

**The effect of different interventions on the inferencing abilities of academically  
vulnerable first-year students**

**by**

**NANDI WEDER**

**submitted in accordance with the requirements  
for the degree of**

**DOCTOR OF LINGUISTICS**

**at the**

**UNIVERSITY OF PRETORIA**

**Supervisor: DR I. FOUCHE**

**Co-supervisor: PROF. E.J. PRETORIUS**

**October 2022**

## ACKNOWLEDGEMENTS

The successful completion of this thesis would not have been possible without the support and assistance from a number of people.

Thank you to my research supervisors, Dr Ilse Fouche and Professor Elizabeth Pretorius. I learned so much from both of you during the last five years. Knowing that I could always check in with two people who were invested in the research and who were always available was encouraging and I always left our meetings feeling energised. Despite all the curveballs that came with the pandemic, and many other ups and downs, I could always count on your guidance.

To my husband, Stef, you helped me to keep my balance in very challenging circumstances and never complained when I worked through the weekend. Thank you for your patience, kindness and honesty, and for always having my back. Also, thank you for all the tech support.

Many thanks go to my parents, Brenda and Wallie, for nurturing a love of books and stories that neither of you shared, for taking me to the library even though it took so long, and for all the many, many hours of loving support that kept me on track all these years.

Thank you to the Mamelodi Extended Curriculum Programme students who participated in the study and who wrote a long and difficult test twice so that I could analyse the data. Finally, thank you to my colleagues on the Mamelodi campus for being such good sports as my thesis writing period got longer and longer, for always being available to brainstorm or advise, and for all the encouragement you gave me these last six years.

## ABSTRACT

The reading crisis in South Africa is well-documented by now, and the implications of poor reading proficiencies can be observed in the limited outcomes and high attrition rates at primary, secondary and tertiary educational level. Reading comprehension is a fundamental aspect of academic literacy at tertiary level, but shortcomings in this relatively ‘invisible’ skill easily remain undiagnosed. Many South African universities provide foundational support to academically vulnerable students in the form of Extended Curriculum Programmes (ECPs) and academic literacy modules, but these tend to be writing-centred, with limited time dedicated to targeted instruction of advanced reading competencies, like inferencing, that often remain underdeveloped. Thus, more evidence-based research into reading instruction best practices for academically vulnerable students is urgently required. This study evaluated the effect of three different academic literacy interventions on the inferencing proficiencies of ECP students, in addition to the relationship between academic literacy and inferencing for this population. A quasi-experimental design with pre- and post-tests using the Test for Academic Literacy Levels and a self-designed instrument was augmented by data on participants’ reading habits and language profiles. Results indicate that many students who exit foundational interventions like ECPs and academic literacy modules need additional support in order to meet the reading demands of tertiary education, that inferencing and academic literacy are strongly correlated, and that targeted instruction on reading comprehension has a larger effect on improving inferencing skills than more writing-centred interventions. These results imply that more resources are needed to address the reading crisis at tertiary level by optimising existing remedial frameworks in order to provide the necessary support for vulnerable students.

**KEY TERMS:** inferencing, reading comprehension, academic literacy, Extended Curriculum Programmes, reading instruction

## Table of Contents

<b>CHAPTER 1: Introduction</b>	<b>1</b>
1.1 Introduction	1
1.2 Contextualisation of research problem	1
1.2.1 The reading crisis in South Africa	2
1.2.2 Factors that underpin the reading crisis in South Africa	6
1.2.3 Academic literacy and extended curriculum programmes at South African universities	9
1.3 Aim and phases of the study	13
1.3.1 Research questions	14
1.3.2 Research design	15
1.4 Structure of thesis	16
1.5 Conclusion	17
<b>CHAPTER 2: Literature review</b>	<b>18</b>
2.1 Introduction	18
2.2 Reading	18
2.3 Components of reading	21
2.3.1 Decoding competencies	22
2.3.2 Comprehension competencies	23
2.4 Reading in a second language	27
2.4.1 The Developmental Interdependence Hypothesis	28
2.4.2 The Linguistic Threshold Hypothesis	30
2.4.3 Implications of HL shortcomings	31
2.5 Reading comprehension	34
2.6 Inferencing	36

2.6.1 Types of inferences	37
2.6.2 The role of inferential ability in reading comprehension	47
2.6.3 The role of reading comprehension in academic achievement	48
2.6.4 Factors that influence inference generation	49
2.7 Teaching reading – a theoretical framework	54
2.7.1 Constructivist approaches learning and reading	55
2.7.2 Social cognitivist approaches to learning	57
2.8 Teaching inferencing	60
2.8.1 Why should inferencing be taught?	60
2.8.2 What aspects of inferencing should be taught?	61
2.8.3 How should inferencing be taught?	63
2.8.4 How should inferencing be tested?	66
2.9 Conclusion	68
<b>CHAPTER 3: Methodology</b>	<b>70</b>
3.1 Introduction	70
3.2 Research design	70
3.2.1 The original research design	70
3.2.2 An introduction to the revised research design	73
3.3 Research context	74
3.3.1 Aim of the study and research questions	75
3.4 Research design: Phases 1 to 4	77
3.5 Ethical considerations	79
3.6 The pilot study: instrument and material development in Phase 1	79
3.6.1 Design of the Academic Inferencing Test	80
3.6.2 Sampling	82
3.6.3 Procedure	82

3.6.4 Pilot results	84
3.6.5 Changes made after pilot study	86
3.7 The main study: assessing the effect of academic literacy interventions in Phase 2 to 4	86
3.7.1 Sampling and participants	87
3.7.2 Instruments	91
3.7.3 Data collection procedure	93
3.8 Data analysis	94
3.9 Interventions	98
3.9.1 2019 (Phase 2), face-to-face academic literacy intervention	98
3.9.2 2021 (Phase 3), online academic literacy intervention	100
3.9.3 2022 (Phase 4), online academic literacy and inferencing intervention	101
3.10 Conclusion	108
<b>CHAPTER 4: Results and Discussion</b>	<b>109</b>
4.1 Introduction	109
4.2 Test reliability	110
4.3 Results of the interventions	111
4.3.1 Performance in academic inferencing	111
4.3.2 Performance in anaphoric inferences	113
4.3.3 Performance in causal inferences	117
4.3.4 Performance in contrastive inferences	120
4.3.5 Performance in general inferences	123
4.3.6 Performance in academic literacy	127
4.3.7 Relationship between academic literacy and inferencing	128
4.4 Results from the Reading Habits questionnaire	130
4.5 Discussion	137
4.5.1 University responses to the COVID-19 lockdown in 2020	138

4.5.2 Face-to-face vs online instruction on inferencing ability	140
4.5.3 Academic literacy only vs explicit inference instruction on inferencing ability	144
4.5.4 Inferencing abilities in less-capable versus more-capable students	147
4.5.5 Relationship between academic literacy and inferencing	150
4.5.6 Responses from the questionnaire: reading habits and language profiles	151
4.6 Conclusion	155
<b>Chapter 5: Conclusions and recommendations</b>	<b>157</b>
5.1 Introduction	157
5.2 Review of research aims and phases	157
5.3 Research questions and main findings	158
5.3.1 Research questions	159
5.3.2 Main trends	163
5.4 Implications for instructional practices and interventions	164
5.5 Limitations of study	166
5.6 Recommendations for further research	168
5.6.1 Revisions to the Academic Inferencing Test	168
5.6.2 Replication of the study	168
5.6.3 Revising and extending the intervention	169
5.6.4 Include assessment of academic literacy for all cohorts	169
5.6.5 Include assessment of reading fluency	170
5.6.7 Expanding the sample to include different types of students	171
5.7 Contribution of study	171
5.8 Final thoughts	172
<b>6. References</b>	<b>174</b>
<b>Appendix A: Ethical clearance and informed consent</b>	<b>200</b>

<b>Appendix B: Academic Inferencing Test</b>	<b>203</b>
Academic Inferencing Test 1/2	203
Academic Inferencing Test 2/2	215
<b>Appendix C: Reading Habits questionnaire</b>	<b>226</b>
<b>Appendix D: Intervention schedules</b>	<b>229</b>
2019 Phase 2 intervention schedule	229
2021 Phase 3 intervention schedule	236
2022 Phase 4 intervention schedule	237
<b>Appendix E: Worksheets</b>	<b>240</b>
Worksheet 1.1: History's Biggest Fraud	240
Worksheet 1.2: History's Biggest Fraud	244
Worksheet 2.1: Always Connected	248
Worksheet 2.2: Always Connected	252
Worksheet 3.1: McDonald's Didn't Create a Better Hamburger	256
Worksheet 3.2: McDonald's Didn't Create a Better Hamburger	260
Worksheet 3.3: McDonald's Didn't Create a Better Hamburger	263
Worksheet 4.1: Coming Full Circle: How Legalisation Threatens Drug Lords	267
Worksheet 4.2: Coming Full Circle: How Legalisation Threatens Drug Lords	270
Worksheet 4.3: Coming Full Circle: How Legalisation Threatens Drug Lords	274



## LIST OF FIGURES

Figure 3.1	Revision of the research design in response to COVID-19 lockdown	72
Figure 3.2	Excerpt from the Academic Inferencing Test	82
Figure 3.3	Box and whisker graph for Pilot Test 1	87
Figure 3.4	Box and whisker graph for Pilot Test 2	87
Figure 3.5	Box and whisker graph for Pilot Test 3	87
Figure 3.6	Box and whisker graph for Pilot Test 4	87
Figure 3.7	Excerpt used for mental modelling	103
Figure 3.8	Mental modelling example	104
Figure 3.9	Scaffolding of causal inference questions in worksheets	106

## LIST OF TABLES

Table 2.1	Types of inferences	39
Table 2.2	Examples of anaphoric ties with anaphors underlined and referents highlighted	40
Table 2.3	Types of text-semantic markers	42
Table 3.1	Pilot test descriptive statistics	83
Table 3.2	Number of items per construct in the Academic Inferencing Test	85
Table 3.3	Overview of study, Phases 2 to 4	86
Table 3.4	Cohort demographic information	90
Table 3.5	Dominant demographic in each group per cohort	90
Table 3.6	Reliability of pilot tests and constructs using Chronbach's alpha	91
Table 3.7	Results of Shapiro-Wilk test	94
Table 3.8	Results of independent t-test	94
Table 3.9	Development of effect size categories	96
Table 3.10	Overview of 2019 academic literacy intervention	97
Table 3.11	LST 133 Workbook condensed table of contents	98
Table 3.12	Overview of the 2021 online academic literacy intervention	99
Table 3.13	Overview of intervention	101
Table 4.1	Reliability indices (Cronbach's alpha) for inferencing constructs	109
Table 4.2	Number of students in each stratified group for Phases 2, 3 and 4	110
Table 4.3	Academic inferencing performance 2019, 2021, 2022	113
Table 4.4	Anaphoric inferencing performance 2019, 2021, 2022	115
Table 4.5	Causal inferencing performance 2019, 2021, 2022	118
Table 4.6	Contrastive inferencing performance 2019, 2021, 2022	121
Table 4.7	General inferencing performance 2019, 2021, 2022	123
Table 4.8	Summary of performance for 2019, 2021 and 2022 cohorts	126
Table 4.9	Academic inferencing and academic literacy performance 2019	127
Table 4.10	Correlation between inferencing and academic literacy	128
Table 4.11	Language use	130
Table 4.12	Reading languages	131

Table 4.13	Language of Teaching and Learning (LoLT)	132
Table 4.14	Library membership and favourite book	133
Table 4.15	Sources and variety	134
Table 4.16	Reading online	134
Table 4.17	Own perception of reading	135

# CHAPTER 1: Introduction

## 1.1 Introduction

Advanced reading abilities, especially when reading academic texts in English, play an instrumental role in students' tertiary education outcomes (Van Dyk, 2011: 488; Andrianatos, 2018: 5) which, in turn, determine professional and economic prospects. Thus, the importance of reading comprehension as part of academic literacy education cannot be overstated. This study concerns the academic literacy in general and inferencing proficiencies in particular of academically vulnerable university students in South Africa. The study is contextualised within the framework of academic literacy education at tertiary level, with a focus on the roles that inferencing, reading comprehension and academic literacy play in academic success. Empirical evidence on the inferencing proficiencies of academically vulnerable students was collected before and after three different academic literacy interventions (in 2019, 2021 and 2022) by means of a self-developed test, called the Academic Inferencing Test (AIT). The AIT consists of four different constructs, namely anaphoric inferences, causal inferences, contrastive inferences and general inferences. Participants' performance and improvement were measured in each of these constructs as well as the full AIT score, and comparisons were made between different groups, such as students of different levels of proficiency or from different cohorts. The data from the AIT were complemented by data collected using the Test for Academic Literacy Levels (TALL) and a questionnaire on reading habits. The results indicated that more attention should be paid to testing the reading proficiencies of undergraduate students and establishing how best to bridge potential gaps with evidence-based instructional approaches.

## 1.2 Contextualisation of research problem

In this section, the state of primary school, high school and tertiary education in South Africa will be discussed with specific reference to the current reading crisis in South Africa. Thereafter, a number of potential causes for the reading crisis in the country will be considered. Finally, the implementation of academic literacy modules and extended curriculum programmes in South African universities in an attempt to address some of these educational challenges are investigated.

### 1.2.1 The reading crisis in South Africa

The chronic reading and literacy crisis in South Africa has been well documented by now. Many South African students already fall behind in the Foundation Phase of their schooling (Grades 1-3); thereafter, the problems accumulate (Pretorius & Currin 2010: 67). For example, in 2008, 36% of Grade 3 learners scored less than 35% in literacy in the home language (Bharuthram, 2012: 206). Three years later, in 2011, the Department of Basic Education tested Grade 6 students as part of the ANAs and found that 57% of them scored below 35%; during that same year, 45% of Grade 3 learners scored less than 35% (Bharuthram, 2012: 206). In other words, the prevalence of low literacy levels increased as students got older, and, up until 2011, each new intake of learners performed worse than previous years' intakes. Many of the students who participated in the current study would have been in Grade 2 in or around 2008, making these statistics particularly relevant. Drawing on local data of over 40,000 learners in no-fee schools over the past five years, research shows that by the end of Grade 3, four out of five learners cannot read fluently or with understanding in any language (Ardington, Wills, Pretorius, Mohohlwane & Menendez, 2021b; Wills, Ardington, Pretorius & Sebaeng, 2022a).

