reading comprehension as a function of rhetorically-oriented framework and recall

DISPEC	RECALL	ORIGINAL DATA	SQRT TRANSFORMED DATA
		MEAN	MEAN
WITHOUT	L2	19.07	4.27
	L1	27.48	5.17
WITH-L2	L2	20.42	4.44
	L1	29.58	5.38
WITH-L1	L2	23.06	4.71
	L1	31.07	5.51

Graphically, the non-significant interaction effect of rhetorically-oriented framework and recall on reading comprehension is illustrated using joint means of levels of rhetorically-oriented framework and recall, as presented in Figure 4.15. These data indicate that for the without framework level, the mean values of recall L2 and recall L1 can be ordered from high to low as follows: recall L1, recall L2. The same condition is also true for with-L2 framework as well as for with-L1 framework.

Figure 4.15 Joint means of two-way interaction effect of rhetorically-oriented framework and recall on reading comprehension



Thus, the mean values of all levels of recall for with-L1 framework are higher than those for with-L2 framework; and in the without framework are lower than for with-L2 framework. This situation clearly indicates the non-significance of the two-way interaction in the sense of an additive relationship among the factors.

4.3 Testing of hypothesis 2

Hypothesis 2 states: ‘There are significant main effects of discipline-specific background, text structure, prefatory framework, or recall on the EFL reading comprehension of expository texts’. This hypothesis is broken down into the following alternative hypotheses:

- H₁ 2.1 There is a significant main effect of discipline-specific background on reading comprehension of expository texts.
- H₁ 2.2 There is a significant main effect of text structure on reading comprehension of expository texts.

H₁ 3.3 There is a significant main effect of rhetorically-oriented framework on reading comprehension of expository texts.

H₁ 3.4 There is a significant main effect of recall on reading comprehension of expository texts.

4.3.1 Testing of hypothesis 2.1

Hypothesis 2.1 was tested using the values of the cell mean for the factor of discipline-specific background, and the values of the column total mean, and the row total mean, ignoring the presence of text structure, rhetorically-oriented framework and recall as shown in Table 4.1. The Logistic Regression computation (Table 4.2) for the main effect of discipline-specific background on reading comprehension yielded parameters as follows: Wald Chi-Square = 155.636, df = 2, p = .000, $\omega^2 = .083$. The ANOVA computation (Table 4.6) showed the parameters F = .38.450, p = .000, $\omega^2 = .053$.

Given the parameters using Logistic Regression, it is evident that the main effect of discipline-specific background on reading comprehension is significant (p = .000 is less than $\alpha = .05$). Similarly, the parameters based on the ANOVA calculation indicate that the main effect of discipline-specific background on reading comprehension is significant (p=.000 is less than $\alpha = .05$). From this condition, it can be concluded that H₀ 2.1 was rejected at $\alpha = .05$, and thus the alternative hypothesis H₁ 2.1 was not rejected.

4.3.2 Testing of hypothesis 2.2

Hypothesis 2.2 was tested using the values of the cell mean for the factor of text structure, and the values of the column total mean and the row total mean, ignoring the presence of discipline-specific background, rhetorically-oriented framework and recall, as shown in Table 4.1. The Logistic Regression computation (Table 4.2) for the main effect of discipline-specific background on reading comprehension yielded parameters as follows: Wald

Chi-Square = 167.931, $df = 2$, $p = .000$, $\omega^2 = .089$. The ANOVA computation (Table 4.6) showed the parameters $F = 44.478$, $p = .000$, $\alpha = .05$, $\omega^2 = .061$.

Given the parameters using Logistic Regression, it is evident that the main effect of text structure on reading comprehension is significant ($p = .000$ is less than $\alpha = .05$). Similarly, the parameters based on the ANOVA calculation, the main effect of text structure on reading comprehension was significant ($p = .000$ is less than $\alpha = .05$). From this condition, it can be concluded that H_0 2.2 was rejected at $\alpha = .05$ and thus, the alternative hypothesis H_1 2.2 is not rejected.

4.3.3 Testing of hypothesis 2.3

Hypothesis 2.3 was tested using the values of the cell mean of the factor of rhetorically-oriented framework, and the values of the column total mean and the row total mean, ignoring the presence of discipline-specific background, text structure and recall as shown in Table 4.1. The Logistic Regression computation (Table 4.2) for the main effect of discipline-specific background on reading comprehension yielded parameters as follows: Wald Chi-Square = 71.737, $df = 2$, $p = .000$, $\omega^2 = .037$. The ANOVA computation (Table 4.6) showed the parameters $F = .18.117$, $p = .000$, $\alpha = .05$, $\omega^2 = .024$.

Given the parameters using Logistic Regression, it is evident that the main effect of rhetorically-oriented framework on reading comprehension is significant ($p = .000$ is less than $\alpha = .05$). Similarly, the parameters based on the ANOVA calculation, the main effect of rhetorically-oriented framework on reading comprehension is significant ($p = .000$ is less than $\alpha = .05$). From this condition, it can be concluded that H_0 2.3 is rejected at $\alpha = .05$ and thus, the alternative hypothesis H_1 2.3 is not rejected.

4.3.4 Testing of hypothesis 2.4

Hypothesis 2.4 was tested using the values of the cell mean of the heading of recall column, and the values of column total mean, and the row total mean,

ignoring the presence of discipline-specific background, text structure and rhetorically-oriented framework, as shown in Table 4.1. The Logistic Regression computation (Table 4.2) for the main effect of recall on reading comprehension yielded parameters as follows: Wald Chi-Square = 526.144, $df = 1$, $p = .000$, $\omega^2 = .283$. The ANOVA computation (Table 4.6) showed the parameters $F = .279.127$, $p = .000$, $\alpha = .05$, $\omega^2 = .195$.

Given the parameters using Logistic Regression, it is evident that the main effect of recall on reading comprehension is significant ($p = .000$ is less than $\alpha = .05$). Similarly, the parameters based on the ANOVA calculation, the main effect of recall on reading comprehension is significant ($p = .000$ is less than $\alpha = .05$). From this condition, it can be concluded that H_0 2.4 is rejected at $\alpha = .05$ and thus, the alternative hypothesis H_1 2.4 is not rejected.

Using the Logistic Regression computation, the analysis has found that: (1) the percentage accounted for by the factor of discipline-specific background in explaining reading comprehension was about 8.3 %, (2) the percentage accounted for by the factor of text structure in explaining reading comprehension was approximately 8.9%, (3) the proportion of the percentage accounted for by the factors of rhetorically-oriented framework in explaining reading comprehension was approximately 3.7%, and (4) the proportion of the percentage accounted for by the factors of recall was approximately 28.3%.

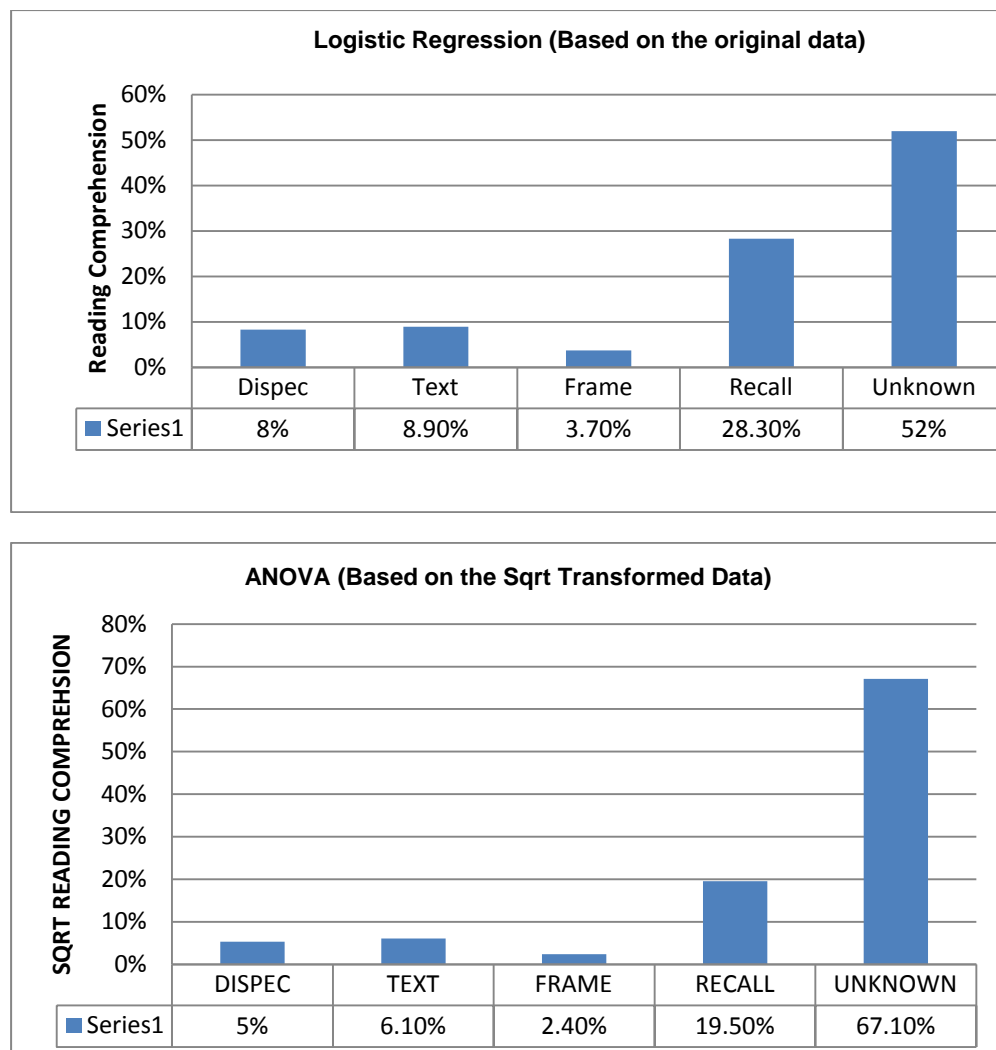
Using the ANOVA computation, it was found that: (1) the percentage accounted for by the factor of discipline-specific background in explaining reading comprehension is about 5.3%, (2) the percentage accounted for by the factor of text structure in explaining reading comprehension was approximately 6.1 %, (3) the proportion of the percentage accounted for by the factors of rhetorically-oriented framework in explaining reading comprehension was approximately 2.4%, and (4) the proportion of the percentage accounted for by the factors of recall was approximately 19.5%.

From the utilisation of both test models for the data analysis, the significant difference in the relative importance of the factors of discipline-

specific background, text structure, rhetorically-oriented framework, and the factor of recall in facilitating the reading comprehension as illustrated in Figure 5.16 can be reported as follows:

1. The factor of recall was the superior among other factors in facilitating reading comprehension.
2. The factor of text structure was more influential than the factor of discipline-specific background
3. The factor of rhetorically-oriented framework was the least among other factors in facilitating reading comprehension.

Figure 4.16 The values of effect size magnitude of the factors in reading comprehension



Based on the discussion from point 1 to point 3 above, the significant difference in the relative importance of the factors of discipline-specific background, text structure, rhetorically-oriented framework and the factor of recall in facilitating the reading comprehension, can be ordered from the least to the most influential as follows: rhetorically-oriented framework, discipline-specific background, text structure and recall.

4.4 Testing of hypothesis 3

Hypothesis 3 postulates: ‘There are significant different effects among levels of discipline-specific background, text structure, rhetorically-oriented framework, or recall on reading comprehension of expository texts.

This hypothesis is broken down into the following alternative hypotheses:

- H1 3.1 There is a significant different effect among levels of discipline-specific background (Economics, Agriculture, and Pure Sciences) on reading comprehension of expository texts.
- H1 3.2 There is a significant different effect among levels of text structure (problem-solution, causation, and collection of description) on reading comprehension of expository texts.
- H1 3.3 There is a significant different effect among levels of rhetorically-oriented framework (without, with-L1, and with-L2) on reading comprehension of expository texts.
- H1 3.4 There is significant different effect among levels of recall (English and Indonesian) on reading comprehension of expository texts.

4.4.1 Testing of hypothesis 3.1

Hypothesis 3.1, as stated in Chapter 2, postulates: ‘There is significant different effect among levels of discipline-specific background (economics,

agriculture, and pure sciences) on reading comprehension of expository texts’.

The ANOVA computation for the main effect of discipline-specific background on reading comprehension, as shown in testing of hypothesis 3.1, yielded a significant effect at $\alpha = .05$ with $F = 38.450$, $p = .000$, $\omega^2 = .053$. However, it cannot be assumed that because the main effect is significant, that there is significant different effect among levels of discipline-specific background. To determine this, the Scheffe Test is used for the analysis.

Using ANOVA for data analysis of the square root transformed data of the experiment, the means for the levels of discipline-specific background as shown in Table 4.19 were: 5.22 for economics, 4.86 for agriculture and 4.67 for pure sciences. To test the different effects of the discipline-specific background levels (economics, agriculture, and pure sciences) on reading comprehension, the use of Multiple Comparison tests was required given that the factor of discipline-specific background consists of more than two levels. The Multiple Comparison used was Scheffe Test with a significance level .05.

Table 4.19 Matrix of differences between means of the levels of discipline-specific background

ANOVA (BASED ON THE SQRT TRANSFORMED DATA)					
DISCIPLINE-SPECIFIC BACKGROUND	MEAN	COMPARISON	ESTIMATE	95% CONFIDENCE INTERVAL	
				LOWER BOUND	UPPER BOUND
economics	5.22	econimic-agriculture	.36*	.20	.52
agriculture	4.86	economics-pure sciences	.56*	.40	.71
pure sciences	4.67	agriculture-Pure sciences	.20*	.04	.36
LOGISTIC REGRESSION (BASED ON THE ORIGINAL DATA)					
economics	.43	econimic-agriculture	.06*	.04	.07
agriculture	.37	economics-pure sciences	.09*	.07	.10
pure sciences	.34	agriculture-pure sciences	.03*	.02	.04

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

The matrix of the different means of the three levels of discipline-specific background is presented in Table 4.19. Using ANOVA to compare the mean differences of the discipline-specific background levels with the value of Multiple Comparison Scheffe test with significant level .05, it was found that the different means between economics and agriculture equalled .36, between economics and pure sciences is .56, and between the agriculture and the pure sciences equals .20.

Using Logistic Regression using the original data, the Estimated Marginal Means for the levels of discipline-specific background as shown in Table 4.19 were: .43 for economics, .37 for agriculture and .34 for pure sciences. Comparing the mean differences of the discipline-specific background levels with the value of pairwise comparison of Cheffe Test, it was found that the difference in means between economics and agriculture equalled .06, between economics and pure sciences is .09, and between the agriculture and the pure sciences equalled .03.

Using both the Logistic Regression and ANOVA, it was found that the mean differences among the levels of discipline-specific background were significant at $\alpha = .05$. In conclusion, the null hypothesis was rejected and the alternative hypothesis indicating the significant different effects among levels of discipline-specific background (economics, agriculture and pure sciences) on reading comprehension of expository texts was not rejected.

4.4.2 Testing of hypothesis 3.2

Hypothesis 3.2, as stated in Chapter 2, postulates: ‘There are significant different effects among levels of text structure (problem-solution, causation, and collection of description) on reading comprehension of expository texts’. This alternative scientific hypothesis is tested using the null statistical hypothesis as follows: 1) $\mu \text{Text}_{\text{Prosol L1}} = \mu \text{Text}_{\text{Cau}}$, 2) $\mu \text{Text}_{\text{Prosol}} = \mu \text{Text}_{\text{Coldes}}$, 3) $\mu \text{Text}_{\text{Cau}} = \mu \text{Text}_{\text{Coldes}}$.

The ANOVA computation for the main effect of text structure on reading comprehension, as shown in testing of hypothesis 3.2, yielded a

significant effect at $\alpha = .05$ with $F = 44.478$, $p = .000$, $\omega^2 = .061$. It cannot be assumed, however, that because the main effect is significant, there is significant different effect among levels of discipline-specific background. To determine this, the Scheffe Test is used for the analysis.

Using ANOVA for data analysis using the square root transformed data of the experiment, the Means for the levels of text structure as shown in Table 4.20 were 5.19 for problem-solution, 4.95 for causation and 4.59 for collection of description. To test the different effects of the text structure levels (problem-solution, causation, collection of description) on reading comprehension, the use of Multiple Comparison tests was required given that the factor of text structure consists of more than two levels. The multiple comparison used was the Scheffe Test with significance level .05.

The matrix of the different means of the three levels of text structure as presented in Table 4.20, using ANOVA to compare the mean differences of the text structure levels with the value of Multiple Comparison Scheffe Test with significance level .05, it was found that the different means between problem-solution and causation equalled .24, between problem-solution and collection of description was .61, and between the causation and the collection of description equalled .37.

Table 4.20 Matrix of differences between means of the levels of text structure

ANOVA (BASED ON THE SQRT TRANSFORMED DATA)					
TEXT STRUCTURE	MEAN	COMPARISON	ESTIMATE	95% CONFIDENCE INTERVAL	
				LOWER BOUND	UPPER BOUND
pro-sol	5.19	pro-sol -causation	.24*	.08	.39
causation	4.95	prosol – collection of des	.61*	.45	.76
collection of des	4.59	causation – collection of des	.37*	.21	.53
LOGISTIC REGRESSION (BASED ON THE ORIGINAL DATA)					
pro-sol	.43	pro-sol -causation	.04*	.02	.05
causation	.39	pro-sol – collection of des	.09*	.08	.11
collection of des	.33	causation – collection of des	.05*	.04	.07

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

Using Logistic Regression using the original data, the Estimated Marginal Means for the levels of text structure as shown in Table 20 were: .43 for problem-solution, .39 for causation and .33 for collection of description. Comparing the mean differences of the text structure levels with the value of pairwise comparison of Cheffe Test, it was found that the difference in means between problem-solution and causation was .04, between problem-solution and collection of description was .09 and between causation and the collection of description was .05.

Using both the Logistic Regression and ANOVA, it was found that the mean differences among the levels of text structure were significant at $\alpha = .05$. In conclusion, the null hypothesis was rejected, and the alternative hypothesis indicating the significant different effects among levels of text structure (problem-solution, causation and collection of description) on reading comprehension of expository texts was not rejected.

4.4.3 Testing of hypothesis 3.3

Hypothesis 3.3, as stated in Chapter 2, postulates: ‘There are significant different effects among levels of rhetorically-oriented framework (without, with-L2, and with-L1) on reading comprehension of expository texts’. This alternative scientific hypothesis is tested using the null statistical hypothesis as follows: $\mu_{\text{pref}_{\text{with-L1}}} = \mu_{\text{pref}_{\text{with-L2}}}$, $\mu_{\text{pref}_{\text{with-L1}}} = \mu_{\text{pref}_{\text{without}}}$, $\mu_{\text{pref}_{\text{with-L2}}} = \mu_{\text{pref}_{\text{without}}}$.

The ANOVA computation for the main effect of rhetorically-oriented framework on reading comprehension, as shown in testing of hypothesis 3.3, yielded a significant effect at $\alpha = .05$ with $F = 18.117$, $p = .000$, $\omega^2 = .024$. It cannot be assumed, however, that because the main effect is significant, there is significant different effect among levels of rhetorically-oriented framework. To determine this, the Scheffe test is used for the analysis.

Using ANOVA for data analysis using the square root transformed data of the experiment, the means for the levels of rhetorically-oriented framework as shown in Table 4.21 were: 5.12 for with-L1, 4.91 for with-L2

and 4.72 for without. To test the different effects of the rhetorically-oriented framework levels (with-L1, with-L2, and without) on reading comprehension, the use of Multiple Comparison tests was required given that the factor of discipline-specific background consists of more than two levels. The multiple comparison used was the Scheffe test with significance level .05.

The matrix of the different means of the three levels of rhetorically-oriented framework as presented in Table 4.21, using ANOVA to compare the mean differences of the rhetorically-oriented framework levels with the value of Multiple Comparison of the Scheffe Test with significance level .05, it was found that the different means between with-L1 and with-L2 equalled .19, between with-L1 and without was .39, and between the with-L2 and without equalled .20.

Table 4.21 Matrix of differences between means of the levels of rhetorically-oriented framework

ANOVA (BASED ON THE SQRT TRANSFORMED DATA)					
RHETORICALLY ORIENTED FRAMEWORK	MEAN	COMPARISON	ESTIMATE	95% CONFIDENCE INTERVAL	
				LOWER BOUND	UPPER BOUND
without	4.72	without – with-L2	-.19*	-.35	-.03
with-L2	4.91	without – with-L1	-.39*	-.55	-.23
with-L1	5.12	with-L2 – with-L1	-.20*	-.36	-.04
LOGISTIC REGRESSION (BASED ON THE ORIGINAL DATA)					
without	.35	without – with-L2	-.03*	-.04	-.01
with-L2	.38	without – with-L1	-.06*	-.07	-.05
with-L1	.41	with-L2 – with-L1	-.03*	-.05	-.02

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

Using Logistic Regression to analyse the original data, the Estimated Marginal Means for the levels of rhetorically-oriented framework as shown in Table 4.21 were .41 for with-L1, .38 for with-L2 and .35 for without. Comparing the mean differences of the rhetorically-oriented framework levels with the value of pairwise comparison of Cheffe Test, it was found that the difference in means between with-L1 and with-L2 equals .03, between

with-L1 and without is .06, and between with-L2 and the without equalled .03.

Using both the Logistic Regression and ANOVA, it was found that the mean differences among the levels of rhetorically-oriented framework were significant at $\alpha = .05$. In conclusion, the null hypothesis was rejected, and the alternative hypothesis indicating the significant different effects among levels of rhetorically-oriented framework (with-L1, with-L2, and without) on reading comprehension of expository texts was not rejected.

4.4.4 Testing of hypothesis 3.4

Hypothesis 3.4, as stated in Chapter 2, postulates: 'There are significant different effects among levels of recall (English and Indonesian) on reading comprehension of expository texts'. This alternative scientific hypothesis is tested using the null statistical hypothesis as follows: $\mu \text{ Recall}_{\text{Eng}} = \mu \text{ Recall}_{\text{Indo}}$.

The ANOVA computation for the main effect of recall on reading comprehension, as shown in testing of Hypothesis 3.4, yielded a significant effect at $\alpha = .05$ with $F = 279.127$, $p = .000$, $\omega^2 = .195$. The Logistic Regression computation for the main effect of recall on reading comprehension yielded parameters as follows: Wald Chi-Square = 528.144, $df = 1$, $p = .000$, $\omega^2 = .283$. Since the factor of recall consists of two levels, the significant main effect of recall on reading comprehension has given sufficient information that the effects of recall levels on reading comprehension were different from each other.

Using ANOVA for data analysis using the square root transformed data of the experiment, the mean of English level of recall (mean = 4.47) was significantly different from that of Indonesian level of recall (mean = 5.35) as shown in Table 4.22. Similarly, using Logistic Regression for data analysis based on the original data, the Estimated Marginal Means for the levels of recall was .32 for English and .45 for Indonesian. Comparing the mean

differences between levels with the value of pairwise comparison of Cheffe Test, it was found that the different means between recall in English and in Indonesian equals -.03. This means the alternative hypothesis indicating the significant different effects among levels of recall (Indonesian and English) on reading comprehension of expository texts was not rejected.

Table 4.22 Matrix of differences between means of the levels of recall

ANOVA (BASED ON THE SQRT TRANSFORMED DATA)					
RECALL	MEAN	COMPARISON	ESTIMATE	95% CONFIDENCE INTERVAL	
				LOWER BOUND	UPPER BOUND
English	4.47	-	-	-	-
Indonesian	5.35	-	-	-	-
LOGISTIC REGRESSION (BASED ON THE ORIGINAL DATA)					
English	.32	English - Indonesian	-.13*	-.14	-.12
Indonesian	.45	-	-	-	-

CHAPTER 5

Discussion

5.1 Introduction

Reading comprehension involves a very complex process for it includes a number of abilities and skills that must work together in order to achieve accurate comprehension. Among the abilities and skills involved are the four concerns under investigation in this study. The first of these deals with text rhetorical structure in order to answer the question of how effective such structures are in facilitating reading comprehension. The second concern deals with one of the adjunct types, specifically a rhetorically-oriented framework, and the role it plays in facilitating reading comprehension. The influence of knowledge from a discipline-specific background on reading comprehension forms the third consideration of this study. And the degree to which the language of recall is influential in facilitating reading comprehension is the study's fourth and final concern. Consideration of the influences of these four main factors has been focused on the context of the reading comprehension of expository texts. A summary of the hypothesis testing is presented below.

5.2 Summary of findings

A summary of the findings resulting from the detailed data analysis discussed in Chapter 4 is presented in the three tables in this section: the interaction effects (Table 5.1); the main effects (Table 5.2); and the different effects

among levels (Table 5.3).

As the data in Table 5.1 shows, all of the interaction effects – discipline-specific background, text structure, rhetorically-oriented framework and recall – using both Logistic Regression and ANOVA, were found to be not significant.

Table 5.1 Summary of interaction effects

NULL HYPOTHESIS	LOGISTIC REGRESSION	ANOVA	$\alpha = .05$	INTERACTION EFFECT
1 There is <i>no</i> significant interaction effects of discipline-specific background, text structure, prefatory framework, and recall on the EFL reading comprehension of expository texts'				
1.1. There is no significant interaction effect of <ul style="list-style-type: none"> • discipline-specific background • text structure • rhetorically-oriented framework • recall on reading comprehension of expository texts.	.972	.994	$P > .05$	Not significant
1.2. There is no significant interaction effect of <ul style="list-style-type: none"> • discipline-specific background • text structure • rhetorically-oriented framework on reading comprehension of expository texts.	.933	.997	$P > .05$	Not significant
1.3. There is no significant interaction effect of <ul style="list-style-type: none"> • discipline-specific background • text structure • recall on reading comprehension of expository texts'	.421	.825	$P > .05$	Not significant
1.4. There is no significant interaction effect of <ul style="list-style-type: none"> • discipline-specific background • rhetorically-oriented framework • recall on reading comprehension of expository texts	.590	.880	$P > .05$	Not significant
1.5. There is no significant interaction effect of <ul style="list-style-type: none"> • text structure • rhetorically-oriented framework • recall on reading comprehension of expository texts	.596	.839	$P > .05$	Not significant
1.6. There is no significant interaction effect of <ul style="list-style-type: none"> • discipline-specific background • text structure on reading comprehension of expository texts	.890	.974	$P > .05$	Not significant
1.7. There is no significant interaction effect of <ul style="list-style-type: none"> • discipline-specific background • text structure • prefatory framework on reading comprehension of expository texts	.968	.987	$P > .05$	Not significant

NULL HYPOTHESIS	LOGISTIC REGRESSION	ANOVA	$\alpha = .05$	INTERACTION EFFECT
1.8. There is no significant interaction effect of <ul style="list-style-type: none"> discipline-specific background recall on reading comprehension of expository texts	.101	.467	$P > .05$	Not significant
1.9. There is no significant interaction effect of <ul style="list-style-type: none"> text structure rhetorically-oriented framework on reading comprehension of expository texts	.919	.975	$P > .05$	Not significant
1.10. There is no significant interaction effect of <ul style="list-style-type: none"> text structure recall on reading comprehension of expository texts	.086	.246	$P > .05$	Not significant
1.11. There is no significant interaction effect of <ul style="list-style-type: none"> rhetorically-oriented framework recall on reading comprehension of expository texts	.309	.554	$P > .05$	Not significant

As the data in Table 5.2 shows, all of the main effects of all four factors – discipline-specific background, text structure, rhetorically-oriented framework and recall – when analysed using both Logistic Regression and ANOVA, were significant.

Table 5.2 Summary of main effects

ALTERNATIVE HYPOTHESIS	LOGISTIC REGRESSION	ANOVA	$\alpha = .05$	INTERACTION EFFECT
2 There <i>are</i> significant main effects of discipline-specific background, text structure, rhetorically-oriented framework, and recall on the EFL reading comprehension of expository texts'				
2.1 There is a significant main effect of <ul style="list-style-type: none"> discipline-specific background on reading comprehension of expository texts	.000	.000	$P < .05$	Significant
2.2 There is a significant interaction effect of <ul style="list-style-type: none"> text structure on reading comprehension of expository texts	.000	.000	$P < .05$	Significant
2.3 There is a significant interaction effect of <ul style="list-style-type: none"> rhetorically-oriented framework on reading comprehension of expository texts	.000	.000	$P < .05$	Significant
2.4 There is a significant interaction effect of <ul style="list-style-type: none"> recall on reading comprehension of expository texts	.000	.000	$P < .05$	Significant

The data in Table 5.3 indicates, all of the different effects among levels of the factors – discipline-specific background, text structure, rhetorically-oriented framework, and recall – after analysis using both Logistic Regression and ANOVA, were significant.

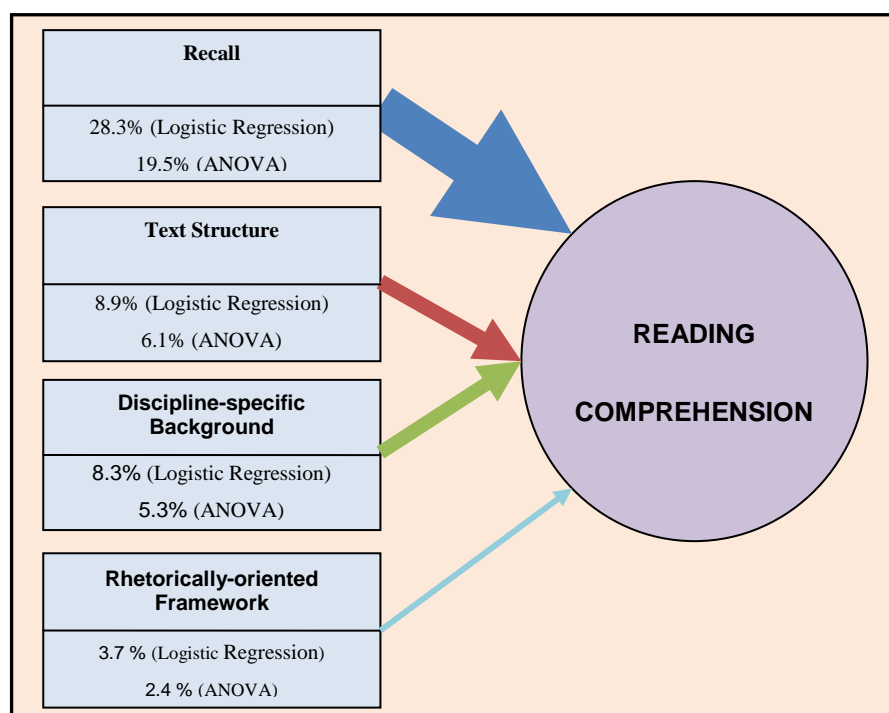
Table 5.3 Summary of different level effects

ALTERNATIVE HYPOTHESIS	LOGISTIC REGRESSION		ANOVA		$\alpha = .05$	INTERACTION EFFECT
	Comparison	Estimate	Comparison	Estimate		
3 There are significant different effects of discipline-specific background levels (economics, agriculture, and pure sciences) on reading comprehension of expository texts.						
3.1 There are significant different effects among levelsof <ul style="list-style-type: none">discipline-specific background levels (economics, agriculture, and pure sciences) on reading comprehension of expository texts	Eco-Agri	.06	Eco-Agri	.36	P > .05	Significant
	Eco-PS	.09	Eco-PS	.56	P > .05	Significant
	Agri-PS	.03	Agri-PS	.20	P > .05	Significant
3.2 There are significant different effects among levelsof <ul style="list-style-type: none">text structure levels (problem-solution, causation, and collection of description) on reading comprehension of expository texts	Prosol-Causation	.04	Prosol-Causation	.24	P > .05	Significant
	Prosol-Coll Des	.09	Prosol- Coll Des	.61	P > .05	Significant
	Causation-Coll Des	.05	Causation-Coll Des	.37	P > .05	Significant
3.3 There are significant different effects among levelsof <ul style="list-style-type: none">rhetorically-oriented framework levels (without, with-L1, and with-L2) on reading comprehension of expository texts	With-L1-With-L2	-.03	With-L1-With-L2	-.20	P > .05	Significant
	With-L1-Without	-.06	With-L1-Without	-.39	P > .05	Significant
	With-L2-Without	-.03	With-L2-Without	-.19	P > .05	Significant
3.4 There are significant different effects among levelsof <ul style="list-style-type: none">recall levels (English and Indonesian) on reading comprehension of expository texts	Eng-Indo	-.13	Eng	Mean = 4.47	P > .05	Significant
	Eng	-	Indo	Mean = 5.35	P > .05	Significant

As is highlighted in these tables, whilst none of the interaction effects were significant, all the main effects and different effects among levels of factors were significant. Additionally, significant differences in the relative importance of the four factors in facilitating reading comprehension were directly identified. These differences were derived from the results of hypothesis testing (Hypothesis 2) in relation to the main effects of all the

investigated factors on reading comprehension. Using the results of both Logistic Regression and ANOVA analyses, it was determined that recall was the most influential of all factors, that text structure was the second most influential, followed by discipline-specific background and with rhetorically-oriented being the least influential (See Figure 5.1). It can also be noted that Logistic Regression consistently attributed a higher proportion of variance for each factor (on average 50% larger than the ANOVA results in each case) but with the order of influence of the factors remaining the same.