The Southern African Consortium for Monitoring Educational Quality (SACMEQ) assesses literacy and numeracy in Grade 6 across 14 African countries. In SACMEQ IV in 2013, South African results showed significant improvements (by more than 0.9 standard deviations) in participants' reading scores in English in Grade 6 between 2007 and 2013, although the validity of these results has been called into question (Spaull, 2016). Even if their validity is accepted, and despite the significant increase in scores, these results still show low levels of reading ability. The ambiguity of these results was further emphasized by the fact that the same test that purportedly indicated a significant improvement in students' reading skills revealed that the South African Grade 6 teachers who also wrote the test did poorly, especially when faced with questions that required inferential reasoning (Taylor, 2019). In fact, fewer than half of these teachers were able to demonstrate the reading skills expected of competent readers in the SACMEQ literacy tests (Taylor, 2019: 269).

Possibly the most cited of a large host of concerning statistics regarding South African students' reading levels came from the 2006, 2011 and 2016 Progress in International Reading Literacy Study (PIRLS), which assesses the reading proficiencies of fourth-grade learners on an international scale. South Africa scored the lowest out of 40 participating countries in each by a wide margin in each instance, despite the fact that the assessment is undertaken in all 11 official languages. The PIRLS tests have been administered

every five years since 2001, and aim to document worldwide trends in the learning and teaching of reading comprehension on a 4<sup>th</sup> Grade level. According to the results from the 2006 PIRLS, only 12% of Grade 4 students could understand texts at a basic level, referred to as the Low International Benchmark (i.e. answer explicit information-retrieval questions and straightforward inferences); in contrast, the international norm for answering such questions was 94% of students (Pretorius & Lephala, 2011: 2; Zimmerman & Smit, 2014: 3). The 2016 PIRLS Literacy (which used shorter and easier passages and items compared to the 2006 test) found that only 22% of Grade 4 students could read for meaning (i.e. performed at or above the Low International Benchmark), compared to the 2016 international norm of 96% (Howie, Combrinck, Roux, Tshela, Mokoena & McLeod Palane, 2017: 4). Moreover, the fact that those who completed the comprehension tests in the indigenous South African languages on average performed the worst refutes the common argument that South African students do poorly because they are handicapped by being taught and tested in a language other than their home language.

The issues facing South African learners are clearly not simply the result of second language instruction, but reveal a lack of foundational literacy development irrespective of language. Most learners (across all languages) are exiting the Foundation Phase without foundational reading skills and the longitudinal data show that they never catch up on their own in primary school (Wills *et al.* 2022a). As was shown in the SACMEQ data, teachers with insufficient literacy competencies could be a contributing factor to these results. There is no direct comparison between the SACMEQ and the PIRLS, but Taylor (2019: 269) theorises that these SACMEQ results suggest that only about 55% of the teachers would have been able to attain the PIRLS Intermediate Benchmark, which 82% of all Grade 4 children internationally who participate in the PIRLS achieve. Again, this is just a theory, but if it is accurate, South African teachers would therefore be performing worse in this test than Grade 4 learners around the world who participate in this test. This is particularly worrisome since, “if teachers themselves do not have a relatively sophisticated grasp of the language, they are unable to improve the linguistic competence of their learners or to convey complex ideas in class” (Taylor, 2016: 271).

Unfortunately, the situation does not look much better when considering high school learners. Although research into the reading abilities of high school learners is not as plentiful as the research on primary school learners, studies show a similar pattern (Matjila & Pretorius, 2004; Department of Basic Education, 2014; Van Broekhuizen & Spaull, 2017). In one study with 88 Grade 8 learners from a high school which served a mixed socio-economic community and was not academically high-performing, Matjila and

Pretorius (2004: 12-15) found that, on average, these learners, who were assessed in Setswana and English, were reading at a Grade 3 to 4 level, at least four years lower than their maturation level<sup>1</sup>. It is also worth noting that only about 50% of each cohort of learners starting Grade 1 in South African schools make it to Grade 12 within a period of 12 years; the rest either leave the school system or repeat at least one year of school (Van Broekhuizen & Spaull, 2017: 8). The 2014 ANA results, which give some insight into the reading level of this study's 2019 participants when they were in Grade 9, found that only 48% of English Home Language (HL) and only 18% of English First Additional Language (EFAL) learners scored more than 50% in the relevant ANA test (Department of Basic Education, 2014: 44-45). Thus, although the reading literature shows that weak readers, if identified and remediated early, can catch up (Chall *et al.*, 1990; Vadasy, Sanders & Abbott, 2008), in the current schooling context learners do not seem to bridge the gap in reading abilities in high school. Instead, they seem to get off to a poor start in primary school, with this trend continuing throughout their high school careers. Any systematic improvements made in these fields would thus take a long time to filter through the entire educational system to ultimately raise the reading and literacy levels of South African learners and students. It is therefore undeniably necessary that educators at all levels, including university, work to address this issue.

Studies undertaken in the past two decades show that many students enter South African universities with inadequate reading abilities (Nel, Dreyer & Klopper, 2004: 95; Cliff & Yeld, 2006; Bharuthram, 2012: 2008; Cliff, 2014; Fouche, 2016; Andrianatos, 2018: 110) with substantial drop-out rates remaining a problem at universities (Van Broekhuizen & Spaull, 2017). Reading comprehension is unlikely to be a significant feature of a university-level curriculum, and many lecturers assume that they can at least rely on students being able to understand most of what they read. Students' perceptions of their own reading ability also tend to be unrealistically high (Van Dyk, Van de Poel & Van der Slik, 2013: 363), and this mismatch affects their motivation to improve reading skills. The discrepancy between students' perceptions and competencies is an issue that is also examined in Phase 4 of the current study (see Section 4.4).

Many students cannot access much of the information they are expected to master at universities as a result of their limited reading abilities. A study by Cliff (2014) which assessed the academic readiness of a

---

<sup>1</sup> In this context, 'maturation level' refers to the expected reading level for an average learner from a specific grade or age. For instance, a Grade 3 learner whose reading capabilities are on par with the average expected Grade 1 learner is reading below his or her maturation level.

group of over 1000 school leavers about to enter into degree programmes at a South African university found that only a quarter of those students had the necessary reading proficiency to cope with the reading and reasoning demands they would face at university. Similarly, another South African study which assessed the reading efficiency (a product of reading speed and reading comprehension) of 558 first year university students randomly selected across seven faculties found that that the mean reading level of the students, in terms of efficiency, was at a Grade 7 level (Andrianatos, 2018: 110).

South African students reading at lower levels than their maturation level<sup>2</sup> is not a recent phenomenon; in fact, this trend has been observed by several researchers for the last two decades. For instance, Nel *et al.* (2004: 98) found a group of randomly selected first-year students at the University of Potchefstroom to have an average reading level of Grade 9. Pretorius's (2000) study conducted at the University of South Africa found that a significant number of students enrolled in Psychology and Sociology programmes read with an average comprehension level of 53% and a very slow reading speed of 96 WCPM (words correctly read per minute). Recent research involving over 20,000 South African ESL learners proposed that 90 WCPM be adopted as a benchmark for the end of Grade 5 and 100 WCPM for the end of Grade 6; strong empirical evidence shows that ESL learners reading less than that have major reading comprehension problems (Wills, Ardington, Pretorius, Pope & Ramagoshi, 2022b). To further put these results into perspective, a study by Hasbrouck and Tindal (2006: 639), which collected data from schools across 23 states in the United States (with over 28,000 learners in their data bank), cited similar reading speeds for first-language learners in Grades 2 to 4 as were found in the case of these South African undergraduate students. If McCormick's (1997) findings are taken into consideration, that in standardised reading tests, a comprehension level of 60% indicates that a reader needs reading support, this would suggest that many of the students from Pretorius's study would have a hard time accessing the content they were required to master in order to complete their qualifications. The relationship between reading ability and academic performance is further discussed in Section 2.6.3.

In short, many undergraduate students' reading skills are so poor that reading to learn will be almost impossible for them without assistance (Pretorius, 2002: 173; Bharuthram, 2012: 206); moreover, many of these students are not aware of this shortcoming (Boakye & Southey (2008) and therefore are unlikely to ask for help early on. Ultimately, the knock-on effects of poor reading abilities which, for many students,

start early in their schooling career result in underprepared students entering universities still in need of reading instruction. The current paucity of reading research at tertiary level reflects a lack of awareness of these issues. Thus, rigorous research is necessary to examine what kind of reading interventions are needed by academically vulnerable students.

### **1.2.2 Factors that underpin the reading crisis in South Africa**

Poor reading levels constitute a complex issue, with many contributing factors relating to quality of schooling, language policies and socioeconomic inequality. The evident challenges associated with South African students' reading prowess are often dismissed as being the result of language barriers (Owen-Smith, 2010: 31), since most South African students switch from home language instruction to English (or even Afrikaans) as the language of learning and teaching (LoLT) after completing three years of formal schooling. Consequently, the majority of South African learners have little choice but to complete the majority of their schooling in a second language. For instance, one recent study which assessed the reading proficiencies of students in a multi-lingual South African primary school described a "buddy-system" in which "stronger learners interpret the work for those who do not understand the LoLT" (Ntshikila, Condy, Meda & Phillips, 2022: 329). This type of work-around is not the norm for most South African learners, but there are undoubtedly many whose literacy and education are severely impeded by language barriers. While the issue of limited LoLT variety and access complicates the South African educational landscape, it does not fully explain the country's poor reading performance in the early years of schooling. Moreover, the debate surrounding the impact of English as the language of instruction has arguably masked the issue of low literacy levels in any language, including students' home language (Hoadley, 2012: 8).

South Africa has 11 official languages: English, Afrikaans, Sepedi, Sesotho, Tswana, Swati, Venda, Tsonga, Ndebele, Xhosa and Zulu. Roughly 75% of the population has an indigenous South African language<sup>3</sup> as Home Language) (Lehohla, 2012: 24). Over 75% of Quintile 1-3<sup>4</sup> schools have an African language as language of learning and teaching (LoLT) in Foundation Phase; thus, the majority of South African students receive instruction in an indigenous South African language during the Foundation Phase of formal

---

<sup>3</sup> For the purposes of this study, the nine indigenous South African languages are Sepedi (also known as Sesotho sa Leboa), Sesotho, Setswana, Tshivenda, Xitsonga, isiNdebele, siSwati, isiXhosa and isiZulu.

<sup>4</sup> South African schools are divided into five groups, or 'quintiles', ranging from non-fee paying Quintile 1-3 schools (the poorest group) which get the most state funding to fee-paying Quintile 5 schools (the wealthiest group) which get the least state funding. Quintile 1-3 schools are the poorest performing schools across all provinces.



schooling (Taylor & von Fintel, 2016: 32) – in other words, between Grades 1 and 3. This is usually similar to the predominant language they speak at home, although it may be another African language (e.g. a Xhosa child attending a Sesotho school). They subsequently switch to English as the LoLT from Grade 4 onwards<sup>5</sup>. This is in line with the 1998 Norms and Standards for Language Policy in Public Schools, often referred to as the Language in Education Policy (LIEP) (Mohohlwane, 2019). The ‘early exit’ language policy of only completing schooling in learners’ mother tongue until Grade 3, combined with the complexities of a multilingual and severely unequal society, have certain implications for literacy levels in the country.

These implications are further complicated by economic factors and government policies. For example, South Africa spends less than 6% of its GDP on education (a lower percentage than all of its neighbouring countries) (Spaull, 2019: 18); in addition, less than a third of the students attending school in South Africa pay school fees (Department of Basic Education, 2018: 33). Therefore, many South African learners attend state-funded non-fee schools where they are likely to receive poor quality schooling due to funding limitations as well as a number of other issues relating to the functioning of the school. Class sizes in these schools are often too large, school governance is poor and school functionality mediocre; many teachers are poorly trained, and a large number of schools either have limited academic resources or do not use the resources at their disposal effectively (Hoadley, 2012: 6; Department of Basic Education, 2017: 9; Mohohlwane, 2019: 132).

These concerns are further compounded by an assortment of issues stemming from problematic educational practices and limited support from learners’ homes, specifically in the context of language and reading development. While the Department of Basic Education recommends using the dominant home language as the LoLT in the Foundation Phase (Grades 1-3), most of the indigenous South African languages spoken in South Africa stem from a predominantly oral culture and do not have a strong written tradition (Pretorius & Currin, 2010: 68). Thus, indigenous South African language educational resources are limited and these languages are also less standardised in practice than English, meaning that the everyday language spoken in the home or in class can differ noticeably from the standardised written form of the language, especially in township settings (cf. Rudwick, 2005) where multi-language dialects reflect the linguistic diversity of these urban environments. The extent and the rate of learning to read and write in indigenous South African languages is inevitably hampered by these factors. Poor pedagogic

---

<sup>5</sup> It should be noted that the majority of the participants in the current study attended English LoLT schools from Grade 1 (refer to Section 4.4).

practices compound the problem: the focus of reading instruction tends to be on teaching decoding skills with relatively little attention being paid to comprehension (Hoadley, 2012: 8). Historically, in South Africa, the teaching of decoding itself also tended to be problematically lacking in meaningful learning opportunities (Pretorius, 2015: 60). Unfortunately, despite more attention recently being paid to the mechanics of reading, decoding skills are still found to be inefficient and poorly developed, and thus provide an inadequate basis for comprehension (Pretorius & Spaull, 2016: 159). Moreover, reading comprehension does not develop automatically as a result of exposure and observation (Seidenberg, 2017: 105). Instead, it requires regular exposure to written text, many hours of reading practice and rigorous, evidence-driven instruction.