Figure 5.1 Proportion of the variance accounted for by each factor in explaining reading comprehension using Logistic Regression and ANOVA



In this chapter, the findings of the present study are discussed by comparing them with relevant previous research findings and by considering them within the context of the relevant theories. This discussion comprises the following: a consideration of the interaction effects (which were not statistically significant), and a detailed discussion of the main effects and the different effects among levels of the factors (each of which was found to be

statistically significant). Discussion of each of the main findings is presented below.

5.3 Text structure

Text structures for expository texts – formal schemata – have been identified in different categorisations in different research studies, as previously discussed in Chapter 2. This section is chiefly concerned with the main effects of text structures on reading comprehension, as well as different effects among levels of factors in the three selected text structure types: problem-solution, causation and collection of description.

5.3.1 Main effect of text structure on reading comprehension

The present study found there to be a significant main effect of text structure on reading comprehension. This finding is consistent with most previous research findings on the effects of text structure on both L1 and L2 reading comprehension. In L1 reading comprehension, Meyer, Brand and Bluth (1980) – studying secondary students – and Meyer and Freedle (1984) – studying college students – all found that text structure affected reading comprehension. Similarly, in L2 research across a number of research designs, there has been much evidence of text structure positively affecting reading comprehension (Carrell 1984; Foo 1989; Goh 1990; Sharp 2002; Talbot, Ng & Alan 1991). Recent studies, such as Hallam (2000), Kobayashi (2002), Kendeou and Van den Broek (2007), Sharp (2004) and Wylie and McGuiness (2004), which have each adopted complex designs that consider a range of schematic and other factors, have generally concluded that text structure is a main effect facilitating reading comprehension. McNamara and Kintsch (1996) and Cekik (2007), however, found no main effect for formal schemata, and McNamara and Kintsch found an interaction effect between formal and content schemata. The findings of McNamara and Kintsch and Cekik, which were different from the present study finding in terms of the

main effect of formal schemata, can be accounted for as being due to the different research design in terms of variability investigated. In their studies the factor of content schemata was directly investigated as the main variable, whereas in the present study the factor of content schemata was only controlled.

The present study's finding of the significant main effect of formal schemata on reading comprehension provides further support to theory concerning the role of formal schemata in facilitating reading comprehension. The role of text structures, or formal schemata, has been supported as an essential influencing factor enabling the reader to understand the message conveyed by the text not only in an L1 (Bodycott 1997; Meyer & Freedle 1984; O'Reilly & McNamara 2002; Peregoy & Boyle 2000) but also, in an L2 (Carrell 1998b, Kobayashi 2002; Sharp 2004), because text structure facilitates the reader's ability to distinguish the informational organisation of the text, particularly when differentiating between important and unimportant information within the text (Leon & Carretero 1995). Dole et al. (1991) show that having awareness of formal schemata is an important element for effective comprehension. Sharp (2002) further indicates that this type of schemata is an element of the macrostructure of a text which aids the reader in comprehending the intended message of the writer.

5.3.2 Different effects among levels of text structure on reading comprehension

The present study found a significant different effect among levels of text structure, with the most tightly structured text (in this case, problem-solution) better at facilitating readers' comprehension than the least tightly structured text (collection of description); the third type, causation, was intermediate to the other structures for comprehension. Previous L1 reading studies have conclusively found that more tightly structured texts are easier to comprehend (Meyer & Freedle 1984; Meyer, Brandt & Bluth 1980; Meyer, Marsiske & Willis 1993). With L2, however, the findings are less consistent.

For example, whilst some studies have found that more tightly structured texts are easier to comprehend (Carrell 1984; Foo 1989; Lee and Riley 1990; Zhang 2008), others have found that the more tightly structured texts are not always better in facilitating readers' comprehension (Caillies, Denhiere & Jhean-Larose 1999; Kobayashi 2002; Linderholm et al. 2000; Sharp 2004).

The inconsistency of the findings on the different effects among levels of text structure on reading comprehension appears to be due to differences in both the type of response formats adopted as measures of comprehension, and in the readers' proficiency levels. For example, Kobayashi (2002), using open-ended questions, and including a loosely organized text structure referred to as association, found that the loosely structured association text was the easiest for both higher and lower L2 proficiency readers. By contrast, using a cloze test with higher L2 proficiency students, the more tightly structured text was found to lead to better comprehension, whereas the more loosely organised texts sometimes generated better performance from the lower L2 proficiency students. Similarly, Wylie and McGuinness (2004), using recall in different formats – immediate and delayed – to study different text types, found a different ranking order of performance on the text types in each recall formats. The above findings clearly contrast with the findings of the present study, which has only used immediate recall as a measure. In fact, the present study's finding is consistent with those of others who used the immediate recall format (Carrell 1984, Foo 1989; Lee and Riley 1990, Zhang 2008), which has shown that more organised texts are better recalled than less organised texts. This suggests that, in immediate response contexts, formal schemata are most influential in supporting L2 reading comprehension, whereas when recall is delayed, other aspects of memory and cognitive processing in L2 become more influential.

Additionally, readers' proficiency levels contribute different effects among levels of reading comprehension. Caillies, Denhiere and Jhean-Larose (1999) found that advanced readers performed better in a hierarchically organised text version than they did in a causally organised text version;

intermediate and beginner learners, on the other hand, performed better in the causally organised version. The performance of the advanced learners was more similar to that of the intermediate learners than to the beginner learners in the causally organised version. Linderholm et al. (2000), who investigated the effect of causally repaired easy and difficult text on more and less skilled readers, found that both sets of readers were affected by the causally repaired difficult text, but not by the causally repaired easy text. Both studies showed contrasting findings among text structure types in association with proficiency levels – where the findings were varied, indicating that the role of text structure types in facilitating reading comprehension is inconsistent. These findings contrast the present study findings where it was revealed that text rhetorical structure consistently affected the reading comprehension of the research participants. In the present study, the participants' L2 proficiency levels were controlled, so were not directly functioning as a variable of the study (although refer to Section 5.5 for further discussion of this).

5.4 Rhetorically-oriented framework as an adjunct

Pre-reading is a concept that relates to schema activation. As discussed in detail in Chapter 2, three types of pre-reading are commonly recognised: background information, advance organisers and adjunct aids. Although they are +different in form, they can be understood to belong to a single category (pre-reading) as they function to activate schemata (in this case both formal and content schemata) in order to foreground relevant prior knowledge. Many studies have attempted to investigate the effect that pre-reading content has on clarifying reading comprehension. For this study an adjunct was presented in the form of an advance organiser providing a rhetorically-oriented framework in three different forms.

Discussion in this section focuses on the main effect and the different effect on reading comprehension among levels of the adjunct of a

rhetorically-oriented framework in three different treatments: without adjunct, with-L1 adjunct and with-L2 adjunct. These two major aspects are discussed below by comparing them with the relevant theoretical bases and with previous research findings into the effect of adjuncts on reading comprehension.

5.4.1 Main effect of rhetorically-oriented framework as adjunct on reading comprehension

This study has found that the influence of the main effect of a rhetorically-oriented framework as an adjunct on reading comprehension is significant. This finding is consistent with the majority of the previous research findings on the effects of pre-reading on reading comprehension, in whatever forms and designs they may take (Armbruster & Boothby 1991; Baxendell 2003; Chun and Plass 1996; Geva 1983; Hanley, Herron, and Cole 1995; Kiewra et al. 1997; Tang 1992). In contrast, Lee and Riley (1990), when examining the effect of a rhetorically-oriented framework on L2 reading with native speakers of English (L1) studying French (L2), contradict the present study's finding, by indicating no influence as a main effect of rhetorically-oriented framework as one of adjunct types, on reading comprehension. Their study adopted an experimental three factorial design using immediate written recall in the participants' native language as a measure. In terms of research design and response format used, both the present study and theirs appear to be, in some respects, similar. A possible explanation for the contrast of Lee and Riley's findings with the present study is a difference in their utilisation of the types of rhetorically-oriented framework. Lee and Riley adopted three levels in their types of rhetorically-oriented framework: extended and minimum and no rhetorically-oriented framework. The present study, on the other hand, used three types of rhetorically-oriented frameworks, but specifically incorporated L1 versus L2 as distinctive formats in addition to the equivalent no rhetorically-oriented framework. The first two levels, with-L1 and with-L2, of the present study are actually variations of the extended

rhetorically-oriented framework as utilised by Lee and Riley, since the extended rhetorically-oriented framework includes information of the text content and the structure used within the forthcoming text.

A source of evidence in support of the main effect of rhetorically-oriented framework on L2 reading comprehension is research on text structure awareness (Carrell 1992; Meyer & Poon 2001; Tang 1992). In the Indonesian context, based on the researcher's experience, there is a focus in teaching English (commencing at secondary school and continuing to university level) on the many different types of text structure to provide students with appropriate background knowledge to support their reading activities. It appears that such focus may have been valuable in contributing to the development of pre-reading skills associated with an adjunct – a rhetorically-oriented adjunct, in particular – and thereby may have contributed to it being a main effect within this study, albeit contributing only a small amount to variance in comparison to other factors.

The present study findings provide support to theoretical perspectives concerning the efficacy of various pre-reading types on reading comprehension. In relation to the role of adjunct displays, for example, Kester et al. (2006) indicate that this pre-reading type has great promise for progressing the relational information process and facilitating comprehension and memory of the text, thus enabling significant learning to be maintained. Similarly, graphic organisers, as one of the forms of adjunct displays, are said to be predominantly effective because they can present the whole, related key points of the text (Jones, Pierce & Hunter 1988/1989) and create for readers' a logical description, thus easing their comprehension of the text with which they are confronted (Pretorius 2006). Similar views have also been addressed to other pre-reading types, such as an advance organiser focused on awareness of text structure. According to Grabe (2003) and Trabasso and Bouchard (20021), text structure awareness has proved to be facilitative in enhancing comprehension. It has also been demonstrated that students' awareness can be gained via training, (e.g. Carrell 1992; Meyer &

Poon 2001; Tang 1992). With regard to advance organisers, this type of pre-reading, in particular, can encourage learning because it benefits readers by linking what they already know (background knowledge) to what they wish to know from the text (new information) (Kloster & Winne 1989; Caverly 1997; Paik 2003; Ausubel 1963).

In sum, the various pre-reading types are important and facilitate comprehension, and so should be taken into consideration for their capacity to enhance L2 readers' comprehension. The findings in this study support the effectiveness of a rhetorically-oriented framework designed on the basis of Schema Theory.

5.4.2 Different effect among levels of rhetorically-oriented framework on reading comprehension

The present study found a significant different effect among levels of rhetorically-oriented framework on reading comprehension, with the effect of the with-L1 rhetorically-oriented framework being superior to the other levels; and the with-L2 rhetorically-oriented framework better facilitating reading comprehension than the level without a rhetorically-oriented framework. To the writer's knowledge, there has been no other L2 reading study of adjuncts which compares the variants of the same rhetorically-oriented framework in L1 (readers' native language) and L2 (readers' target language). Thus, it is not possible to directly compare the results of the present study with others; however, the finding that the use of an adjunct designed to activate formal and content schemata is more effective in the learners' L1, such as was the case for the learners in this study, is an important one that is capable of application to support the presentation of texts to facilitate L2 reading comprehension.

In terms of whether different levels of *any adjuncts* impact on L2 reading comprehension, aside from the language used within the levels under investigation, the present study result confirms a number of previous research findings. These concern the provision of an adjunct versus the employment

of no adjunct or an adjunct not directly focused on schema activation. Among the studies supported by the present study are: Marefat and Ghahari (2009), which compares texts with and without adjunct displays; Rawson and Kintsch (2002), which compares issue information versus non-issue information; Karakas (2009), which compares a previewing/brainstorming condition and brainstorming only condition; and part of Lee and Riley (1990), specifically, that which compares an expanded rhetorically-oriented framework, a minimum rhetorically-oriented framework and no rhetorically-oriented framework, to find there to be a significant different effect between the expanded and the minimum and between the expanded and the rhetorically-oriented framework, but no different effect between the minimum and the no rhetorically-oriented framework.

5.5 Discipline-specific backgrounds

Discipline-specific background, as one of the factors investigated in this study, was considered in the case of students from three disciplines: Economics, Agriculture and Pure Sciences. Discussion in this section focuses on the main effect and the different effect among levels of discipline-specific background on reading comprehension. The discussion is a comparison of the findings related to the theoretical basis and the previous research findings within this area.

5.5.1 Main effect of discipline-specific background on reading comprehension

The present study finds a significant main effect of discipline-specific background on reading comprehension. The finding provides support to some of the previous research findings dealing with the significant independent role of discipline-specific background in facilitating reading comprehension. Three important studies – Alderson and Urquhart's (1985) investigation of the performance of readers' background knowledge, Hale's (1988) study into

the effects of students' major disciplinary fields and text contents on their English as Foreign Language (EFL) reading performance, and Uso-Juan's (2006) research of the contribution of discipline-related knowledge and English language proficiency to English for Academic Purposes (EAP) reading comprehension – have found that the role of the readers' discipline-specific background is significant in facilitating reading comprehension. This has been a consistent finding, even though each of these three studies was carried out with different designs and different related factors. Uso-Juan (2006) and also Tan (1990) consider readers' content specialisations and language proficiency and both conclude that language proficiency is a better predictor of comprehension than the participants' specific disciplinary knowledge. In contrast, Alderson and Urquhart (1985) find the influence of the level of language proficiency in facilitating reading comprehension for students of various discipline-specific backgrounds to be insignificant. One possible explanation for these differences might be the test materials that were used across the respective studies. Tests based on readers' specialisations, as in the case of Tan (1990) and Uso-Juan (2006), seem to be more valid because the test materials are designed for the intended test takers, whereas standardised tests like the International English Language Testing System (IELTS) used by Alderson and Urquhart (1985) their study, have more general characteristics and content, which is sometimes unfamiliar to the test takers.

In the case of the present study the test content was designed to be accessible to all of the participating students, suggesting that language proficiency issues may account for the findings. Whilst all participating students were required to have met a certain threshold for English proficiency based on them having passed the EAP and BCS subjects, based on the researcher's knowledge of the context and given that there was no actual proficiency test administered, it is considered possible that the average proficiency of students in some faculties may well have been superior to others.

5.5.2 Different effect among levels of discipline-specific background on reading comprehension

The present study found different effects among levels of discipline-specific background on reading comprehension. Superficially, the findings in this study appear to somewhat contradict those of Alderson and Urquhart's (1985) study of three groups of students in different disciplines – business and economics, science and engineering, and liberal arts – in that the economics students performed better than those in pure sciences. However, but it is important to recognize that Alderson and Urquhart's main study (study 3) included measures of general proficiency as well as performance on texts with different disciplinary foci that were closer or more distant to their own disciplines. Alderson and Urquhart (1985, p. 201) argue that the test outcomes provide evidence of 'an interaction between background knowledge and linguistic proficiency'.

In the present study, the design intended to control for the participants' content familiarity through their completion of the same basic cultural science subject, and as all had passed an EAP unit so it was assumed that all had a shared base level of English proficiency, regardless of their disciplines. However, if we consider Alderson and Urquhart's findings and the differential recall results across the three Indonesian discipline-specific background groups, it may be that the economics students either were, on average, more proficient in English than the other groups, or the nature of the text (social science) made it more accessible to them given the social science based of economics, or underlying differences between the groups were evident in both these intersecting parameters.

5.6 Recall as a means of reading comprehension measure

The focus of discussion in this section is on the findings of the effect of the language of recall which took place in either Indonesian or English. The discussion predominantly deals with the main effect of recall on reading

comprehension, and different levels of recall in facilitating reading comprehension.

5.6.1 Main effect of recall on reading comprehension

The present study has found a significant main effect of recall on reading comprehension. This supports several previous studies whose results showed significant main effects of recall in different languages on reading comprehension. Lee (1986), using two different languages of recall, found a significant effect of language of recall on reading comprehension. Fecteau's (1999) investigation of the English and French reading comprehension and inferencing skills of native English speakers' versions of text and language combination used two different response formats: recall and multiple choice questions. The results show better recall of L1 than L2 texts. In contrast, Brantmeier (2006), after investigating the effects of different language of written immediate recall in advanced L2 instruction and the effects of L2 reading performance in relation to L1 reading achievement, finds no significant main effect for the language of recall on performance, but a main effect for L2 reading achievement on overall performance, and a main effect for L2 reading achievement on recall score. The present study finding, then, is consistent with that of Lee's and of Fecteau's findings, but is inconsistent with Brantmeier's finding. This is further indication of learners' proficiency in L2 being a contributor to their recall capacity.

The present study supports theory that posits a role for recall in comprehension, when it is used as a response format. It is reasonable to judge that the immediate recall protocol is a potential measure of reading comprehension. Bernhardt (1991, p. 200) indicates that an immediate written recall protocol that is written in the learners' native language is as a valid measure for reading comprehension, because 'a free recall measure provides a purer measure of comprehension, uncomplicated by linguistic performance and tester interference'. In the context of the use of recall, this suggests that immediate written recall can avoid miscomprehension due to the reader's

lack of grammar, as it avoids focusing the reader's attention on the linguistic elements in texts (Bernhardt 1991). That is why immediate written recall is generally regarded as the 'most straightforward assessment of the result of the text-reader interaction' (Johnston 1983, p. 54). All the characteristics of free written recall and the present study findings support this method as cognitive psychology's most powerful tool for tracking psychological processes (Hayes in Bernhardt 1991). The recall protocol as a reading measure is also assumed to have more benefits than other more conventional reading assessments. According to Harris and Smith (1986), free written recall is a method of assessing reading comprehension that allows us to know what and how comprehension occurs. It appears that when recall, as opposed to other measures is used for assessing reading comprehension of any schemata types, contrasting findings are the outcome (See, for example, Chang 2006; Sharp 2004; Wylie & McGuinness 2004).

5.6.2 Different effect among levels of recall on reading comprehension

The present study found a significant difference between the recall levels in facilitating reading comprehension, indicating that recall in L1 better facilitates readers' comprehension than in L2. This finding provides support to several previous research findings. Brantmeier (2006), investigating the effects of different languages using written immediate recall for advanced L2 instruction, found that the contribution of L2 reading performance was 16% in L2 written recall and 28% in L1 written recall, indicating that there is significant different effect between the languages of recall. Similarly, Lee (1986), using two different languages of recall, found a significant effect of language of recall on reading comprehension, where texts were better recalled in L1 than they were in L2. Similarly, Fecteau (1999), investigating English and French reading comprehension and the inferencing skills of native English speakers, finds text to be better recalled in L1 (65%) than in

L2 (33%). These findings indicate that using the learners' more familiar language for recall generates higher levels of recall.

The present study's finding is also in line with theory related to the language of recall. Bernhardt (2005) claims that one variable among the complex variables involved in L2 reading is language of assessment. Alderson (1984, 2000) asserts the importance of using the readers' native language as the language of recall if they are not proficient enough in L2 to eliminate readers' inadequacy of production skills. Based on previous research findings, for Indonesian speakers with intermediate proficiency, such as these, the most suitable language for recall is Indonesian, and the findings confirm this. Shohamy (1984) also confirms this approach to recall by recommending that questions – not only for the recall task, but also for other fixed test methods, like comprehension questions and open-ended questions – which are written in the readers' native language are much easier to recall than those written in the readers' target language; readers are also more comfortable and less nervous in such a test. Similarly, Lee (1986) recommends, especially for L2 readers in the intermediate level of language proficiency, the use of the readers' native language to avoid underestimating and distorting the second language comprehension. In contrast, Roller and Matambo (1992) found the language of written recall in L2 to be easier than in L1 for L1 readers' of the Zimbabwean Shona language, who were proficient in English L2. Based on this finding, recall in L2 is not at all times worse than recall in L1. This suggests that Alderson's (2000, p. 230) assertion that 'the recall should be completed in the test taker's L1 because otherwise it becomes a test of writing instead of reading' (Alderson 2000, p. 230), needs to be reconsidered, and to be more nuanced in relation to how proficient a reader is with the language used in recall.

In relation to the present study's finding that L1 recall is better than L2 recall, the transfer of L2 readers' English language proficiency, their L1 reading ability and strategy transferred from L1 to L2 reading might be considered to be other factors contributing to reading comprehension (Kong

2006; Upton & Thomson 2001; Walter 2004). This transfer seems to be empirically conditional, due to some other potentially influencing factors, such as linguistic knowledge, reading strategy or proficiency levels (Alderson 2000; Bernhardt & Kamil 1995; Block 1986; Schoonen, Hulstijn & Bossers 1998; Ulijn & Slager-Meyer 1998; Upton & Thompson 2001; Yamashita 2002). It is claimed that only L1 reading skills are transferable to L2 reading, while L1 linguistic knowledge is not, and that this is because L1 reading ability is comprehensively constructed by linguistic knowledge and general reading skills (Schoonen, Hulstijn & Bossers 1998). Similarly, Yamashita (2002) indicates that L1 reading proficiency and L2 linguistic knowledge show complex interaction, and that L2 reading is a matter of, not only linguistic knowledge, but also of reading strategies (Ulijn and Slager-Meyer 1998). Accordingly, Block (1986), Alderson (2000) and Bernhardt and Kamil (1995) indicate both linguistic knowledge and reading strategies are factors influencing reading comprehension. In addition, Upton and Thompson (2001), find that L1 for both intermediate and advanced learners plays a significant role in L2 reading tasks, but that for L1 post-ESL learners the L1 role was almost not significant.

For the present study, the use of different language of recall by allowing for the influence of linguistic knowledge, proficiency levels and reading strategy can be assumed to have been beneficially affecting the use of L1 as opposed to L2 recall. Readers who are more proficient in L2, and/or in L1 reading strategies, may be less reliant on the use of L1 recall, because, according to Walter (2004), the ability to build a well-structured mental representation is transferable to L2 by upper-intermediate proficiency groups and not by the lower-intermediate proficiency group. Similarly, only those with moderate to high L2 proficiency levels frequently transferred their strategy use from L1 to L2 reading. Thus, it can be interpreted that the gap between the use of L1 and L2 recall lessens as readers improve their linguistic knowledge and reading strategy.

5.6.3 Interaction Effects

In this study four factors were brought together into a single research design to examine the effects of text structure, a rhetorically-oriented framework, discipline-specific background and the language of recall on reading comprehension. This single design addressed three main research questions, as stated in Chapter 1, one being ‘What are the interaction effects of discipline-specific background, text structure, rhetorically-oriented framework or recall on the EFL reading comprehension of expository texts?’. Three primary hypotheses were tested in relation to four-way interaction, three-way interaction and two-way interaction effects on reading comprehension. Based on the hypotheses testing, all of the interaction effects were found to be not significant, meaning that the relationship among factors in facilitating reading comprehension is independent, in the sense that outcomes from one factor do not depend on the others. The relationships of all of the interactions the factors in facilitating reading comprehension can be seen in Chapter 4.

The researcher has been unable to locate any study investigating the respective four factors in a single design thus far. For this reason, the present study’s finding on the lack of a four-way interaction effect between these respective factors represents new knowledge that cannot be directly compared to previous research findings. Similarly, for all the three-way interactions, no study has been found with a similar design addressing similar factors, and so the finding of no three-way interactions also constitutes new knowledge and that has no direct comparison to previous studies. Although, there are a number of studies examining single factors, or various collaborations of pairs of factors, in their design, only one revealed an interaction effect. McNamara and Kintsch (1996) found a significant interaction effect between content and formal schemata, but no main effect for either. This finding cannot be compared to the present study since the present study did not directly investigate the factor of content in collaboration with text structure, but rather the content was controlled.

5.6.4 Generalised Linear Models versus Transformations

A distinctive feature of the analysis here has been the use of two different statistical methods to determine effects of the four factors: analysis of the square root of the dependent variable using methods appropriate for normally distributed variables with homogeneous variances; and Logistic Regression – a particular example of a Generalised Linear Model.

Maindonald and Braun (2011, p. 279) contrast the two approaches:

Transformations were at one time commonly used to make count data amenable to analysis using normal theory methods. Generalized linear models have largely removed the need for such approaches. They are, however, still sometimes a useful recourse.

They outline the main transformations that are used:

The square root transformation: —

The angular transformation: —

The probit or normal equivalent deviate:

The logit transformation: —

The complementary log-log transformation: .

The last four are specifically for proportion data. Despite this, the simpler square root transformation has been used. The correlation between the square root and angular transformation is over 0.98, so similar results will be obtained. In addition, since

the bias in ‘back-transforming’ has a simpler form than the square root transformation.

McCullagh and Nelder (1989, pp. 22-3) also comment:

The choice of scale for analysis is an important aspect of model selection. ... In classical regression analysis a good scale should combine constancy of variance, approximate normality of errors and additivity of systematic effects....in the analysis of discrete data where the errors are well approximated by the Poisson distribution, the systematic effects are often

multiplicative. Here $\sigma^2 = \mu$ gives approximate constancy of variance, $\sigma^2 = \mu^2$ does better for approximate symmetry or normality, and $\sigma^2 = 1/\mu$ produces additivity of the systematic effects. Evidently, no single scale will simultaneously produce all the desired properties.

With the introduction of generalized linear models, scaling problems are greatly reduced. Normality and constancy of variance are no longer required, although the way in which the variance depends on the mean must be known. If the data was binomial, then the variance is given by

although it is usual to allow over-dispersion

with McCullagh and Nelder (1989, pp. 124-5) explain that

By the term ‘over-dispersion’ we mean that the variance of the response exceeds the nominal variance—in this case the nominal binomial variance, $\sigma^2 = \mu(1-\mu)$. Over-dispersion is not uncommon in practice.[...] Unless there is good external reason for relying on the binomial assumption, it seems wise to be cautious and to assume that over-dispersion is present to some extent unless and until it is shown to be absent.

There are a number of reasons why the binomial assumption is unlikely, including the heterogeneity of the students, the heterogeneity of the idea units and the correlation between the idea units.

In the following analysis, however, it can be shown that

and hence a generalised linear model can be used to model the data.

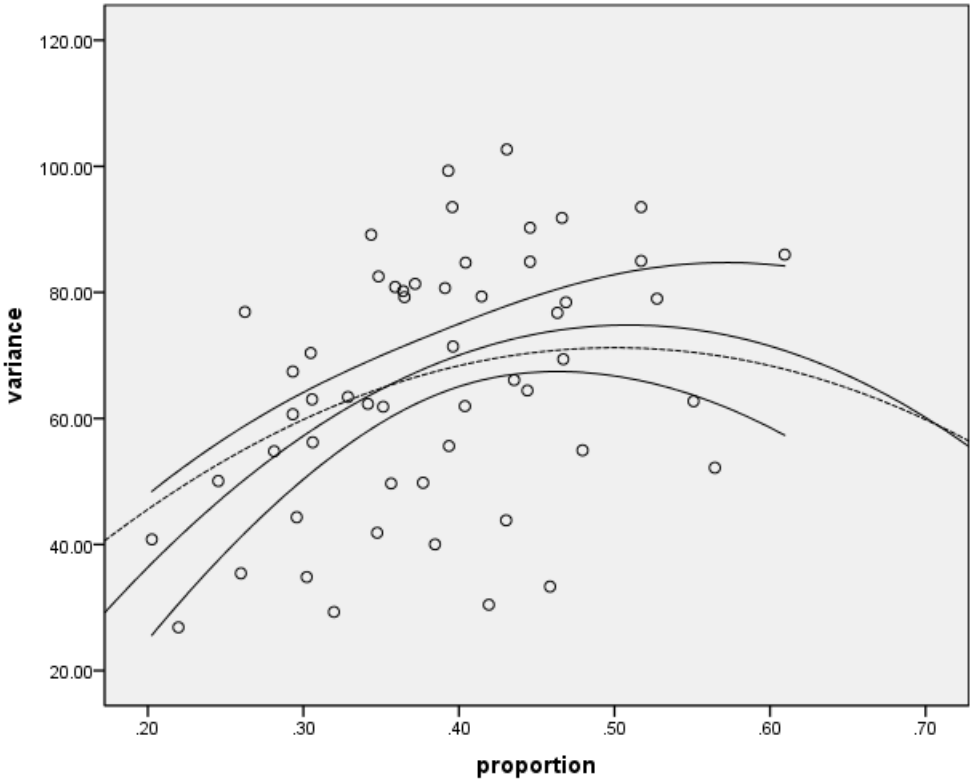
Figure 1 shows the sample variances of the 54 groups of this study versus the corresponding sample means. The best fitting quadratic equation and associated 95% confidence band are also shown on the graph. Also shown on the graph is the curve following the equation

where p is the proportion of idea units recalled and the constant 284.86 is the mean value of

$$\frac{\sum_{i=1}^n (p_i - \bar{p})^2}{n-1}$$

Note that the curve corresponding to the equation falls within the confidence band. This shows that the generalised linear model approach is valid for this data.

Figure 5.2 Relationship between estimated proportion for the 54 groups and sample variance.



The solid lines represent the best fitting quadratic relationship for the variance as a function of the proportion, with an associated 95% confidence band. The dotted line corresponds to $\sigma^2(p)$, the mean-variance relationship assumed in the fitting of a generalised linear model, where $\sigma^2(p)$ is the variance of the response variable. Note that the dotted line is within the confidence band

over the range of the data, indicating that a generalised linear model is appropriate.

Both methods for data analysis yielded identical results in terms of the significance of the factors and levels; however, in terms of the percentage of the factors which explained the variability in reading comprehension, Logistic Regression yielded stronger results than the ANOVA on a transformed response for all factors. The percentage of each factor that explains the variability in reading comprehension, as stated in the summary section, shows that the total percentage of the relative importance of the four factors is approximately 33% (ANOVA on a transformed response) and 49% (Logistic Regression) in explaining reading comprehension. The use of both methods is actually very comparable, and the results relating the proportion of the percentage of each factor using Logistic Regression are quite confident. Thus, the use of Logistic Regression when compared with the use of ANOVA on a transformed response is much more robust and is considered to be worthy for data analysis in collaboration with any experimental designs, particularly in research with factorial designs. Furthermore, based on these results, approximately 67% (ANOVA on a transformed response) and 51% (Logistic Regression) of the factors affecting reading comprehension are left unanswered. This situation is a source of encouragement for other researchers in the area of reading comprehension to uncover some of the possible factors affecting reading comprehension that are still to be found.

Traditionally, in experimental research, and especially research using factorial designs, ANOVA has usually been the tool of choice. Based on the results of the present study which used the two methods discussed, it is the Logistic Regression which has been identified as the more robust in comparison with ANOVA on a transformed response. A preference for using Logical Regression for data analysis on the transformed response comes not only from it being more sensitive when used in isolation but also in that it is less rigid in terms of the assumptions required prior to its use for data analysis. It is not unreasonable then to suggest that Logistic Regression is

more preferable for data analysis, particularly for factorially designed research studies.

CHAPTER 6

Conclusions

6.1 Introduction

This study was carried out with the aim of drawing on knowledge from reading theory to improve reading pedagogy and reading task design by developing knowledge that will support better stimulation of readers' abilities to read efficiently. In order to build up systematic knowledge of reading improvement, an experimental study was designed for investigation of the role of text factors (text structure and rhetorically-oriented framework) and of the language of recall, in facilitating reading comprehension across a group of Indonesian EFL tertiary students with three different discipline-specific backgrounds. The findings show no significant interaction effects, but the main effects of all the independent variables on reading comprehension are significant, as are the different effects among the levels of the various factors. The findings are useful for increasing knowledge and appreciation of the relative importance of the role of text factors and the language of recall in facilitating reading comprehension.