The inevitable gaps created by the situation at school are also unlikely to be filled at home, especially for children who grow up in low-income homes. Many South Africans grow up in a print-poor environment in communities that do not associate reading with leisure (Pretorius & Mampuru, 2007: 40-41; Cekiso, Rabeleman, Jadezweni, Mandende & Dieperink, 2022: 15). Almost three decades after the advent of democracy, South Africa is still facing a massive wealth discrepancy; according to Spaull (2019: 1), it is “the most unequal country in the world”, and the average child’s prospects are largely predetermined by factors such as his or her race, socioeconomic status, and province of birth. This wealth discrepancy is mirrored in the state of the country’s schooling system where literacy and numeracy rates vary significantly between fee-paying, former Whites-only upper-quintile schools (Quintile 5) which are racially integrated but mainly accessible to the middle class, and lower-quintile schools (Quintiles 1-4) which are attended almost exclusively by poor Black pupils from low socioeconomic communities (Spaull, 2019: 14). Linked to these socioeconomic differences are enormous differences in quality of schooling. A striking example of the discrepancy between these two types of schools and their bimodal performance (theorised as comprising two distinct schooling systems, one functional and one dysfunctional, cf. Fleisch, 2008; Taylor & Yu, 2009) can be found in their matric Mathematics scores:

In 2018 the top 200 high schools in the country have more students achieving distinctions in Mathematics (80%+) than the remaining 6,600 combined. Put differently 3% of South African high schools produce more Mathematics distinctions than the remaining 97% put together. Of those 200 schools, 175 charge significant fees. Although they are now deracialized, 41% of the learners in these schools were White. It is also worth noting that half of all White matrics [Grade 12 students] (48%) were in one of these 200 schools (Spaull 2019: 1-2).

While this does not speak to the learners' reading capabilities, it does illustrate the impact of school quality on school performance, and it is improbable that significantly different patterns would emerge in terms of learners' reading abilities. Success in early reading is critical for future academic success. In fact, if learners cannot read fluently by Grade 3, they tend to struggle throughout their school career (Ardington *et al.*, 2021b). Considering that the education provided by the majority of schools during learners' formative grades does not seem up to the task of adequately teaching reading, the implication is that this responsibility rolls over to universities. Universities are accountable to the students they accept into their degree programmes, and must provide the necessary support to enable these students to successfully complete their degrees. Academic literacy interventions are one strategy that many universities have put into place to address this reality.

### **1.2.3 Academic literacy and extended curriculum programmes at South African universities**

Academic literacy, a sub-field of applied linguistics, refers to students' ability to "engage successfully with the demands of academic study in the medium of instruction of the particular study environment" (Cliff & Yeld 2006: 19) in order to acquire the necessary practices that will allow them to take on active roles within their respective academic communities (Van Dyk & Van de Poel, 2013: 59). In order to accommodate changes in student populations that include increasing numbers of students from disadvantaged schools, most, if not all, South African universities have developed academic literacy programmes for undergraduate students (Fouché, 2016: 161). In practice, in South African universities, academic literacy modules aim to empower students who, despite meeting basic entry requirements, are not sufficiently prepared for the academic rigour of studying at university level.

Although reducing any complex field of knowledge to discrete skills is certainly problematic, devaluing and ignoring the role that discrete skills play in acquiring high levels of competence in complex fields is equally problematic. At this stage it might be useful to point out that academic literacy curricula typically focus on developing students' ability to effectively interact with the discourses and expectations of university study in order to better equip them with the language skills required for a specific field of study. Literacy in the learning context can be defined more narrowly as "the activity of interpretation [reading] and production [writing] of academic and discipline-based texts" (Leki 2017: 3); this narrower definition which focuses on written language is used in the study. As a construct, it incorporates a range of sociocultural, linguistic and cognitive factors (Kern 2000) which form the basis for knowledge acquisition, application and generation in the formal learning/teaching context. The first factor, sociocultural factors,

is concerned with acculturation to academic language uses and literacy practices (Kern, 2000). Secondly, lexical, morphological, syntactic, semantic and pragmatic knowledge make up the linguistic factors involved in academic literacy (Kern, 2000). Lastly, cognitive and metacognitive proficiencies involve actively engaging prior knowledge in order to establish relationships between propositions in order to predict, infer, and synthesise meaning (Kern, 2000). Based on this construct, effective reading (or interpretation) is essential for students to adequately engage with academic discourses. However, most academic literacy interventions (including the one investigated in this study) tend to focus more on writing. This emphasis on writing in academic literacy interventions is common, since students are typically evaluated on their written work (Archer 2008; Van Dyk, Zybrands, Cillié, & Coetzee 2009). Although academic writing instruction at tertiary level has its own challenges – such as providing meaningful feedback despite limited instructor to student ratios (Maphoto, 2022: 11) – reading is often side-lined even more as an arguably more invisible skill.

At the University of Pretoria, there are various routes that first-year students follow, depending on the faculty they are registered with: students might be exempted from the relevant academic literacy module based on their Grade 12 English marks; they might be required to write a standardised AL test (such as the Test for Academic Literacy Levels [TALL]) as a diagnostic to determine whether they need to complete an academic literacy module; or they might have to take the module regardless of their Grade 12 performance. In the context of the current study, BCom and BSc degree programme students whose school-leaving marks are too low to allow them entry into various BCom and BSc degree programmes are given the opportunity to complete an additional year of university studies, called an Extended Curriculum Programme (ECP), prior to enrolling for their chosen mainstream degree programme. This additional year of study is intended to provide academically vulnerable students with intensive instruction in various content subjects as well as two specially designed and intensive academic literacy modules, called Language and Study Skills (henceforth referred to by its course code, LST; the two semester-long [i.e. 28 weeks in total] LST modules are called LST 133 and LST 143).

Due to the specific requirements of the students enrolled in these programmes, the classes are different from typical university lectures in size, instructional approach and number of contact hours. As part of the University of Pretoria's Extended Curriculum Programme, LST classes typically have roughly 50 students per group who receive four hours of workshop-style classes per week during which they engage in a number of writing exercises, often in small groups, with the lecturer's assistance. There are also two

different LST ‘streams’: one for BSc students and one for BCom students. Both LST streams were developed in consultation with science and commerce content lecturers, and the two LST streams are built around the discourses in the two specific disciplines, and extensively draw on texts and examples from these disciplines, as discipline specific literacy modules have been shown to have a bigger impact than generic modules (Carstens, 2009; Butler 2013). However, they can present unique challenges when it comes to assessment, as they require either a collaboration between literacy and discipline content instructors, or they require literacy instructors who have at least some understanding of discipline content (Sebolai, 2022a: 9). Throughout the year, students complete a significant volume of AL assignments for which they receive frequent, detailed feedback, culminating in a discipline-specific research assignment, often in collaboration with one or more of their content modules. Admission requirements for the ECP at the University of Pretoria are lower than they would be for mainstream programmes. Currently, students enrolled in one of the three BSc programmes require a matric mark of at least 50% in English and Mathematics, while those enrolled in the BCom programme need 50% in English and only 40% in Mathematics. Mainstream degree programme entry requirements vary, but the majority require an English mark of 60% and a Mathematics mark of 70%.

Unfortunately, despite the institutionalising of academic literacy modules and increasing moves from various universities, including the University of Pretoria, to situate these modules within various disciplines to give students access to discipline-specific discourses, South African universities have consistently been experiencing problematically high drop-out rates over the past three decades, losing up to a third of their first-year students (Scott, 2009:2). In addition, according to the then Department of Education (quoted in Bharuthran, 2012: 208), another 20% dropped out in their second and third years. This picture does not appear to have improved much in recent years: in a study which used population-wide panel data, Van Broekhuizen and Spaul (2017: 10) found that only about half of the students who accessed higher education in South Africa completed an undergraduate qualification. While academic literacy instruction at university level alone cannot be expected to solve the lack of literacy skills and academic preparedness discussed in this chapter, it is becoming an important tool in addressing some of these issues and therefore needs to be effective, research-based and systematically monitored.

The assumption of writing-focused academic literacy programmes could be that an improvement in writing will go hand in hand with an improvement in other AL skills, such as reading. However, challenges with reading often remain undiagnosed in writing-focused literacy programmes and, consequently,

continue to impede student success. According to Pretorius (2002: 192), “[i]t is through reading that students acquire Cognitive Academic Language Proficiency, it is largely through reading that students are enculturated into the world of higher learning, and it is through reading that students improve their writing, not the other way around.” In other words, a writing-focused literacy module misses the opportunity to assist students in building solid reading-based competencies which can later contribute to better academic literacy overall. Thus, there is much to be gained from developing interventions to improve students’ reading competencies, particularly relating to competencies like making connections between elements of text and inferring information from text, which have been found to be particularly challenging for academically vulnerable students and English L2<sup>6</sup> readers (Bowyer-Crane & Snowling, 2005: 199; Kispal, 2008: 17; Barth, Barnes, Francis, Vaughn & York, 2015). Inferencing can be thought of as “reading between the lines”, or as accessing implicit information necessary for understanding that extends beyond the literal meaning of the words in the text (see Section 2.6). Linking ideas in text, understanding the main ideas of a piece of writing and how they are connected, and understanding vocabulary connotations are all examples of cognitive processes that rely on inference generation (Cain & Oakhill 1999; McMackin & Lawrence 2001; Kispal 2008).

Currently, the most vulnerable group of students who take LST 133 and LST 143 are those enrolled in the BCom ECP. These students generally struggle more with the academic literacy modules, consistently achieving lower marks compared to their BSc counterparts. As a result, they have been identified as the group of students who are most in need of an intervention targeted at improving their literacy and general academic proficiency. Current trends of increasing numbers of vulnerable students entering university careers will likely continue for as long as South African schools struggle to address the reading crisis (see Section 1.2.1). Therefore, extended curriculum programmes like the one at the University of Pretoria are likely to continue playing an important role in assisting vulnerable students in making the transition from secondary to tertiary education. If we intend to better serve these students, we must first establish, more precisely and without second-guessing, what exactly their needs are, where the gaps in their competencies are, what level of proficiency they need to obtain before having a realistic chance of completing a degree programme, and how these proficiencies can be accurately measured. This requires

---

<sup>6</sup> In this thesis, I am using the abbreviations L1, L2 and L3 to refer to first, second and third language respectively. EFAL (English First Additional language) is used only in the context of the South African CAPS curriculum which uses this term to refer to the school subject. HL (Home Language) is used exclusively to refer to the language(s) spoken by a child’s caretakers at home during the child’s formative years, even if this does not remain the child’s L1.

more systematic evaluation of the academic literacy interventions themselves in order to establish evidence-driven policies for the implementation of these modules.

### **1.3 Aim and phases of the study**

The original aim of this study was to compare the effect of an existing academic literacy intervention on ECP students' academic literacy and inferencing capabilities with one that included an explicit focus on inferencing, in the usual face-to-face contact teaching mode. More specifically, the aim was to assess different aspects of students' inferencing abilities during reading before and after an ECP course to determine whether general academic literacy instruction improved students' inferencing abilities or whether a more targeted approach to inferencing built into academic literacy instruction produced more effective inferencing outcomes. This would then be complemented by qualitative data collected using a questionnaire.

However, the COVID-19 pandemic and the resulting lockdown in 2020 and switch to online teaching modes required modifications to the design of the study. While the original aim was still the same (and the qualitative section of the study remained unchanged), the new design included three cohorts of students across three years which also allowed for comparisons along two dimensions: firstly, the impact of face-to-face versus online instruction on the inferencing ability of ECP students, and, secondly, the impact of including targeted inferencing instruction on their inferencing ability, compared to the same intervention without inferencing-focused instruction. In sum, the aim of this study was to investigate three iterations of an academic literacy intervention and their differential effects on students' competencies in drawing inferences while reading. In order to achieve this, the study was designed in four phases.

#### **2018 (Phase 1): Assessment and material development and piloting**

Two test instruments, an inferencing test (called the Academic Inferencing Test) and a survey (called the Reading Habits Questionnaire), were developed. The Academic Inferencing Test (AIT) was piloted on BCom ECP students and analysed for reliability. In addition, intervention worksheets were developed for the explicit inferencing component of the intervention, which was implemented in 2022 (Phase 4). This phase is discussed in more detail in Section 3.6.

#### **2019 (Phase 2): Face-to-face academic literacy intervention**

A cohort of 51 BCom ECP students received the existing face-to-face academic literacy course comprising 78 hours of instruction time over 14 weeks. Data were collected from pre- and post-tests using the self-designed AIT and an existing standardised academic literacy test (TALL). This phase is discussed in more detail in Section 3.7.

### **2021 (Phase 3): Online academic literacy intervention**

A cohort of 54 BCom ECP students received the existing academic literacy course which was adapted to an online format, comprising 78 hours of instruction time over 14 weeks. Data were collected from pre- and post-tests, using only the self-designed Academic Inferencing Test. (An online version of the TALL could not be administered due to copyright issues.) This phase is discussed in more detail in Section 3.7.

### **2022 (Phase 4): Online academic literacy and inferencing intervention**

A cohort of 77 BCom ECP students received the existing online academic literacy course with an inferencing component built into it, and comprising 78 hours of instruction time over 14 weeks. Data were collected from pre- and post-tests, using the self-designed Academic Inferencing Test, as well as the Reading Habits Questionnaire. This phase is discussed in more detail in Section 3.7.