6.2 Summary of the thesis

Being a proficient reader of English is vital for the purposes of seeking current knowledge and gaining access to technology in any person's professional field or discipline. Indonesians desiring to pursue their studies at tertiary level, must, therefore, demonstrate a good understanding of English

texts and so tutelage is provided. Yet, despite this, most Indonesian students still find reading English texts a great challenge. One possible way to address students' reading deficiency is to draw on knowledge from reading theories to boost reading pedagogy and reading task design and thereby better trigger the readers' inherent capabilities to read efficiently.

There is considerable empirical evidence from previous studies to support the importance of schemata in facilitating reading comprehension; however, from the studies previously conducted, it was noted that no controlled study had been undertaken to investigate the main and interaction effects of the text factors associated with schemata on the reading comprehension of expository texts using recall techniques, in both the student's native and target languages, across discipline-specific backgrounds. For the benefit of reading theory and reading instruction, further research-based information from such a single controlled study entitled and investigating 'Cross Disciplinary Effects of Text Factors and Recall on Reading Comprehension of Expository Texts' was considered to be worthwhile and to hold the potential to contribute new knowledge. The main concern of this study has been to investigate how discipline-specific background, text structures, the use of rhetorically-oriented framework and the language of recall, affect reading comprehension outcomes for tertiary level English as a Foreign Language (EFL) students in an Indonesian university context.

This study specifically investigates the main effects, interaction effects and different effects on reading comprehension of expository texts among various levels of four factors: discipline-specific background, text structure, rhetorically-oriented framework and recall... It was designed drawing on two theoretical frameworks: the Schema Theory model of reading for the reading process and content structure analysis as an approach and procedure for analysing the rhetorical structure of the text. As discussed in detail in Chapter 2, in Schema Theory, reading is defined as an interactive process between the reader's background knowledge and the text, in which the intended

interaction constitutes the interaction between the gained information from bottom-up processes and top-down processes depending on certain kinds of prior knowledge and information processing skills. The background knowledge and the information as to how it is to be used is organised into a set of units called schemata.

The factors involved in this study included (1) participants from different discipline-specific backgrounds, (2) text structure, (3) a rhetorically-oriented framework and (4) recall. The discipline-specific background, as one of the variables investigated in this study, comprised three levels, in the form of students studying economics, agriculture and pure sciences. The factor of text structure comprised three levels in the form of text types: problem-solution, causation and collection of description. The factor of rhetorically-oriented framework comprised three levels: without framework, with-L1- framework, and with-L2 framework. The factor of recall comprised two levels: Indonesian and English. Therefore, the factorial design employed in this study can be referred to as specifically a 3 x 3 x 3 x 2 Multiple Treatment Four-Factorial Design. The participants' recall protocols were scored and analysed using Logistic Regression and ANOVA to determine the effects of the investigated factors.

Prior to conducting the main study, a pilot study of the instrument to be used in the main study, the reading comprehension tests, was conducted. The criterion for selecting the texts used was in line with the theoretical framework of the Schema Theory model of reading. Thus, the selected texts for the reading comprehension tests were selected as being appropriate for the participants in terms of language difficulty (vocabulary and syntactic complexity) and text content familiarity (background knowledge required). To gain that purpose, two texts on the topic of the 'nature of culture', considered to be familiar material to the participants of the pilot study, were chosen and validated as the raw material. Each of the chosen texts was then adapted and presented in comparable versions according to three text structure types: problem-solution, causation and collection of description.

The comparable versions were developed by modifying the top-level structure of the original passages without changing the original content and language. In relation to the text appropriateness, the two adapted texts were then assessed by eight lecturers of English for Specific Purposes (ESP) at the Jember University in Indonesia. These judges were asked to assess the texts in terms of the appropriateness of vocabulary difficulty, text structure, syntactic complexity and background knowledge required to comprehend them. The scores of the degree of appropriateness of the two text types given were analysed using a non-parametric technique of the Kruskal-Wallis one-way ANOVA in order to determine which was more appropriate for use in the reading comprehension tests. The result showed that the texts were not significantly different in difficulty, structure and knowledge required and so both were classified as fairly appropriate. The writer arbitrarily chose the text entitled *Some Aspects of Culture*, as the text to be used for the reading comprehension tests. The text structure variants were then analysed following Meyer's content structure analysis to determine the list of idea units common to all three text versions.

Attempts were also made to validate the text rhetorical structure types in terms of how the three different text types were identified to assess the acceptability of both the texts and the rhetorical frameworks. These efforts were performed by asking three native English speakers – teaching experts at Victoria University, Melbourne, Australia – to judge the three tasks developed by the researcher. All the three of these experts indicated their reference to text representation and their acceptability.

The reading comprehension test developed for this study is considered to have both construct and content validity. It shows construct validity in that the reading comprehension tests align with the theory adopted, particularly as it acknowledges the readers' background knowledge. In addition, the use of free written recall testing acknowledges the reader's background knowledge as integrated in nature, meaning that it is impossible for the participants of the study to recall the passages they have read without using their schemata

to interact with the text through both bottom-up decoding and top-down analysis.

The reading comprehension tests were assumed to have content validity for two main reasons. First, the reading comprehension test was designed to measure readers' ability in comprehending a text with immediate free written recall as the means of assessment. To establish the content validity, prior to the implementation of the tests, the test had been assessed to assure that the tests represented the aims of what it was intended to be measured. Second, the scoring system developed on the basis of the idea units common to the three text types was adopted as the test guide, as based on the results of the text structure analyses of the three text versions.

Determination of the appropriate sample size for the current study was performed based on the data of the pilot study. Examination of the graphical data shows that the most case scenario is for a 4 factor x 3 factor interaction. The sample size was determined as a function of

1. the significance level, set at $\alpha = .05$,
2. the standard deviation, set at 7.82 from the pilot study data (as presented in Appendix 8A),
3. the size of the effect that it is desired to pick up, and the probability of picking up the effect (the power), set at 0.8 ($1 - \beta = 0.8$) for two-way interaction the effect that is desired to pick up is expressed as Δ = most positive deviation from additive model –most negative deviation from additive model.

It was felt that a value and practical importance of $\Delta = 4$ would be scientifically appropriate. Using this value of Δ leads to a sample size of 16 participants per cell. However, to be conservative, a sample size of 18 participants per cell was chosen.

To provide empirical findings from this research, data were gathered, statistically analysed and interpreted in alignment with the research questions. Based on the results of the hypotheses testing, the findings of the present study are as follows. The results of testing of all the interaction

effects yielded insignificant effects, that is, all of the null hypotheses in the present study are accepted. Based on the testing of Hypothesis 2, the main effects of discipline-specific background, text structure, rhetorically-oriented framework and recall on reading comprehension, were found to be significant. From the parameters provided as a result of testing of Hypothesis 2, the significant differences in relative importance of discipline-specific background, text structure, rhetorically-oriented framework and recall in facilitating reading comprehension, were also directly identified through the means of the ω^2 value of the factors investigated. As with the findings for the main effect, the different means of the levels within the factors investigated (Hypothesis 3) also showed significant different levels in facilitating reading comprehension.

6.3 Conclusion

The present study's focus was on a single schematic type, formal schemata, while the other schematic types were held constant, in the sense that the content and linguistic schemata were controlled and not directly observed as main variables. In addition, a rhetorically-oriented framework, functioning as a schema activation device for formal and content schemata, was included as an additional contributing factor. Both of these schema-related factors significantly affected the reading comprehension of expository text. This result provides positive support for the Schema Theory model of reading as a conceptually valid theoretical approach for the design of reading comprehension texts and for improving the quality of reading in this L2 context.

A further important point regarding the use of a four factorial experimental design is that whilst each factor contributed to the variance there were no significant interaction effects observed, meaning that each factor operated independently. This suggests that further research should be able to incorporate one or more of these factors without concern about the

impact of interaction effects associated with each. Despite this finding, the inclusion of four factors in the one design has been beneficial in highlighting the differential impact of each factor on reading comprehension. Using a four factorial design highlighted the relative impact of factors, such as text structure and rhetorically-oriented framework, but also emphasised the effect of recall as by far the largest, suggesting that of the four factors, the language of recall in the response format is the most important for facilitating reading comprehension.

The inclusion of four factors in a single study design has highlighted the importance of these four factors in an overall accounting for the variability observed in reading comprehension: approximately 33% of variance in using ANOVA and 49% using Logistic Regression. Having said this, it is important to recognise that there is still approximately 67% (ANOVA) and 51% (Logistic Regression) of variance unaccounted for by the factors considered here. A range of other factors not included in this study clearly influences reading comprehension outcomes. These factors are likely to come from beyond the schematic factors included in the present study. Based on previous studies of schematic factors, linguistic schemata (Clarke 1998; Francis & Hallams 2000; Hudson 1988; Nodoushan 2007) and content schemata (Ahmadi, Keshavarz & Atai 2007; Carrell 1987; Cekik 2007; Kang 1992; Van den Broek 2007), as well as other means of schema activation (Alvermann 2001; Hudson 1988; Karakas 2009; Marefat & Gahari 2009; Rawson & Kintsch 2002) are all important influences on reading comprehension. Beyond schematic factors, according to Harris and Smith (1986), other factors affecting reading comprehension include reader background experience, language abilities, affection (interest, motivation, attitude, beliefs, feelings), reading purpose, the nature of the text to be read and physical factors such as room lighting, room temperature, legible reading matter and, not least, a well-rested learner.

The language used for both the assessment of the effects of the recall format and the rhetorically-oriented framework has indicated superior

outcomes within each factor when L1 is used for recall and for the rhetorically-oriented framework. This finding is important for the design of both reading comprehension tasks and the instruments used to assess reading comprehension outcomes. The findings concerning the readers' superior performance when the schema activation device, in this case the adjunct with a rhetorically-oriented framework, is presented in L1, is a new contribution to L2 reading instruction pedagogy. To the best of the researcher's knowledge, there have been no other investigations of the comparative effect of such adjuncts, using the participants' native language (L1) as opposed to L2. The superiority of L1 recall's impact upon reading has provided further confirmation of the importance of the use of a participant's native language for better reading comprehension outcomes noted in other research (Brantmeier 2006; Fecteau 1999; Lee 1986).

The results of the present study, in relation to text structure and the use of recall as a response format, provide further support for the effectiveness of the use of Meyer's (1975) system for the content analysis of expository text. Meyer's system has been shown to provide a solid basis for analysis in realising the utilisation of text structure, as it creates a content structure diagram showing the rhetorical relationships.

The present study finds that discipline-specific background is a significant factor in facilitating reading comprehension. However, given that the planning of the experiment attempted to ensure that text passages were accessible to all students, regardless of background, this factor most likely acted as a proxy for other learner differences associated with discipline background, such as the participants' level of content familiarity with social science material and/or their average level of English proficiency. Although the content familiarity and English proficiency levels of the participants were intended to be comparable, it seems that despite this the economics students found the passages more accessible than the Agriculture students and the pure science students. In terms of content, it may well have been that economics students had greater familiarity with a text about culture since this

is more closely related to the field of social sciences to which their discipline belongs. In relation to proficiency level, based on the researcher's teaching experience, economics students tend to be more proficient in English than students from the other two disciplines, and generally, economics graduates have a stronger focus within their studies on competing in a world of work where English is directly used than those who are graduating from agriculture and pure science.

A distinctive feature of this study's approach to the data analysis has been the use of two different statistical methods, Logistic Regression and ANOVA, to determine the effects of the four factors. The use of both methods yielded identical results in terms of significance of the factors and levels; however, in terms of the percentage of the variability explained by the factors in reading comprehension outcomes, Logistic Regression yielded stronger results than the ANOVA for all factors. The gap in the proportion of the variability explained by the findings between these two methods is about 13%; a substantial difference. Given the discussion of each method of analysis in Chapter 5, it can be concluded that the Logistic Regression approach to analysis is more robust and is worthy for adoption in data analysis in conjunction with any similar factorial experimental designs.

6.4 Application of findings

The present study findings can benefit reading instruction and the development of reading materials. The following sections deal with this application of the present study's findings, particularly as they relate to teachers or instructors of reading, but also to the developers of reading materials.

6.4.1 To teachers and instructors of reading

These findings provide EFL reading teachers or reading instructors with encouragement to develop in themselves and their students an awareness of

the importance of text structure, and to consider the use of a rhetorically-oriented framework and attention to the students' language of recall, when teaching tertiary level EFL reading classes to students from various discipline-specific backgrounds. Awareness of text structure and training in the identification of the specific features of specific text structures will benefit EFL students and assist them in maximising their expected reading outcomes.

Teachers of English for Academic Purposes (EAP)/English for Specific Purposes (ESP) at tertiary level should be encouraged and supported in explicitly teaching and training their students to be aware of the importance of text structure. More tightly organised structures appear to better facilitate reading comprehension. For this reason reading instructors should not only provide clear explanations in their teaching of the various types of text structures, but also utilise more tightly-structured specific texts initially, to facilitate comprehension in specific topic areas. Reading a text with knowledge of its text structures should enable readers to form more accurate hypotheses about that text. Teaching of and about text structure should enable students to differentiate the top level of rhetorical structure, or the writer's main idea, from the lower structure, or supporting information. This knowledge can assist students as readers towards a more strategic reading comprehension: by being aware of text structure in its various organisational manifestations, readers will be assisted in differentiating between major and minor information in the text, thereby enhancing their capacity to discern the most important meanings in the text.

Reading instructors should similarly consider incorporating appropriate adjuncts in their teaching of reading so as to facilitate the reading comprehension process and achieve better reading outcomes. The use of a rhetorically-oriented framework in the form of an adjunct may assist the reader by raising their awareness of either one or both of the text's structure and topic. Providing students with a rhetorically-oriented framework, whether in the target (L2) or in the native language (L1), will assist them by

providing access to decisive features of the text structure and/or content. Logically, such a strategy indirectly familiarises the students with aspects of the text and so makes it easier for them to understand the text itself more fully. Given the findings on the relative merits of a rhetorically-oriented framework in the form of an adjunct in L1 or L2, in maximising comprehension, this study suggests that the most effective adjunct form will be in L1.

The use of other adjunct types, such as advanced organisers, for example, may also be considered to be a good pre-reading device for the linking of readers' prior knowledge with the new information in the text. Furthermore any determination of suitable types of advance organisers may depend on both the characteristics of the materials to be presented and the types of learners to whom the materials are to be addressed to. Irrespective of their form, however, advance organisers should be presented in an uncomplicated manner so that they can be clearly and effectively applied to aid the reading process.

Reading instructors of EAP need to consider recall techniques in their different forms and languages in determining how best to assess students' reading comprehension. Based on the findings of this research and that of others, it is reasonable to judge that immediate recall protocol is the most direct potential measure of reading comprehension. Written recall in the learners' native language can be regarded as a valid measure for reading comprehension since it provides a pure measure of comprehension with no obstruction by the language or the tester. Considering all the characteristics of free written recall as mentioned above, it is reasonable to describe this method as a cognitively effective means of tracking psychological processes in reading. It is also evident that recall as a reading measure is more direct and pure than any other more conventional reading assessments because using recall enables knowledge of what and how L2 comprehension occurs. In order to be more effective, the use of the language with which the learners are more familiar is advisable when recall is to be used as a reading measure.

Given that the teaching of reading across disciplines needs to consider the learner's content knowledge and focus, it is suggested that teachers need to be aware of the requirements of each discipline to maximise the reading comprehension outcomes. The role of the teacher in content area instruction tends to be as a facilitator of the process, with an emphasis on the relevance and suitability of instructional materials geared towards the learning of reading. To realise the purpose of having qualified and skilful university graduates within their discipline, places great responsibility on teachers to create mutual and beneficial interaction with and among their students. The modes of instruction play an important role in improving students' reading skills, as well as in raising their comprehension. Instruction provided for the development and utilisation of reading strategies needs 'explanation, modelling, practice, and application' (Vacca & Vacca 2002 p. 194). The teacher's role in discipline-specific reading instruction is not merely to function as a reading teacher, but to also function as a facilitator in the process of activating students' prior knowledge in their efforts to maximise reading outcomes.

6.4.2 To developers of EAP reading material

It is important for the developers of EAP reading materials to consider text types based on their tightness of organisation. The data from the present study suggest that the more tightly organised the text, the more easily it is comprehended by learners of similar proficiency levels to those in this study. Based on the findings of the present study, the text structure types can be ordered from most facilitating to least facilitating as follows: problem-solution structured texts are easier, those involving the structure of causation are next, and collection of description texts are the least accessible. After considering these findings, developers of written instructional materials may wish to contemplate the application of some alternatives. For example, when introducing reading materials in a new topic area, it could be advantageous to present the initial text/s in a problem-solution or other, more tightly

organised structure, gradually introducing more loosely structured text types as the content becomes more familiar to students.

This study has also revealed that providing students with a rhetorically-oriented framework can significantly facilitate their reading comprehension. The findings suggest that reading material developers can support the users of their materials by designing appropriate adjuncts to facilitate reading comprehension. Instructional texts can be provided with a rhetorically-oriented framework that assists in activating those specific schemata that are desired to be activated (either formal, content and linguistic or a combination of these), so as to enable readers to make full use of their knowledge. Whenever the content and the text structure of the instructional text is not so familiar to the readers, the use of a rhetorically-oriented framework may operate as a vehicle to deliver the requisite information (in terms of content, formal or linguistic schemata) needed to more effectively cope with that particular instructional text. For readers with L2 proficiency comparable to those in this study, such a rhetorically-oriented framework is best presented in the students' native language (L1).

Reading material developers are also recommended to consider the design of materials taking into account all the factors involved in this study and the levels of each of manipulatable factors which were found to be most advantageous in their impacts upon reading comprehension. The best outcomes can be achieved by presenting the text to readers in a tightly organised structure presented with a pre-reading rhetorically-oriented framework in the readers' L1 that incorporates both content and structure awareness and providing recall in the readers' L1 for the reading comprehension assessment tool.

6.4.3 Limitations of the study

This study has been an experimental investigation into factors that affect reading comprehension, and there are several limitations that need to be acknowledged.

The first limitation concerns the study design's capacity to only include four factors which affect reading comprehension. In addition, within each of the four factors decisions had to be made about the levels of the factors to be included given the overall design's capacity to accommodate a limited number of variants within a sample that was feasible to recruit. In an ideal context and without these limitations it would have been desirable to include other important factors, such as linguistic and content schemata, and language proficiency, and to manipulate some of the factors, such as the measure of reading comprehension and the schema activation format, to see how these relatively impact in relation to the factors that were included.

The second limitation has to do with the extent to which the findings can be generalised beyond the study. The present experimental study involved the random assignment of participants to conditions that may allow us to make causal conclusions due to the variables manipulated not being confounded by other variables. However, there is still a limitation with respect to the generality of the findings. The students' disciplines are varied within the university where the data were collected. Yet, in this study discipline-specific background had to be delimited to students in three disciplines: economics, agriculture, and pure sciences. As a result, the data were collected from students in these disciplines in one of the state universities in Malang, Indonesia, so care needs to be exercised in generalising from this context to that of students from other disciplines and studying in other university contexts within Indonesia and beyond.

The third limitation is connected with the theoretical frameworks adopted in this study – the Schema Theory model of reading and Meyer's content structure analysis. Many theoretical models of reading are identified in the literature, such as Dual Coding Theory (Sadoski, Paipio & Goetz 1991), Rauding Theory (Carver 1992) and Schema Theory model of reading (Carrell and Eisterhold 1998). It may be that research designs that draw on concepts from other reading theories may also provide valuable insights into the reading process for L2 readers and also contribute to improving aspects

of tertiary students' reading capacity. Similarly, in relation to approaches to text structure analysis, there are other approaches to Meyer's that could have been adopted, for examples, Kintsch's and Frederiksen's, and which may have provided other insights to what the chosen approach has done. Having acknowledged this, however, Meyer's model adopted for this study has been widely used by scholars for text-content analysis in reading research (see, for example, Brantmeier 2005; Carrell 1984; Goh 1990; Kobayashi 2004; McGee 1982; Meyer & Poon 2001; Wen-Yeh & Lehman 2001) and has proved its value in clarifying differences in recall performance (Schnotz 1983), so it was judged to be the preferred approach for this research.

The fourth limitation relates to the lack of an independent measure of participants' English proficiency. Because of the need to limit the factors, even within the quite complex design that was adopted, there was no formal testing of proficiency and as consequence no capacity to consider the effect of each participating individual's proficiency (as elementary, intermediate or advanced) on their reading comprehension score. Participants were selected based on their satisfactory completion of a tertiary level mandated EAP course, which was assumed to indicate that all had achieved a certain base threshold of English proficiency. However, the differential results for the students from the different disciplines has suggested that across the groups there was most likely a differential distribution in English proficiency that related to the discipline in which the student was specialising. It is clearly very important to be able to unpack this more, and more detail on the participants' English proficiency would have enhanced the capacity to make sense of aspects of the results, and to consider implications for the teaching and learning of L2 reading. It also raises the unable to be answered question of whether some faculties and disciplines may be achieving greater success in developing their students' capacities to access current knowledge, information and technology printed in English, and if so, how they are achieving this through their English and disciplinary pedagogies.

6.5 Future research directions

To deal with the limitations raised in conjunction with the present study, a number of perspectives on future research need to be adopted.

Considering the overall proportion of variance accounted for by the four factors included in this study, there is clear value in exploring other factors that impact on reading comprehension. An important finding has been the independence of each factor from the others. This opens up potential to extend the investigation by considering other under-researched aspects of schemata and schema activation. Given the emphasis on only one of the schematic types as a variable, formal schemata, content and linguistic have not been covered and it would be worth to include these schematic factors further research. Which schemata are more important and how best to activate the relevant schemata, are still areas where further research could be beneficial.

In addition, considering that the selection of participants for the present study was not based on their measured levels of L2 proficiency or their L1 reading capacities, it would be extremely valuable to research further on the impact of these variables in relation to students from different disciplinary backgrounds in order to broaden the scope of the generalisations that can be drawn from understanding about reading comprehension for Indonesian tertiary students in universities such as the one included in this study.

Another important finding from this study beside the independent result of each factor in facilitating reading is the impact of the use of L1 for both the effectiveness of the rhetorically-oriented framework and for recall as a measure of comprehension in an L2. The findings suggest that pre-reading orientation and instruction designed to enhance reading comprehension, may be more effective if written in the readers' first language, rather than in L2 for this proficiency level of students. There is clearly scope for further exploration of the relationship of the process of pre-reading orientation and reading outcomes using both L1 and L2, including how the nature and extent of typological differences between L1 and L2 may mediate the value of the

use of L1 to support the reading comprehension process. The role of the language of recall has been highlighted to be the most influential factor among others in this study. What is not clear when we compare the findings from this study on L1 versus L2 in immediate written recall is whether the superiority of L1 is similarly notable and important in other means of assessing comprehension. Therefore, it would be valuable to undertake further research comparing comprehension in L1 versus L2 in other measures, such as written delayed recall and cued recall.

The scope for using some more sophisticated analytical tools to uncover complex patterns of relationships of factors included in a single study design is important also to note. The present study, which included four factors in a single study design, is an example of a study with a relatively complex design. The tools used in this study were ANOVA and Logistic Regression. Despite their very similar results in terms of significance of the factors and levels, Logistic Regression yielded stronger results than the ANOVA on the transformed response for all factors in terms of the percentage of the variability explained by the factors in reading comprehension outcomes. It appears that Logistic Regression (a form of generalised linear model) is a more sensitive analytical approach and the proportion of the variability explained by the findings from the two methods showed a significant gap. Not only does this finding point to the advantage of using several different analytical tools when analysing data from complex designs, but such studies will result in valuable information about the effective use of the compared tools. In addition, the comparative differences suggest the value of further utilisation of more sophisticated statistical approaches, such as generalised linear models and structural equation modelling, to make sense of the influences of the complex array of factors on L2 reading.

The present study with a quantitative approach has investigated how certain reading factors, such as text structure and the language of recall affect readers' comprehension outcomes. With this methodological approach, the study has been able to cover only a small number of the ten components

affecting reading comprehension that Grabe (2004) has highlighted, based on his review of reading theory, research and assessment. Since this study has been conducted quantitatively, it is important also to consider the scope for further L2 reading research from different perspectives. In addition to some of the ideas already raised, it would be valuable to undertake in-depth investigation from a qualitative point of view exploring how individual learners engage with the relevant reading test, their learning styles and reading strategies. This should result in essential research-based information about the range of background knowledge, textual and learner-related affective and cognitive factors affecting reading comprehension and thus enrich our capacities to further enhance L2 reading comprehension outcomes.

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Appendices

Appendix 1 Selection and development of texts

Appendix 1A The problem-solution text structure type (text 1A)

Culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

The problem with this taxonomy is that in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

The solution to the problem of the discrepancies between ideal and real culture is the idea of norm, which combines the concepts of both aspects. It would seem that what one does becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. Even when the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt when there is deviation from them.

Appendix 1B The causation text structure type (text 1B)

It is true that culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists. In all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

As a consequence of the discrepancies between ideal and real culture, a new appreciation for the idea of norm was developed. The idea of norm emerged as a result of the idea of combining the concepts of ideal culture and real culture.

It would seem that what one does becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. Even when the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt when there is deviation from them.

Appendix 1C The collection of description text structure type (text 1C)

The discussion that follows will deal with several aspects of culture. First, culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

Second, in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

Third, the concepts of ideal and real culture brought a new appreciation for the idea of norm. The emergence of the idea of norm originally resulted from the combination of the concepts of ideal culture and real culture. It would seem that what one does becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. Even when the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt when there is deviation from them.

Appendix 1D The problem-solution text structure type (text 2A)

There have been a number of responses and cultural policies relating to ethnic diversity throughout the two hundred years of white settlement in Australia. The main problem with these approaches and policies was a significant lack of recognition of ethnic diversity. The earliest response was the indifference to the death of whole Aboriginal tribes as a result of European destruction of traditional food sources and the spread of the European diseases. The second response was the exclusion of Chinese and colored peoples. The third response was the isolation from the mainstream of national life of Aboriginal Australians and migrants from the dominant Anglo-Australian majority. The final response was that of assimilation and

integration which included a gradual incorporation of people of various ethnic backgrounds into the dominant Anglo-Australian ethnic group.

The solution to the problem of the lack of recognition of ethnic diversity came from academics, professional, and politicians who challenged the concept of a homogeneous society. This in turn create a greater self-awareness and self-criticism of the Australian society which led to a new, self-questioning approach to ethnic diversity, called multiculturalism.

Multiculturalism can be looked at in various ways. It can be descriptive, a statistical statement about the ethnic composition of a population. It can refer to the collectivity of customs and practices tolerated in the privacy of homes and families—but not in the public sphere—of person from minority ethnic groups. It can also refer to semi-official recognition of ethnic diversity in the form of support for welfare organizations, token gestures by government bodies, and even limited power sharing arrangements. A much more significant response to ethnic diversity is at the ideological level, the level at which the multicultural nature of the society itself becomes the framework for all activities, developments and organizations. Recent times have seen such a type of society develops in Australia.

Appendix 1E The causation text structure type (text 2B)

There is evidence that since mid-1960s the lack of recognition of ethnic diversity in Australia has come under severe criticism. Academics, professions, and politicians have been criticizing the responses to ethnic diversity developed in the period of two hundred years of white settlement in Australia. These responses were of four kinds. The first response was the indifference to the death of whole Aboriginal tribes as a result of European destruction of traditional food sources and the spread of the European diseases. The second response was the exclusion of Chinese and colored peoples. The third response was the isolation from the mainstream of national life of Aboriginal Australians and migrants from the dominant Anglo-Australian majority. The final response was that of assimilation and integration which included a gradual incorporation of people of various ethnic backgrounds into the dominant Anglo-Australian ethnic group.

As a result of the top-down criticism of these approaches as well as a greater self-awareness and self-criticism of the Australian society, a new questioning approach to ethnic diversity, called multiculturalism, was developed.

Multiculturalism can be looked at in various ways. It can be descriptive, a statistical statement about the ethnic composition of a population. It can refer to the collectivity of customs and practices tolerated in the privacy of homes and families—but not in the public sphere—of person from minority ethnic groups. It can also refer to semi-official recognition of ethnic diversity in the form of support for welfare organizations, token gestures by government bodies, and even limited power sharing arrangements. A much more significant response to ethnic diversity is at the ideological level, the level at which the multicultural nature of the society itself becomes the framework for all activities, developments and organizations. Recent times have seen such a type of society develops in Australia.

Appendix 1F The collection of description text structure type (text 2C)

The following discussion concentrates on three aspects of an Australian approach relating to ethnic diversity.

First, early approach to ethnic diversity showed a significant lack of recognition of cross-cultural differences. The earliest response was the indifference to the death of whole Aboriginal tribes as a result of European destruction of traditional food sources and the spread of the European diseases. The second response was the exclusion of Chinese and colored peoples. The third response was the isolation from the mainstream of national life of Aboriginal Australians and migrants from the dominant Anglo-Australian majority. The final response was that of assimilation and integration which included a gradual incorporation of people of various ethnic backgrounds into the dominant Anglo-Australian ethnic group.

Second, since about the mid-1960s, these four responses relating to ethnic diversity have come under increasing attack. The attack came from the non English speaking background ethnic groups, as well as the Anglo-Australian establishment such as: academics, professionals, and politicians. This in turn created a greater self-awareness and self-criticism of the Australian society.

Third, a new self-questioning approach to ethnic diversity, called multiculturalism was developed. Multiculturalism can be looked at in various ways. It can be descriptive, a statistical statement about the ethnic composition of a population. It can refer to the collectivity of customs and practices tolerated in the privacy of homes and families—but not in the public sphere—of person from minority ethnic groups. It can also refer to semi-official recognition of ethnic diversity in the form of support for welfare organizations, token gestures by government bodies, and even limited power sharing arrangements. A much more significant response to ethnic diversity is at the ideological level, the level at which the multicultural nature of the society itself becomes the framework for all activities, developments and organizations. Recent times have seen such a type of society develops in Australia.

Appendix 1 G Text Appropriateness by eight ESP lecturers of Jember University

Instruction: Please circle either 4, 3, 2, or 1 to show your judgment on the appropriateness of each component of the text.

Text		Scales to be judged			
Type	Component				
1A	Vocabulary	1	2	3	4
	Syntactic Complexity	1	2	3	4
	Background Knowledge	1	2	3	4
	English Language Acceptability	1	2	3	4
1B	Vocabulary	1	2	3	4
	Syntactic Complexity	1	2	3	4
	Background Knowledge	1	2	3	4
	English Language Acceptability	1	2	3	4
1C	Vocabulary	1	2	3	4
	Syntactic Complexity	1	2	3	4
	Background Knowledge	1	2	3	4
	English Language Acceptability	1	2	3	4
2A	Vocabulary	1	2	3	4
	Syntactic Complexity	1	2	3	4
	Background Knowledge	1	2	3	4
	English Language Acceptability	1	2	3	4
2B	Vocabulary	1	2	3	4
	Syntactic Complexity	1	2	3	4
	Background Knowledge	1	2	3	4
	English Language Acceptability	1	2	3	4
2C	Vocabulary	1	2	3	4
	Syntactic Complexity	1	2	3	4
	Background Knowledge	1	2	3	4
	English Language Acceptability	1	2	3	4

Where:

1A = A version of text Some Aspects of Culture written in problem-solution text structure

1B = A version of text Some Aspects of Culture written in causation text structure

1C = A version of text Some Aspects of Culture written in collection of description text structure

2A = A version of text Multiculturalism written in problem-solution text structure

2B = A version of text Multiculturalism written in causation text structure

2C = A version of text Multiculturalism written in collection of description text structure

Appendix 1 H Text appropriateness by three lecturers of native speakers of English at Victoria University

Name of English Teaching Expert :

Provisional position :

Years of teaching experience :

Task 1

Please indicate what structure type each text represents by marking (X) on either (A), (B), or (C) (Note: Texts to be identified are presented in Text 1, Text 2 and Text 3.

Text 1 belongs to text structure type of : (A) problem-solution

- (B) causation
- (C) collection of description

Text 2 belongs to text structure type of :

- (A) problem-solution
- (B) causation
- (C) collection of description

Text 3 belongs to text structure type of :

- (A) problem-solution
- (B) causation
- (C) collection of description

Concepts of text structure types adopted in this study

Meyer (1975), who categorized expository texts according to a set of hierarchically nested segments which typically form a tree diagram, presented five types of expository texts, namely: collection, attribution, causation, problem-solution, and comparison. These five categories were then elaborated by Meyer and Freedle by combining collection and attribution to form collection of description (Meyer and Freedle in Carrell 1984). Thus, the expository text types developed by Meyer and Freedle are: collection of description, comparison, causation, and problem-solution. The categorization proposed by Meyer and Freedle seems to be more representative than those of others in terms of its commonality. It is for this reason, in addition to the selection of the content structure analysis from Meyer (1975), that the expository text categorization adopted here is the categorization developed by Meyer and Freedle.

The Collection and Description text structure type is yielded by the combination of the collection text structure type and description text structure type. Collection type is a group or a list of ideas or concepts by association. This type of structure will be more organized if the association is by sequence (e.g., by time). Description type is a grouping too, but it is organized by association in which one element of association is subordinate to another. Thus, the Collection and Description type is none other than a description type with a number of collection type attributes.

The causation type is characterized by the causally or quasi-causally related ideas that are chronologically grouped. Thus, it is like a type of text commonly known as cause-effect type.

The Problem-Solution type contains all the attributes of causation type, with an additional feature of overlapping content between propositions in the problem and solution. One or more propositional elements of the solution can neutralized a causal antecedent of the problem.

Text 1:

The discussion that follows will deal with several aspects of culture. First, culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

Second, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords

them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

Third, the concepts of ideal and real culture brought a new appreciation for the idea of norm. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Text 2

Culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

The problem with this taxonomy is that there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

The solution to the problem of the discrepancies between ideal and real culture is the idea of norm. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Text 3

It is true that culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists. There are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant

mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

As a consequence of the discrepancies between ideal and real culture, a new appreciation for the idea of norm was developed. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Task 2

Please rate each text on its acceptability as an example of the text structure type it represents. Put (4) if the organization of the text structure type is *acceptable*, (3) is *fairly acceptable*, (2) is *somewhat acceptable*, or (1) is *not acceptable*.

Text types to be judged	Scales of Judgement			
	4	3	2	1
collection of description				
problem-solution				
causation				

Task 3

1. Read each Rhetorically-Oriented Framework and then read the passage it refers to.
2. Indicate how acceptable each of the Rhetorically-Oriented Framework is in representing the content and structure of the text to which it refers by rating each on a scale of (1) to (4) where (1) = not acceptable, (2) = somewhat acceptable, (3) = fairly acceptable, and (4) = acceptable. Do so by marking (√) on the table provided in each passage.

Rhetorically-Oriented Framework is a type of adjunct which contains a description of the text topic and the name of the text structure type used to organize the respective passage (Lee and Riley 1990).

Rhetorically- Oriented Framework:

- The following text provides descriptive and collective information about differences between ideal and real cultures. These two cultural aspects are different in all cultures.

Please put check mark (\checkmark) to number (4) if the Rhetorically-Oriented Framework of each text structure type above is *acceptable*, (3) is *fairly acceptable*, (2) is *somewhat acceptable*, or (1) is *not acceptable*.

Rhetorically-Oriented Framework	Scales of Judgement			
	4	3	2	1
Rhetorically-Oriented Framework of Text 1				

Rhetorically-oriented framework:

The following text provides information about the problem and the solution of differences between ideal and real cultures. These two cultural aspects are different in all cultures.

Please put check mark (\checkmark) to number (4) if the Rhetorically-Oriented Framework of each text structure type above is *acceptable*, (3) is *fairly acceptable*, (2) is *somewhat acceptable*, or (1) is *not acceptable*.

Rhetorically-Oriented Framework	Scales of Judgement			
	4	3	2	1
Rhetorically-Oriented Framework of Text 2				

Rhetorically-oriented framework:

- The following text provides information about the cause and the effect of differences between ideal and real cultures. These two cultural aspects are different in all cultures.

Please put check mark (✓) to number (4) if the Rhetorically-Oriented Framework of each text structure type above is *acceptable*, (3) is *fairly acceptable*, (2) is *somewhat acceptable*, or (1) is *not acceptable*.

Rhetorically-Oriented Framework	Scales of Judgement			
	4	3	2	1
Rhetorically-Oriented Framework of Text 3				

**Appendix 1 I Formulir Permintaan informasi tentang identitas mahasiswa
dan kelulusan Mereka untuk mata kuliah bahasa Inggris dan Ilmu
Budaya Dasar**

Untuk keperluan penelitian, mohon kesediaan anda untuk melengkapi formulir berikut dengan:

Menuliskan

- Nama Lengkap :
- Nomor Mahasiswa :
- Fakultas :
- Tahun Angkatan :

melingkari huruf A jika ***lulus*** atau B jika ***belum lulus*** untuk

- Mata Kuliah Bahasa Inggris:
A. lulus
B. belum lulus
- Mata Kuliah Ilmu Budaya Dasar:
A. lulus
B. belum lulus

Atas bantuan serta partisipasinya, diucapkan terima kasih.

In English, the inquiry form can be translated as follows:

Appendix 1 J An inquiry form asking for students' information about their ID and their completion of the subjects of English for Academic Purposes (EAP) and Basic Cultural Science (BCS)

Prior to my research project, please complete the following form by:

Writing down your

- Name :
- Student Number :
- Faculty :
- Year In :

circle either **A** for **pass** or **B** for **not pass** for the subjects of

- English for Academic Purposes (EAP)

A. pass

B. not pass

Basic Cultural Science (BCS)

A. pass

B. not pass

Thank you for your assistance and participation.

Appendix 2 Instrument for reading comprehension

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INGGRIS, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca DALAM KALIMAT YANG LENGKAP dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text A

Culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

The problem with this taxonomy is that, in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

The solution to the problem of the discrepancies between ideal and real culture is the idea of norm. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INDONESIA, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca DALAM KALIMAT YANG LENGKAP dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text B

Culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

The problem with this taxonomy is that, in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

The solution to the problem of the discrepancies between ideal and real culture is the idea of norm. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
3. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
6. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
7. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INGGRIS, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca **DALAM KALIMAT YANG LENGKAP** dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text C

The following text provides information about the problem and solution of differences between ideal and real cultures. These two cultural aspects are different in all cultures.

Culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

The problem with this taxonomy is that, in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

The solution to the problem of the discrepancies between ideal and real culture is the idea of norm. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
8. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
9. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
10. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INDONESIA, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca DALAM KALIMAT YANG LENGKAP dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text D

The following text provides information about the problem and solution of differences between ideal and real cultures. These two cultural aspects are different in all cultures.

Culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

The problem with this taxonomy is that, in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

The solution to the problem of the discrepancies between ideal and real culture is the idea of norm. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INGGRIS, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca **DALAM KALIMAT YANG LENGKAP** dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text E

Teks berikut membicarakan sebab dan akibat dari perbedaan antara budaya ideal dan budaya riil. Kedua aspek budaya tersebut berbeda pada semua budaya.

Culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

The problem with this taxonomy is that, in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

The solution to the problem of the discrepancies between ideal and real culture is the idea of norm. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INDONESIA, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca DALAM KALIMAT YANG LENGKAP dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text F

Teks berikut membicarakan sebab dan akibat dari perbedaan antara budaya ideal dan budaya riil. Kedua aspek budaya tersebut berbeda pada semua budaya.

Culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

The problem with this taxonomy is that, in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

The solution to the problem of the discrepancies between ideal and real culture is the idea of norm. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INGGRIS, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca **DALAM KALIMAT YANG LENGKAP** dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text G

It is true that culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists. In all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

As a consequence of the discrepancies between ideal and real culture, a new appreciation for the idea of norm was developed. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INDONESIA, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca DALAM KALIMAT YANG LENGKAP dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text H

It is true that culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists. In all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

As a consequence of the discrepancies between ideal and real culture, a new appreciation for the idea of norm was developed. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INGGRIS, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca **DALAM KALIMAT YANG LENGKAP** dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text I

The following text provides information about the cause and the effect of differences between ideal and real cultures. These two cultural aspects are different in all cultures.

It is true that culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists. In all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

As a consequence of the discrepancies between ideal and real culture, a new appreciation for the idea of norm was developed. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INDONESIA, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca DALAM KALIMAT YANG LENGKAP dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text J

The following text provides information about the cause and the effect of differences between ideal and real cultures. These two cultural aspects are different in all cultures.

It is true that culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists. In all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

As a consequence of the discrepancies between ideal and real culture, a new appreciation for the idea of norm was developed. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INGGRIS, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca **DALAM KALIMAT YANG LENGKAP** dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text K

Teks berikut membicarakan sebab dan akibat dari perbedaan antara budaya ideal dan budaya riil. Kedua aspek budaya tersebut berbeda pada semua budaya.

It is true that culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists. In all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

As a consequence of the discrepancies between ideal and real culture, a new appreciation for the idea of norm was developed. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INDONESIA, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca DALAM KALIMAT YANG LENGKAP dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text L

Teks berikut membicarakan sebab dan akibat dari perbedaan antara budaya ideal dan budaya riil. Kedua aspek budaya tersebut berbeda pada semua budaya.

It is true that culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists. In all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

As a consequence of the discrepancies between ideal and real culture, a new appreciation for the idea of norm was developed. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tuliskan:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INGGRIS, tuliskan informasi apapun yang saudara ingat dari teks yang baru saja saudara baca **DALAM KALIMAT YANG LENGKAP** dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text M

The discussion that follows will deal with several aspects of culture. First, culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

Second, in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

Third, the concepts of ideal and real culture bring a new appreciation for the idea of norm. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INDONESIA, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca **DALAM KALIMAT YANG LENGKAP** dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text N

The discussion that follows will deal with several aspects of culture. First, culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

Second, in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

Third, the concepts of ideal and real culture bring a new appreciation for the idea of norm. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tuliskan:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INGGRIS, tuliskan informasi apapun yang saudara ingat dari teks yang baru saja saudara baca **DALAM KALIMAT YANG LENGKAP** dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text O

The following text provides descriptive and collective information about differences between ideal and real cultures. These two cultural aspects are different in all cultures.

The discussion that follows will deal with several aspects of culture. First, culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

Second, in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

Third, the concepts of ideal and real culture bring a new appreciation for the idea of norm. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INDONESIA, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca DALAM KALIMAT YANG LENGKAP dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text P

The following text provides descriptive and collective information about differences between ideal and real cultures. These two cultural aspects are different in all cultures.

The discussion that follows will deal with several aspects of culture. First, culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

Second, in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

Third, the concepts of ideal and real culture bring a new appreciation for the idea of norm. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas:
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INGGRIS, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca **DALAM KALIMAT YANG LENGKAP** dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text Q

Teks berikut menyampaikan informasi deskriptif dan kolektif tentang perbedaan antara budaya ideal dan budaya riil. Kedua aspek budaya tersebut berbeda pada semua budaya.

The discussion that follows will deal with several aspects of culture. First, culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

Second, in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

Third, the concepts of ideal and real culture bring a new appreciation for the idea of norm. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

Petunjuk Mengerjakan Soal

1. Sebelum membaca teks, pada kertas bergaris yang telah saudara terima tulislah:
 - Nama:
 - Nomor mahasiswa:
 - Fakultas
 - Text yang dibaca: (contoh: Text A, Text B atau text C, dan seterusnya)
2. Dalam waktu maksimal 20 menit, bacalah teks dibawah ini dengan seksama sampai saudara benar-benar mengerti dan dapat menyerap informasi yang ada dalam teks tersebut. Selama membaca anda tidak diperkenankan membuat catatan.
3. Setelah selesai membaca, baliklah lembar teks, sehingga anda tidak dapat melihat kembali teks tersebut.
4. Dalam waktu maksimal 20 menit, dengan menggunakan BAHASA INDONESIA, tulislah informasi apapun yang saudara ingat dari teks yang baru saja saudara baca DALAM KALIMAT YANG LENGKAP dan dengan menggunakan kata-kata yang ada dalam text atau kata-kata anda sendiri.
5. Setelah selesai mengerjakan, tinggalkan pekerjaan anda diatas meja anda sendiri.

Text R

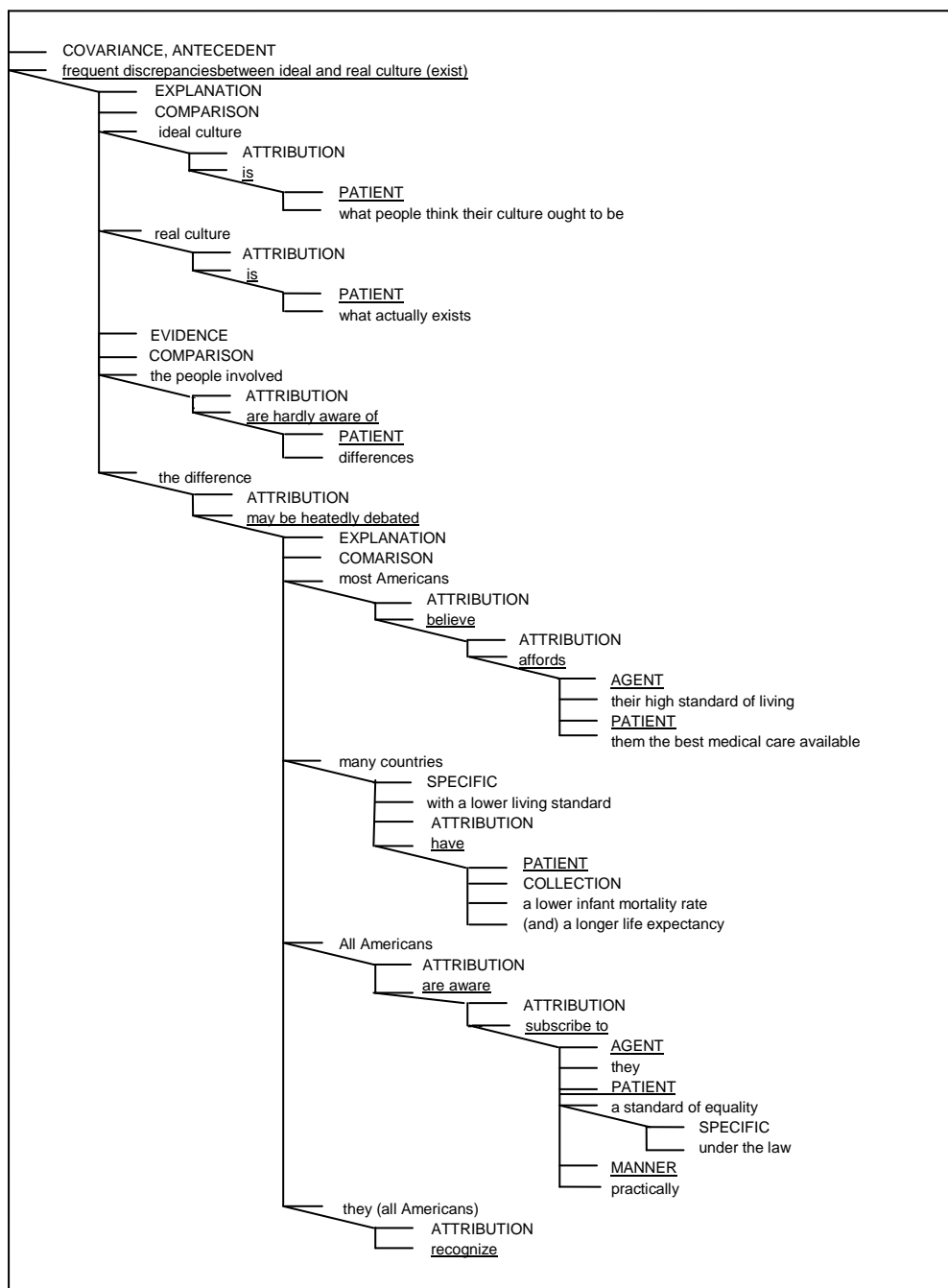
Teks berikut menyampaikan informasi deskriptif dan kolektif tentang perbedaan antara budaya ideal dan budaya riil. Kedua aspek budaya tersebut berbeda pada semua budaya.

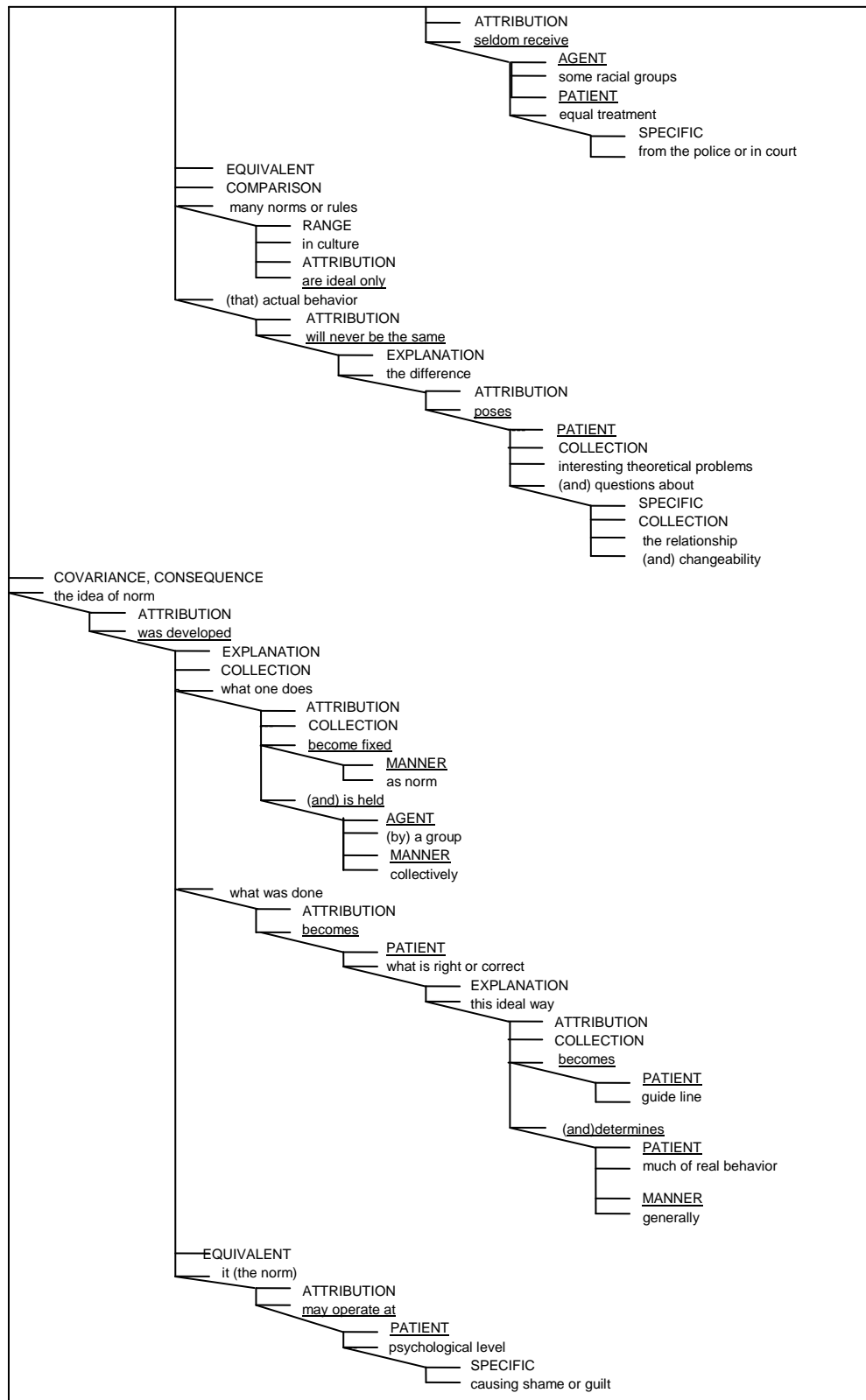
The discussion that follows will deal with several aspects of culture. First, culture has ideal and real aspects. Ideal culture is what people think their culture ought to be. Real culture, on the other hand, is what actually exists.

Second, in all cultures, there are frequent discrepancies between the two facets. In some instances, the people involved are hardly aware of differences, in other cases the difference may be heatedly debated. For example, most Americans believe their high standard of living affords them the best medical care available; yet, in reality many countries with a lower living standard have a lower infant mortality rate and a longer life expectancy. On the other hand, practically all Americans are aware that they subscribe to a standard of equality under the law although they recognize that some racial groups seldom receive equal treatment from the police or in court. It seems inherent in culture that many norms or rules are ideal only, that actual behavior will never be the same. Thus, the discovery that real culture so frequently varies from ideal culture poses interesting theoretical problems and questions about the relationship and changeability of the two facets.

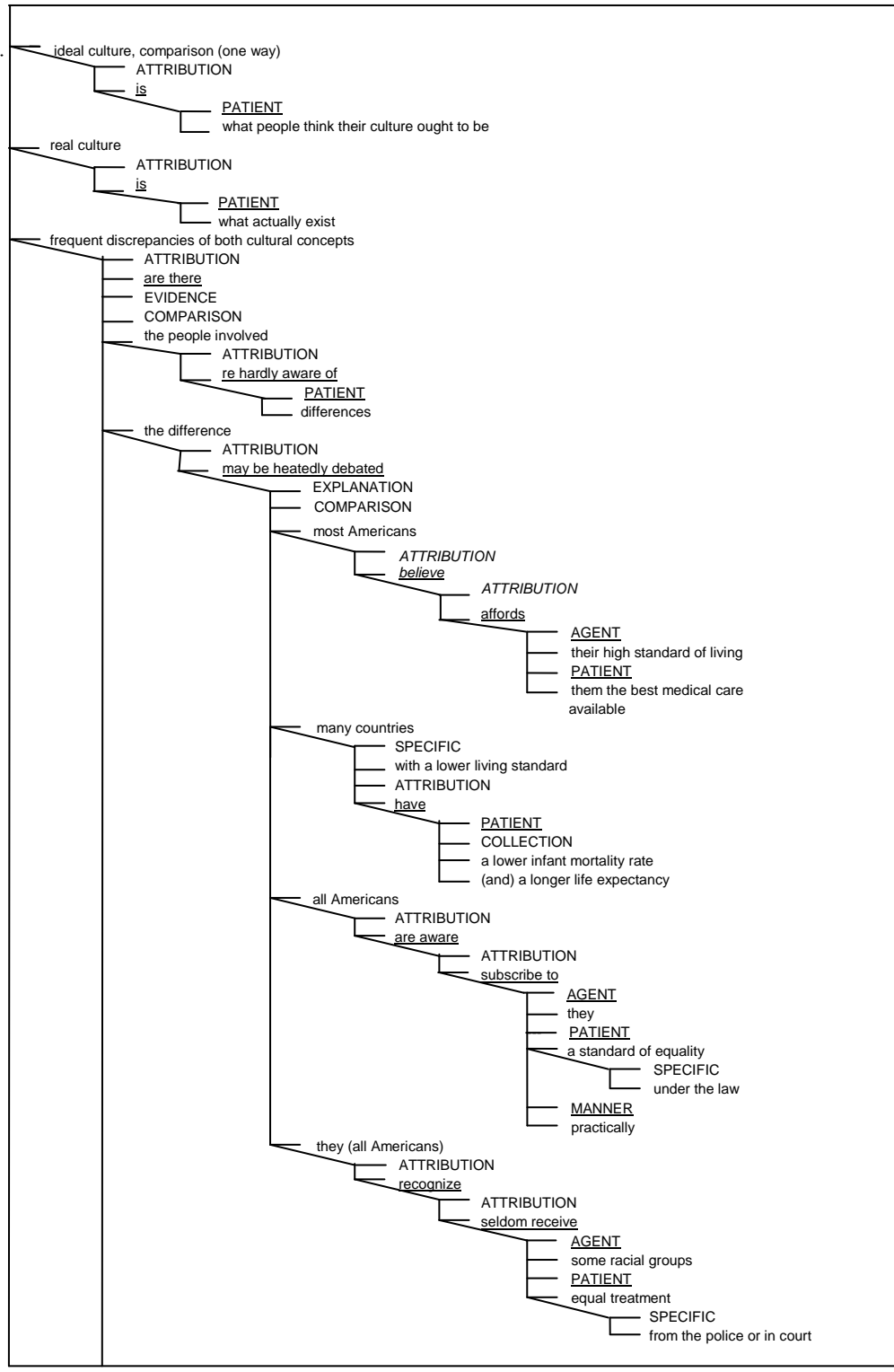
Third, the concepts of ideal and real culture bring a new appreciation for the idea of norm. It would seem that what one does becomes fixed as a norm and is held collectively by a group. What was done becomes what is right or correct. This ideal way becomes an important guideline and generally determines much of real behavior. When the real behavior begins to differ from the ideal, the norms may operate at a psychological level causing shame or guilt.

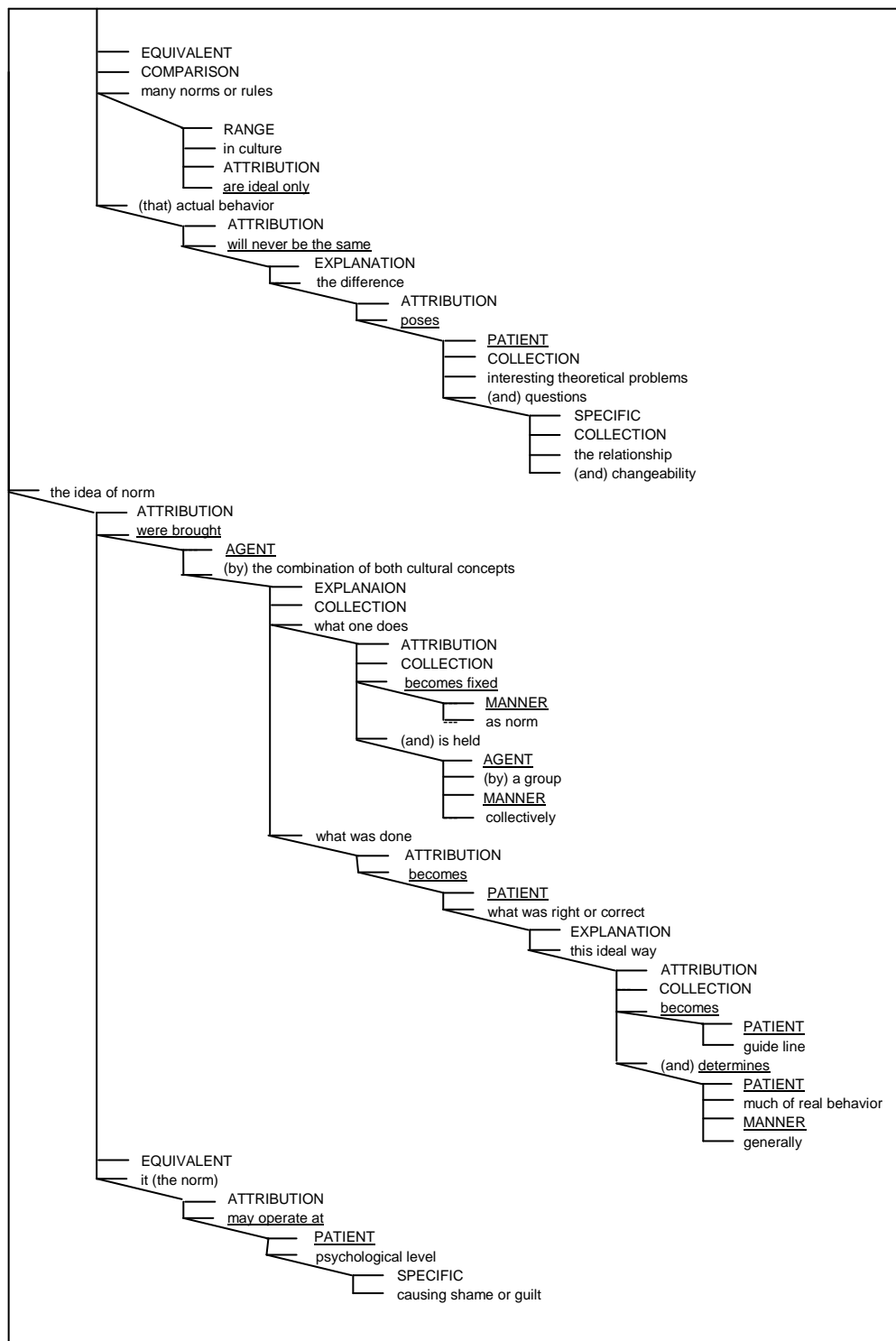
Appendix 3 The rhetorical structure analysis of the three text structure types
Appendix 3A The rhetorical structure analysis of the causation text structure type





Appendix 3B The rhetorical structure analysis of the collection of description text structure type





Key:

Words in lower case

Underlined words in lower case

UNDERLINED, SMALL-CAPITALIZED WORDS

SMALL-CAPITALIZED WORDS

= content words from the text

= lexical predicates

= ROLES

= RHETORICAL PREDICATES

Appendix 4 Idea units of text structure types

Appendix 4A Idea units of the causation text structure type

No	Level	Idea Unit
1	1	Frequent discrepancies between ideal and real culture
2	2	ideal culture
3	3	is
4	4	what people think their culture ought to be
5	2	real culture
6	3	is
7	4	what actually exists
8	2	the people involved
9	3	are hardly aware of
10	4	differences
11	2	the difference
12	3	may be heatedly debated
13	4	most Americans
14	5	believe
15	7	their high standard of living
16	6	affords
17	7	them the best medical care available
18	4	many countries
19	5	with a lower living standard
20	5	have
21	6	a lower infant mortality rate
22	6	(and) a longer life expectancy
23	7	practically
24	4	all Americans
25	5	are aware
26	7	(that) they
27	6	subscribe to
28	7	a standard of equality
29	8	under the law
30	4	they (all Americans)
31	5	recognize
32	7	(that) some racial groups
33	6	seldom receive
34	7	equal treatment
35	8	from the police or in court
36	4	in culture
37	3	many norms or rules
38	4	are ideal only
39	3	(that) actual behavior
40	4	will never be the same
41	5	the difference
42	6	poses
43	7	interesting theoretical problems
44	7	(and) questions about
45	8	the relationship
46	8	(and) changeability
47	1	the idea of norm
48	2	was developed
49	3	what one does
50	4	becomes fixed
51	5	as norm
52	4	(and) is held
53	5	(by) a group
54	5	collectively

55	3	what was done
56	4	becomes
57	5	what is right or correct
58	6	this ideal way
59	7	becomes
60	8	guide line
61	8	(and) generally
62	7	determines
63	8	much of real behavior
64	3	it (the norm)
65	4	may operate at
66	5	psychological level
67	6	causing shame or guilt

Appendix 4B Idea units of the collection of description text structure type

No	Level	Idea Unit
1	1	ideal culture
2	2	is
3	3	what people think their culture ought to be
4	1	real culture
5	2	is
6	3	what actually exists
7	1	frequent discrepancies of both cultural concepts
8	2	are there
9	2	the people involved
10	3	are hardly aware of
11	4	differences
12	2	the difference
13	3	may be heatedly debated
14	4	most Americans
15	5	believe
16	7	their high standard of living
17	6	affords
18	7	them the best medical care available
19	4	many countries
20	5	with a lower living standard
21	5	have
22	6	a lower infant mortality rate
23	6	(and) a longer life expectancy
24	7	practically
25	4	all Americans
26	5	are aware
27	7	(that) they
28	6	subscribed to
29	7	a standard of equality
30	8	under the law
31	4	they (all Americans)
32	5	recognize
33	7	some racial groups
34	6	seldom received
35	7	equal treatment
36	8	from the police or in court
37	3	in culture
38	2	many norms or rules
39	3	are ideal only
40	2	that actual behavior

41	3	will never be the same
42	4	the difference
43	5	poses
44	6	interesting theoretical problems
45	6	and questions about
46	7	the relationship
47	7	and changeability
48	1	the idea of norm
49	2	was brought
50	3	(by) the combination of both cultural concepts
51	4	what one does
52	5	becomes fixed
53	6	as norm
54	5	(and) is held
55	6	(by) a group
56	6	collectively
57	4	what was done
58	5	becomes
59	6	what is right or correct
60	7	this ideal way
61	8	becomes
62	9	guide line
63	9	(and) generally
64	8	determines
65	9	much of real behavior
66	2	it (the norm)
67	3	may operate at
68	4	psychological level
69	5	causing shame or guilt

Appendix 5 The Indonesian equivalence of the idea units common to the three text structure types (Indonesian)