## **1.3.1 Research questions**

This overarching aim was addressed using the following research questions:

**Research Question 1: What is the effect of an intervention on the academic inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

- 1a A 78-hour face-to-face academic literacy intervention (Phase 2 in 2019)
- 1b A 78-hour online academic literacy intervention (Phase 3 in 2021)
- 1c A 78-hour online academic literacy and inferencing intervention (Phase 4 in 2022)

**Research Question 2: What is the effect of an intervention on the anaphoric inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

- 2a A 78-hour face-to-face academic literacy intervention (Phase 2 in 2019)
- 2b A 78-hour online academic literacy intervention (Phase 3 in 2021)
- 2c A 78-hour online academic literacy and inferencing intervention (Phase 4 in 2022)



**Research Question 3: What is the effect of an intervention on the causal inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

- 3a A 78-hour face-to-face academic literacy intervention (Phase 2 in 2019)
- 3b A 78-hour online academic literacy intervention (Phase 3 in 2021)
- 3c A 78-hour online academic literacy and inferencing intervention (Phase 4 in 2022)

**Research Question 4: What is the effect of an intervention on the contrastive inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

- 4a A 78-hour face-to-face academic literacy intervention (Phase 2 in 2019)
- 4b A 78-hour online academic literacy intervention (Phase 3 in 2021)
- 4c A 78-hour online academic literacy and inferencing intervention (Phase 4 in 2022)

**Research Question 5: What is the effect of an intervention on the general inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

- 5a A 78-hour face-to-face academic literacy intervention (Phase 2 in 2019)
- 5b A 78-hour online academic literacy intervention (Phase 3 in 2021)
- 5c A 78-hour online academic literacy and inferencing intervention (Phase 4 in 2022)

**Research Question 6: What is the effect of a 78-hour academic literacy intervention on ECP students' academic literacy proficiencies, overall and according to stratified ability groups?**

**Research Question 7: What is the relationship between ECP students' inferencing proficiencies and their academic literacy proficiencies? (Phase 2 in 2019)**

**Research Question 8: What are ECP students' reading habits and the relationships between these habits and students' inferencing proficiencies, overall and according to stratified ability groups?**

### **1.3.2 Research design**

A quantitative, quasi-experimental, sequential research design was used in this study. Due to challenges around the sudden move to online instruction as a result of the COVID-19 pandemic in 2020, additional counterfactual evidence was required to reliably assess the efficacy of the inferencing intervention. Thus, in addition to the already-collected 2019 face-to-face baseline data, it was decided during the course of

2020, when it became evident that face-to-face tuition was unlikely to resume in 2021, to add another baseline group, one which received online instruction in the general academic literacy intervention. For this reason, data was collected from the fully-online 2021 cohort who received the normal academic literacy content. Next, data was collected from the fully-online 2022 cohort who received inferencing-focused instruction in addition to their normal academic literacy content. In this way three sets of data (from three cohorts that had each received a different version of a specific academic literacy intervention) were available for analysis.

This study was concerned with assessing the impact of three iterations of an academic literacy course on participants' inferencing proficiencies. Specifically, it compared the growth in students' inferencing abilities under the three different tuition conditions as specified in the research questions.

Comparisons were made across the three interventions (for instance, comparing the results obtained from the 2019 cohort to those obtained from the 2021 cohort), as well as within interventions, by analysing stratified groups. For instance, comparing performance by students categorised as High-Risk to students categorised as At-Risk or Borderline (refer to Section 4.2 for a more detailed discussion of this categorisation). The method for stratifying these groups is explained in Section 4.2. The AIT, TALL and Reading Habits questionnaire were used to collect data. Participants for all three phases were commerce (BCom) ECP students; no student participated in more than one of the three phases. The research design, instruments and sample are discussed in more detail in Chapter 3, along with the collection and analysis procedures.

## **1.4 Structure of thesis**

This thesis is divided into five chapters, including this chapter.

- Chapter 2 discusses the concepts of reading, reading comprehension and inferencing in more detail, specifically focusing on the factors that influence inferencing while reading. Thereafter, the question of how to teach reading comprehension and inferencing is investigated with reference to various instructional models.
- Chapter 3 explains the research methodology and research design for all three phases of the study. This chapter also provides an overview of the inferencing training intervention which is the focus of this study as well as the various instruments that were used to assess the effect of the intervention.

- Chapter 4 presents the results of the quantitative and qualitative data collected from these instruments; then, it analyses these results in relation to current theoretical frameworks and available research evidence.
- Chapter 5 concludes the thesis with an overview of the findings, recommendations for pedagogy and future research, and acknowledgements of the limitations of the study.

## 1.5 Conclusion

Due to the challenges faced by South African readers, the high attrition rates at universities across the country, and the extent to which reading ability influences academic performance, it is essential that vulnerable students receive effective reading instruction. Academic literacy interventions serve an important function at South African universities, but it remains unclear whether these interventions assist students in obtaining the necessary literacy and reading competencies required for tertiary education. By measuring one aspect of competencies in detail (i.e. inferencing ability during reading) across three different conditions, this study aimed to contribute to the field of reading and literacy instruction at the level of higher education. Ultimately, the intention was to gain insight into the needs of vulnerable students and how to better meet those needs. Therefore, this study measured, and aimed to improve, the inference generation proficiencies of students enrolled in the BCom extended curriculum programme at the University of Pretoria. It endeavoured to do so through the development of a practicable inferencing strategy instruction intervention that can form part of an existing academic literacy module. The following chapter provides a discussion of the concepts relevant to this study, a review of the literature, and a theoretical framework for reading comprehension instruction and inferencing.

## CHAPTER 2: Literature review

### 2.1 Introduction

The purpose of this chapter is to situate the study within contextual frameworks relating to reading, broadly, inferencing, specifically, as well as academic literacy, at tertiary level. The first section of the chapter defines reading and situates this study within a broader framework of reading research. The reading process is then analysed by investigating various component groups of reading skills and proficiencies, such as decoding and comprehension. Thereafter, reading in a second language is discussed, with specific reference to the South African context. Next, inferencing is discussed with particular attention paid to text-semantic and anaphoric inferences, which leads to a discussion of the relationships between inferencing, reading comprehension and academic achievement. Further discussion of the different factors that influence inferencing is followed by a consideration of two different theoretical frameworks for the teaching of reading, constructivism and social cognitivism. Finally, the need for explicit reading instruction at tertiary level is discussed with reference to the potential content and mode of instruction for such an intervention.

### 2.2 Reading

Reading is a complex cognitive-linguistic process (Pretorius, 2002: 170) during which the reader is responsible for actively constructing meaning from the text through his or her interaction with it. While reading, the reader simultaneously harnesses bottom-up and top-down processes to decode language and construct meaning (Pressley, 2000: 549). In alphabetic writing systems, spoken language is represented by visual symbols at the phonological level. Decoding, which is a bottom-up process, concerns the translation of phonological symbols in the text into language (Beishuizen, Le Grand & Van der Schalk, 1999: 37). At the same time, reading comprehension includes top-down processes such as the activation of higher-order ideas and prior knowledge to inform the reader's understanding of information in the text and interpretation of the text. Reading comprehension also involves the processing of individual linguistic cues and propositions to form a broader understanding of the text, as well as the application of metacognitive strategies that monitor these processes (Zimmerman, 2014: 2). Such cognitive processes are also influenced by and filtered through social aspects, such as home background and socio-economic status, as well as affective factors, such as interest, motivation and self-efficacy (Boakye, Sommerville & Debusho, 2014: 176-179).

The reading process is dependent on several distinctive, reader-based factors. Firstly, a reader's approach is influenced by his or her goals when reading, such as reading for pleasure, reading to study, or scanning a text to find a specific piece of information. Secondly, a reader's approach is also affected by his or her reading ability and prior knowledge (Kendeou & Van den Broek, 2007). According to Koda (2007: 1), this construction of meaning from visually encoded information "entails converting print into language and, then, [language into] the message intended by the author". However, the reader has to draw on personal experience, understanding and perspective throughout this active meaning-making process, while reading accuracy and fluency also play a role. Consequently, the "message intended by the author" may be somewhat distorted as the reader produces a unique text, parallel to the author's text and constantly interacting with it (Wurr, 2003: 158). This is an active and involved process. Reading does not constitute the passive reception of information; rather, meaning is constructed by an informed reader who brings his or her own knowledge to bear.

Regardless of individual reader differences, it is impractical and factually dissonant to conceive of reading as a single, homogeneous process. Instead, reading relies on the simultaneous functioning of several component skills (Nassaji, 2003: 261; Van Gelderen, Schoonen, de Glopper, Hulstijn, Snellings, Simis & Stevenson, 2003: 10). According to Perfetti and Stafura (2014: 22), there is currently no single theory of reading as there are too many different yet interrelated components involved in the reading process to be encompassed by a single, overarching theory; instead, research in this field has been preoccupied with addressing specific problems that are grounded in flexible frameworks of reading.

Two dominant frameworks concerning the nature of reading development and the consequent best practices for instruction have been under debate by reading researchers for decades, and much of the debate hinges on whether reading is best viewed as a set of interacting processes, or as a single holistic action, focused entirely on meaning-making. Whole-language approaches favour the latter option and were shaped by Goodman's (1965) framing of reading as "a psycholinguistic guessing game" in the late 1960s. Whole-language models are strongly influenced by constructivist pedagogical theories that oppose the breaking down of complex tasks into components as well as explicit instruction. On the other hand, the science of reading has a long tradition in diverse fields such as psychology, cognition, neurology and linguistics and tends to approach the complex process of meaning-making (still the essential goal of reading) incrementally and componentially, in terms of all the linguistic, cognitive and neurological

processes involved in reading. Historically, this approach is erroneously framed as focussing on pedagogically weak tasks such as phonics drills by Goodman and his proponents since the 1960s (Kim, 2008: 373).

These two opposing views come to a head in early reading instruction in alphabetic writing systems, in particular, as this is when phonics instruction – a component which whole language approaches vehemently oppose – is especially relevant. While a skills-based approach to early reading would include instruction on phonics (amongst various other skills and knowledge bases, never as an end in itself), a whole language model would assume that reading acquisition occurs spontaneously (like language acquisition does) on exposure to storybook reading and would thus be focussed on immersion and meaning-focused activities, with little consideration for the mechanics involved in processes such as decoding (Castles, Rastle & Nation, 2018: 5). This is a lot to ask of early readers, and a wide range of evidence consistently shows that instructional approaches that initially focus on phonics instruction and allow for explicit instruction yield bigger effect sizes than those that do not (Kim, 2008: 372; Hattie, 2009; Castles *et al.*, 2018: 6; Sampa, Ojanen, Westerholm, Ketonen & Lytinen, 2018). It is also worth noting that the whole language approach to early reading instruction is a response specifically to the English language and its unusually opaque orthography (Share, 1995). Thus, whole language style instruction is even less appropriate for more transparent languages, especially agglutinating languages like the Nguni languages that have very long words and where a single word can constitute a whole sentence (Pretorius, 2019). While the intricacies of early years reading instruction are beyond the scope of this study, which focuses on improving the reading comprehension of university students, it is worth noting here that this study is grounded in a cognitive-linguistic approach that views reading as involving different but interrelated components and processes, and which also takes cognisance of the influence of contextual variables that shape reading development and practice.

According to the skills-based model of reading, the component skills and knowledge bases involved in the reading process can be theorised as complex phenomena comprised of interrelated components that address different functions while simultaneously contributing to the effective functioning of the meaning-making process as a whole (Koda, 2007: 3). Viewing reading through this lens allows for a much more analytical approach to reading research and assists the identification and addressing of individual reading challenges. For instance, this componential view hypothetically allows researchers to separate reading into distinct constructs, isolate and study these components individually in order to ascertain how they

develop, the extent to which each component contributes to skilled reading and the manner in which various components interact with each other (Jeon & Yamashita, 2014: 161) to yield a comprehensive understanding of a text and to better understand the integrated process of reading. Although there are varieties in the naming and grouping of components in the research, this thesis conceives of reading as a product of a variety of cognitive processes operating in concert; these processes are conceptually divided into three sub-sets, using the model put forward by the Zenex Literacy Project 2014-2017; the model was influenced by emerging evidence from the science of reading which has found that gaps that exist between less-proficient and more-proficient readers at the Foundation Phase of primary school have the potential to widen substantially as these students progress with their education (Zenex Foundation, 2019). In other words, the foundation of reading literacy is extremely important, and challenges encountered at this stage of learning to read can have long-lasting consequences.

According to this model, reading can be thought of consisting of the following three-subset processes:

1. Decoding processes which rely on phonological, orthographic, morphological knowledge, word recognition and oral reading fluency.
2. Comprehension processes which rely on vocabulary knowledge, background knowledge, language knowledge (including knowledge about syntax, parsing, and cohesive devices such as anaphors and discourse markers), drawing inferences and metacognitive skills.
3. Response processes (influenced by socio-affective aspects).

While decoding processes are influenced by typological linguistic features and the way in which the alphabetic code of a particular language encodes them, comprehension competencies make up a more generalised underlying cognitive proficiency which is generic across languages (refer to Section 2.4 for the role played by language-specific and language-generic skills when dealing with reading in a second language).

### **2.3 Components of reading**

Below, the two main sub-sets of cognitive-linguistic competencies, namely decoding competencies and comprehension competencies, that reading consists of will now be discussed in more detail.

### 2.3.1 Decoding competencies

Skills relating to decoding assist readers with the most basic dimension of reading: mapping the alphabetic code onto language (Koda, 2007: 1). Doing this requires the reader to have phonological, orthographic and morphological knowledge. Phonological and code knowledge informs one's understanding of the letter-sound relationships in written alphabetic language and helps young readers to draw from a wealth of linguistic knowledge built up through oral communication (Koda, 2007: 5). Therefore, phonological awareness plays an important role in second language (L2) reading of alphabetic writing systems as well as the initial stages of first language (L1) reading. Furthermore, orthographic knowledge enables readers to decode sound-symbol relationships rapidly, while morphological knowledge is used in order to determine the meaning of components of words, such as affixes (Zhang & Koda, 2011: 1199). Together, phonological, orthographic and morphological knowledge enable readers to access meaning at the sub-word level, even when encountering words outside their vocabularies or, in the case of very young readers, in order to decipher the correct word when encountering a known word in its written form for the first time. On the other hand, more seasoned readers who have developed accuracy and automaticity in word recognition are less likely to rely on basic sound-symbol processing in order to establish meaning at the word level as they have made the switch from serial to parallel processing and are therefore able to access meaning lexically rather than phonologically. Lexical processing now replaces phonological processing of frequently encountered words. This distinction is more pronounced for readers of a language like English which has many short words than it would be for readers of an agglutinating language which consists of longer, morphologically more complex words (Ardington *et al.*, 2021b). In other words, if one were to compare two readers who are equally proficient, one in English and the other in isiZulu, one could expect the English reader to be more reliant on lexical processing whereas phonological processing would be dominant for the isiZulu reader, due to the orthographic differences in the two language systems.