No	Pro-Sol	Cau	CoDes	Idea Unit
1	H	H	T	budaya ideal
2	M	M	H	adalah
3	L	L	M	Apa yang orang pikir seharusnya terjadi
4	H	H	T	budaya real
5	M	M	H	adalah
6	L	L	M	apa yang sesungguhnya terjadi
7	H	H	H	orang-orang yang terlibat
8	M	M	M	agak tidak peduli terhadap
9	L	L	L	perbedaan
10	H	H	H	perbedaan itu
11	M	M	M	bisa diperdebatkan secara sengit
12	L	L	L	sebahagian besar orang Amerika
13	L	L	L	percaya
14	L	L	L	standar hidup mereka yang tinggi
15	L	L	L	mampu
16	L	L	L	bagi mereka menyediakan layanan kesehatan yang terbaik
17	L	L	L	banyak negara
18	L	L	L	dengan standar hidup yang rendah
19	L	L	L	mempunyai
20	L	L	L	tingkat kematian bayi yang rendah

21	L	L	L	(dan) harapan hidup lebih lama
2	L	L	L	Secara praktek
23	L	L	L	semua orang Amerika
24	L	L	L	perduli
25	L	L	L	(bahwa) mereka
26	L	L	L	menganut suatu paham tentang
27	L	L	L	kesamaan hak yang standar
28	L	L	L	dibawah hukum
29	L	L	L	mereka
30	L	L	L	mengenali
31	L	L	L	(bahwa) beberapa kelompok ras
32	L	L	L	jarang menerima
33	L	L	L	perlakuan yang sama
34	L	L	L	dari polisi atau di pengadilan
35	L	L	M	dalam budaya
36	M	M	H	banyak norma atau aturan aturan
37	L	L	M	hanya bersifat ideal semata
38	M	M	H	(bahwa) sikap yang sesungguhnya
39	L	L	M	tidak akan pernah sama.
40	L	L	L	perbedaan itu
41	L	L	L	merupakan
42	L	L	L	permasalahan yang secara teoritis sangat menarik
43	L	L	L	(dan) pertanyaan tentang
44	L	L	L	hubungan
45	L	L	L	(dan) perubahan konsep
46	T	T	T	pemikiran terhadap norma
47	L	L	L	apa yang orang lakukan
48	L	L	L	menjadi pasti
49	L	L	L	sebagai norma
50	L	L	L	(dan) diadakan
51	L	L	L	(oleh) suatu kelompok
52	L	L	L	secara bersama-sama
53	L	L	L	apa yang telah diperbuat
54	L	L	L	menjadi
55	L	L	L	sesuatu yang baik dan benar
56	L	L	L	cara yang ideal ini
57	L	L	L	menjadi
58	L	L	L	penuntun
59	L	L	L	(dan) umumnya
60	L	L	L	banyak menentukan
61	L	L	L	sikap yang sesungguhnya
62	M	M	H	norma itu
63	L	L	M	bisa beroperasi pada
64	L	L	L	tingkat psikologi
65	L	L	L	yang menimbulkan rasa malu atau perasaan bersalah

Appendix 6 Pilot study

Appendix 6A Raw data for the pilot study

CODE	GROUP	DISPEC	TEXT	FRAME	R_1	R_2	AVERAGE
1	1	1	1	1	20	21	20.5
2	1	1	1	1	29	28	28.5
3	1	1	1	1	29	28	28.5
4	1	1	1	1	19	17	18
5	1	1	1	1	15	14	14.5
6	1	1	1	1	27	26	26.5
7	1	1	1	1	24	25	24.5
8	1	1	1	1	26	25	25.5
9	1	1	1	1	18	18	18
10	1	1	1	1	23	22	22.5
11	1	1	1	1	40	43	41.5
12	1	1	1	1	33	31	32
13	1	1	1	1	31	31	31
14	1	1	1	1	39	38	38.5
15	1	1	1	1	23	24	23.5
16	1	1	1	1	21	25	23
17	1	1	1	1	21	19	20
18	1	1	1	1	40	37	38.5
19	2	1	1	2	26	25	25.5
20	2	1	1	2	25	26	25.5
21	2	1	1	2	22	22	22
22	2	1	1	2	33	32	32.5
23	2	1	1	2	35	36	35.5
24	2	1	1	2	19	20	19.5
25	2	1	1	2	37	39	38
26	2	1	1	2	25	24	24.5
27	2	1	1	2	29	28	28.5
28	2	1	1	2	19	19	19
29	2	1	1	2	34	34	34
30	2	1	1	2	20	21	20.5
31	2	1	1	2	23	21	22
32	2	1	1	2	31	33	32
33	2	1	1	2	32	33	32.5
34	2	1	1	2	54	50	52
35	2	1	1	2	34	34	34
36	2	1	1	2	44	45	44.5
37	3	1	2	1	34	35	34.5
38	3	1	2	1	28	30	29.5
39	3	1	2	1	17	19	18
40	3	1	2	1	17	18	17.5
41	3	1	2	1	18	20	19
42	3	1	2	1	14	17	15.5
43	3	1	2	1	37	36	36.5
44	3	1	2	1	26	30	28
45	3	1	2	1	28	29	28.5
46	3	1	2	1	17	18	17.5
47	3	1	2	1	39	39	39
48	3	1	2	1	17	19	18
49	3	1	2	1	42	44	43
50	3	1	2	1	32	32	32
51	3	1	2	1	23	24	23.5
52	3	1	2	1	28	29	28.5
53	3	1	2	1	35	36	35.5
54	3	1	2	1	23	23	23
55	4	1	2	2	33	37	35

56	4	1	2	2	28	29	28.5
57	4	1	2	2	24	23	23.5
58	4	1	2	2	43	44	43.5
59	4	1	2	2	21	22	21.5
60	4	1	2	2	29	33	31.5
61	4	1	2	2	19	20	19.5
62	4	1	2	2	31	31	31
63	4	1	2	2	46	45	45.5
64	4	1	2	2	22	23	22.5
65	4	1	2	2	32	32	32
66	4	1	2	2	36	37	36.5
67	4	1	2	2	22	22	22
68	4	1	2	2	43	42	42.5
69	4	1	2	2	27	27	27
70	4	1	2	2	45	42	43.5
71	4	1	2	2	47	46	46.5
72	4	1	2	2	30	26	28
73	5	1	3	1	14	15	14.5
74	5	1	3	1	18	17	17.5
75	5	1	3	1	18	18	18
76	5	1	3	1	28	27	27.5
77	5	1	3	1	25	26	25.5
78	5	1	3	1	35	38	36.5
79	5	1	3	1	23	23	23
80	5	1	3	1	16	17	16.5
81	5	1	3	1	30	27	28.5
82	5	1	3	1	17	17	17
83	5	1	3	1	18	20	19
84	5	1	3	1	20	19	19.5
85	5	1	3	1	30	31	30.5
86	5	1	3	1	17	18	17.5
87	5	1	3	1	19	17	18
88	5	1	3	1	18	20	19
89	5	1	3	1	37	35	36
90	5	1	3	1	9	8	8.5
91	6	1	3	2	16	16	16
92	6	1	3	2	38	40	39
93	6	1	3	2	26	27	26.5
94	6	1	3	2	11	12	11.5
95	6	1	3	2	6	7	6.5
96	6	1	3	2	15	15	15
97	6	1	3	2	18	19	18.5
98	6	1	3	2	32	30	31
99	6	1	3	2	31	32	31.5
100	6	1	3	2	21	23	22
101	6	1	3	2	17	16	16.5
102	6	1	3	2	32	32	32
103	6	1	3	2	31	30	30.5
104	6	1	3	2	40	39	39.5
105	6	1	3	2	27	24	25.5
106	6	1	3	2	20	23	21.5
107	6	1	3	2	30	30	30
108	6	1	3	2	40	40	40
109	7	2	1	1	29	30	29.5
110	7	2	1	1	26	28	27
111	7	2	1	1	17	17	17
112	7	2	1	1	25	25	25
113	7	2	1	1	30	29	29.5
114	7	2	1	1	7	9	8
115	7	2	1	1	20	20	20
116	7	2	1	1	17	18	17.5
117	7	2	1	1	29	31	30

118	7	2	1	1	16	17	16.5
119	7	2	1	1	8	6	7
120	7	2	1	1	20	21	20.5
121	7	2	1	1	13	13	13
122	7	2	1	1	10	10	10
123	7	2	1	1	20	20	20
124	7	2	1	1	33	34	33.5
125	7	2	1	1	32	33	32.5
126	7	2	1	1	21	23	22
127	8	2	1	2	21	20	20.5
128	8	2	1	2	19	19	19
129	8	2	1	2	21	21	21
130	8	2	1	2	28	29	28.5
131	8	2	1	2	16	16	16
132	8	2	1	2	24	25	24.5
133	8	2	1	2	29	30	29.5
134	8	2	1	2	29	29	29
135	8	2	1	2	21	22	21.5
136	8	2	1	2	20	19	19.5
137	8	2	1	2	26	27	26.5
138	8	2	1	2	12	13	12.5
139	8	2	1	2	23	21	22
140	8	2	1	2	15	14	14.5
141	8	2	1	2	10	10	10
142	8	2	1	2	18	19	18.5
143	8	2	1	2	45	44	44.5
144	8	2	1	2	39	41	40
145	9	2	2	1	23	22	22.5
146	9	2	2	1	12	11	11.5
147	9	2	2	1	24	24	24
148	9	2	2	1	15	17	16
149	9	2	2	1	24	25	24.5
150	9	2	2	1	24	22	23
151	9	2	2	1	14	14	14
152	9	2	2	1	31	29	30
153	9	2	2	1	23	22	22.5
154	9	2	2	1	19	21	20
155	9	2	2	1	16	18	17
156	9	2	2	1	27	26	26.5
157	9	2	2	1	19	19	19
158	9	2	2	1	31	31	31
159	9	2	2	1	25	27	26
160	9	2	2	1	17	17	17
161	9	2	2	1	21	22	21.5
162	9	2	2	1	23	22	22.5
163	10	2	2	2	33	35	34
164	10	2	2	2	18	19	18.5
165	10	2	2	2	33	35	34
166	10	2	2	2	25	27	26
167	10	2	2	2	30	31	30.5
168	10	2	2	2	20	19	19.5
169	10	2	2	2	30	29	29.5
170	10	2	2	2	25	27	26
171	10	2	2	2	39	38	37
172	10	2	2	2	21	22	21.5
173	10	2	2	2	16	17	16.5
174	10	2	2	2	21	21	21
175	10	2	2	2	34	36	35
176	10	2	2	2	14	17	15.5
177	10	2	2	2	27	24	25.5
178	10	2	2	2	21	21	21
179	10	2	2	2	19	18	18.5

180	10	2	2	2	21	22	21.5
181	11	2	3	1	16	15	15.5
182	11	2	3	1	22	23	22.5
183	11	2	3	1	16	16	16
184	11	2	3	1	18	17	17.5
185	11	2	3	1	21	19	20
186	11	2	3	1	16	18	17
187	11	2	3	1	30	32	31
188	11	2	3	1	16	16	16
189	11	2	3	1	15	16	15.5
190	11	2	3	1	20	19	19.5
191	11	2	3	1	21	18	19.5
192	11	2	3	1	13	13	13
193	11	2	3	1	28	27	27.5
194	11	2	3	1	31	32	31.5
195	11	2	3	1	23	24	23.5
196	11	2	3	1	22	21	21.5
197	11	2	3	1	13	14	13.5
198	11	2	3	1	11	10	10.5
199	12	2	3	2	18	19	18.5
200	12	2	3	2	14	16	15
201	12	2	3	2	30	31	30.5
202	12	2	3	2	20	22	21
203	12	2	3	2	19	19	19
204	12	2	3	2	26	28	27
205	12	2	3	2	26	26	26
206	12	2	3	2	20	20	20
207	12	2	3	2	18	21	19.5
208	12	2	3	2	17	17	17
209	12	2	3	2	13	12	12.5
210	12	2	3	2	18	17	17.5
211	12	2	3	2	17	17	17
212	12	2	3	2	20	22	21
213	12	2	3	2	8	10	9
214	12	2	3	2	21	23	22
215	12	2	3	2	12	13	12.5
216	12	2	3	2	31	29	30

Where:

Group 1 – 12 : experimental groups

DisPec 1 : economics

DisPec 2 : agriculture

Text 1 : problem-solution text structure type

2 : causation text structure type

3 : collection of description text structure type

Frame 1 : without rhetorically-oriented framework

2 : with rhetorically-oriented framework

r_1 : rater 1

r_2 : rater 2

Appendix 6B Data analysis of the pilot study

GET

FILE='C:\Documents and Settings\s3077195\Desktop\data of the Pilot Study.sav'.

DATASET NAME DataSet1 WINDOW=FRONT.

UNIANOVA average BY dispec text frame

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/SAVE=PRED RESID

/POSTHOC=text frame(SCHEFFE)

/PRINT=OPOWER ETASQ HOMOGENEITY DESCRIPTIVE PARAMETER

/PLOT=RESIDUALS

/CRITERIA=ALPHA(.05)

/DESIGN=dispec text frame dispec*text dispec*frame text*frame dispec*text*frame.

Univariate Analysis of Variance

Notes

Output Created		28-Jan-2012 06:18:30
Comments		
Input	Data	C:\Documents and Settings\s3077195\Desktop\data of the Pilot Study.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	216
Missing Handling	Value Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the model.
Syntax		UNIANOVA average BY dispec text frame /METHOD=SSTYPE(3) /INTERCEPT=INCLUDE /SAVE=PRED RESID /POSTHOC=text frame(SCHEFFE) /PRINT=OPOWER ETASQ HOMOGENEITY DESCRIPTIVE PARAMETER /PLOT=RESIDUALS /CRITERIA=ALPHA(.05) /DESIGN=dispec text frame dispec*text dispec*frame text*frame dispec*text*frame.
Resources	Processor Time	00 00:00:01.656
	Elapsed Time	00 00:00:01.687
Variables Created or Modified	PRE_2	Predicted Value for average
	RES_2	Residual for average

**Between-Subjects
Factors**

		N
dispec	1.00	108
	2.00	108
text	1.00	72
	2.00	72
	3.00	72
frame	1.00	108
	2.00	108

Descriptive Statistics

Dependent Variable: average

dispec	text	frame	Mean	Std. Deviation	N
1.00	1.00	1.00	26.3889	7.59364	18
		2.00	30.1111	8.94190	18
		Total	28.2500	8.39090	36
	2.00	1.00	27.0556	8.47989	18
		2.00	32.2222	9.00690	18
		Total	29.6389	9.01080	36
	3.00	1.00	21.8056	7.49144	18
		2.00	25.1667	9.87272	18
		Total	23.4861	8.80380	36
	Total	1.00	25.0833	8.06913	54
		2.00	29.1667	9.58330	54
		Total	27.1250	9.05258	108
2.00	1.00	1.00	21.0278	8.28796	18
		2.00	23.1944	8.86523	18
		Total	22.1111	8.52904	36
	2.00	1.00	21.5833	5.22227	18
		2.00	25.0556	6.82747	18
		Total	23.3194	6.24403	36
	3.00	1.00	19.5000	5.91857	18
		2.00	19.7222	5.87172	18
		Total	19.6111	5.81146	36
	Total	1.00	20.7037	6.54269	54
		2.00	22.6574	7.49643	54
		Total	21.6806	7.07122	108
Total	1.00	1.00	23.7083	8.29232	36
		2.00	26.6528	9.45049	36
		Total	25.1806	8.95108	72
	2.00	1.00	24.3194	7.47487	36
		2.00	28.6389	8.67477	36
		Total	26.4792	8.32882	72
	3.00	1.00	20.6528	6.75576	36
		2.00	22.4444	8.46824	36
		Total	21.5486	7.65918	72
	Total	1.00	22.8935	7.63509	108
		2.00	25.9120	9.16613	108
		Total	24.4028	8.55066	216

**Levene's Test of Equality of Error
Variances^a**

Dependent Variable:average

F	df1	df2	Sig.
1.604	11	204	.099

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

a. Design: Intercept + dispec + text + frame + dispec * text + dispec * frame + text * frame + dispec * text * frame

Tests of Between-Subjects Effects

Dependent Variable:average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	3225.792 ^a	11	293.254	4.788	.000
Intercept	128627.042	1	128627.042	2100.257	.000
dispec	1600.667	1	1600.667	26.136	.000
text	940.507	2	470.253	7.678	.001
frame	492.019	1	492.019	8.034	.005
dispec * text	66.799	2	33.399	.545	.580
dispec * frame	61.227	1	61.227	1.000	.319
text * frame	57.655	2	28.828	.471	.625
dispec * text * frame	6.919	2	3.459	.056	.945
Error	12493.667	204	61.243		
Total	144346.500	216			
Corrected Total	15719.458	215			

Tests of Between-Subjects Effects

Dependent Variable:average

Source	Partial Eta Squared	Noncent. Parameter	Observed Power ^b
Corrected Model	.205	52.672	1.000
Intercept	.911	2100.257	1.000
dispec	.114	26.136	.999
text	.070	15.357	.946
frame	.038	8.034	.805
dispec * text	.005	1.091	.139
dispec * frame	.005	1.000	.169
text * frame	.005	.941	.126
dispec * text * frame	.001	.113	.058

a. R Squared = .205 (Adjusted R Squared = .162)

b. Computed using alpha = .05

Parameter Estimates

Dependent Variable:average

Parameter	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	19.722	1.845	10.692	.000	16.085	23.359
[dispec=1.00]	5.444	2.609	2.087	.038	.301	10.588
[dispec=2.00]	0 ^b	.	.	.	.	.
[text=1.00]	3.472	2.609	1.331	.185	-1.671	8.616
[text=2.00]	5.333	2.609	2.045	.042	.190	10.477
[text=3.00]	0 ^b	.	.	.	.	.
[frame=1.00]	-.222	2.609	-.085	.932	-5.366	4.921
[frame=2.00]	0 ^b	.	.	.	.	.
[dispec=1.00]	* 1.472	3.689	.399	.690	-5.801	8.746
[text=1.00]						
[dispec=1.00]	* 1.722	3.689	.467	.641	-5.551	8.996
[text=2.00]						
[dispec=1.00]	* 0 ^b	.	.	.	.	.
[text=3.00]						
[dispec=2.00]	* 0 ^b	.	.	.	.	.
[text=1.00]						
[dispec=2.00]	* 0 ^b	.	.	.	.	.
[text=2.00]						
[dispec=2.00]	* 0 ^b	.	.	.	.	.
[text=3.00]						
[dispec=1.00]	* -3.139	3.689	-.851	.396	-10.413	4.135
[frame=1.00]						
[dispec=1.00]	* 0 ^b	.	.	.	.	.
[frame=2.00]						
[dispec=2.00]	* 0 ^b	.	.	.	.	.
[frame=1.00]						
[dispec=2.00]	* 0 ^b	.	.	.	.	.
[frame=2.00]						
[text=1.00]	* -1.944	3.689	-.527	.599	-9.218	5.329
[frame=1.00]						
[text=1.00]	* 0 ^b	.	.	.	.	.
[frame=2.00]						
[text=2.00]	* -3.250	3.689	-.881	.379	-10.524	4.024
[frame=1.00]						
[text=2.00]	* 0 ^b	.	.	.	.	.
[frame=2.00]						
[text=3.00]	* 0 ^b	.	.	.	.	.
[frame=1.00]						
[text=3.00]	* 0 ^b	.	.	.	.	.
[frame=2.00]						
[dispec=1.00]	* 1.583	5.217	.303	.762	-8.703	11.870
[text=1.00]						
[frame=1.00]						
[dispec=1.00]	* 0 ^b	.	.	.	.	.
[text=1.00]						
[frame=2.00]						
[dispec=1.00]	* 1.444	5.217	.277	.782	-8.842	11.731
[text=2.00]						
[frame=1.00]						

[dispec=1.00]	*	0 ^b	.	.	.	.	.
[text=2.00]	*						
[frame=2.00]							
[dispec=1.00]	*	0 ^b	.	.	.	.	.
[text=3.00]	*						
[frame=1.00]							
[dispec=1.00]	*	0 ^b	.	.	.	.	.
[text=3.00]	*						
[frame=2.00]							
[dispec=2.00]	*	0 ^b	.	.	.	.	.
[text=1.00]	*						
[frame=1.00]							
[dispec=2.00]	*	0 ^b	.	.	.	.	.
[text=1.00]	*						
[frame=2.00]							
[dispec=2.00]	*	0 ^b	.	.	.	.	.
[text=2.00]	*						
[frame=1.00]							
[dispec=2.00]	*	0 ^b	.	.	.	.	.
[text=2.00]	*						
[frame=2.00]							
[dispec=2.00]	*	0 ^b	.	.	.	.	.
[text=3.00]	*						
[frame=1.00]							
[dispec=2.00]	*	0 ^b	.	.	.	.	.
[text=3.00]	*						
[frame=2.00]							

Parameter Estimates

Dependent Variable:average

Parameter		Partial Eta Squared	Noncent. Parameter	Observed Power ^a
Intercept		.359	10.692	1.000
[dispec=1.00]		.021	2.087	.547
[dispec=2.00]		.	.	.
[text=1.00]		.009	1.331	.263
[text=2.00]		.020	2.045	.530
[text=3.00]		.	.	.
[frame=1.00]		.000	.085	.051
[frame=2.00]		.	.	.
[dispec=1.00]	*	.001	.399	.068
[text=1.00]				
[dispec=1.00]	*	.001	.467	.075
[text=2.00]				
[dispec=1.00]	*	.	.	.
[text=3.00]				
[dispec=2.00]	*	.	.	.
[text=1.00]				
[dispec=2.00]	*	.	.	.
[text=2.00]				
[dispec=2.00]	*	.	.	.
[text=3.00]				
[dispec=1.00]	*	.004	.851	.135
[frame=1.00]				

[dispec=1.00]	*	.	.	.
[frame=2.00]				
[dispec=2.00]	*	.	.	.
[frame=1.00]				
[dispec=2.00]	*	.	.	.
[frame=2.00]				
[text=1.00] * [frame=1.00]		.001	.527	.082
[text=1.00] * [frame=2.00]		.	.	.
[text=2.00] * [frame=1.00]		.004	.881	.142
[text=2.00] * [frame=2.00]		.	.	.
[text=3.00] * [frame=1.00]		.	.	.
[text=3.00] * [frame=2.00]		.	.	.
[dispec=1.00]	*	.000	.303	.061
[text=1.00] * [frame=1.00]		.	.	.
[dispec=1.00]	*	.	.	.
[text=1.00] * [frame=2.00]		.	.	.
[dispec=1.00]	*	.000	.277	.059
[text=2.00] * [frame=1.00]		.	.	.
[dispec=1.00]	*	.	.	.
[text=2.00] * [frame=2.00]		.	.	.
[dispec=1.00]	*	.	.	.
[text=3.00] * [frame=1.00]		.	.	.
[dispec=1.00]	*	.	.	.
[text=3.00] * [frame=2.00]		.	.	.
[dispec=2.00]	*	.	.	.
[text=1.00] * [frame=1.00]		.	.	.
[dispec=2.00]	*	.	.	.
[text=1.00] * [frame=2.00]		.	.	.
[dispec=2.00]	*	.	.	.
[text=2.00] * [frame=1.00]		.	.	.
[dispec=2.00]	*	.	.	.
[text=2.00] * [frame=2.00]		.	.	.
[dispec=2.00]	*	.	.	.
[text=3.00] * [frame=1.00]		.	.	.
[dispec=2.00]	*	.	.	.
[text=3.00] * [frame=2.00]		.	.	.

- a. Computed using alpha = .05
b. This parameter is set to zero because it is redundant.

Post Hoc Tests

text

Multiple Comparisons

average
Scheffe

(I) text	(J) text	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1.00	2.00	-1.2986	1.30430	.610	-4.5148	1.9176
	3.00	3.6319*	1.30430	.022	.4158	6.8481
2.00	1.00	1.2986	1.30430	.610	-1.9176	4.5148
	3.00	4.9306*	1.30430	.001	1.7144	8.1467
3.00	1.00	-3.6319*	1.30430	.022	-6.8481	-.4158
	2.00	-4.9306*	1.30430	.001	-8.1467	-1.7144

Based on observed means.

The error term is Mean Square(Error) = 61.243.

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

Homogeneous Subsets

average

Scheffe^{a,b}

text	N	Subset	
		1	2
3.00	72	21.5486	
1.00	72		25.1806
2.00	72		26.4792
Sig.		1.000	.610

Means for groups in homogeneous subsets are displayed.

Based on observed means.

The error term is Mean Square(Error) = 61.243.

a. Uses Harmonic Mean Sample Size = 72.000.

b. Alpha = .05.

Appendix 7 The experiment

Appendix 7A Raw data of the experiment

	Group	Code	Text	Frame	Recall	Reading Comprehension Score		Average (Original data)	SqrtAverage (Transformed data)
						Rater 1	Rater 2		
Ec.001-A	1	1	1	1	1	22.00	22.00	22.00	4.69
Ec.002-A	1	1	1	1	1	24.00	22.00	23.00	4.80
Ec.003-A	1	1	1	1	1	28.00	28.00	28.00	5.29
Ec.004-A	1	1	1	1	1	27.00	33.00	30.00	5.48
Ec.005-A	1	1	1	1	1	25.00	27.00	26.00	5.10
Ec.006-A	1	1	1	1	1	11.00	12.00	11.50	3.39
Ec.007-A	1	1	1	1	1	12.00	12.00	12.00	3.46
Ec.008-A	1	1	1	1	1	22.00	22.00	22.00	4.69
Ec.009-A	1	1	1	1	1	35.00	31.00	33.00	5.74
Ec.010-A	1	1	1	1	1	19.00	19.00	19.00	4.36
Ec.011-A	1	1	1	1	1	13.00	13.00	13.00	3.61
Ec.012-A	1	1	1	1	1	26.00	28.00	27.00	5.20
Ec.013-A	1	1	1	1	1	18.00	16.00	17.00	4.12
Ec.014-A	1	1	1	1	1	12.00	13.00	12.50	3.54
Ec.015-A	1	1	1	1	1	24.00	24.00	24.00	4.90
Ec.016-A	1	1	1	1	1	34.00	34.00	34.00	5.83
Ec.017-A	1	1	1	1	1	48.00	44.00	46.00	6.78
Ec.018-A	1	1	1	1	1	20.00	20.00	20.00	4.47
Ec.019-B	2	1	1	1	2	12.00	10.00	11.00	3.32
Ec.020-B	2	1	1	1	2	40.00	38.00	39.00	6.24
Ec.021-B	2	1	1	1	2	32.00	34.00	33.00	5.74
Ec.022-B	2	1	1	1	2	28.00	28.00	28.00	5.29
Ec.023-B	2	1	1	1	2	37.00	38.00	37.50	6.12
Ec.024-B	2	1	1	1	2	38.00	38.00	38.00	6.16
Ec.025-B	2	1	1	1	2	35.00	33.00	34.00	5.83
Ec.026-B	2	1	1	1	2	44.00	45.00	44.50	6.67
Ec.027-B	2	1	1	1	2	38.00	38.00	38.00	6.16
Ec.028-B	2	1	1	1	2	19.00	18.00	18.50	4.30
Ec.029-B	2	1	1	1	2	37.00	32.00	34.50	5.87
Ec.030-B	2	1	1	1	2	36.00	36.00	36.00	6.00
Ec.031-B	2	1	1	1	2	37.00	40.00	38.50	6.20
Ec.032-B	2	1	1	1	2	22.00	24.00	23.00	4.80
Ec.033-B	2	1	1	1	2	34.00	35.00	34.50	5.87
Ec.034-B	2	1	1	1	2	50.00	46.00	48.00	6.93
Ec.035-B	2	1	1	1	2	48.00	44.00	46.00	6.78
Ec.036-B	2	1	1	1	2	22.00	24.00	23.00	4.80
Ec.037-C	3	1	1	2	1	42.00	44.00	43.00	6.56
Ec.038-C	3	1	1	2	1	23.00	22.00	22.50	4.74
Ec.039-C	3	1	1	2	1	31.00	31.00	31.00	5.57
Ec.040-C	3	1	1	2	1	19.00	19.00	19.00	4.36
Ec.041-C	3	1	1	2	1	24.00	24.00	24.00	4.90
Ec.042-C	3	1	1	2	1	26.00	24.00	25.00	5.00
Ec.043-C	3	1	1	2	1	17.00	19.00	18.00	4.24
Ec.044-C	3	1	1	2	1	20.00	22.00	21.00	4.58
Ec.045-C	3	1	1	2	1	19.00	19.00	19.00	4.36
Ec.046-C	3	1	1	2	1	35.00	35.00	35.00	5.92
Ec.047-C	3	1	1	2	1	32.00	30.00	31.00	5.57

Ec.048-C	3	1	1	2	1	35.00	33.00	34.00	5.83
Ec.049-C	3	1	1	2	1	19.00	16.00	17.50	4.18
Ec.050-C	3	1	1	2	1	29.00	33.00	31.00	5.57
Ec.051-C	3	1	1	2	1	18.00	16.00	17.00	4.12
Ec.052-C	3	1	1	2	1	18.00	18.00	18.00	4.24
Ec.053-C	3	1	1	2	1	31.00	29.00	30.00	5.48
Ec.054-C	3	1	1	2	1	25.00	24.00	24.50	4.95
Ec.055-D	4	1	1	2	2	31.00	30.00	30.50	5.52
Ec.056-D	4	1	1	2	2	33.00	37.00	35.00	5.92
Ec.057-D	4	1	1	2	2	36.00	34.00	35.00	5.92
Ec.058-D	4	1	1	2	2	32.00	34.00	33.00	5.74
Ec.059-D	4	1	1	2	2	35.00	37.00	36.00	6.00
Ec.060-D	4	1	1	2	2	32.00	36.00	34.00	5.83
Ec.061-D	4	1	1	2	2	38.00	40.00	39.00	6.24
Ec.062-D	4	1	1	2	2	30.00	32.00	31.00	5.57
Ec.063-D	4	1	1	2	2	35.00	31.00	33.00	5.74
Ec.064-D	4	1	1	2	2	33.00	33.00	33.00	5.74
Ec.065-D	4	1	1	2	2	43.00	44.00	43.50	6.60
Ec.066-D	4	1	1	2	2	45.00	41.00	43.00	6.56
Ec.067-D	4	1	1	2	2	48.00	48.00	48.00	6.93
Ec.068-D	4	1	1	2	2	39.00	37.00	38.00	6.16
Ec.069-D	4	1	1	2	2	49.00	53.00	51.00	7.14
Ec.070-D	4	1	1	2	2	43.00	40.00	41.50	6.44
Ec.071-D	4	1	1	2	2	35.00	39.00	37.00	6.08
Ec.072-D	4	1	1	2	2	20.00	18.00	19.00	4.36
Ec.073-D	5	1	1	3	1	42.00	43.00	42.50	6.52
Ec.074-D	5	1	1	3	1	20.00	22.00	21.00	4.58
Ec.075-E	5	1	1	3	1	19.00	16.00	17.50	4.18
Ec.076-E	5	1	1	3	1	20.00	20.00	20.00	4.47
Ec.077-E	5	1	1	3	1	28.00	29.00	28.50	5.34
Ec.078-E	5	1	1	3	1	35.00	34.00	34.50	5.87
Ec.079-E	5	1	1	3	1	21.00	21.00	21.00	4.58
Ec.080-E	5	1	1	3	1	27.00	25.00	26.00	5.10
Ec.081-E	5	1	1	3	1	39.00	37.00	38.00	6.16
Ec.082-E	5	1	1	3	1	26.00	25.00	25.50	5.05
Ec.083-E	5	1	1	3	1	36.00	40.00	38.00	6.16
Ec.084-E	5	1	1	3	1	28.00	28.00	28.00	5.29
Ec.085-E	5	1	1	3	1	34.00	34.00	34.00	5.83
Ec.086-E	5	1	1	3	1	37.00	35.00	36.00	6.00
Ec.087-E	5	1	1	3	1	17.00	16.00	16.50	4.06
Ec.088-E	5	1	1	3	1	36.00	35.00	35.50	5.96
Ec.089-E	5	1	1	3	1	22.00	22.00	22.00	4.69
Ec.090-E	5	1	1	3	1	35.00	35.00	35.00	5.92
Ec.091-F	6	1	1	3	2	34.00	34.00	34.00	5.83
Ec.092-F	6	1	1	3	2	45.00	46.00	45.50	6.75
Ec.093-F	6	1	1	3	2	52.00	55.00	53.50	7.31
Ec.094-F	6	1	1	3	2	40.00	44.00	42.00	6.48
Ec.095-F	6	1	1	3	2	53.00	53.00	53.00	7.28
Ec.096-F	6	1	1	3	2	49.00	53.00	51.00	7.14
Ec.097-F	6	1	1	3	2	42.00	43.00	42.50	6.52
Ec.098-F	6	1	1	3	2	31.00	33.00	32.00	5.66
Ec.099-F	6	1	1	3	2	39.00	37.00	38.00	6.16
Ec.100-F	6	1	1	3	2	40.00	40.00	40.00	6.32
Ec.101-F	6	1	1	3	2	36.00	37.00	36.50	6.04
Ec.102-F	6	1	1	3	2	36.00	36.00	36.00	6.00
Ec.103-F	6	1	1	3	2	55.00	56.00	55.50	7.45
Ec.104-F	6	1	1	3	2	28.00	26.00	27.00	5.20
Ec.105-F	6	1	1	3	2	27.00	25.00	26.00	5.10
Ec.106-F	6	1	1	3	2	26.00	26.00	26.00	5.10
Ec.107-F	6	1	1	3	2	38.00	39.00	38.50	6.20
Ec.108-F	6	1	1	3	2	36.00	36.00	36.00	6.00
Ec.109-G	7	1	2	1	1	33.00	35.00	34.00	5.83

Ec.110-G	7	1	2	1	1	18.00	22.00	20.00	4.47
Ec.111-G	7	1	2	1	1	15.00	15.00	15.00	3.87
Ec.112-G	7	1	2	1	1	11.00	10.00	10.50	3.24
Ec.113-G	7	1	2	1	1	20.00	19.00	19.50	4.42
Ec.114-G	7	1	2	1	1	18.00	17.00	17.50	4.18
Ec.115-G	7	1	2	1	1	23.00	22.00	22.50	4.74
Ec.116-G	7	1	2	1	1	17.00	16.00	16.50	4.06
Ec.117-G	7	1	2	1	1	24.00	23.00	23.50	4.85
Ec.118-G	7	1	2	1	1	23.00	24.00	23.50	4.85
Ec.119-G	7	1	2	1	1	34.00	32.00	33.00	5.74
Ec.120-G	7	1	2	1	1	9.00	8.00	8.50	2.92
Ec.121-G	7	1	2	1	1	17.00	15.00	16.00	4.00
Ec.122-G	7	1	2	1	1	27.00	27.00	27.00	5.20
Ec.123-G	7	1	2	1	1	28.00	29.00	28.50	5.34
Ec.124-G	7	1	2	1	1	38.00	38.00	38.00	6.16
Ec.125-G	7	1	2	1	1	22.00	21.00	21.50	4.64
Ec.126-G	7	1	2	1	1	25.00	24.00	24.50	4.95
Ec.127-H	8	1	2	1	2	27.00	29.00	28.00	5.29
Ec.128-H	8	1	2	1	2	36.00	34.00	35.00	5.92
Ec.129-H	8	1	2	1	2	38.00	36.00	37.00	6.08
Ec.130-H	8	1	2	1	2	25.00	24.00	24.50	4.95
Ec.131-H	8	1	2	1	2	20.00	22.00	21.00	4.58
Ec.132-H	8	1	2	1	2	32.00	34.00	33.00	5.74
Ec.133-H	8	1	2	1	2	19.00	19.00	19.00	4.36
Ec.134-H	8	1	2	1	2	22.00	26.00	24.00	4.90
Ec.135-H	8	1	2	1	2	39.00	37.00	38.00	6.16
Ec.136-H	8	1	2	1	2	45.00	45.00	45.00	6.71
Ec.137-H	8	1	2	1	2	18.00	16.00	17.00	4.12
Ec.138-H	8	1	2	1	2	41.00	39.00	40.00	6.32
Ec.139-H	8	1	2	1	2	42.00	40.00	41.00	6.40
Ec.140-H	8	1	2	1	2	22.00	24.00	23.00	4.80
Ec.141-H	8	1	2	1	2	24.00	26.00	25.00	5.00
Ec.142-H	8	1	2	1	2	38.00	38.00	38.00	6.16
Ec.143-H	8	1	2	1	2	30.00	32.00	31.00	5.57
Ec.144-H	8	1	2	1	2	26.00	28.00	27.00	5.20
Ec.145-I	9	1	2	2	1	34.00	30.00	32.00	5.66
Ec.146-I	9	1	2	2	1	16.00	16.00	16.00	4.00
Ec.147-I	9	1	2	2	1	22.00	20.00	21.00	4.58
Ec.148-I	9	1	2	2	1	24.00	24.00	24.00	4.90
Ec.149-I	9	1	2	2	1	30.00	28.00	29.00	5.39
Ec.150-I	9	1	2	2	1	14.00	12.00	13.00	3.61
Ec.151-I	9	1	2	2	1	24.00	26.00	25.00	5.00
Ec.152-I	9	1	2	2	1	18.00	18.00	18.00	4.24
Ec.153-I	9	1	2	2	1	20.00	19.00	19.50	4.42
Ec.154-I	9	1	2	2	1	34.00	32.00	33.00	5.74
Ec.155-I	9	1	2	2	1	26.00	28.00	27.00	5.20
Ec.156-I	9	1	2	2	1	17.00	19.00	18.00	4.24
Ec.157-I	9	1	2	2	1	35.00	34.00	34.50	5.87
Ec.158-I	9	1	2	2	1	16.00	15.00	15.50	3.94
Ec.159-I	9	1	2	2	1	18.00	17.00	17.50	4.18
Ec.160-I	9	1	2	2	1	21.00	21.00	21.00	4.58
Ec.161-I	9	1	2	2	1	18.00	18.00	18.00	4.24
Ec.162-I	9	1	2	2	1	36.00	34.00	35.00	5.92
Ec.163-J	10	1	2	2	2	35.00	36.00	35.50	5.96
Ec.164-J	10	1	2	2	2	38.00	42.00	40.00	6.32
Ec.165-J	10	1	2	2	2	22.00	21.00	21.50	4.64
Ec.166-J	10	1	2	2	2	38.00	36.00	37.00	6.08
Ec.167-J	10	1	2	2	2	37.00	38.00	37.50	6.12
Ec.168-J	10	1	2	2	2	42.00	41.00	41.50	6.44
Ec.169-J	10	1	2	2	2	22.00	22.00	22.00	4.69
Ec.170-J	10	1	2	2	2	30.00	33.00	31.50	5.61
Ec.171-J	10	1	2	2	2	23.00	22.00	22.50	4.74

Ec.172-J	10	1	2	2	2	22.00	18.00	20.00	4.47
Ec.173-J	10	1	2	2	2	30.00	30.00	30.00	5.48
Ec.174-J	10	1	2	2	2	46.00	47.00	46.50	6.82
Ec.175-J	10	1	2	2	2	53.00	50.00	51.50	7.18
Ec.176-J	10	1	2	2	2	39.00	39.00	39.00	6.24
Ec.177-J	10	1	2	2	2	31.00	30.00	30.50	5.52
Ec.178-J	10	1	2	2	2	31.00	31.00	31.00	5.57
Ec.179-J	10	1	2	2	2	38.00	39.00	38.50	6.20
Ec.180-J	10	1	2	2	2	42.00	40.00	41.00	6.40
Ec.181-K	11	1	2	3	1	39.00	42.00	40.50	6.36
Ec.182-K	11	1	2	3	1	16.00	15.00	15.50	3.94
Ec.183-K	11	1	2	3	1	20.00	18.00	19.00	4.36
Ec.184-K	11	1	2	3	1	22.00	23.00	22.50	4.74
Ec.185-K	11	1	2	3	1	29.00	28.00	28.50	5.34
Ec.186-K	11	1	2	3	1	50.00	50.00	50.00	7.07
Ec.187-K	11	1	2	3	1	19.00	19.00	19.00	4.36
Ec.188-K	11	1	2	3	1	24.00	21.00	22.50	4.74
Ec.189-K	11	1	2	3	1	16.00	16.00	16.00	4.00
Ec.190-K	11	1	2	3	1	30.00	31.00	30.50	5.52
Ec.191-K	11	1	2	3	1	17.00	17.00	17.00	4.12
Ec.192-K	11	1	2	3	1	16.00	14.00	15.00	3.87
Ec.193-K	11	1	2	3	1	26.00	22.00	24.00	4.90
Ec.194-K	11	1	2	3	1	31.00	31.00	31.00	5.57
Ec.195-K	11	1	2	3	1	25.00	25.00	25.00	5.00
Ec.196-K	11	1	2	3	1	33.00	33.00	33.00	5.74
Ec.197-K	11	1	2	3	1	37.00	37.00	37.00	6.08
Ec.198-K	11	1	2	3	1	14.00	14.00	14.00	3.74
Ec.199-L	12	1	2	3	2	41.00	41.00	41.00	6.40
Ec.200-L	12	1	2	3	2	39.00	43.00	41.00	6.40
Ec.201-L	12	1	2	3	2	31.00	31.00	31.00	5.57
Ec.202-L	12	1	2	3	2	25.00	21.00	23.00	4.80
Ec.203-L	12	1	2	3	2	35.00	35.00	35.00	5.92
Ec.204-L	12	1	2	3	2	37.00	37.00	37.00	6.08
Ec.205-L	12	1	2	3	2	37.00	36.00	36.50	6.04
Ec.206-L	12	1	2	3	2	42.00	42.00	42.00	6.48
Ec.207-L	12	1	2	3	2	40.00	36.00	38.00	6.16
Ec.208-L	12	1	2	3	2	39.00	39.00	39.00	6.24
Ec.209-L	12	1	2	3	2	44.00	40.00	42.00	6.48
Ec.210-L	12	1	2	3	2	22.00	21.00	21.50	4.64
Ec.211-L	12	1	2	3	2	45.00	46.00	45.50	6.75
Ec.212-L	12	1	2	3	2	40.00	41.00	40.50	6.36
Ec.213-L	12	1	2	3	2	47.00	46.00	46.50	6.82
Ec.214-L	12	1	2	3	2	20.00	20.00	20.00	4.47
Ec.215-L	12	1	2	3	2	34.00	38.00	36.00	6.00
Ec.216-L	12	1	2	3	2	29.00	29.00	29.00	5.39
Ec.217-M	13	1	3	1	1	21.00	19.00	20.00	4.47
Ec.218-M	13	1	3	1	1	30.00	29.00	29.50	5.43
Ec.219-M	13	1	3	1	1	14.00	13.00	13.50	3.67
Ec.220-M	13	1	3	1	1	10.00	9.00	9.50	3.08
Ec.221-M	13	1	3	1	1	24.00	24.00	24.00	4.90
Ec.222-M	13	1	3	1	1	14.00	14.00	14.00	3.74
Ec.223-M	13	1	3	1	1	31.00	30.00	30.50	5.52
Ec.224-M	13	1	3	1	1	14.00	13.00	13.50	3.67
Ec.225-M	13	1	3	1	1	18.00	17.00	17.50	4.18
Ec.226-M	13	1	3	1	1	10.00	10.00	10.00	3.16
Ec.227-M	13	1	3	1	1	8.00	7.00	7.50	2.74
Ec.228-M	13	1	3	1	1	22.00	19.00	20.50	4.53
Ec.229-M	13	1	3	1	1	34.00	36.00	35.00	5.92
Ec.230-M	13	1	3	1	1	9.00	7.00	8.00	2.83
Ec.231-M	13	1	3	1	1	16.00	17.00	16.50	4.06
Ec.232-M	13	1	3	1	1	25.00	23.00	24.00	4.90
Ec.233-M	13	1	3	1	1	22.00	23.00	22.50	4.74

Ec.234-M	13	1	3	1	1	26.00	28.00	27.00	5.20
Ec.235-N	14	1	3	1	2	26.00	25.00	25.50	5.05
Ec.236-N	14	1	3	1	2	21.00	21.00	21.00	4.58
Ec.237-N	14	1	3	1	2	32.00	32.00	32.00	5.66
Ec.238-N	14	1	3	1	2	20.00	18.00	19.00	4.36
Ec.239-N	14	1	3	1	2	33.00	31.00	32.00	5.66
Ec.240-N	14	1	3	1	2	18.00	14.00	16.00	4.00
Ec.241-N	14	1	3	1	2	17.00	15.00	16.00	4.00
Ec.242-N	14	1	3	1	2	17.00	18.00	17.50	4.18
Ec.243-N	14	1	3	1	2	37.00	35.00	36.00	6.00
Ec.244-N	14	1	3	1	2	14.00	14.00	14.00	3.74
Ec.245-N	14	1	3	1	2	41.00	40.00	40.50	6.36
Ec.246-N	14	1	3	1	2	36.00	32.00	34.00	5.83
Ec.247-N	14	1	3	1	2	34.00	36.00	35.00	5.92
Ec.248-N	14	1	3	1	2	38.00	37.00	37.50	6.12
Ec.249-N	14	1	3	1	2	34.00	30.00	32.00	5.66
Ec.250-N	14	1	3	1	2	52.00	49.00	50.50	7.11
Ec.251-N	14	1	3	1	2	25.00	25.00	25.00	5.00
Ec.252-N	14	1	3	1	2	21.00	20.00	20.50	4.53
Ec.253-O	15	1	3	2	1	20.00	20.00	20.00	4.47
Ec.254-O	15	1	3	2	1	22.00	21.00	21.50	4.64
Ec.255-O	15	1	3	2	1	22.00	26.00	24.00	4.90
Ec.256-O	15	1	3	2	1	25.00	23.00	24.00	4.90
Ec.257-O	15	1	3	2	1	17.00	17.00	17.00	4.12
Ec.258-O	15	1	3	2	1	15.00	15.00	15.00	3.87
Ec.259-O	15	1	3	2	1	24.00	25.00	24.50	4.95
Ec.260-O	15	1	3	2	1	21.00	22.00	21.50	4.64
Ec.261-O	15	1	3	2	1	11.00	10.00	10.50	3.24
Ec.162-O	15	1	3	2	1	25.00	28.00	26.50	5.15
Ec.263-O	15	1	3	2	1	8.00	8.00	8.00	2.83
Ec.264-O	15	1	3	2	1	25.00	25.00	25.00	5.00
Ec.265-O	15	1	3	2	1	23.00	22.00	22.50	4.74
Ec.266-O	15	1	3	2	1	18.00	18.00	18.00	4.24
Ec.267-O	15	1	3	2	1	14.00	13.00	13.50	3.67
Ec.268-O	15	1	3	2	1	28.00	32.00	30.00	5.48
Ec.269-O	15	1	3	2	1	19.00	19.00	19.00	4.36
Ec.270-O	15	1	3	2	1	13.00	13.00	13.00	3.61
Ec.271-P	16	1	3	2	2	21.00	21.00	21.00	4.58
Ec.172-P	16	1	3	2	2	21.00	20.00	20.50	4.53
Ec.273-P	16	1	3	2	2	24.00	23.00	23.50	4.85
Ec.274-P	16	1	3	2	2	46.00	44.00	45.00	6.71
Ec.275-P	16	1	3	2	2	33.00	33.00	33.00	5.74
Ec.276-P	16	1	3	2	2	37.00	37.00	37.00	6.08
Ec.277-P	16	1	3	2	2	27.00	28.00	27.50	5.24
Ec.278-P	16	1	3	2	2	39.00	38.00	38.50	6.20
Ec.279-P	16	1	3	2	2	42.00	38.00	40.00	6.32
Ec.280-P	16	1	3	2	2	30.00	31.00	30.50	5.52
Ec.281-P	16	1	3	2	2	24.00	22.00	23.00	4.80
Ec.282-P	16	1	3	2	2	19.00	19.00	19.00	4.36
Ec.283-P	16	1	3	2	2	14.00	13.00	13.50	3.67
Ec.284-P	16	1	3	2	2	37.00	38.00	37.50	6.12
Ec.285-P	16	1	3	2	2	31.00	28.00	29.50	5.43
Ec.286-P	16	1	3	2	2	34.00	32.00	33.00	5.74
Ec.287-P	16	1	3	2	2	43.00	39.00	41.00	6.40
Ec.288-P	16	1	3	2	2	28.00	30.00	29.00	5.39
Ec.289-Q	17	1	3	3	1	30.00	34.00	32.00	5.66
Ec.290-Q	17	1	3	3	1	29.00	28.00	28.50	5.34
Ec.291-Q	17	1	3	3	1	19.00	23.00	21.00	4.58
Ec.292-Q	17	1	3	3	1	18.00	17.00	17.50	4.18
Ec.293-Q	17	1	3	3	1	29.00	29.00	29.00	5.39
Ec.294-Q	17	1	3	3	1	21.00	21.00	21.00	4.58
Ec.295-Q	17	1	3	3	1	16.00	14.00	15.00	3.87

Ec.296-Q	17	1	3	3	1	30.00	32.00	31.00	5.57
Ec.297-Q	17	1	3	3	1	32.00	32.00	32.00	5.66
Ec.298-Q	17	1	3	3	1	20.00	22.00	21.00	4.58
Ec.299-Q	17	1	3	3	1	11.00	10.00	10.50	3.24
Ec.300-Q	17	1	3	3	1	16.00	14.00	15.00	3.87
Ec.301-Q	17	1	3	3	1	13.00	13.00	13.00	3.61
Ec.302-Q	17	1	3	3	1	14.00	13.00	13.50	3.67
Ec.303-Q	17	1	3	3	1	25.00	23.00	24.00	4.90
Ec.304-Q	17	1	3	3	1	34.00	32.00	33.00	5.74
Ec.305-Q	17	1	3	3	1	19.00	18.00	18.50	4.30
Ec.306-Q	17	1	3	3	1	9.00	9.00	9.00	3.00
Ec.307-R	18	1	3	3	2	25.00	25.00	25.00	5.00
Ec.308-R	18	1	3	3	2	34.00	35.00	34.50	5.87
Ec.309-R	18	1	3	3	2	21.00	20.00	20.50	4.53
Ec.310-R	18	1	3	3	2	37.00	38.00	37.50	6.12
Ec.311-R	18	1	3	3	2	29.00	26.00	27.50	5.24
Ec.312-R	18	1	3	3	2	33.00	27.00	30.00	5.48
Ec.313-R	18	1	3	3	2	42.00	46.00	44.00	6.63
Ec.314-R	18	1	3	3	2	35.00	37.00	36.00	6.00
Ec.315-R	18	1	3	3	2	31.00	35.00	33.00	5.74
Ec.316-R	18	1	3	3	2	26.00	24.00	25.00	5.00
Ec.317-R	18	1	3	3	2	22.00	19.00	20.50	4.53
Ec.318-R	18	1	3	3	2	40.00	35.00	37.50	6.12
Ec.319-R	18	1	3	3	2	18.00	18.00	18.00	4.24
Ec.320-R	18	1	3	3	2	39.00	40.00	39.50	6.28
Ec.321-R	18	1	3	3	2	21.00	21.00	21.00	4.58
Ec.322-R	18	1	3	3	2	43.00	38.00	40.50	6.36
Ec.323-R	18	1	3	3	2	41.00	42.00	41.50	6.44
Ec.324-R	18	1	3	3	2	17.00	17.00	17.00	4.12
Ag.325-A	19	1	1	1	1	32.00	32.00	32.00	5.66
Ag.326-A	19	1	1	1	1	33.00	32.00	32.50	5.70
Ag.327-A	19	1	1	1	1	24.00	24.00	24.00	4.90
Ag.328-A	19	1	1	1	1	12.00	12.00	12.00	3.46
Ag.329-A	19	1	1	1	1	33.00	29.00	31.00	5.57
Ag.330-A	19	1	1	1	1	26.00	28.00	27.00	5.20
Ag.331-A	19	1	1	1	1	10.00	10.00	10.00	3.16
Ag.332-A	19	1	1	1	1	16.00	18.00	17.00	4.12
Ag.333-A	19	1	1	1	1	32.00	32.00	32.00	5.66
Ag.334-A	19	1	1	1	1	12.00	16.00	14.00	3.74
Ag.335-A	19	1	1	1	1	15.00	17.00	16.00	4.00
Ag.336-A	19	1	1	1	1	20.00	20.00	20.00	4.47
Ag.337-A	19	1	1	1	1	15.00	15.00	15.00	3.87
Ag.338-A	19	1	1	1	1	46.00	42.00	44.00	6.63
Ag.339-A	19	1	1	1	1	11.00	11.00	11.00	3.32
Ag.340-A	19	1	1	1	1	15.00	15.00	15.00	3.87
Ag.341-A	19	1	1	1	1	26.00	27.00	26.50	5.15
Ag.342-A	19	1	1	1	1	24.00	22.00	23.00	4.80
Ag.343-B	20	1	1	1	2	24.00	23.00	23.50	4.85
Ag.344-B	20	1	1	1	2	9.00	10.00	9.50	3.08
Ag.345-B	20	1	1	1	2	25.00	25.00	25.00	5.00
Ag.346-B	20	1	1	1	2	41.00	45.00	43.00	6.56
Ag.347-B	20	1	1	1	2	23.00	23.00	23.00	4.80
Ag.348-B	20	1	1	1	2	24.00	24.00	24.00	4.90
Ag.349-B	20	1	1	1	2	29.00	30.00	29.50	5.43
Ag.350-B	20	1	1	1	2	19.00	17.00	18.00	4.24
Ag.351-B	20	1	1	1	2	23.00	25.00	24.00	4.90
Ag.352-B	20	1	1	1	2	29.00	29.00	29.00	5.39
Ag.353-B	20	1	1	1	2	31.00	32.00	31.50	5.61
Ag.354-B	20	1	1	1	2	31.00	31.00	31.00	5.57
Ag.355-B	20	1	1	1	2	34.00	32.00	33.00	5.74
Ag.356-B	20	1	1	1	2	43.00	43.00	43.00	6.56
Ag.357-B	20	1	1	1	2	45.00	51.00	48.00	6.93

Ag.358-B	20	1	1	1	2	37.00	37.00	37.00	6.08
Ag.359-B	20	1	1	1	2	27.00	29.00	28.00	5.29
Ag.360-B	20	1	1	1	2	22.00	21.00	21.50	4.64
Ag.361-C	21	1	1	2	1	39.00	38.00	38.50	6.20
Ag.362-C	21	1	1	2	1	12.00	12.00	12.00	3.46
Ag.363-C	21	1	1	2	1	26.00	25.00	25.50	5.05
Ag.364-C	21	1	1	2	1	18.00	17.00	17.50	4.18
Ag.365-C	21	1	1	2	1	21.00	21.00	21.00	4.58
Ag.366-C	21	1	1	2	1	31.00	31.00	31.00	5.57
Ag.367-C	21	1	1	2	1	31.00	30.00	30.50	5.52
Ag.368-C	21	1	1	2	1	18.00	19.00	18.50	4.30
Ag.369-C	21	1	1	2	1	20.00	19.00	19.50	4.42
Ag.370-C	21	1	1	2	1	13.00	13.00	13.00	3.61
Ag.371-C	21	1	1	2	1	21.00	21.00	21.00	4.58
Ag.372-C	21	1	1	2	1	23.00	22.00	22.50	4.74
Ag.373-C	21	1	1	2	1	40.00	37.00	38.50	6.20
Ag.374-C	21	1	1	2	1	18.00	19.00	18.50	4.30
Ag.375-C	21	1	1	2	1	21.00	20.00	20.50	4.53
Ag.376-C	21	1	1	2	1	15.00	15.00	15.00	3.87
Ag.377-C	21	1	1	2	1	19.00	18.00	18.50	4.30
Ag.378-C	21	1	1	2	1	30.00	29.00	29.50	5.43
Ag.379-D	22	1	1	2	2	32.00	30.00	31.00	5.57
Ag.380-D	22	1	1	2	2	32.00	32.00	32.00	5.66
Ag.381-D	22	1	1	2	2	27.00	26.00	26.50	5.15
Ag.382-D	22	1	1	2	2	21.00	20.00	20.50	4.53
Ag.383-D	22	1	1	2	2	37.00	38.00	37.50	6.12
Ag.384-D	22	1	1	2	2	23.00	22.00	22.50	4.74
Ag.385-D	22	1	1	2	2	31.00	31.00	31.00	5.57
Ag.386-D	22	1	1	2	2	41.00	40.00	40.50	6.36
Ag.387-D	22	1	1	2	2	41.00	37.00	39.00	6.24
Ag.388-D	22	1	1	2	2	23.00	24.00	23.50	4.85
Ag.389-D	22	1	1	2	2	15.00	15.00	15.00	3.87
Ag.390-D	22	1	1	2	2	40.00	39.00	39.50	6.28
Ag.391-D	22	1	1	2	2	35.00	34.00	34.50	5.87
Ag.392-D	22	1	1	2	2	37.00	37.00	37.00	6.08
Ag.393-D	22	1	1	2	2	39.00	39.00	39.00	6.24
Ag.394-D	22	1	1	2	2	27.00	25.00	26.00	5.10
Ag.395-D	22	1	1	2	2	34.00	35.00	34.50	5.87
Ag.396-D	22	1	1	2	2	32.00	31.00	31.50	5.61
Ag.397-E	23	1	1	3	1	35.00	35.00	35.00	5.92
Ag.398-E	23	1	1	3	1	25.00	24.00	24.50	4.95
Ag.399-E	23	1	1	3	1	25.00	25.00	25.00	5.00
Ag.400-E	23	1	1	3	1	37.00	34.00	35.50	5.96
Ag.401-E	23	1	1	3	1	13.00	11.00	12.00	3.46
Ag.402-E	23	1	1	3	1	17.00	16.00	16.50	4.06
Ag.403-E	23	1	1	3	1	14.00	13.00	13.50	3.67
Ag.404-E	23	1	1	3	1	37.00	35.00	36.00	6.00
Ag.405-E	23	1	1	3	1	16.00	14.00	15.00	3.87
Ag.406-E	23	1	1	3	1	15.00	15.00	15.00	3.87
Ag.407-E	23	1	1	3	1	31.00	30.00	30.50	5.52
Ag.408-E	23	1	1	3	1	33.00	33.00	33.00	5.74
Ag.409-E	23	1	1	3	1	29.00	28.00	28.50	5.34
Ag.410-E	23	1	1	3	1	19.00	18.00	18.50	4.30
Ag.411-E	23	1	1	3	1	39.00	39.00	39.00	6.24
Ag.412-E	23	1	1	3	1	33.00	37.00	35.00	5.92
Ag.413-E	23	1	1	3	1	25.00	25.00	25.00	5.00
Ag.414-F	23	1	1	3	1	19.00	21.00	20.00	4.47
Ag.415-F	24	1	1	3	2	20.00	18.00	19.00	4.36
Ag.416-F	24	1	1	3	2	52.00	50.00	51.00	7.14
Ag.417-F	24	1	1	3	2	28.00	30.00	29.00	5.39
Ag.418-F	24	1	1	3	2	28.00	27.00	27.50	5.24
Ag.419-F	24	1	1	3	2	26.00	27.00	26.50	5.15

Ag.420-F	24	1	1	3	2	27.00	29.00	28.00	5.29
Ag.421-F	24	1	1	3	2	47.00	43.00	45.00	6.71
Ag.422-F	24	1	1	3	2	34.00	33.00	33.50	5.79
Ag.423-F	24	1	1	3	2	45.00	45.00	45.00	6.71
Ag.424-F	24	1	1	3	2	26.00	25.00	25.50	5.05
Ag.425-F	24	1	1	3	2	27.00	28.00	27.50	5.24
Ag.426-F	24	1	1	3	2	39.00	43.00	41.00	6.40
Ag.427-F	24	1	1	3	2	36.00	37.00	36.50	6.04
Ag.428-F	24	1	1	3	2	30.00	27.00	28.50	5.34
Ag.429-F	24	1	1	3	2	32.00	31.00	31.50	5.61
Ag.430-F	24	1	1	3	2	43.00	42.00	42.50	6.52
Ag.431-F	24	1	1	3	2	45.00	45.00	45.00	6.71
Ag.432-F	24	1	1	3	2	23.00	22.00	22.50	4.74
Ag.433-G	25	1	2	1	1	37.00	38.00	37.50	6.12
Ag.434-G	25	1	2	1	1	26.00	26.00	26.00	5.10
Ag.435-G	25	1	2	1	1	17.00	17.00	17.00	4.12
Ag.436-G	25	1	2	1	1	19.00	19.00	19.00	4.36
Ag.437-G	25	1	2	1	1	24.00	29.00	26.50	5.15
Ag.438-G	25	1	2	1	1	17.00	17.00	17.00	4.12
Ag.439-G	25	1	2	1	1	11.00	9.00	10.00	3.16
Ag.440-G	25	1	2	1	1	26.00	30.00	28.00	5.29
Ag.441-G	25	1	2	1	1	12.00	13.00	12.50	3.54
Ag.442-G	25	1	2	1	1	14.00	12.00	13.00	3.61
Ag.443-G	25	1	2	1	1	20.00	20.00	20.00	4.47
Ag.444-G	25	1	2	1	1	13.00	12.00	12.50	3.54
Ag.445-G	25	1	2	1	1	11.00	11.00	11.00	3.32
Ag.446-G	25	1	2	1	1	31.00	32.00	31.50	5.61
Ag.447-G	25	1	2	1	1	9.00	9.00	9.00	3.00
Ag.448-G	25	1	2	1	1	18.00	18.00	18.00	4.24
Ag.449-G	25	1	2	1	1	31.00	31.00	31.00	5.57
Ag.450-G	25	1	2	1	1	18.00	16.00	17.00	4.12
Ag.451-H	26	1	2	1	2	27.00	28.00	27.50	5.24
Ag.452-H	26	1	2	1	2	22.00	21.00	21.50	4.64
Ag.453-H	26	1	2	1	2	17.00	16.00	16.50	4.06
Ag.454-H	26	1	2	1	2	27.00	28.00	27.50	5.24
Ag.455-H	26	1	2	1	2	15.00	15.00	15.00	3.87
Ag.456-H	26	1	2	1	2	17.00	15.00	16.00	4.00
Ag.457-H	26	1	2	1	2	33.00	36.00	34.50	5.87
Ag.458-H	26	1	2	1	2	27.00	27.00	27.00	5.20
Ag.459-H	26	1	2	1	2	31.00	32.00	31.50	5.61
Ag.460-H	26	1	2	1	2	18.00	16.00	17.00	4.12
Ag.461-H	26	1	2	1	2	27.00	26.00	26.50	5.15
Ag.462-H	26	1	2	1	2	25.00	23.00	24.00	4.90
Ag.463-H	26	1	2	1	2	32.00	30.00	31.00	5.57
Ag.464-H	26	1	2	1	2	40.00	38.00	39.00	6.24
Ag.465-H	26	1	2	1	2	36.00	34.00	35.00	5.92
Ag.466-H	26	1	2	1	2	26.00	26.00	26.00	5.10
Ag.467-H	26	1	2	1	2	17.00	18.00	17.50	4.18
Ag.468-H	26	1	2	1	2	40.00	39.00	39.50	6.28
Ag.469-I	27	1	2	2	1	32.00	31.00	31.50	5.61
Ag.470-I	27	1	2	2	1	6.00	6.00	6.00	2.45
Ag.471-I	27	1	2	2	1	9.00	8.00	8.50	2.92
Ag.472-I	27	1	2	2	1	14.00	13.00	13.50	3.67
Ag.473-I	27	1	2	2	1	23.00	23.00	23.00	4.80
Ag.474-I	27	1	2	2	1	22.00	22.00	22.00	4.69
Ag.475-I	27	1	2	2	1	16.00	15.00	15.50	3.94
Ag.476-I	27	1	2	2	1	18.00	18.00	18.00	4.24
Ag.477-I	27	1	2	2	1	36.00	34.00	35.00	5.92
Ag.478-I	27	1	2	2	1	26.00	26.00	26.00	5.10
Ag.479-I	27	1	2	2	1	12.00	12.00	12.00	3.46
Ag.480-I	27	1	2	2	1	26.00	26.00	26.00	5.10
Ag.481-I	27	1	2	2	1	23.00	24.00	23.50	4.85