Research has determined fluent decoding to be an essential component in reading comprehension, and differences in decoding ability have been found to account for reading comprehension differences (Wolf & Katzir-Cohen, 2001; Jeon, 2012; Pretorius & Spaull, 2016). One argument for the influence of decoding skills on higher-level processes like inferencing is that decoding needs to be fluent and fully automatized before higher-level processing can occur. Reading is a resource-demanding process, and slow, effortful decoding takes too much of a cognitive toll, leaving few resources in working memory for more complex tasks such as maintaining coherence across phrases and sentences. If higher-level skills like inferencing



have to compensate for poor decoding skills, the result is likely to be over-burdened attentional resources (Stanovich, 1982: 83). In fact, several theorists argue that reading difficulties are more likely the result of lower-level processing deficiencies, not higher-level processing deficiencies (Grabe, 1991: 391; Fender, 2001: 383; Nassaji, 2003: 263). Differences in decoding fluency have been found to account for level of comprehension even at university-level (Nasaji, 2003: 271). However, the evidence suggests that the strong correlation between fluency and reading comprehension that exists during the first four years of formal schooling diminishes as learners get older (Spear-Swerling, 2006), provided that the decoding threshold has been reached. Specifically, in a large-scale longitudinal study involving 30 000 students from Grades 5 to 10, Wang, Sabatini, O'Reilly and Weeks (2019: 37) found evidence of a 'decoding threshold'; learners who read below this threshold showed little to no development in reading comprehension in the following years, leading the researchers to conclude that "nothing seems to be effectively driving reading comprehension when decoding is insufficient". At the same time, proficiency in decoding alone also does not guarantee successful comprehension. In a longitudinal study comparing the reading skills of Dutch L1 and English L2 (second language) students, Droop and Verhoeven (2003: 82) found significant differences in decoding and comprehension at preschool and grade one levels; however, when working with older primary school children, they established that once decoding fluency was established, then the influence of decoding skills on reading comprehension diminished (Droop & Verhoeven, 2003: 99). Furthermore, other studies using similar samples found the decoding gap narrowing or disappearing, while still detecting a significant difference in comprehension abilities of older L1 and L2 Dutch students. Therefore, decoding plays an important role and acts as a fundamental basis on which higher-level proficiencies are built; however, fluent decoding on its own will not necessarily guarantee comprehension, even though without it, comprehension cannot take place (Van Gelderen *et al.*, 2003: 10).

### **2.3.2 Comprehension competencies**

Comprehension competencies rely on a set of componential skills that build on, and extend beyond, decoding and oral reading fluency. Instead, these competencies focus on larger linguistic and syntactic structures as well as the ways in which these structures relate to each other. Additionally, this subset also involves the reader's oral language comprehension, vocabulary, background knowledge, meta-cognitive awareness and ability to infer information from text.

Syntactic proficiencies include assigning syntactic structure to a sentence and understanding syntactic devices such as anaphoric ties (e.g. *she, they, this*) and discourse markers (e.g. *and, but, because, then*).

In order to comprehend a text without ambiguity, a reader must integrate incoming information with that which has already been read, maintain some awareness of the boundaries and relationships between successive chunks of information, and consolidate those chunks in such a manner that the overall meaning or main idea remains intact (Koda, 2007: 7). Two aspects that typically support this endeavour are cohesive anaphoric ties that link sentences in texts in specific ways and discourse markers that signal specific relationships between units of information in text and contribute to text coherence. In this section, a reader's ability to interpret these two types of connective devices is briefly introduced as an example of a syntactic skill which forms part of reading, whereas the mechanics of anaphors and discourse markers are discussed in more detail in Section 2.6.1).

Anaphoric ties maintain local cohesion in a text by referring to an aspect mentioned elsewhere in the text (Ehrlich, Remond & Tardieu, 1999: 30). The most common anaphors are pronouns (like *he*, *she*, *they*, *it*), determiners (*this* or *that*) and synonyms which refer to previously stated nouns or noun phrases (*the culprits* referring to *the scapegoats*). In order to resolve an anaphoric tie, readers must hold the referent in their working memory (which becomes challenging if decoding is slow and resource-intensive), while using grammatical clues such as gender and number in order to establish a mental link between an antecedent and its referent (refer to Section 2.6.1.1 for a more detailed discussion of anaphors). If this operation is unsuccessful, the text loses cohesion and reading it becomes more demanding and less efficient.

Similar to anaphoric ties, connective devices such as discourse markers also maintain coherence across the boundaries of large linguistic units such as phrases, sentences and paragraphs (Koda, 2007: 8). Furthermore, these devices give the reader information about the nature of the relationship between these units and become increasingly important in complex academic texts (August, 2006: 250). For instance, discourse markers like *although* indicate contrasting or opposing ideas, while *thus* highlights a causal relationship as illustrated in the following sentences:

[1] *Although they planned on getting up early, they ended up sleeping late on Sunday.* (contrasting relationship)

[2] *She had been on vacation the previous week; thus, she needed to work over the weekend to catch up.* (causal relationship)

Yet merely having the necessary vocabulary knowledge to grasp the meaning of these terms is not sufficient for comprehension. When encountering a contrastive discourse marker such as *however*, a reader must understand what exactly is being contrasted and what the implication thereof is. Moreover, causal relationships are not always explicitly stated by means of a causal discourse marker, in which case the reader must infer the relationship; for example,

*[3] We were able to book his favourite band and make his favourite food – the surprise party was a success.*

Even when a discourse marker highlights a causal relationship, the reader must still establish and distinguish between the cause and effect. In short, syntactic skills are dependent on fluent and efficient decoding while also relying on higher-order competencies like inferencing.

The next element of comprehension, vocabulary knowledge, is a strong predictor of reading comprehension. Many studies have determined a strong correlation between vocabulary size and reading proficiency (Droop & Verhoeven, 2003: 97; Guo & Roehrig, 2011: 58). In fact, some have tried to establish the number of words in a text that must be known by readers in order for them to comprehend a text without assistance. Several studies have concluded that approximately 98% of the words in a text must be known in order for a reader to attain workable comprehension (understanding roughly 60% of a text) (Carver, 1994; Nation, 2006; Schmitt, Jiang & Grabe, 2011). At the same time, Nagy, Herman and Anderson (1985: 234) state that a significant portion of one's vocabulary is developed "incidentally" by encountering new words while reading, and extensive reading is often presented as a potential remedy to limited vocabulary knowledge (Pigada & Schmitt, 2006). In fact, the relationship between vocabulary and reading comprehension is most likely reciprocal: sufficient vocabulary knowledge is a key component of reading comprehension, while extensive reading promotes vocabulary growth (Verhoeven & Leeuwe, 2008: 408). The role played by vocabulary in the process of generating inferences will be expanded on in Section 2.6.4.3.

Proficient readers also make use of their own prior knowledge as they read and, if sufficiently engaged, employ metacognitive strategies in order to monitor their own comprehension. Much like the vocabulary thresholds discussed in Section 2.6.4.3, readers need some prior knowledge on the subject matter or related concepts dealt with in the text in order to fully comprehend what they are reading (Al-Issa, 2006:

42). At the same time, reading comprehension is not simply a function of background knowledge, but also enables growth in background knowledge, especially when the reader is skilled and actively engaged. An active reader draws on his or her prior knowledge when engaging with the text, almost as if in a dialogue, in order to fill in gaps, infer and integrate information, perceive author stance, draw conclusions, and make predictions. In the process, new knowledge on a topic can be built up, which is the basis of 'reading to learn'.

Throughout this interactive process, proficient readers might also rely on metacognitive awareness to further guide the reading process, if they have the cognitive capacity to spare. According to Taylor, Stevens and Asher (2006: 216), "cognitive strategies are simply those used to interact with [the text], and metacognitive strategies are those used to manage how interaction with ... the text takes place." In short, metacognitive awareness helps detect errors or contradictions in comprehension, informs efforts to repair comprehension and manages reading strategies (Jeon & Yamashita, 2014: 171). Without metacognitive awareness, a reader might approach vastly different texts like blog posts and academic articles in a similar fashion and would continue reading, without any change in tactic, even after comprehension has broken down.

To summarise, while it is advantageous from an analytical perspective to break down the complex process of reading into individual components in order to better understand them these components all feed into one another, working together in an extremely intricate and nuanced cognitive process of which we can merely observe the products, not the process itself. According to Rumelhart's (1977) interactive model of reading, bottom-up decoding processes and top-down comprehension strategies cooperate during the reading process in order to establish the most likely interpretation. Wurr (2003: 158) and Grabe and Stoller, (2013) describe reading as an active, interactive process that strategically incorporates several lower-level and higher-level proficiencies in order to construct meaning. The ways in which this process is used to construct meaning is discussed in more detail in Section 2.3.

A noteworthy consequence of the interconnectivity of all the components that make up the reading process is the tendency of one component skill to make up for a lack in another (Van Gelderen *et al.*, 2003: 9), provided that the relevant decoding threshold has been reached. For instance, when faced with a text containing a large percentage of unknown words and phrases, other component skills like morphological awareness, prior knowledge and inferencing can aid in filling the comprehension gap caused by

shortcomings in vocabulary. Likewise, some research suggests that vocabulary knowledge could compensate for limitations in background knowledge and other higher-level processes as proficient readers can use reading as a tool to gain new knowledge (Perfetti, 1998; Proctor, August, Carlo & Snow, 2006: 167). This compensatory phenomenon is encouraging as it suggests that improvements in any of the componential skills of reading have the potential to improve reading comprehension as a whole, provided that the student is reading above the decoding threshold. In fact, academic reading, which rarely presents readers with as high an incidence of familiar words as prescribed by Carver (1994) and Nation (2006) (see Section 2.6.4.5), very much depends on advanced readers' ability to amend background knowledge and vocabulary shortcomings with higher-level skills like inferencing.

## 2.4 Reading in a second language

Reading in a second language (L2) constitutes an intricate collection of the same interacting cognitive processes as in L1 reading; moreover, it is further complicated by additional variables unique to L2 reading. For instance, L2 readers are potentially advantaged in their ability to compare two languages, resulting in a greater metalinguistic awareness, especially if the reading languages share a similar alphabetic writing system (as do English and African languages); on the other hand, this ability is less likely to be present if one language is logographic, like Chinese Mandarin, and the other alphabetic, like German (Proctor *et al.*, 2006: 159). At the same time, the phonological, graphemic and semantic and morphosyntactic networks of L2 readers will likely be weaker than their L1 counterparts (Droop & Verhoeven, 2003: 81). Moreover, if the second language is culturally distant from the first, concepts of vocabulary, tone, idioms and background knowledge will often also pose a challenge to L2 readers (Al-Issa, 2006: 42-44). Its dual-language nature also means that L2 reading involves frequent, complex interactions between the reader's L1 and L2 knowledge. Other noteworthy variables include the linguistic distance between the L1 and L2, the social status of the L2 relative to the L1, and the individual reader's perspective of the L2 relative to the L2 (Proctor *et al.*, 2006: 159). With such complexity and variability, it is hardly a surprise that we have limited empirical models of L2 reading, especially for adult reading and advanced L2 reading (August, 2006: 245).

One ubiquitous point of contention in L2 reading theory is whether reader differences and reading difficulties are the result of L2 language challenges and/or reading issues in general or both. Ideally, in order to address shortcomings in a student's L2 reading, an instructor would first need to determine whether the shortcoming originated due to difficulties experienced with the L2 language or whether it is

the result of poor reading ability in general, in which case the student might experience similar difficulties when reading in his or her HL. Following this concern, reading theorists have also set out to determine how much of a reader's L2 reading ability is constructed anew along with other L2 language competencies and how much is transferred from his or her HL proficiencies (Guo & Roehrig, 2011: 43). Accordingly, two models of L2 proficiency developed by Cummins (1979) inform this investigation: the Developmental Interdependence Hypothesis and the Linguistic Threshold Hypothesis.

#### **2.4.1 The Developmental Interdependence Hypothesis**

The application of one type of knowledge to a different domain is known as “transfer”. Within the context of L2 reading, transfer typically occurs through the process of acquiring L2 reading skills by drawing on HL linguistic and literacy competencies, or the process through which previously mastered HL language and literacy skills and knowledge influence newly acquired skills and knowledge in an L2 (August, 2006: 251; Koda, 2007: 17). Although our understanding of the exact nature of the transfer process is limited (August, 2006: 251), transfer from L1 to L2 is generally assumed to be automatic and non-volitional, provided that the relevant HL competencies are sufficiently automatized (Koda, 2007: 17). The phenomenon of cross-linguistic transfer was first formally theorised by Cummins's (1979: 233) Developmental Interdependence Hypothesis (DIT), which states that “the level of L2 competence which a bilingual [learner] attains is partially a function of the type of competence the [learner] has developed in L1” In other words, shortcoming in L2 reading is largely due to shortcomings in L1 reading; therefore, the less-efficient L2 reader will experience a reading issue and will display similar weaknesses in L1 and L2 reading.

There is evidence of L1 skills influencing L2 skills, even when there is a significant linguistic distance between the two languages. For instance, a cognitive neuroscience study by Tan, Spinks, Feng, Siok, Perfetti, Xiong, Fox and Gao (2003) used fMRI scanning to establish that Chinese L1, English L2 readers displayed virtually identical brain activity when reading Chinese texts and English texts. In contrast, monolingual English participants displayed brain activity that was noticeably different from the bilingual readers when reading. In other words, the bilingual participants might be using similar strategies when reading English L1 as they did when reading Chinese L2, and these strategies appear to differ from those used by monolingual English readers (Tan *et al.*, 2003: 158). Another study conducted by Shu and Anderson (1999, quoted in Koda, 2003: 21) found that adult L2 readers of Japanese and Chinese will, after mastering roughly three hundred characters, display comparable metalinguistic sensitivity during reading as Chinese L1 children who have mastered six times as many characters. In other words, the adult English

L2 learners were able to draw on their superior HL knowledge to make connections and inferences, even though their L2 knowledge was still very limited, once they had reached a certain threshold of character knowledge, after which their existing reading strategies could be applied (cf. Section 2.4.2).

However, inter-linguistic transfer is a complex process which is influenced by various factors and is therefore quite difficult to predict. It is also worth noting that the context within which Cummins's L2 development processes were theorised (improving the educational success of bilingual minority students in primary schools in developed countries) has little in common with the higher education context in South Africa, a multilingual, developing country with a weak education system, unequal access to language and print-based resources (Coetzee-Van Rooy, 2010: 25-26). Comparisons between the South African context and the context within which Cummins theorised are further complicated by the dearth of data available on HL performance in indigenous South African languages at secondary and tertiary level, where roughly 75% of the population has an indigenous South African language as an HL (Pretorius & Mampuru, 2008: 46; Coetzee-Van Rooy, 2010: 28; Lehohla, 2012: 24). Yet despite these disparities, there is some evidence in support of the DIT in the South African higher education context (Coetzee-Van Rooy, 2010: 30) and strong evidence at school level (Pretorius & Mampuru, 2007; Pretorius & Currin, 2010; Wilsenach 2016, 2019).

Another of Cummins's (1984) constructs, the distinction between "basic interpersonal communication skills" (BICS) and "cognitive academic language proficiency" (CALP), helps to distinguish between those HL proficiencies that do transfer and those that do not. BICS describes communicative language proficiency in everyday, primarily oral, social contexts, while CALP describes proficient use of language in formal and academic contexts that emphasize learning and new knowledge (Royer & Carlo, 1991: 450; Pretorius, 2015: 52). These are not absolute terms, and what constitutes BICS or CALP in one scenario will likely differ from another (Cummins, 2001: 43). However, the theorising of these two constructs does assist reading researchers to analyse different levels of language proficiency as well as the ways in which these proficiencies influence L2 language acquisition. For instance, Royer and Carlo's (1991: 454-455) study (which tested the transfer of listening and reading skills in a cohort of English L2, Spanish HL sixth grade students) found support for Cummings's (1983) theory that the more basic, often oral, competencies that make up BICS would not readily transfer to an L2, while the academic literacies that constitute CALP do transfer. These results have implications for bilingual education and policies regarding the language of teaching and learning, as will be discussed below.

### 2.4.2 The Linguistic Threshold Hypothesis

The Linguistic Threshold Hypothesis (LTH) expands on the DIH by theorising the role played by L2 competencies. According to the LTH, higher-level comprehension strategies that have been mastered in the L1 will only transfer to the L2 once a certain minimum threshold of L2 linguistic knowledge has been obtained. Various studies have found some evidence to support this theory (Laufer & Sim, 1985; August, 2006; Droop & Verhoeven, 2003; Van Gelderen *et al.*, 2003; Proctor *et al.*, 2006; Koda, 2007; Guo & Roehrig, 2011; Jeon & Yamashita, 2014).

Vocabulary can be used as an index of language proficiency. When oral reading fluency (ORF) is controlled, L2 vocabulary knowledge has been identified as one of the strongest predictors of L2 reading comprehension in most of the above-mentioned studies, with Guo and Roehrig (2011: 44) indicating that competent readers require both adequate size or breadth (number of words known) and depth (knowledge such as register, collocation and phraseology) in their L2 vocabulary. Vocabulary is an even stronger predictor of reading comprehension in the case of L2 reading than in L1 reading (Droop & Verhoeven, 2003: 81; Koda, 2007: 23). Novice L2 readers are much more likely to deplete their attentional resources on lower-level processes such as decoding than HL readers or advanced L2 readers are. Consequently, unlike HL readers and advanced L2 readers who can harness higher-level processes like inferring meaning from context, novice L2 readers will most likely either know a word or not – shortcomings in their vocabulary cannot yet be compensated for by resource-demanding inferencing skills.

Vocabulary is surely one of the most significant factors in language competency in general, but constructing its relationship with reading comprehension as unidirectional is problematic. Rather, reading comprehension (in any language) has a reciprocal causative relationship with vocabulary (Stanovich, 2009: 35; Jeon & Yamashita, 2014: 191); in other words, this is a bidirectional relationship in which either factor could be cause or effect. Therefore, when limited vocabulary knowledge correlates with poor reading comprehension, the problem is caused just as much by inefficient use of higher-level comprehension strategies, like inferencing, as it is caused by vocabulary shortcomings. If basic decoding skills are in place, then having a larger vocabulary improves reading comprehension, just as inferring meaning from context while reading improves vocabulary.



Apart from L2 vocabulary, L2 grammatical knowledge tends to be the second strongest predictor of L2 reading comprehension (assuming that the relevant decoding threshold has been reached). Studies by Droop and Verhoeven (2003: 81), Laufer and Sim (2006: 405), Guo and Roehrig (2011: 46), and Jeon and Yamashita (2014: 188) established that certain aspects of grammatical knowledge will compromise L2 reading comprehension if insufficiently developed. Specifically, August (2002: 251) and Laufer and Sim (2006: 405) mention the significance of knowledge of anaphoric devices and discourse markers, respectively, when it comes to L2 reading. Moreover, August (2002: 251) notes the importance of syntactic knowledge when reading academic texts in an L2.

Several of the authors who found that syntactic knowledge functioned as a significant predictor of L2 reading interpreted this result as support for the linguistic threshold theory, concluding that less efficient L2 readers were struggling because of limited L2 language skills, not a lack of reading proficiency. However, some of these syntactic competencies depend on higher-level processes. Successful use and understanding of both discourse markers and anaphors rely heavily on readers' inferencing skills. Here, as with vocabulary, strong syntactic competencies reduce the need for higher-level comprehension strategies, just as sufficiently developed comprehension strategies like inferencing can compensate for shortcomings in syntactic knowledge.

### **2.4.3 Implications of HL shortcomings**

Although the DIH and the LTH hypotheses provide a valuable theoretical basis that informs L2 reading, there are still issues that remain unaddressed. For instance, the DIH has not been able to explain exactly how transfer takes place, which means it has little to offer instructors eager to facilitate the process (August, 2006: 251). Moreover, while the LTH expands on the DIH by theorising the role played by L2 language knowledge, there is little to no empirical evidence that determines where exactly the threshold lies (August, 2006: 248; Coetzee-Van Rooy, 2010: 26). One limitation of both the DIH and LTH that has a significant impact on the South African context is the issue of poor HL reading proficiency. The general conception of an L2 reader in the research is someone who has already obtained "HL strategic behaviours [that] undergird those in the L2" (Taylor, Stevens & Asher, 2006: 219). Unfortunately, this assumption is not always true.

Most L2 reading theories, the DHI and LTH included, describe a theoretical context in which a learner's HL language and reading proficiencies continue to be stronger than his or her L2, or at least assumes that HL

proficiencies are relatively strong. Even if a hypothetical linguistic threshold is reached in the L2, it is possible that a learner has limited transfer-appropriate HL knowledge, especially if his or her HL knowledge consists mostly of HL BICS capabilities and poorly developed HL reading. Following established theories of transfer, the logical solution to such a scenario would be to improve the learner's HL proficiencies to the point of fluent, transferable CALP before introducing an L2, but this would be impossible in formal educational settings comprising multilingual classes. Based on the fact that the PIRLS results from tests written in indigenous South African languages as a LoLT (that is to say, those most likely written in the learners' HL) were particularly poor (refer to Section 1.2.1), it is reasonable to assume that weak HL reading skills constitute a significant contributing factor to issues with L2 literacy in South Africa. Studies like Pretorius and Mampuru's (2007) which tested the HL North Sotho and L2 proficiency and reading of Grade 7 students in a high-poverty school give some much-needed insight. They found that L2 reading was a stronger predictor of HL reading than HL language proficiency, to some extent confirming, but also complicating, the DIH by suggesting that the transfer of reading skills is bidirectional in scenarios where the L2 is the dominant language, rather than occurring exclusively from the HL to the L2 (Pretorius & Mampuru, 2007: 55). More recent research on bilingual readers in South Africa indicate robust correlations between reading skills in the L1 and L2; in other words, weak readers in one language tend to also be weak in the other (Pretorius & Currin, 2010; Wilsenach 2016, 2019; Kotze & Schaefer 2019).

In fact, the phenomenon of weak HL oral and reading proficiencies inhibiting L2 academic development is not unique to South Africa, and this phenomenon is strongly influenced by socioeconomic factors. As migration increases globally (United Nations, 2017: 1), HL language classes are becoming progressively more diverse, necessitating a move away from established theoretical frameworks that assume ample HL proficiency. A small study by Jiang and Kuehn (2001) which looked at the academic progress of immigrant learners in the United States found that those who immigrated when they were older tended to perform better than students who moved to the United States at a young age. They concluded that the discrepancy was due to the younger students having less CALP proficiencies in their HL by the time they started school in English (Jiang & Kuehn, 2001:665).

Similarly, van Gelderen *et al.* (2003) found that Moroccan and Turkish HL minority students in a Dutch school performed poorly in English reading compared to their Dutch peers. Neither the Dutch nor the Turkish and Moroccan students came from English L1 homes, leading the researchers to conclude that all the students should have started English lessons on relatively equal footing. Nevertheless, the study

revealed that the Moroccan and Turkish students used the same limiting word-level strategies when reading English as when they read Dutch texts (van Gelderen *et al.*, 2003: 23). The researchers concluded that a possible cause of the discrepancy was the fact that the minority students acquired CALP proficiencies in their L2, Dutch, not their respective L1s. This may have resulted in them having shakier literacy foundations than those acquired by their L1 Dutch peers as a result of the Moroccan and Turkish students' poorer socioeconomic status. This tentative conclusion is somewhat supported by a study with students from the same population which found that English L3 readers are more inclined to use language oriented (as opposed to content oriented) strategies when reading than their L2, Dutch HL peers (Stevenson, Schoonen & De Glopper, 2003). The English L3 (third language) students' tendency of approaching language problems at the word level suggests poorer literacy in general, which could compromise reading comprehension in all subsequent languages; however, more research into the reading and literacy proficiencies of students with weak HL literacy is needed. Other Dutch researchers have attributed similar outcomes experienced by a different group of Moroccan and Turkish students to poor socioeconomic status resulting in limited HL literacy exposure at home and, consequently, very little CALP in their HL (Droop & Verhoeven, 2003: 82).

In comparison to countries like the Netherlands and the United States, the situation in South Africa is further complicated by factors such as limited quality of schooling and print-based resources, (refer to Section 1.2.2), which makes effective interventions more challenging than in high-income countries where quality schooling and availability of resources are more evenly spread through the education system. It is worth mentioning that there are far fewer books for children in South African home languages with which to hone early reading skills, a situation which disadvantages children learning to read in an African language. Although the current policy for language of instruction in South African schools recommends HL instruction for the first three years of primary school before switching to (most commonly) English in Grade 4, many students start their formal education by receiving instruction in a second language, mostly English (Taylor & von Fintel, 2016: 3). On the other hand, those schools that do start with HL instruction (at least 75% of primary schools) tend to be poorer schools, with fewer resources, and teachers who, on average, have fewer qualifications and less effective training (Taylor & Coetzee, 2013). In fact, the PIRLS 2016 results show that learners who completed the test in English L2 (which tends to occur in Quintile 4 or 5 schools) did better than those who did it in their South African indigenous HL – as would have mostly happened in Quintile 1-3 schools (Howie *et al.*, 2017: 58). These language and socioeconomic factors

combined suggest that many South African learners start their formal education with a less-than-ideal HL foundation.

In response to the limitations of the DIH and the LTH, August (2002: 257-258) proposes two models of L2 reading, distinguishing between “traditional” and “non-traditional” adult L2 readers. According to August (2006: 258), traditional adult English L2 readers (or ESL readers) possess ample HL language and reading skills, which means that, once they reach the L2 language threshold (or ESLR threshold), HL competencies will transfer to the L2. However, non-traditional adult L2 readers do not possess sufficient HL reading or academic literacy for transfer to take place (August, 2006: 258). This means that academic literacy competencies, as well as fluency, would have to be developed more rigorously as part of non-traditional readers’ L2 learning, which will benefit from explicit reading strategies instruction (Taylor, Stevens & Asher, 2006: 234). Whether due to lack of access to quality education, limiting home environments or resource-poor schools, many South African students, particularly those who access university education through extended curriculum programmes, are non-traditional L2 readers. Therefore, it is imperative that they receive intensive and explicit reading instruction (refer to Section 2.7.2) which is sufficiently informed by the evidence from the science of reading as well as the issues and limitations of the South African educational environment.

## 2.5 Reading comprehension

Comprehension is, according to Pretorius and Lephala (2011: 3), “what reading is all about”. When considering reading comprehension through a cognitive-linguistic construction-integration lens, it can be defined as “the process of simultaneously extracting and constructing meaning through interaction and involvement with written language” (Pearson & Cervetti, 2015: 12). Specifically, comprehension involves the integrating of information from two sources, namely the text that is being read and the reader’s prior knowledge, in order to form a coherent representation of the text which is encoded into memory and continuously updated as new information is processed (McKoon & Ratcliff, 1992: 440; Barnes, Dennis & Haefele-Kalvaitis, 1996: 217; Van den Broek, Tzeng, Risdien, Trabasso & Basche, 2001: 521; Barth *et al.*, 2015: 253). This representation, known as a mental model, develops from the text-based representation; however, it consists of more than just the meaning of individual words and sentences and should also encompass the relationship between ideas in the text as well as implicit information inferred from ‘reading between the lines’ (Pretorius & Lephala, 2011: 4). If readers succeed in comprehending a text, they should be able to paraphrase or summarise information from it, determine whether the information

contradicts or augments their prior knowledge and update their mental model if needed (Graesser, Singer & Trabasso, 1994: 374). In contrast, if comprehension fails, the reader's mental model will remain superficial and simplistic, often without his or her awareness (Graesser, *et al.*, 1994: 374). If this lack of awareness continues, issues with comprehension can remain undiagnosed, to the detriment of studies in any field.