Ag.482-I	27	1	2	2	1	23.00	23.00	23.00	4.80
Ag.483-I	27	1	2	2	1	19.00	18.00	18.50	4.30
Ag.484-I	27	1	2	2	1	16.00	13.00	14.50	3.81
Ag.485-I	27	1	2	2	1	21.00	20.00	20.50	4.53
Ag.486-I	27	1	2	2	1	21.00	21.00	21.00	4.58
Ag.487-J	28	1	2	2	2	30.00	30.00	30.00	5.48
Ag.488-J	28	1	2	2	2	28.00	28.00	28.00	5.29
Ag.489-J	28	1	2	2	2	18.00	19.00	18.50	4.30
Ag.490-J	28	1	2	2	2	39.00	38.00	38.50	6.20
Ag.491-J	28	1	2	2	2	17.00	17.00	17.00	4.12
Ag.492-J	28	1	2	2	2	30.00	28.00	29.00	5.39
Ag.493-J	28	1	2	2	2	27.00	31.00	29.00	5.39
Ag.494-J	28	1	2	2	2	29.00	30.00	29.50	5.43
Ag.495-J	28	1	2	2	2	42.00	39.00	40.50	6.36
Ag.496-J	28	1	2	2	2	37.00	37.00	37.00	6.08
Ag.497-J	28	1	2	2	2	22.00	22.00	22.00	4.69
Ag.498-J	28	1	2	2	2	48.00	46.00	47.00	6.86
Ag.499-J	28	1	2	2	2	40.00	39.00	39.50	6.28
Ag.500-J	28	1	2	2	2	35.00	35.00	35.00	5.92
Ag.501-J	28	1	2	2	2	19.00	20.00	19.50	4.42
Ag.502-J	28	1	2	2	2	28.00	27.00	27.50	5.24
Ag.503-J	28	1	2	2	2	17.00	17.00	17.00	4.12
Ag.504-J	28	1	2	2	2	18.00	16.00	17.00	4.12
Ag.505-K	29	1	2	3	1	22.00	22.00	22.00	4.69
Ag.506-K	29	1	2	3	1	34.00	34.00	34.00	5.83
Ag.507-K	29	1	2	3	1	27.00	27.00	27.00	5.20
Ag.508-K	29	1	2	3	1	28.00	28.00	28.00	5.29
Ag.509-K	29	1	2	3	1	12.00	11.00	11.50	3.39
Ag.510-K	29	1	2	3	1	22.00	26.00	24.00	4.90
Ag.511-K	29	1	2	3	1	17.00	16.00	16.50	4.06
Ag.512-K	29	1	2	3	1	14.00	14.00	14.00	3.74
Ag.513-K	29	1	2	3	1	36.00	35.00	35.50	5.96
Ag.514-K	29	1	2	3	1	20.00	20.00	20.00	4.47
Ag.515-K	29	1	2	3	1	13.00	11.00	12.00	3.46
Ag.516-K	29	1	2	3	1	38.00	38.00	38.00	6.16
Ag.517-K	29	1	2	3	1	18.00	18.00	18.00	4.24
Ag.518-K	29	1	2	3	1	30.00	29.00	29.50	5.43
Ag.519-K	29	1	2	3	1	15.00	13.00	14.00	3.74
Ag.520-K	29	1	2	3	1	36.00	35.00	35.50	5.96
Ag.521-K	29	1	2	3	1	16.00	16.00	16.00	4.00
Ag.522-K	29	1	2	3	1	12.00	12.00	12.00	3.46
Ag.523-L	30	1	2	3	2	28.00	28.00	28.00	5.29
Ag.524-L	30	1	2	3	2	20.00	18.00	19.00	4.36
Ag.525-L	30	1	2	3	2	21.00	19.00	20.00	4.47
Ag.526-L	30	1	2	3	2	20.00	19.00	19.50	4.42
Ag.527-L	30	1	2	3	2	41.00	41.00	41.00	6.40
Ag.528-L	30	1	2	3	2	36.00	35.00	35.50	5.96
Ag.529-L	30	1	2	3	2	34.00	34.00	34.00	5.83
Ag.530-L	30	1	2	3	2	44.00	41.00	42.50	6.52
Ag.531-L	30	1	2	3	2	38.00	42.00	40.00	6.32
Ag.532-L	30	1	2	3	2	26.00	25.00	25.50	5.05
Ag.533-L	30	1	2	3	2	37.00	38.00	37.50	6.12
Ag.534-L	30	1	2	3	2	32.00	31.00	31.50	5.61
Ag.535-L	30	1	2	3	2	40.00	39.00	39.50	6.28
Ag.536-L	30	1	2	3	2	23.00	22.00	22.50	4.74
Ag.537-L	30	1	2	3	2	35.00	33.00	34.00	5.83
Ag.538-L	30	1	2	3	2	14.00	13.00	13.50	3.67
Ag.539-L	30	1	2	3	2	19.00	19.00	19.00	4.36
Ag.540-L	30	1	2	3	2	45.00	41.00	43.00	6.56
Ag.541-M	31	1	3	1	1	20.00	20.00	20.00	4.47
Ag.542-M	31	1	3	1	1	10.00	9.00	9.50	3.08
Ag.543-M	31	1	3	1	1	10.00	14.00	12.00	3.46

Ag.544-M	31	1	3	1	1	8.00	9.00	8.50	2.92
Ag.545-M	31	1	3	1	1	14.00	14.00	14.00	3.74
Ag.546-M	31	1	3	1	1	21.00	19.00	20.00	4.47
Ag.547-M	31	1	3	1	1	14.00	12.00	13.00	3.61
Ag.548-M	31	1	3	1	1	10.00	9.00	9.50	3.08
Ag.549-M	31	1	3	1	1	9.00	8.00	8.50	2.92
Ag.550-M	31	1	3	1	1	23.00	23.00	23.00	4.80
Ag.551-M	31	1	3	1	1	7.00	8.00	7.50	2.74
Ag.552-M	31	1	3	1	1	13.00	13.00	13.00	3.61
Ag.553-M	31	1	3	1	1	18.00	18.00	18.00	4.24
Ag.554-M	31	1	3	1	1	11.00	10.00	10.50	3.24
Ag.555-M	31	1	3	1	1	15.00	14.00	14.50	3.81
Ag.556-M	31	1	3	1	1	12.00	12.00	12.00	3.46
Ag.557-M	31	1	3	1	1	23.00	23.00	23.00	4.80
Ag.558-M	31	1	3	1	1	20.00	21.00	20.50	4.53
Ag.559-N	32	1	3	1	2	15.00	15.00	15.00	3.87
Ag.560-N	32	1	3	1	2	37.00	35.00	36.00	6.00
Ag.561-N	32	1	3	1	2	17.00	17.00	17.00	4.12
Ag.562-N	32	1	3	1	2	16.00	16.00	16.00	4.00
Ag.563-N	32	1	3	1	2	18.00	18.00	18.00	4.24
Ag.564-N	32	1	3	1	2	22.00	20.00	21.00	4.58
Ag.565-N	32	1	3	1	2	27.00	27.00	27.00	5.20
Ag.566-N	32	1	3	1	2	19.00	17.00	18.00	4.24
Ag.567-N	32	1	3	1	2	21.00	21.00	21.00	4.58
Ag.568-N	32	1	3	1	2	33.00	31.00	32.00	5.66
Ag.569-N	32	1	3	1	2	32.00	32.00	32.00	5.66
Ag.570-N	32	1	3	1	2	19.00	19.00	19.00	4.36
Ag.571-N	32	1	3	1	2	22.00	22.00	22.00	4.69
Ag.572-N	32	1	3	1	2	33.00	37.00	35.00	5.92
Ag.573-N	32	1	3	1	2	25.00	23.00	24.00	4.90
Ag.574-N	32	1	3	1	2	31.00	29.00	30.00	5.48
Ag.575-N	32	1	3	1	2	34.00	34.00	34.00	5.83
Ag.576-N	32	1	3	1	2	25.00	23.00	24.00	4.90
Ag.577-O	33	1	3	2	1	22.00	20.00	21.00	4.58
Ag.578-O	33	1	3	2	1	19.00	17.00	18.00	4.24
Ag.579-O	33	1	3	2	1	11.00	12.00	11.50	3.39
Ag.580-O	33	1	3	2	1	14.00	14.00	14.00	3.74
Ag.581-O	33	1	3	2	1	17.00	17.00	17.00	4.12
Ag.582-O	33	1	3	2	1	22.00	19.00	20.50	4.53
Ag.583-O	33	1	3	2	1	11.00	11.00	11.00	3.32
Ag.584-O	33	1	3	2	1	11.00	10.00	10.50	3.24
Ag.585-O	33	1	3	2	1	12.00	12.00	12.00	3.46
Ag.586-O	33	1	3	2	1	10.00	10.00	10.00	3.16
Ag.587-O	33	1	3	2	1	18.00	17.00	17.50	4.18
Ag.588-O	33	1	3	2	1	20.00	20.00	20.00	4.47
Ag.589-O	33	1	3	2	1	13.00	13.00	13.00	3.61
Ag.590-O	33	1	3	2	1	17.00	18.00	17.50	4.18
Ag.591-O	33	1	3	2	1	16.00	16.00	16.00	4.00
Ag.59O-O	33	1	3	2	1	35.00	33.00	34.00	5.83
Ag.59O-O	33	1	3	2	1	25.00	25.00	25.00	5.00
Ag.59O-O	33	1	3	2	1	15.00	16.00	15.50	3.94
Ag.595-P	34	1	3	2	2	24.00	23.00	23.50	4.85
Ag.596-P	34	1	3	2	2	21.00	19.00	20.00	4.47
Ag.597-P	34	1	3	2	2	31.00	31.00	31.00	5.57
Ag.598-P	34	1	3	2	2	16.00	15.00	15.50	3.94
Ag.599-P	34	1	3	2	2	27.00	26.00	26.50	5.15
Ag.600-P	34	1	3	2	2	30.00	29.00	29.50	5.43
Ag.601-P	34	1	3	2	2	39.00	39.00	39.00	6.24
Ag.602-P	34	1	3	2	2	35.00	33.00	34.00	5.83
Ag.603-P	34	1	3	2	2	35.00	35.00	35.00	5.92
Ag.604-P	34	1	3	2	2	14.00	14.00	14.00	3.74
Ag.605-P	34	1	3	2	2	19.00	18.00	18.50	4.30

Ag.606-P	34	1	3	2	2	15.00	16.00	15.50	3.94
Ag.607-P	34	1	3	2	2	17.00	16.00	16.50	4.06
Ag.608-P	34	1	3	2	2	36.00	35.00	35.50	5.96
Ag.609-P	34	1	3	2	2	39.00	37.00	38.00	6.16
Ag.610-P	34	1	3	2	2	26.00	30.00	28.00	5.29
Ag.611-P	34	1	3	2	2	27.00	25.00	26.00	5.10
Ag.612-P	34	1	3	2	2	18.00	17.00	17.50	4.18
Ag.613-Q	35	1	3	3	1	37.00	37.00	37.00	6.08
Ag.614-Q	35	1	3	3	1	24.00	24.00	24.00	4.90
Ag.615-Q	35	1	3	3	1	14.00	13.00	13.50	3.67
Ag.616-Q	35	1	3	3	1	24.00	23.00	23.50	4.85
Ag.617-Q	35	1	3	3	1	16.00	16.00	16.00	4.00
Ag.618-Q	35	1	3	3	1	18.00	17.00	17.50	4.18
Ag.619-Q	35	1	3	3	1	27.00	26.00	26.50	5.15
Ag.620-Q	35	1	3	3	1	21.00	21.00	21.00	4.58
Ag.621-Q	35	1	3	3	1	21.00	21.00	21.00	4.58
Ag.622-Q	35	1	3	3	1	12.00	11.00	11.50	3.39
Ag.623-Q	35	1	3	3	1	26.00	27.00	26.50	5.15
Ag.624-Q	35	1	3	3	1	11.00	10.00	10.50	3.24
Ag.625-Q	35	1	3	3	1	15.00	15.00	15.00	3.87
Ag.626-Q	35	1	3	3	1	33.00	34.00	33.50	5.79
Ag.627-Q	35	1	3	3	1	10.00	11.00	10.50	3.24
Ag.628-Q	35	1	3	3	1	24.00	22.00	23.00	4.80
Ag.629-Q	35	1	3	3	1	8.00	9.00	8.50	2.92
Ag.630-Q	35	1	3	3	1	18.00	19.00	18.50	4.30
Ag.631-R	36	1	3	3	2	25.00	21.00	23.00	4.80
Ag.632-R	36	1	3	3	2	30.00	26.00	28.00	5.29
Ag.633-R	36	1	3	3	2	28.00	30.00	29.00	5.39
Ag.634-R	36	1	3	3	2	20.00	21.00	20.50	4.53
Ag.635-R	36	1	3	3	2	35.00	33.00	34.00	5.83
Ag.636-R	36	1	3	3	2	27.00	27.00	27.00	5.20
Ag.637-R	36	1	3	3	2	20.00	18.00	19.00	4.36
Ag.638-R	36	1	3	3	2	20.00	21.00	20.50	4.53
Ag.639-R	36	1	3	3	2	36.00	36.00	36.00	6.00
Ag.640-R	36	1	3	3	2	20.00	20.00	20.00	4.47
Ag.641-R	36	1	3	3	2	38.00	36.00	37.00	6.08
Ag.642-R	36	1	3	3	2	34.00	36.00	35.00	5.92
Ag.643-R	36	1	3	3	2	33.00	33.00	33.00	5.74
Ag.644-R	36	1	3	3	2	20.00	20.00	20.00	4.47
Ag.645-R	36	1	3	3	2	23.00	22.00	22.50	4.74
Ag.646-R	36	1	3	3	2	34.00	33.00	33.50	5.79
Ag.647-R	36	1	3	3	2	38.00	36.00	37.00	6.08
Ag.648-R	36	1	3	3	2	29.00	28.00	28.50	5.34
PS.649-A	37	1	1	1	1	33.00	31.00	32.00	5.66
PS.650-A	37	1	1	1	1	23.00	23.00	23.00	4.80
PS.651-A	37	1	1	1	1	35.00	33.00	34.00	5.83
PS.652-A	37	1	1	1	1	20.00	21.00	20.50	4.53
PS.653-A	37	1	1	1	1	15.00	16.00	15.50	3.94
PS.654-A	37	1	1	1	1	25.00	23.00	24.00	4.90
PS.655-A	37	1	1	1	1	16.00	19.00	17.50	4.18
PS.656-A	37	1	1	1	1	24.00	20.00	22.00	4.69
PS.657-A	37	1	1	1	1	22.00	22.00	22.00	4.69
PS.658-A	37	1	1	1	1	23.00	23.00	23.00	4.80
PS.659-A	37	1	1	1	1	11.00	11.00	11.00	3.32
PS.660-A	37	1	1	1	1	19.00	15.00	17.00	4.12
PS.661-A	37	1	1	1	1	20.00	19.00	19.50	4.42
PS.662-A	37	1	1	1	1	11.00	12.00	11.50	3.39
PS.663-A	37	1	1	1	1	11.00	13.00	12.00	3.46
PS.664-A	37	1	1	1	1	12.00	12.00	12.00	3.46
PS.665-A	37	1	1	1	1	12.00	13.00	12.50	3.54
PS.666-A	37	1	1	1	1	17.00	17.00	17.00	4.12
PS.667-B	38	1	1	1	2	13.00	13.00	13.00	3.61

PS.668-B	38	1	1	1	2	23.00	22.00	22.50	4.74
PS.669-B	38	1	1	1	2	21.00	22.00	21.50	4.64
PS.670-B	38	1	1	1	2	31.00	30.00	30.50	5.52
PS.671-B	38	1	1	1	2	22.00	25.00	23.50	4.85
PS.672-B	38	1	1	1	2	29.00	29.00	29.00	5.39
PS.673-B	38	1	1	1	2	17.00	17.00	17.00	4.12
PS.674-B	38	1	1	1	2	19.00	20.00	19.50	4.42
PS.675-B	38	1	1	1	2	33.00	37.00	35.00	5.92
PS.676-B	38	1	1	1	2	14.00	14.00	14.00	3.74
PS.677-B	38	1	1	1	2	23.00	21.00	22.00	4.69
PS.678-B	38	1	1	1	2	20.00	19.00	19.50	4.42
PS.679-B	38	1	1	1	2	41.00	38.00	39.50	6.28
PS.680-B	38	1	1	1	2	39.00	40.00	39.50	6.28
PS.681-B	38	1	1	1	2	32.00	32.00	32.00	5.66
PS.682-B	38	1	1	1	2	32.00	30.00	31.00	5.57
PS.683-B	38	1	1	1	2	36.00	36.00	36.00	6.00
PS.684-B	38	1	1	1	2	38.00	42.00	40.00	6.32
PS.685-C	39	1	1	2	1	28.00	32.00	30.00	5.48
PS.686-C	39	1	1	2	1	24.00	24.00	24.00	4.90
PS.687-C	39	1	1	2	1	18.00	20.00	19.00	4.36
PS.688-C	39	1	1	2	1	21.00	19.00	20.00	4.47
PS.689-C	39	1	1	2	1	30.00	30.00	30.00	5.48
PS.690-C	39	1	1	2	1	20.00	19.00	19.50	4.42
PS.691-C	39	1	1	2	1	14.00	14.00	14.00	3.74
PS.692-C	39	1	1	2	1	29.00	29.00	29.00	5.39
PS.693-C	39	1	1	2	1	13.00	11.00	12.00	3.46
PS.694-C	39	1	1	2	1	17.00	17.00	17.00	4.12
PS.695-C	39	1	1	2	1	14.00	15.00	14.50	3.81
PS.696-C	39	1	1	2	1	24.00	23.00	23.50	4.85
PS.697-C	39	1	1	2	1	21.00	19.00	20.00	4.47
PS.698-C	39	1	1	2	1	16.00	16.00	16.00	4.00
PS.699-C	39	1	1	2	1	26.00	24.00	25.00	5.00
PS.700-C	39	1	1	2	1	20.00	21.00	20.50	4.53
PS.701-C	39	1	1	2	1	22.00	24.00	23.00	4.80
PS.702-C	39	1	1	2	1	17.00	17.00	17.00	4.12
PS.703-D	40	1	1	2	2	16.00	17.00	16.50	4.06
PS.704-D	40	1	1	2	2	28.00	27.00	27.50	5.24
PS.705-D	40	1	1	2	2	38.00	36.00	37.00	6.08
PS.706-D	40	1	1	2	2	25.00	24.00	24.50	4.95
PS.707-D	40	1	1	2	2	31.00	27.00	29.00	5.39
PS.708-D	40	1	1	2	2	22.00	20.00	21.00	4.58
PS.709-D	40	1	1	2	2	21.00	20.00	20.50	4.53
PS.710-D	40	1	1	2	2	20.00	20.00	20.00	4.47
PS.711-D	40	1	1	2	2	20.00	21.00	20.50	4.53
PS.712-D	40	1	1	2	2	29.00	25.00	27.00	5.20
PS.713-D	40	1	1	2	2	42.00	42.00	42.00	6.48
PS.714-D	40	1	1	2	2	21.00	21.00	21.00	4.58
PS.715-D	40	1	1	2	2	27.00	27.00	27.00	5.20
PS.716-D	40	1	1	2	2	36.00	38.00	37.00	6.08
PS.717-D	40	1	1	2	2	27.00	25.00	26.00	5.10
PS.718-D	40	1	1	2	2	32.00	32.00	32.00	5.66
PS.719-D	40	1	1	2	2	37.00	39.00	38.00	6.16
PS.720-D	40	1	1	2	2	43.00	43.00	43.00	6.56
PS.721-E	41	1	1	3	1	44.00	46.00	45.00	6.71
PS.722-E	41	1	1	3	1	22.00	23.00	22.50	4.74
PS.723-E	41	1	1	3	1	22.00	26.00	24.00	4.90
PS.724-E	41	1	1	3	1	32.00	30.00	31.00	5.57
PS.725-E	41	1	1	3	1	16.00	16.00	16.00	4.00
PS.726-E	41	1	1	3	1	12.00	16.00	14.00	3.74
PS.727-E	41	1	1	3	1	15.00	16.00	15.50	3.94
PS.728-E	41	1	1	3	1	30.00	30.00	30.00	5.48
PS.729-E	41	1	1	3	1	29.00	31.00	30.00	5.48

PS.730-E	41	1	1	3	1	13.00	12.00	12.50	3.54
PS.731-E	41	1	1	3	1	14.00	13.00	13.50	3.67
PS.732-E	41	1	1	3	1	34.00	36.00	35.00	5.92
PS.733-E	41	1	1	3	1	32.00	32.00	32.00	5.66
PS.734-E	41	1	1	3	1	13.00	13.00	13.00	3.61
PS.735-E	41	1	1	3	1	30.00	28.00	29.00	5.39
PS.736-E	41	1	1	3	1	23.00	23.00	23.00	4.80
PS.737-E	41	1	1	3	1	26.00	27.00	26.50	5.15
PS.738-E	41	1	1	3	1	22.00	23.00	22.50	4.74
PS.739-F	42	1	1	3	2	35.00	34.00	34.50	5.87
PS.740-F	42	1	1	3	2	23.00	23.00	23.00	4.80
PS.741-F	42	1	1	3	2	24.00	20.00	22.00	4.69
PS.742-F	42	1	1	3	2	33.00	31.00	32.00	5.66
PS.743-F	42	1	1	3	2	28.00	28.00	28.00	5.29
PS.744-F	42	1	1	3	2	32.00	32.00	32.00	5.66
PS.745-F	42	1	1	3	2	25.00	23.00	24.00	4.90
PS.746-F	42	1	1	3	2	24.00	26.00	25.00	5.00
PS.747-F	42	1	1	3	2	29.00	27.00	28.00	5.29
PS.748-F	42	1	1	3	2	24.00	25.00	24.50	4.95
PS.749-F	42	1	1	3	2	26.00	25.00	25.50	5.05
PS.750-F	42	1	1	3	2	36.00	34.00	35.00	5.92
PS.751-F	42	1	1	3	2	27.00	28.00	27.50	5.24
PS.752-F	42	1	1	3	2	28.00	25.00	26.50	5.15
PS.753-F	42	1	1	3	2	31.00	35.00	33.00	5.74
PS.754-F	42	1	1	3	2	36.00	38.00	37.00	6.08
PS.755-F	42	1	1	3	2	42.00	44.00	43.00	6.56
PS.756-F	42	1	1	3	2	37.00	35.00	36.00	6.00
PS.757-G	43	1	2	1	1	29.00	27.00	28.00	5.29
PS.758-G	43	1	2	1	1	25.00	23.00	24.00	4.90
PS.759-G	43	1	2	1	1	25.00	27.00	26.00	5.10
PS.760-G	43	1	2	1	1	17.00	15.00	16.00	4.00
PS.761-G	43	1	2	1	1	18.00	17.00	17.50	4.18
PS.762-G	43	1	2	1	1	22.00	21.00	21.50	4.64
PS.763-G	43	1	2	1	1	14.00	13.00	13.50	3.67
PS.764-G	43	1	2	1	1	12.00	9.00	10.50	3.24
PS.765-G	43	1	2	1	1	10.00	9.00	9.50	3.08
PS.766-G	43	1	2	1	1	11.00	10.00	10.50	3.24
PS.767-G	43	1	2	1	1	20.00	16.00	18.00	4.24
PS.768-G	43	1	2	1	1	9.00	8.00	8.50	2.92
PS.769-G	43	1	2	1	1	29.00	29.00	29.00	5.39
PS.770-G	43	1	2	1	1	21.00	25.00	23.00	4.80
PS.771-G	43	1	2	1	1	29.00	27.00	28.00	5.29
PS.772-G	43	1	2	1	1	24.00	26.00	25.00	5.00
PS.773-G	43	1	2	1	1	13.00	11.00	12.00	3.46
PS.774-G	43	1	2	1	1	9.00	8.00	8.50	2.92
PS.775-H	44	1	2	1	2	25.00	24.00	24.50	4.95
PS.776-H	44	1	2	1	2	17.00	17.00	17.00	4.12
PS.777-H	44	1	2	1	2	19.00	19.00	19.00	4.36
PS.778-H	44	1	2	1	2	18.00	19.00	18.50	4.30
PS.779-H	44	1	2	1	2	21.00	21.00	21.00	4.58
PS.780-H	44	1	2	1	2	27.00	27.00	27.00	5.20
PS.781-H	44	1	2	1	2	30.00	28.00	29.00	5.39
PS.782-H	44	1	2	1	2	28.00	29.00	28.50	5.34
PS.783-H	44	1	2	1	2	41.00	42.00	41.50	6.44
PS.784-H	44	1	2	1	2	19.00	20.00	19.50	4.42
PS.785-H	44	1	2	1	2	24.00	23.00	23.50	4.85
PS.786-H	44	1	2	1	2	23.00	24.00	23.50	4.85
PS.787-H	44	1	2	1	2	27.00	28.00	27.50	5.24
PS.788-H	44	1	2	1	2	27.00	27.00	27.00	5.20
PS.789-H	44	1	2	1	2	35.00	35.00	35.00	5.92
PS.790-H	44	1	2	1	2	18.00	16.00	17.00	4.12
PS.791-H	44	1	2	1	2	27.00	28.00	27.50	5.24

PS.792-H	44	1	2	1	2	23.00	24.00	23.50	4.85
PS.793-I	45	1	2	2	1	27.00	26.00	26.50	5.15
PS.794-I	45	1	2	2	1	26.00	30.00	28.00	5.29
PS.795-I	45	1	2	2	1	11.00	11.00	11.00	3.32
PS.796-I	45	1	2	2	1	15.00	15.00	15.00	3.87
PS.797-I	45	1	2	2	1	11.00	12.00	11.50	3.39
PS.798-I	45	1	2	2	1	14.00	15.00	14.50	3.81
PS.799-I	45	1	2	2	1	14.00	15.00	14.50	3.81
PS.800-I	45	1	2	2	1	18.00	16.00	17.00	4.12
PS.801-I	45	1	2	2	1	11.00	11.00	11.00	3.32
PS.802-I	45	1	2	2	1	10.00	10.00	10.00	3.16
PS.803-I	45	1	2	2	1	9.00	9.00	9.00	3.00
PS.804-I	45	1	2	2	1	24.00	28.00	26.00	5.10
PS.805-I	45	1	2	2	1	32.00	30.00	31.00	5.57
PS.806-I	45	1	2	2	1	36.00	32.00	34.00	5.83
PS.807-I	45	1	2	2	1	26.00	26.00	26.00	5.10
PS.808-I	45	1	2	2	1	20.00	19.00	19.50	4.42
PS.809-I	45	1	2	2	1	21.00	19.00	20.00	4.47
PS.810-I	45	1	2	2	1	19.00	18.00	18.50	4.30
PS.811-J	46	1	2	2	2	32.00	31.00	31.50	5.61
PS.812-J	46	1	2	2	2	34.00	34.00	34.00	5.83
PS.813-J	46	1	2	2	2	24.00	24.00	24.00	4.90
PS.814-J	46	1	2	2	2	32.00	34.00	33.00	5.74
PS.815-J	46	1	2	2	2	30.00	33.00	31.50	5.61
PS.816-J	46	1	2	2	2	32.00	30.00	31.00	5.57
PS.817-J	46	1	2	2	2	28.00	27.00	27.50	5.24
PS.818-J	46	1	2	2	2	32.00	29.00	30.50	5.52
PS.819-J	46	1	2	2	2	29.00	27.00	28.00	5.29
PS.820-J	46	1	2	2	2	19.00	21.00	20.00	4.47
PS.821-J	46	1	2	2	2	36.00	40.00	38.00	6.16
PS.822-J	46	1	2	2	2	22.00	23.00	22.50	4.74
PS.823-J	46	1	2	2	2	20.00	19.00	19.50	4.42
PS.824-J	46	1	2	2	2	21.00	19.00	20.00	4.47
PS.825-J	46	1	2	2	2	27.00	28.00	27.50	5.24
PS.826-J	46	1	2	2	2	28.00	28.00	28.00	5.29
PS.827-J	46	1	2	2	2	20.00	20.00	20.00	4.47
PS.828-J	46	1	2	2	2	23.00	25.00	24.00	4.90
PS.829-K	47	1	2	3	1	32.00	33.00	32.50	5.70
PS.830-K	47	1	2	3	1	26.00	24.00	25.00	5.00
PS.831-K	47	1	2	3	1	25.00	24.00	24.50	4.95
PS.832-K	47	1	2	3	1	14.00	13.00	13.50	3.67
PS.833-K	47	1	2	3	1	15.00	15.00	15.00	3.87
PS.834-K	47	1	2	3	1	14.00	15.00	14.50	3.81
PS.835-K	47	1	2	3	1	23.00	22.00	22.50	4.74
PS.836-K	47	1	2	3	1	31.00	32.00	31.50	5.61
PS.837-K	47	1	2	3	1	29.00	29.00	29.00	5.39
PS.838-K	47	1	2	3	1	22.00	20.00	21.00	4.58
PS.839-K	47	1	2	3	1	33.00	31.00	32.00	5.66
PS.840-K	47	1	2	3	1	23.00	23.00	23.00	4.80
PS.841-K	47	1	2	3	1	16.00	16.00	16.00	4.00
PS.842-K	47	1	2	3	1	21.00	22.00	21.50	4.64
PS.843-K	47	1	2	3	1	26.00	27.00	26.50	5.15
PS.844-K	47	1	2	3	1	15.00	14.00	14.50	3.81
PS.845-K	47	1	2	3	1	29.00	26.00	27.50	5.24
PS.846-K	47	1	2	3	1	18.00	15.00	16.50	4.06
PS.847-L	48	1	2	3	2	16.00	16.00	16.00	4.00
PS.848-L	48	1	2	3	2	14.00	12.00	13.00	3.61
PS.849-L	48	1	2	3	2	24.00	25.00	24.50	4.95
PS.850-L	48	1	2	3	2	46.00	47.00	46.50	6.82
PS.851-L	48	1	2	3	2	14.00	13.00	13.50	3.67
PS.852-L	48	1	2	3	2	19.00	18.00	18.50	4.30
PS.853-L	48	1	2	3	2	23.00	24.00	23.50	4.85

PS.854-L	48	1	2	3	2	30.00	26.00	28.00	5.29
PS.855-L	48	1	2	3	2	24.00	24.00	24.00	4.90
PS.856-L	48	1	2	3	2	30.00	30.00	30.00	5.48
PS.857-L	48	1	2	3	2	31.00	30.00	30.50	5.52
PS.858-L	48	1	2	3	2	19.00	16.00	17.50	4.18
PS.859-L	48	1	2	3	2	30.00	29.00	29.50	5.43
PS.860-L	48	1	2	3	2	34.00	34.00	34.00	5.83
PS.861-L	48	1	2	3	2	30.00	29.00	29.50	5.43
PS.862-L	48	1	2	3	2	26.00	26.00	26.00	5.10
PS.863-L	48	1	2	3	2	25.00	24.00	24.50	4.95
PS.864-L	48	1	2	3	2	44.00	44.00	44.00	6.63
PS.865-M	49	1	3	1	1	31.00	29.00	30.00	5.48
PS.866-M	49	1	3	1	1	10.00	11.00	10.50	3.24
PS.867-M	49	1	3	1	1	8.00	9.00	8.50	2.92
PS.868-M	49	1	3	1	1	11.00	11.00	11.00	3.32
PS.869-M	49	1	3	1	1	23.00	24.00	23.50	4.85
PS.870-M	49	1	3	1	1	19.00	23.00	21.00	4.58
PS.871-M	49	1	3	1	1	7.00	7.00	7.00	2.65
PS.872-M	49	1	3	1	1	15.00	13.00	14.00	3.74
PS.873-M	49	1	3	1	1	15.00	15.00	15.00	3.87
PS.874-M	49	1	3	1	1	7.00	7.00	7.00	2.65
PS.875-M	49	1	3	1	1	15.00	17.00	16.00	4.00
PS.876-M	49	1	3	1	1	7.00	7.00	7.00	2.65
PS.877-M	49	1	3	1	1	14.00	13.00	13.50	3.67
PS.878-M	49	1	3	1	1	8.00	7.00	7.50	2.74
PS.879-M	49	1	3	1	1	15.00	13.00	14.00	3.74
PS.880-M	49	1	3	1	1	10.00	10.00	10.00	3.16
PS.881-M	49	1	3	1	1	8.00	6.00	7.00	2.65
PS.882-M	49	1	3	1	1	16.00	13.00	14.50	3.81
PS.883-N	50	1	3	1	2	14.00	13.00	13.50	3.67
PS.884-N	50	1	3	1	2	15.00	14.00	14.50	3.81
PS.885-N	50	1	3	1	2	24.00	23.00	23.50	4.85
PS.886-N	50	1	3	1	2	19.00	18.00	18.50	4.30
PS.887-N	50	1	3	1	2	25.00	26.00	25.50	5.05
PS.888-N	50	1	3	1	2	17.00	18.00	17.50	4.18
PS.889-N	50	1	3	1	2	41.00	38.00	39.50	6.28
PS.890-N	50	1	3	1	2	18.00	16.00	17.00	4.12
PS.891-N	50	1	3	1	2	35.00	34.00	34.50	5.87
PS.892-N	50	1	3	1	2	33.00	32.00	32.50	5.70
PS.893-N	50	1	3	1	2	26.00	23.00	24.50	4.95
PS.894-N	50	1	3	1	2	9.00	9.00	9.00	3.00
PS.895-N	50	1	3	1	2	20.00	21.00	20.50	4.53
PS.896-N	50	1	3	1	2	23.00	24.00	23.50	4.85
PS.897-N	50	1	3	1	2	21.00	22.00	21.50	4.64
PS.898-N	50	1	3	1	2	37.00	37.00	37.00	6.08
PS.899-N	50	1	3	1	2	36.00	37.00	36.50	6.04
PS.900-N	50	1	3	1	2	15.00	19.00	17.00	4.12
PS.901-O	51	1	3	2	1	19.00	21.00	20.00	4.47
PS.902-O	51	1	3	2	1	11.00	12.00	11.50	3.39
PS.903-O	51	1	3	2	1	8.00	9.00	8.50	2.92
PS.904-O	51	1	3	2	1	24.00	21.00	22.50	4.74
PS.905-O	51	1	3	2	1	23.00	20.00	21.50	4.64
PS.906-O	51	1	3	2	1	23.00	22.00	22.50	4.74
PS.907-O	51	1	3	2	1	8.00	7.00	7.50	2.74
PS.908-O	51	1	3	2	1	29.00	27.00	28.00	5.29
PS.909-O	51	1	3	2	1	11.00	12.00	11.50	3.39
PS.910-O	51	1	3	2	1	28.00	30.00	29.00	5.39
PS.911-O	51	1	3	2	1	8.00	9.00	8.50	2.92
PS.912-O	51	1	3	2	1	15.00	13.00	14.00	3.74
PS.913-O	51	1	3	2	1	13.00	12.00	12.50	3.54
PS.914-O	51	1	3	2	1	18.00	14.00	16.00	4.00
PS.915-O	51	1	3	2	1	15.00	16.00	15.50	3.94