Although some have argued that comprehension is too broad and complex an entity to be accounted for by means of a single, precise cognitive model (Castles, Rastle & Nation, 2018: 28), a theoretical model of reading comprehension (however broad) can be beneficial in that it contributes certain testable propositions and implications for the reading process (Perfetti & Stafura, 2014: 23). This study's conception of the reading comprehension process is based on Kintsch's Construction-Integration model (C-I model) of comprehension, one of the dominant theories of comprehension in both reading pedagogy and cognitive psychology (Pearson & Cervetti, 2015: 10). In contrast to reading theories from the first half of the 20th century that emphasised the influence of the text (like behaviourism) or those from the 1970s and 80s that focused on the role of the reader (like reader-response theories), the C-I model provides a more balanced approach, giving relatively equal weight to both reader- and text-based factors (Pearson & Cervetti, 2015: 10). Thus, Kintsch's model is an integrated model of reading comprehension in that it conceives of comprehension as being simultaneously a bottom-up (word- and text-based) and top-down (knowledge-driven) process. While the process is understood as being uniform, dividing it into three processing levels is advantageous for the purpose of analysis. According to Kintsch (1998), reading comprehension can be conceived of as consisting of the following three components:

1. *The surface form* consists of the basic understanding of the text's words and syntax. A reader would be unable to access the text at this most basic level if reading in a language that he or she does not understand.
2. *The textbase* is comprised of those propositions and relationships explicitly derived from the text. In other words, it relates to literal information and local connections formed within sentences and across adjacent sentences. Constructing the textbase is an obligatory bottom-up process but which, if left at that, would result in an impoverished mental model that is unlikely to be integrated into long-term memory; however, it is necessary to comprehend the text at this level in order to build a situation model.
3. In order to achieve meaningful understanding, a reader must generate the third level of the C-I model, called *the situation model*. This is the stage where the lower-level, word-based constructs are integrated into a coherent model through a constraint-satisfaction process. As the textbase is formed, a network of associated elements (retrieved from background knowledge, prior

experiences, goals and responses to the text) is established. Since the activation of these associated elements is an automatic process, the nascent network contains both relevant and irrelevant items. Thus, the model starts off chaotically but, through a constraint-satisfaction process informed by continuously upcoming information in the text, those activated elements that are not reinforced by propositions from the textbase are deactivated. In other words, incorrect assumptions are discarded as more information becomes available, thus enabling the reader to continually update his or her situation model during the reading process.

As it reaches consciousness, the mental model becomes stable and orderly. Inferencing plays an essential role in this process by filling in the gaps of implicit information as well as establishing connections between ideas so that the relevant elements are meaningfully related to one another while also continuously being updated throughout the reading process (Kintsch, 1998: 4). Thus, by his or her active involvement, through inference generation and drawing from past knowledge and experience, the reader is able to integrate the situation model with prior knowledge, shifting it from working memory to long-term memory and enabling learning from the text.

The abovementioned process provides a theoretical model of what happens when the comprehension process is successful and more or less seamless, with adequate decoding skills and fluency already in place (refer to Figure 3.8) for a practical example of this process, in the form of mental modelling). However, when comprehension breaks down, conscious and strategic problem-solving strategies can be deployed during the integration of the textbase with the situation model – provided the reader is aware that comprehension is breaking down. Individual readers vary significantly in their ability to recognise the need for such strategies and their ability to consciously harness them (Pearson & Cervetti, 2015: 11). This type of metacognitive awareness along with having access to a repertoire of appropriate strategies are factors that distinguish between better- and poorer performing readers when controlling for background knowledge. Since these skills can be taught successfully to readers at various levels, this study attempts to increase students' awareness of strategic reading strategies and as well as their ability to use them.

## **2.6 Inferencing**

Inferencing is often described as 'reading between the lines' to access information that is implicit (McKoon & Ratcliff, 1992: 440; McMackin & Lawrence, 2001: 119; Kispal, 2008: 6). Many of the processes engaged in while reading can be described as inferential; inferencing includes resolving anaphoric ties (comprised of syntactical and lexical devices that refer back to previous information in a text), linking semantic ideas

in a text, understanding the main idea of a text, understanding the effect of vocabulary choice and many other processes (Hansen & Hubbard, 1984: 587; Cain & Oakhill, 1999: 329; Kispal, 2008: 6). Section 2.6.1 discusses anaphoric and text-semantic inferences, two types of inferences that are essential to academic reading, in more detail. Most texts require the reader's understanding to extend beyond the literal meaning encoded in explicitly stated information, and "almost any reading activity that goes beyond literal understanding involves some degree of inferencing" (Kispal, 2008: 6). Therefore, the ability to generate inferences is essential for the reading process in general (Richards & Anderson, 2003: 290).

An inference is generated when the reader uses, minimally, two pieces of information to extrapolate a third piece of information that is implicit (Kispal, 2008: 2). For example, if a text describes a character as 'pedalling' and 'gripping the handle bars', the reader should infer that the character in question is likely cycling. As is the case with reading comprehension in general, the sources of information used to generate the inference could be information from the text that has already been read as well as the reader's prior knowledge (McMackin & Lawrence, 2001: 119; McGee & Johnson, 2003: 50). Although some inferences are complex and require strategic and analytical processing of information, many inferences are made spontaneously by competent readers (McKoon & Ratcliff, 1992: 441). In fact, several studies have shown that even preschool children are capable of generating inferences (Oakhill & Cain, 2012: 116); however, younger readers and less skilled readers across all ages tend to draw fewer inferences while reading (Cain & Oakhill, 1999: 489).

### 2.6.1 Types of inferences

Even though the body of research that deals with the different types of inferences made by readers is extensive, there is limited consensus on the different categories and names of inferences. Firstly, it is necessary to distinguish between those inferences generated 'online' and those generated 'offline': online inferences are generated automatically during reading, while offline inferences only occur afterwards, for example, if prompted by a question (Graesser *et al.*, 1994). Whether generated online or offline, inferences can further be classified into elaborative inferences versus coherence (also known as connective) inferences; other categories include text-connecting (also known as text-to-text or in-the-text) versus knowledge-based (also known as extra-textual or background-to-text or in-my-head) (McKoon & Ratcliff, 1992; Graesser *et al.*, 1994; Raphael, Highfield & Au 2006; Kispal, 2008; Hara & Tappe, 2016). Refer to Table 2.1 for examples of some of these types of inferences. Elaborative inferences, on the one hand, expand on the information provided in a text through embellishment in order to create a

more elaborative mental model, which is more likely to be encoded in long-term memory (Barnes *et al.*, 1996: 219) (example provided in Table 2.1 below). Coherence inferences, on the other hand, maintain semantic relations between single units (sentences or propositions) of a text. A further distinction can be made between local coherence influences and global coherence inferences. Local coherence is maintained when propositions that are within close proximity to each other are connected logically (within sentences or across adjacent sentences), whereas global coherence connects larger chunks of text (within or across paragraphs) (Graesser, McNamara & Louwerse, 2003: 14). Coherence inferences are necessary to maintain cohesion between different parts of the text and, therefore, are more likely to occur online than elaborative inferences (Calvo, 2005: 53-54).

While elaborative inferences can certainly play a beneficial role in constructing a richer and more memorable situation model of an expository text, it is in the drawing of coherence inferences that comprehension either succeeds or breaks down. It is therefore necessary to clearly define ‘coherence’ in a text before considering the linguistic features that support it. A text is coherent if there is “referential continuity, topic continuity or argument overlap between entities in the text” (Pretorius, 2006: 433); in other words, when “the ideas hang together in a meaningful and organised manner” (Graesser *et al.*, 2003: 3). This is not exclusively a feature of the textbase; the reader must often rely on background knowledge (such as in the knowledge-based inference in Table 2.1) to augment unity and coherence in text and connect incoming information with previously mentioned information (such as in the local coherence inference described in the Table 2.1). Conversely, if coherence breaks down, gaps form in the reader’s situation model. Two elements that bridge such gaps by initiating an inference are anaphors and text-semantic relationships (Graesser *et al.*, 1994: 373); these elements, and the inferences that enable them, are discussed in the following sections.

#### 2.6.1.1 Anaphoric inferences

Anaphoric inferences are a type of text-connecting repeated reference inference that occurs in virtually all texts. An anaphoric tie exists between a word or phrase (called the anaphor) which refers back to previously mentioned information (called the referent). There are different kinds of anaphoric inferences; Table 2.2 provides examples



Table 2.1: Types of inferences

Type of inference	Example/description	Notes
<b>Online</b>	An inference that is made while reading is referred to as an inference that is made online.	
<b>Offline</b>	An inference that is only made after the reader has stopped reading, for example an inference prompted by questioning or reflection, is said to be made offline.	
<b>Coherence (also referred to as 'text-connecting' inferences)</b>	Anaphoric inference <i>The store sold canned goods, cleaning materials and stationery at discounted rates. <u>These products</u> could be bought in bulk and have a long shelf-life.</i>	In this anaphoric inference the reader must connect two pieces of information in the text: <i>canned goods, cleaning materials and stationery</i> with <i>These products</i> in order to maintain cohesion between the sentences. Such inferences are applicable to pieces of information that are no further apart than one or two sentences and are therefore still available in the reader's short-term memory.
	Text semantic inference <i>The increasing popularity of online shopping has made it very easy for market researchers to access more reliable data on shoppers' preferences, <u>yet</u> survey-based research is as prevalent as ever.</i>	In this sentence, the reader is required to recognise the contrastive relationship between the propositions (as indicated by the discourse marker <i>yet</i> ), thus drawing a text-semantic inference.
<b>Elaborative</b>	Visualising a setting, inferring motives or constructing a character's personality based on what he or she does and says are examples of elaborative inferences.	Elaborative inferences strengthen long-term memory representations of concepts encountered in the text.
<b>Global coherence</b>	Inferring the main idea or topic of a text requires the generation of global inferences that extend across several sentences, or even across paragraphs. For example, after reading the story of <i>Little Red Riding Hood</i> , one could infer that the 'big idea' in the story is that people are not always who they appear to be.	
<b>Knowledge-based</b>	<i>He decided to buy two six packs this month, since there was a special. <u>The bottles</u> rattled in the trolley as he walked to the check-out.</i>	Here the reader must infer that the 'six-packs' contain a bottled beverage like beer. He or she will need to rely on prior knowledge about the packaging of such beverages. The inference is local because it occurs across two adjacent sentences

Table 2.2: Examples of anaphors with anaphors underlined and referents highlighted

Type	Example
Pronoun	That lady sells the best books, and <u>she</u> has the most reasonable prices.
Determiner	He decided to put in leave and go on holiday a week before exams, even though he knew that <u>that</u> was a bad idea.
Synonym	There are various instruments that can be used to assess reading speed and accuracy. <u>These measures</u> vary from high-tech computer programs to simple reading aloud exercises.
Paraphrase	It transpired that these viewers had scanned the television listings in such a way that <u>they had not registered the new program at all</u> . When using <u>this type of reflexive mental processing</u> , the unconscious mind can process established program titles very quickly.
Repetition	Shelley once assigned poets the honour of being 'the unacknowledged legislators of <u>mankind</u> '. Today <u>that honour</u> belongs to management theorists.

When drawing an anaphoric inference, the reader has to identify the correct referent in order to successfully integrate incoming information with information that has already been stated (Pretorius, 2005: 522). Pronouns, synonyms and determiners are all examples of anaphors, as are paraphrased text and repeated words or phrases in some instances (Pretorius, 2000). In most cases, anaphoric inferences are cohesive inferences, maintaining word-level coherence, although at times they stretch across several clauses and, consequently, aid in global coherence. For example, consider the following paragraph:

[4] It is my belief that by better understanding our own behaviour as consumers we actually gain more control, not less of it. Because the more we know about why we fall prey to the tricks and tactics of advertisers, the better we can defend ourselves against them. And the more companies know about our subconscious needs and desires, the more useful, meaningful products they will bring to the market.

(Adapted from Lindstrom, 2008: 5).

The underlined anaphors – *it*, *them* and *they* – are all pronouns. A reader would have to infer that these pronouns refer to the highlighted referents, *control*, *the tricks and tactics of advertisers* and *companies*, in order to comprehend this paragraph.

If this process is unsuccessful, comprehension can break down; even if it is slow and effortful, the reading process can also be temporarily compromised. For instance, Cook (2014: 1180) conducted a range of experiments that compared American undergraduate readers' (n=60) processing speed of skilled readers when encountering anaphoric ties of different levels of difficulty. The results suggest that when readers are temporarily tripped up by a confusing anaphoric tie, they also take longer to process unrelated information in subsequent sentences, suggesting that even a minor, temporary breakdown in comprehension at the level of the text-base can have a ripple effect which negatively impacts the rest of the reading process. Moreover, the impact of proficiency in resolving anaphoric ties appears to be larger for less-proficient readers than for more proficient readers when controlling for related competencies like background knowledge and decoding (García, Bustos & Sánchez, 2015: 421), perhaps because more proficient readers are more likely to recognise a breakdown in comprehension and employ conscious repair strategies to address it. A study that compared the reading speed, accuracy and comprehension repair strategies of third-grade readers (n=46) in their HL French found noteworthy differences in the performance of less-skilled readers compared to more skilled readers (Ehrlich *et al.*, 1999: 54). When faced with anaphoric inconsistencies, more skilled readers responded by reading significantly more slowly, using observable repair strategies (like look-backs) and ultimately maintaining higher levels of comprehension compared to their peers. The less-skilled readers also read more slowly when encountering inconsistencies but the difference in reading speed was not significant and it was also not accompanied by sufficient repair strategies which ultimately resulted in lower levels of comprehension. Researchers concluded that while less-skilled readers were somewhat sensitive to anaphoric inconsistencies (based on the adjustment in reading speed), this sensitivity remained below the level of conscious awareness and thus did not elicit the necessary repair strategies (based on the reduction in their comprehension). In other words, the less-skilled readers appear to either be unaware that inaccuracies at this level negatively impact their comprehension, or they do not know which strategies to use in order to address this issue.

### 2.6.1.2 Text semantic inferences

In addition to being able to infer the referents of anaphors in a text, readers must also be aware of the logical relationships between different idea units in the text that are usually signalled by discourse markers such as conjunctives in order to construct a coherent text representation. In their seminal work, Halliday and Hansan (1976) identified four types of conjunctive relationships that exist between two propositions (an X statement and a Y statement) in a text, namely additive, temporal, causal and contrastive. These propositions are expressed in clauses or sentences. When discussing logical coherence in a text, it is necessary to distinguish between text-semantic relationships and discourse markers. *Text-semantic relationships* refer to the connections and associations that exist between propositions in a text; they can be implied or more overtly signalled by linguistic features such as *discourse markers* which then act as signposts for the inherent text-semantic relationships, thus increasing coherence. Halliday and Hansan identify four types of relationships, as shown in Table 2.3 below.

Table 2.3: Types of text-semantic markers

Type	Examples of discourse markers
Additive	and; moreover; furthermore; in addition; as well as
Temporal	then; firstly; secondly; finally; until, before, after, during
Causal	because; therefore; thus; since; due to
Contrastive	but; yet; even though; however, although

This study focuses only on the two most difficult relationships, casual and contrastive, as these are more likely to pose a problem for tertiary level students than additive and temporal relationships. Refer to Section 4.5.4 for a brief discussion of the difference between less-capable and more-capable readers' response to text-semantic inferences.