PS.916-O	51	1	3	2	1	23.00	21.00	22.00	4.69
PS.917-O	51	1	3	2	1	10.00	8.00	9.00	3.00
PS.918-O	51	1	3	2	1	7.00	7.00	7.00	2.65
PS.919-P	52	1	3	2	2	14.00	15.00	14.50	3.81
PS.920-P	52	1	3	2	2	11.00	9.00	10.00	3.16
PS.921-P	52	1	3	2	2	26.00	22.00	24.00	4.90
PS.922-P	52	1	3	2	2	22.00	24.00	23.00	4.80
PS.923-P	52	1	3	2	2	13.00	13.00	13.00	3.61
PS.924-P	52	1	3	2	2	29.00	29.00	29.00	5.39
PS.925-P	52	1	3	2	2	9.00	9.00	9.00	3.00
PS.926-P	52	1	3	2	2	31.00	33.00	32.00	5.66
PS.927-P	52	1	3	2	2	26.00	28.00	27.00	5.20
PS.928-P	52	1	3	2	2	25.00	29.00	27.00	5.20
PS.929-P	52	1	3	2	2	20.00	19.00	19.50	4.42
PS.930-P	52	1	3	2	2	38.00	37.00	37.50	6.12
PS.931-P	52	1	3	2	2	30.00	32.00	31.00	5.57
PS.932-P	52	1	3	2	2	18.00	19.00	18.50	4.30
PS.933-P	52	1	3	2	2	34.00	35.00	34.50	5.87
PS.934-P	52	1	3	2	2	21.00	21.00	21.00	4.58
PS.935-P	52	1	3	2	2	18.00	20.00	19.00	4.36
PS.936-P	52	1	3	2	2	37.00	38.00	37.50	6.12
PS.937-Q	53	1	3	3	1	19.00	19.00	19.00	4.36
PS.938-Q	53	1	3	3	1	8.00	8.00	8.00	2.83
PS.939-Q	53	1	3	3	1	13.00	13.00	13.00	3.61
PS.940-Q	53	1	3	3	1	18.00	16.00	17.00	4.12
PS.941-Q	53	1	3	3	1	12.00	11.00	11.50	3.39
PS.942-Q	53	1	3	3	1	43.00	42.00	42.50	6.52
PS.943-Q	53	1	3	3	1	22.00	23.00	22.50	4.74
PS.944-Q	53	1	3	3	1	10.00	8.00	9.00	3.00
PS.945-Q	53	1	3	3	1	14.00	10.00	12.00	3.46
PS.946-Q	53	1	3	3	1	9.00	8.00	8.50	2.92
PS.947-Q	53	1	3	3	1	8.00	9.00	8.50	2.92
PS.948-Q	53	1	3	3	1	23.00	20.00	21.50	4.64
PS.949-Q	53	1	3	3	1	23.00	22.00	22.50	4.74
PS.950-Q	53	1	3	3	1	8.00	7.00	7.50	2.74
PS.951-Q	53	1	3	3	1	25.00	23.00	24.00	4.90
PS.952-Q	53	1	3	3	1	15.00	15.00	15.00	3.87
PS.953-Q	53	1	3	3	1	24.00	25.00	24.50	4.95
PS.954-Q	53	1	3	3	1	22.00	19.00	20.50	4.53
PS.955-R	54	1	3	3	2	14.00	13.00	13.50	3.67
PS.956-R	54	1	3	3	2	34.00	30.00	32.00	5.66
PS.957-R	54	1	3	3	2	25.00	25.00	25.00	5.00
PS.958-R	54	1	3	3	2	16.00	16.00	16.00	4.00
PS.959-R	54	1	3	3	2	35.00	33.00	34.00	5.83
PS.960-R	54	1	3	3	2	18.00	16.00	17.00	4.12
PS.961-R	54	1	3	3	2	12.00	14.00	13.00	3.61
PS.962-R	54	1	3	3	2	21.00	17.00	19.00	4.36
PS.963-R	54	1	3	3	2	21.00	25.00	23.00	4.80
PS.964-R	54	1	3	3	2	22.00	20.00	21.00	4.58
PS.965-R	54	1	3	3	2	30.00	30.00	30.00	5.48
PS.966-R	54	1	3	3	2	37.00	37.00	37.00	6.08
PS.967-R	54	1	3	3	2	39.00	39.00	39.00	6.24
PS.968-R	54	1	3	3	2	34.00	32.00	33.00	5.74
PS.969-R	54	1	3	3	2	17.00	16.00	16.50	4.06
PS.970-R	54	1	3	3	2	37.00	35.00	36.00	6.00
PS.971-R	54	1	3	3	2	16.00	16.00	16.00	4.00
PS.972-R	54	1	3	3	2	43.00	41.00	42.00	6.48

Where:

Dispec = discipline specific background

Frame = rhetorically-oriented framework

R_1 = rater 1

R_2 = rater 2

Ec = economic group

Ag = agriculture group

PS = pure sciences Group

1-972 = code number

A-R = research treatments

A = prosol-without-English

B = prosol-without-Indonesian

C = prosol-with L2-English

D = prosol-with L2-Indonesian

E = prosol-with L1-English

F = prosol-with L1-Indonesian

G = cau-without-English

H = cau-without-Indonesian

I = cau-with L2-English

J = cau-with L2-Indonesian

K = cau-with L1-English

L = cau-with L1-Indonesian

M = coldes-without-English

N = coldes-without-Indonesian

O = coldes-with L2-English

P = coldes-with L2-Indonesian

Q = coldes-with L1-English

R = coldes-with L1-Indonesian

Appendix 7B Data analysis using Logistic Regression

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GET
FILE='E:\DATA OF EXPERIMENT 19.sav'.
DATASET NAME DataSet1 WINDOW=FRONT.
* Generalized Linear Models.
GENLIN score OF 65 BY Dispec Text Framework Recall Rater (ORDER=ASCENDING)
  /MODEL Rater Dispec Text Framework Recall Dispec*Text Dispec*Framework
Dispec*Recall Text*Framework Text*Recall Framework*Recall Dispec*Text*Framework
Dispec*Text*Recall Dispec*Framework*Recall Text*Framework*Recall
Dispec*Text*Framework*Recall
INTERCEPT=YES
DISTRIBUTION=BINOMIAL LINK=LOGIT
/CRITERIA METHOD=FISHER(1) SCALE=DEVIANCE COVB=MODEL
MAXITERATIONS=100 MAXSTEPHALVING=5 PCONVERGE=1E-006(ABSOLUTE)
SINGULAR=1E-012 ANALYSISTYPE=3(WALD) CILEVEL=95 CITYPE=WALD
LIKELIHOOD=FULL
/EMMEANS TABLES=Rater SCALE=ORIGINAL COMPARE=Rater
CONTRAST=PAIRWISE PADJUST=LSD
/EMMEANS TABLES=Dispec SCALE=ORIGINAL COMPARE=Dispec
CONTRAST=PAIRWISE PADJUST=LSD
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CONTRAST=PAIRWISE PADJUST=LSD
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/PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.

```

Generalized Linear Models

Notes

Output Created		27-Jan-2012 12:39:23
Comments		
Input	Data	E:\DATA OF EXPERIMENT 19.sav
	Active	DataSet1
	Dataset	
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	1944
Missing Value Handling	Definition of Missing Cases	User-defined missing values for factor, subject and within-subject variables are treated as missing. Statistics are based on cases with valid data for all variables in the model.
	Used	
Weight Handling		not applicable

Syntax	GENLIN score OF 65 BY Dispec Text Framework Recall Rater (ORDER=ASCENDING) /MODEL Rater Dispec Text Framework Recall Dispec*Text Dispec*Framework Dispec*Recall Text*Framework Text*Recall Framework*Recall Dispec*Text*Framework Dispec*Text*Recall Dispec*Framework*Recall Text*Framework*Recall Dispec*Text*Framework*Recall INTERCEPT=YES DISTRIBUTION=BINOMIAL LINK=LOGIT /CRITERIA METHOD=FISHER(1) SCALE=DEVIANCE COVB=MODEL MAXITERATIONS=100 MAXSTEPHALVING=5 PCONVERGE=1E-006(ABSOLUTE) SINGULAR=1E- 012 ANALYSISTYPE=3(WALD) CILEVEL=95 CITYPE=WALD LIKELIHOOD=FULL /EMMEANS TABLES=Rater SCALE=ORIGINAL COMPARE=Rater CONTRAST=PAIRWISE PADJUST=LSD /EMMEANS TABLES=Dispec SCALE=ORIGINAL COMPARE=Dispec CONTRAST=PAIRWISE PADJUST=LSD /EMMEANS TABLES=Text SCALE=ORIGINAL COMPARE=Text CONTRAST=PAIRWISE PADJUST=LSD /EMMEANS TABLES=Framework SCALE=ORIGINAL COMPARE=Framework CONTRAST=PAIRWISE PADJUST=LSD /EMMEANS TABLES=Recall SCALE=ORIGINAL COMPARE=Recall CONTRAST=PAIRWISE PADJUST=LSD /MISSING CLASSMISSING=EXCLUDE /PRINT CPS DESCRIPTIVES MODELINFO FIT SUMMARY SOLUTION.	
Resources	Processor	00 00:00:00.608
	Time	
	Elapsed	00 00:00:00.608
	Time	

DataSet1] E:\DATA OF EXPERIMENT 19.sav

Model Information

Events Variable	score
Number of Trials	65
Probability Distribution	Binomial
Link Function	Logit

Case Processing Summary

	N	Percent
Included	1944	100.0%
Excluded	0	.0%
Total	1944	100.0%

Categorical Variable Information

			N	Percent
Dependent Variable ^a	score	Events	48819	38.6%
		Non-Events	77541	61.4%
		Total	126360	100.0%
Factor	Dispec	1	648	33.3%
		2	648	33.3%
		3	648	33.3%
		Total	1944	100.0%
	Text	1	648	33.3%
		2	648	33.3%
		3	648	33.3%
		Total	1944	100.0%
	Framework	1	648	33.3%
		2	648	33.3%
		3	648	33.3%
		Total	1944	100.0%
	Recall	1	972	50.0%
		2	972	50.0%
		Total	1944	100.0%
	Rater	1	972	50.0%
		2	972	50.0%
		Total	1944	100.0%

a. Number of trials = 65

Goodness of Fit^d

	Value	df	Value/df
Deviance	8283.300	1889	4.385
Scaled Deviance	1889.000	1889	
Pearson Chi-Square	8146.724	1889	4.313
Scaled Pearson Chi-Square	1857.854	1889	
Log Likelihood ^{a,b}	-8480.438		
Adjusted Log Likelihood ^c	-1933.957		
Akaike's Information Criterion (AIC)	17070.875		
Finite Sample Corrected AIC (AICC)	17070.924		
Bayesian Information Criterion (BIC)	17606.954		
Consistent AIC (CAIC)	17661.954		

Events: score

Trials: 65

Model: (Intercept), Rater, Dispec, Text, Framework, Recall, Dispec * Text, Dispec * Framework, Dispec * Recall, Text * Framework, Text * Recall, Framework * Recall, Dispec * Text * Framework, Dispec * Text * Recall, Dispec * Framework * Recall, Text * Framework * Recall, Dispec * Text * Framework * Recall

Categorical Variable Information

			N	Percent
Dependent Variable ^a	score	Events	48819	38.6%
		Non-Events	77541	61.4%
		Total	126360	100.0%
Factor	Dispec	1	648	33.3%
		2	648	33.3%
		3	648	33.3%
		Total	1944	100.0%
	Text	1	648	33.3%
		2	648	33.3%
		3	648	33.3%
		Total	1944	100.0%
	Framework	1	648	33.3%
		2	648	33.3%
		3	648	33.3%
		Total	1944	100.0%
	Recall	1	972	50.0%
		2	972	50.0%
		Total	1944	100.0%
	Rater	1	972	50.0%
		2	972	50.0%
		Total	1944	100.0%

- a. The full log likelihood function is displayed and used in computing information criteria.
- b. The log likelihood is based on a scale parameter fixed at 1.
- c. The adjusted log likelihood is based on an estimated scale parameter and is used in the model fitting omnibus test.
- d. Information criteria are in small-is-better form.

Omnibus Test^a

Likelihood Ratio Chi-Square	df	Sig.
949.437	54	.000

Events: score

Trials: 65

Model: (Intercept), Rater, Dispec, Text, Framework, Recall, Dispec * Text, Dispec * Framework, Dispec * Recall, Text * Framework, Text * Recall, Framework * Recall, Dispec * Text * Framework, Dispec * Text * Recall, Dispec * Framework * Recall, Text * Framework * Recall, Dispec * Text * Framework * Recall

- a. Compares the fitted model against the intercept-only model.

Tests of Model Effects

Source	Type III		
	Wald Chi-Square	df	Sig.
(Intercept)	1500.186	1	.000
Rater	.630	1	.427
Dispec	155.636	2	.000
Text	167.931	2	.000
Framework	71.737	2	.000
Recall	526.931	1	.000
Dispec * Text	1.127	4	.890
Dispec * Framework	.556	4	.968
Dispec * Recall	4.587	2	.101
Text * Framework	.937	4	.919
Text * Recall	4.905	2	.086
Framework * Recall	2.346	2	.309
Dispec * Text * Framework	3.026	8	.933
Dispec * Text * Recall	3.893	4	.421
Dispec * Framework * Recall	2.811	4	.590
Text * Framework * Recall	2.765	4	.598
Dispec * Text * Framework * Recall	2.214	8	.974

Events: score

Trials: 65

Model: (Intercept), Rater, Dispec, Text, Framework, Recall, Dispec * Text, Dispec * Framework, Dispec * Recall, Text * Framework, Text * Recall, Framework * Recall, Dispec * Text * Framework, Dispec * Text * Recall, Dispec * Framework * Recall, Text * Framework * Recall, Dispec * Text * Framework * Recall

Parameter Estimates

Parameter	B	Std. Error	95% Wald Confidence Interval		Hypothesis Test		
			Lower	Upper	Wald Chi-Square	df	Sig.
(Intercept)	-.433	.0894	-.608	-.258	23.478	1	.000
[Rater=1]	.020	.0246	-.029	.068	.630	1	.427
[Dispec=1]	.298	.1239	.055	.541	5.795	1	.016
[Dispec=2]	.143	.1244	-.101	.387	1.318	1	.251
[Text=1]	.257	.1240	.014	.500	4.297	1	.038
[Text=2]	.036	.1250	-.209	.281	.081	1	.776
[Framework=1]	-.134	.1262	-.382	.113	1.132	1	.287
[Framework=2]	-.131	.1262	-.378	.117	1.071	1	.301
[Framework=3]	0 ^a	.	.	.	.	.	.
[Recall=1]	-.610	.1324	-.870	-.351	21.259	1	.000
[Recall=2]	0 ^a	.	.	.	.	.	.
[Dispec=1] *	.313	.1754	-.031	.657	3.175	1	.075
[Text=1]							

[Dispec=1] *	.293	.1753	-.050	.637	2.804	1	.094
[Text=2]							
[Dispec=1] *	0 ^a
[Text=3]							
[Dispec=2] *	.092	.1747	-.251	.434	.276	1	.600
[Text=1]							
[Dispec=2] *	.110	.1755	-.234	.454	.390	1	.532
[Text=2]							
[Dispec=2] *	0 ^a
[Text=3]							
[Dispec=3] *	0 ^a
[Text=1]							
[Dispec=3] *	0 ^a
[Text=2]							
[Dispec=3] *	0 ^a
[Text=3]							
[Dispec=1] *	-.019	.1763	-.365	.326	.012	1	.912
[Framework=1]							
[Dispec=1] *	.108	.1760	-.237	.453	.378	1	.538
[Framework=2]							
[Dispec=1] *	0 ^a
[Framework=3]							
[Dispec=2] *	-.088	.1776	-.436	.260	.245	1	.621
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[Dispec=2] *	-.010	.1772	-.358	.337	.003	1	.953
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[Framework=2]	.040	.1890	-.330	.411	.046	1	.831
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] * [Recall=2]							
[Framework=3]	0 ^a
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[Framework=2] *							
] * [Recall=1]							
[Dispec=2] *	0 ^a
[Text=2] *							
[Framework=2] *							
] * [Recall=2]							
[Dispec=2] *	0 ^a
[Text=2] *							
[Framework=3] *							
] * [Recall=1]							
[Dispec=2] *	0 ^a
[Text=2] *							
[Framework=3] *							
] * [Recall=2]							

[Dispec=2] *	0 ^a	.	.	.	.	.	.
[Text=3] *							
[Framework=1] *							
[Recall=1] *							
[Dispec=2] *	0 ^a	.	.	.	.	.	.
[Text=3] *							
[Framework=1] *							
[Recall=2] *							
[Dispec=2] *	0 ^a	.	.	.	.	.	.
[Text=3] *							
[Framework=2] *							
[Recall=1] *							
[Dispec=2] *	0 ^a	.	.	.	.	.	.
[Text=3] *							
[Framework=2] *							
[Recall=2] *							
[Dispec=2] *	0 ^a	.	.	.	.	.	.
[Text=3] *							
[Framework=3] *							
[Recall=1] *							
[Dispec=2] *	0 ^a	.	.	.	.	.	.
[Text=3] *							
[Framework=3] *							
[Recall=2] *							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=1] *							
[Framework=1] *							
[Recall=1] *							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=1] *							
[Framework=1] *							
[Recall=2] *							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=1] *							
[Framework=2] *							
[Recall=1] *							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=1] *							
[Framework=2] *							
[Recall=2] *							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=1] *							
[Framework=3] *							
[Recall=1] *							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=1] *							
[Framework=3] *							
[Recall=2] *							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=2] *							
[Framework=1] *							
[Recall=1] *							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=2] *							
[Framework=1] *							
[Recall=2] *							

[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=2] *							
[Framework=2]							
] * [Recall=1]							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=2] *							
[Framework=2]							
] * [Recall=2]							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=2] *							
[Framework=3]							
] * [Recall=1]							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=2] *							
[Framework=3]							
] * [Recall=2]							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=3] *							
[Framework=1]							
] * [Recall=1]							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=3] *							
[Framework=1]							
] * [Recall=2]							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=3] *							
[Framework=2]							
] * [Recall=1]							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=3] *							
[Framework=2]							
] * [Recall=2]							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=3] *							
[Framework=3]							
] * [Recall=1]							
[Dispec=3] *	0 ^a	.	.	.	.	.	.
[Text=3] *							
[Framework=3]							
] * [Recall=2]							
(Scale)	4.385 ^b						

Events: score

Trials: 65

Model: (Intercept), Rater, Dispec, Text, Framework, Recall, Dispec * Text, Dispec * Framework, Dispec * Recall, Text * Framework, Text * Recall, Framework * Recall, Dispec * Text * Framework, Dispec * Text * Recall, Dispec * Framework * Recall, Text * Framework * Recall, Dispec * Text * Framework * Recall

a. Set to zero because this parameter is redundant.

b. Computed based on the deviance.

Estimated Marginal Means 1: Rater

Estimates

Rater	Mean	Std. Error	95% Wald Confidence Interval
-------	------	------------	------------------------------

			Lower	Upper
1	.38	.004	.38	.39
2	.38	.004	.37	.39

Pairwise Comparisons

(I) Rater	(J) Rater	Mean Difference (I-J)	Std. Error	df	Sig.
1	2	.00	.006	1	.427
2	1	.00	.006	1	.427

Pairwise Comparisons

(I) Rater	(J) Rater	95% Wald Confidence Interval for Difference	
		Lower	Upper
1	2	-.01	.02
2	1	-.02	.01

Pairwise comparisons of estimated marginal means based on the events/trials proportion

Events: score

Trials: 65

Overall Test Results

Wald Chi-Square	df	Sig.
.630	1	.427

The Wald chi-square tests the effect of Rater. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Estimated Marginal Means 2: Dispec

Estimates

Dispec	Mean	Std. Error	95% Wald Confidence Interval	
			Lower	Upper
1	.43	.005	.42	.44
2	.37	.005	.36	.38
3	.34	.005	.33	.35

Pairwise Comparisons

(I) Dispec	(J) Dispec	Mean Difference (I-J)	Std. Error	df	Sig.
1	2	.06 ^a	.007	1	.000
	3	.09 ^a	.007	1	.000
2	1	-.06 ^a	.007	1	.000
	3	.03 ^a	.007	1	.000

3	1	-.09 ^a	.007	1	.000
	2	-.03 ^a	.007	1	.000

Pairwise Comparisons

(I) Dispec	(J) Dispec	95% Wald Confidence Interval for Difference	
		Lower	Upper
1	2	.04	.07
	3	.07	.10
2	1	-.07	-.04
	3	.02	.04
3	1	-.10	-.07
	2	-.04	-.02

Pairwise comparisons of estimated marginal means based on the events/trials proportion

Events: score

Trials: 65

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

Overall Test Results

Wald Chi-Square	df	Sig.
155.416	2	.000

The Wald chi-square tests the effect of Dispec. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Estimated Marginal Means 3: Text

Estimates

Text	Mean	Std. Error	95% Wald Confidence Interval	
			Lower	Upper
1	.43	.005	.42	.44
2	.39	.005	.38	.40
3	.33	.005	.32	.34

Pairwise Comparisons

(I) Text	(J) Text	Mean Difference (I-J)	Std. Error	df	Sig.
1	2	.04 ^a	.007	1	.000
	3	.09 ^a	.007	1	.000
2	1	-.04 ^a	.007	1	.000
	3	.05 ^a	.007	1	.000
3	1	-.09 ^a	.007	1	.000
	2	-.05 ^a	.007	1	.000

Pairwise Comparisons

(I) Text	(J) Text	95% Wald Confidence Interval for Difference	
		Lower	Upper
1	2	.02	.05
	3	.08	.11
2	1	-.05	-.02
	3	.04	.07
3	1	-.11	-.08
	2	-.07	-.04

Pairwise comparisons of estimated marginal means based on the events/trials proportion

Events: score

Trials: 65

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

Overall Test Results

Wald Chi-Square	df	Sig.
171.627	2	.000

The Wald chi-square tests the effect of Text. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Estimated Marginal Means 4: Framework

Estimates

Framework	Mean	Std. Error	95% Wald Confidence Interval	
			Lower	Upper
1	.35	.005	.34	.36
2	.38	.005	.37	.39
3	.41	.005	.40	.42

Pairwise Comparisons

(I) Framework	(J) Framework	Mean Difference (I-J)	Std. Error	df	Sig.
1	2	-.03 ^a	.007	1	.000
	3	-.06 ^a	.007	1	.000
2	1	.03 ^a	.007	1	.000
	3	-.03 ^a	.007	1	.000
3	1	.06 ^a	.007	1	.000
	2	.03 ^a	.007	1	.000

Pairwise Comparisons

(I) Framework	(J) Framework	95% Wald Confidence Interval for Difference	
		Lower	Upper
1	2	-.04	-.01
	3	-.07	-.05
2	1	.01	.04
	3	-.05	-.02
3	1	.05	.07
	2	.02	.05

Pairwise comparisons of estimated marginal means based on the events/trials proportion

Events: score

Trials: 65

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

Overall Test Results

Wald Chi-Square	df	Sig.
71.949	2	.000

The Wald chi-square tests the effect of Framework. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Estimated Marginal Means 5: Recall

Estimates

Recall	Mean	Std. Error	95% Wald Confidence Interval	
			Lower	Upper
1	.32	.004	.31	.33
2	.45	.004	.44	.46

Pairwise Comparisons

(I) Recall	(J) Recall	Mean Difference (I-J)	Std. Error	df	Sig.
1	2	-.13 ^a	.006	1	.000
2	1	.13 ^a	.006	1	.000

Pairwise Comparisons

(I) Recall	(J) Recall	95% Wald Confidence Interval for Difference	
		Lower	Upper
1	2	-.14	-.12
2	1	.12	.14

Pairwise comparisons of estimated marginal means based on the events/trials proportion

Events: score

Trials: 65

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

Overall Test Results

Wald Chi-Square	df	Sig.
541.349	1	.000

The Wald chi-square tests the effect of Recall. This test is based on the linearly independent pairwise comparisons among the estimated marginal means.

Appendix 7C Data analysis using ANOVA

GET

FILE='E:\Data in SPSS 18-5-2011.sav'.

DATASET NAME DataSet1 WINDOW=FRONT.

UNIANOVA sqrtaverage BY Dispec Text Framework Recall

/METHOD=SSTYPE(3)

/INTERCEPT=INCLUDE

/POSTHOC=Dispec Text Framework Recall(SCHEFFE)

/CRITERIA=ALPHA(0.05)

/DESIGN=Dispec Text Framework Recall Dispec*Text Dispec*Framework Dispec*Recall
Text*Framework Text*Recall Framework*Recall Dispec*Text*Framework
Dispec*Text*Recall Dispec*Framework*Recall Text*Framework*Recall
Dispec*Text*Framework*Recall.

Univariate Analysis of Variance

Notes

Output Created		27-Jan-2012 13:02:37
Comments		
Input	Data	E:\Data in SPSS 18-5-2011.sav
	Active Dataset	DataSet1
	Filter	<none>
	Weight	<none>
	Split File	<none>
	N of Rows in Working Data File	1571
Missing Handling	Value Definition of Missing	User-defined missing values are treated as missing.
	Cases Used	Statistics are based on all cases with valid data for all variables in the model.

Syntax		UNIANOVA sqrtaverage BY Dispec Text Framework Recall /METHOD=SSTYPE(3) /INTERCEPT=INCLUDE /POSTHOC=Dispec Text Framework Recall(SCHEFFE) /CRITERIA=ALPHA(0.05) /DESIGN=Dispec Text Framework Recall Dispec*Text Dispec*Framework Dispec*Recall Text*Framework Text*Recall Framework*Recall Dispec*Text*Framework Dispec*Text*Recall Dispec*Framework*Recall Text*Framework*Recall Dispec*Text*Framework*Recall.
Resources	Processor Time	00 00:00:00.110
	Elapsed Time	00 00:00:00.108

Between-Subjects Factors

		N
Dispec	1	324
	2	324
	3	324
Text	1	324
	2	324
	3	324
Framework	1	324
	2	324
	3	324
Recall	1	486
	2	486

Tests of Between-Subjects Effects

Dependent Variable:sqrtaverage

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	333.313 ^a	53	6.289	9.279	.000
Intercept	23454.020	1	23454.020	34606.155	.000
Dispec	52.118	2	26.059	38.450	.000
Text	60.288	2	30.144	44.478	.000
Framework	24.557	2	12.279	18.117	.000
Recall	187.142	1	187.142	276.127	.000
Dispec * Text	.338	4	.085	.125	.974
Dispec * Framework	.231	4	.058	.085	.987
Dispec * Recall	1.032	2	.516	.761	.467
Text * Framework	.327	4	.082	.121	.975
Text * Recall	1.904	2	.952	1.405	.246
Framework * Recall	.801	2	.400	.591	.554

Dispec * Text * Framework	.806	8	.101	.149	.997
Dispec * Text * Recall	1.024	4	.256	.378	.825
Dispec * Framework * Recall	.804	4	.201	.297	.880
Text * Framework * Recall	.967	4	.242	.357	.839
Dispec * Text * Framework * Recall	.972	8	.122	.179	.994
Error	622.166	918	.678		
Total	24409.500	972			
Corrected Total	955.480	971			

a. R Squared = .349 (Adjusted R Squared = .311)

Post Hoc Tests

Dispec

Multiple Comparisons

sqrtaverage
Scheffe

(I) Dispec	(J) Dispec	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.3623 [*]	.06468	.000	.2037	.5208
	3	.5591 [*]	.06468	.000	.4005	.7177
2	1	-.3623 [*]	.06468	.000	-.5208	-.2037
	3	.1968 [*]	.06468	.010	.0383	.3554
3	1	-.5591 [*]	.06468	.000	-.7177	-.4005
	2	-.1968 [*]	.06468	.010	-.3554	-.0383

Based on observed means.

The error term is Mean Square(Error) = .678.

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

sqrtaverage

Scheffe^{a,b}

Dispec	N	Subset		
		1	2	3
3	324	4.6602	4.8571	5.2193
2	324			
1	324			
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

Based on observed means.

The error term is Mean Square(Error) = .678.

a. Uses Harmonic Mean Sample Size = 324.000.

b. Alpha = 0.05.

Text

Multiple Comparisons

sqrtaverage
Scheffe

(I) Text	(J) Text	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
1	2	.2396 [*]	.06468	.001	.0810	.3982
	3	.6057 [*]	.06468	.000	.4471	.7642
2	1	-.2396 [*]	.06468	.001	-.3982	-.0810
	3	.3660 [*]	.06468	.000	.2075	.5246
3	1	-.6057 [*]	.06468	.000	-.7642	-.4471
	2	-.3660 [*]	.06468	.000	-.5246	-.2075

Based on observed means.

The error term is Mean Square(Error) = .678.

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

sqrtaverage

Scheffe^{a,b}

Text	N	Subset		
		1	2	3
3	324	4.5883		
2	324		4.9543	
1	324			5.1940
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

Based on observed means.

The error term is Mean Square(Error) = .678.

a. Uses Harmonic Mean Sample Size = 324.000.

b. Alpha = 0.05.

Framework

Multiple Comparisons

sqrtaverage
Scheffe

(I) Framework	(J) Framework	Mean Difference (I-J)	Std. Error	Sig.
1	2	-.1902 [*]	.06468	.014
	3	-.3893 [*]	.06468	.000
2	1	.1902 [*]	.06468	.014
	3	-.1991 [*]	.06468	.009
3	1	.3893 [*]	.06468	.000
	2	.1991 [*]	.06468	.009

Multiple Comparisons

sqrtaverage
Scheffe

(I) Framework	(J) Framework	95% Confidence Interval	
		Lower Bound	Upper Bound
1	2	-.3487	-.0316
	3	-.5479	-.2307
2	1	.0316	.3487
	3	-.3577	-.0406
3	1	.2307	.5479
	2	.0406	.3577

Based on observed means.

The error term is Mean Square(Error) = .678.

*. The mean difference is significant at the 0.05 level.

Homogeneous Subsets

sqrtaverage

Scheffe^{a,b}

Framework	N	Subset		
		1	2	3
1	324	4.7190		
2	324		4.9092	
3	324			5.1083
Sig.		1.000	1.000	1.000

Means for groups in homogeneous subsets are displayed.

Based on observed means.

The error term is Mean Square(Error) = .678.

a. Uses Harmonic Mean Sample Size = 324.000.

b. Alpha = 0.05.