### 2.6.1.3 Causal relationships

Causal relations are one of the most common types of relationships, and play a significant role in maintaining coherence. These relationships occur when a cause (X) and an effect (Y) are stated or implied in separate clauses or sentences. In real life, the cause occurs first, but the effect could be mentioned first in text, which makes it essential for the reader to be able to distinguish between cause and effect. The relation between X and Y is often indicated by discourse markers such as *because*, *since*, *therefore* and various others, although the relationship could also be implicitly indicated without the use of any such markers (compare Examples 5 and 6), in which case readers are required to infer text-semantic

relationships by harnessing their background knowledge and any other relevant textual evidence (Graesser *et al.*, 2003: 19).

[5] *Neo went home because he was feeling sick.*

[6] *Neo went home. He was feeling sick.*

An experimental study conducted by Degand and Sanders (2002) using French and Dutch HL undergraduate students found that the presence of causal discourse markers in an English text improved participants' performance on comprehension and recall questions. This improvement was reported not only for sections of the text that dealt with these causal relationships but other sections of the text as well. They concluded that these relational markers facilitate in the construction of a coherent mental model of the text as a whole which promotes local as well as global coherence (Degand & Sanders, 2002: 751).

Consider, for example, the following text:

Example 4: Market research emerged during the media and advertising boom of the 1950s, when an understandable desire to know who was listening to or watching a particular program evolved into a desire to know what those people thought. "This seems useful," these new market researchers thought, "if we just ask them, people to tell us what they want, what they like and what they think. All we have to do then is do whatever they say." Either by asking a few hundred people to complete a questionnaire or taking a far smaller number and really grilling them, the theory goes that useful, dependable insights can be garnered this way. You can see how stressed executives would be grateful to hear that corporate decision-making was about to get a whole lot easier.

(Adapted from Graves, 2010: 1)

In the first sentence of this paragraph, a reason is provided for the emergence of market research. If one were to isolate the relevant propositions, they could be presented as follows:

X: product suppliers wanting to know what their customers thought

Y: the emergence of market research

Proposition X stands as an antecedent, or cause, while proposition Y functions as a consequent, or effect. While this particular causal relationship is not signposted by a clear discourse marker such as *therefore*, an attentive reader would still recognise the appropriate text-semantic relationship.

#### 2.6.1.4 Contrastive relationships

A contrastive relationship expresses that a difference between one proposition and another is relevant. Contrastive relationships occur when there is a significant difference between two propositions in a text. An important distinction between causal and contrastive relationships is that causal relationships are continuative while contrastive relationships are discontinuative. As is illustrated in Examples 4 and 5, continuative connections fulfil the expectations set up by previous propositions; conversely, discontinuative connections violate such expectations and instead present a caveat, contradiction or qualifying statement (Graesser *et al.*, 2003: 4).

Continuative:

[7] *Thandeka ordered a slice of cake, since she felt that she deserved a treat.* (causal)

[8] *Thandeka ordered a slice of cake with lunch, and she had dessert after dinner.* (additive)

[9] *Thandeka ordered a slice of cake before asking for the bill.* (sequential)

Discontinuative:

[10] *Thandeka ordered a slice of cake, even though she was on a diet.* (contrastive)

Due to this unexpected turn in reasoning, discontinuative relationships are more difficult to comprehend and take longer to process; developmentally, they are typically only mastered after continuative relationships (Pretorius, 2006: 437). As a result of their increased demand on the reader's cognitive resources, contrastive relations are almost always indicated explicitly by means of a contrastive conjunction, such as *but*, *however* or *although* so as to facilitate understanding.

Consider the paragraph below as an example:

[11] There is a widely held myth among entrepreneurs about the origins of successful companies, which states that those who launch highly successful companies usually begin with a brilliant idea and then ride the growth curve of an attractive product life cycle. Yet this myth – as compelling and pervasive as it is – does not show up as a general pattern in the

founding of the visionary companies. In fact, starting a company with a ‘great idea’ might be a bad idea. Having a great idea or a great product from the start can make a company overconfident. Young, overconfident companies tend to neglect the development of the necessary infrastructure and relationships that any successful business depends on. (Adapted from Collins & Porras, 1994: 7-26)

This paragraph contains the following contrastive relation indicated by the conjunction ‘Yet’.

X: There is a widely held myth among entrepreneurs about the origins of successful companies, which states that those who launch highly successful companies usually begin with a brilliant idea and then ride the growth curve of an attractive product life cycle.

Y: This myth – as compelling and pervasive as it is – does not show up as a general pattern in the founding of the visionary companies.

In contrastive relations, the two ideas (in this case, X and Y) stand in an unexpected relation: the myth about the value of ‘good ideas’ is pervasive; nevertheless, it is not always true.

While they are an important feature in all forms of writing, clearly demarcated text-semantic relationships are particularly important in expository texts dealing with unfamiliar content (as so many expository texts do). When confronted with content of which they have limited domain knowledge, readers are much more reliant on discourse markers that at least clarify relationships between ideas. If these markers are absent, or if the reader cannot draw the necessary inferences to access those relationships, expository text quickly becomes incomprehensible (Graesser *et al.*, 2003: 9).

Yet, despite the evident value of text-semantic inferences, the research suggests that even adult readers sometimes fail to generate them online while reading expository texts. According to Noordman, Vonk and Kempff (1992: 587-588), university-level readers are unlikely to construct causal inferences online when reading technically complex expository texts that deal with content that is unfamiliar to them. Singer, Harknes and Stewart (1997) found that these inferences can be processed online by adult readers, but only if they are permitted to read slowly and are not pressured into rapid surface-level reading by time constraints. Since much of the reading undertaken by students at university level will be technically complex or theoretically abstract, and since the sheer amount of reading required by most degree programmes necessitates reading at a fairly rapid pace, the caveats offered by these researchers are not very reassuring. Therefore, in order to succeed at university, students must be taught reading strategies that make them aware of useful discourse markers that enable them to consistently access meaning in text, even when dealing with large volumes of challenging reading.

It takes time to develop the necessary linguistic knowledge to be able to express and interpret text-semantic relationships correctly, especially in an L2 (Degand & Sanders, 2002: 743). Even though the University of Pretoria's Extended Curriculum Programme (ECP) students are taught the semantic and grammatical functions of various discourse markers, many students still struggle to identify text-semantic relationships correctly when reading, especially when these are implied. It is therefore necessary to consider what an appropriate instructional intervention that focuses on these types of inferences might look like. Graesser *et al.* (2003: 22) suggest integrating reading comprehension strategies that rely on text-semantic relationships with academic literacy instruction that teaches students how to use discourse markers to create local coherence when writing. Since the ECP students who participated in this study were already exposed to discourse markers as part of their academic literacy curriculum, the next aspect to consider would be the optimal instructional mode to bridge the gap from academic writing to reading comprehension.

Two studies dealing with L2 readers give some insight into possible instructional modes that could be effectively employed in the teaching of text-semantic inferences. Innajih (2007) investigated the effect of explicit instruction of text-semantic relations on reading comprehension. In this study, an experimental group of L2 fourth-year Libyan university students (n=70) who participated in a three-month (24 hours in total) intervention outperformed the control group (n=30). Both groups participated in a reading comprehension intervention based on the same texts, but only the intervention group's syllabus was adapted to include explicit instruction on causal, contrastive, additive and sequential text-semantic relationships. In addition to the difference in reading comprehension in general, the researcher found that the participants struggled the most with the two types of text-semantic inferences that form a specific focus of this study – causal and contrastive inferences (Innajih, 2007). In a similar, more recent, study with Saudi-Arabian high school students (n=70) who performed poorly in English reading comprehension tasks, researchers established, with a large effect size, that explicit instruction on text-semantic relationships improved the participants' reading comprehension when compared to a control group that received the standard reading comprehension intervention which did not include explicit instruction on text-semantic relationships (Al-Qahtani, 2015). Another important finding from an older study relating to explicit instruction of reading comprehension strategies that focus on text-semantic relations was that the group that appears to benefit the most from this type of intervention is less proficient L2 readers (Kern, 1989).



Since so much is dependent on an appropriate pedagogical approach to reading comprehension and inferencing instruction, this aspect is discussed in detail in Section 2.8.

### **2.6.2 The role of inferential ability in reading comprehension**

Inferencing undoubtedly forms a key component in reading comprehension. More specifically, studies by Oakhill and Cain (1999: 500) as well as Perfetti and Adolf (2012: 266-267) investigating the direction of the relationship between inferencing and comprehension have confirmed that generating sufficient and correct inferences determines comprehension. In other words, poor comprehension is the result of not drawing inference or of drawing inadequate inferences, not the cause thereof (Cain & Oakhill, 1999: 500; Kispal, 2008: 2; Barnes *et al.*, 2015: 269). Several studies have been conducted to investigate the relationship between text-semantic inferences and reading comprehension, and the majority of research on the relationship between text-semantic relationships and reading comprehension has found that a significant positive effect (Al-Qahtani, 2015: 59), or at least a correlation (Khatib, 2011), exists between these two factors. One study at a South African university found there to be a robust relationship between L2 participants' ability to resolve text-semantic inferences and their academic performance and English proficiency in general (Pretorius, 2006). Interestingly, another, more recent study using a large sample ( $n = 3178$ ) of first-year students at a different South African university found that inferencing was one of the aspects of academic literacy that students found particularly challenging (Sebolai, 2022b: 16).

Research by Sundbye (1987) as well as Gilabert, Martinez and Vidal-Abarca (2005) has also suggested that literary texts that require more inferences to be generated by the reader (rather than more explicitly detailed texts that require fewer inferences) are likely to be viewed as more interesting and challenging by the reader, possibly resulting in a more active reading approach which, in turn, can stimulate critical thinking and self-directed learning. While it is true that factors such as domain knowledge and working memory affect readers' ability to draw inferences, studies by Cain and Oakhill (1999: 500-501), Cain, Oakhill, Barnes and Bryant (2001: 850), and Barnes *et al.* (2015) have found that less skilled readers are less likely to draw inferences even when they possess the necessary domain knowledge and are allowed to refer back to the text. They are also less aware of the need for generating inferences (Bowyer-Crane & Snowling, 2005: 199; Kispal, 2008: 17). In short, inferencing is an essential prerequisite for comprehension and learning; moreover, it is dependent on factors like prior knowledge and working memory but is not guaranteed by those factors being in place.

### 2.6.3 The role of reading comprehension in academic achievement

Just as inferencing is a critical component in reading comprehension, so too is reading comprehension a key requirement for academic performance. Students whose reading skills in general, and reading comprehension abilities in particular, are not up to the task are handicapped in their learning or even excluded from parts of the curriculum (McGee & Johnson, 2003: 49; Bharuthram, 2012: 210). This is due to the essential role played by reading in all academic domains (Cromley & Azevedo, 2007: 1); in fact, according to Bharuthram (2012: 210), “the relationship between reading and academic performance cannot be over-emphasised”.

Studies have found a robust relationship between reading ability and academic performance, with reading ability emerging as a stronger predictor of academic success than language proficiency at university level (Bohlmann & Pretorius, 2002: 15). Unfortunately for the many students who struggle with reading comprehension, reading shortcomings often go unnoticed (Nation & Angell, 2006: 85). As the gaps between capable and less capable readers widen, the less capable readers inevitably fall victim to “Matthew Effects” which cause “the rich to get richer and the poor to get poorer” (Stanovich, 2009). While capable readers benefit from reading as an effective learning tool, struggling readers who find reading effortful and frustrating will avoid it, with increasing detriment to the development of their vocabulary, working memory, domain knowledge, and their use of reading strategies – all of which feed back into poorer and poorer reading abilities. In short, reading is one of the most fundamental building blocks of learning in any subject; working to improve students’ learning abilities is therefore universally beneficial and, in a country like South Africa where reading levels are persistently poor, it is increasingly necessary.

In sum, drawing inferences is a complex and essential reading competency that enables the comprehension of implicit information, allowing readers to ‘connect the dots’ and ‘fill in the gaps’ while reading. Inferences can be classified into various types, depending on the time the inference is drawn (during reading or after reading), the function of the inference (to maintain coherence or to elaborate) or the sources of information involved (textual evidence or background knowledge). Anaphoric inferences and text-semantic inferences are two common types of inferences that are required to maintain basic coherence. If readers fail to draw these necessary inferences, their comprehension would quickly break down. Consequently, their ability to read to learn would be diminished which could contribute to academic difficulties.

## 2.6.4 Factors that influence inference generation

Various abilities and approaches that readers bring to the reading process affect the extent to which they are capable of generating inferences. At the same time, the type of text with which a reader engages also influences reading comprehension and inferencing specifically. In this section both reader-based factors and text-based factors will be discussed. Research suggests that in order for inferencing to take place, readers need sufficient and accessible text knowledge (such as an understanding of discourse markers and genre conventions) as well as some prior knowledge of the concepts dealt with in the text, adequate working memory and a rich vocabulary. Moreover, readers need to be actively engaged in the reading process while simultaneously monitoring their own comprehension in order to recognise the need to draw inferences. Some of this research is discussed below.

### 2.6.4.1 Prior knowledge

Prior knowledge (also referred to as background knowledge or domain specific knowledge) is that knowledge which the student already possesses before encountering new knowledge and information in the text. Prior knowledge is arguably one of the biggest contributing factors to the generation of inferences (Barnes *et al.*, 1996: 218; Singer *et al.*, 1997: 221; Kendeou & Van den Broek, 2007: 1575). However, merely having the requisite domain specific knowledge does not guarantee that an inference will be generated (McKoon & Ratcliff, 2017: 292). Various studies that have tested the relationship between the ability to generate inferences and domain knowledge have found that poor readers sometimes fail to access existing prior knowledge to aid in comprehension through the construction of knowledge-based inferences (Barnes *et al.*, 1996: 227; Cain & Oakhill, 1998: 339). In other words, the reader is either unable to access the information or is unaware of the need to access it.

Whether or not prior knowledge is accessible in a particular reading situation depends partially on how that information is encoded in the reader's memory (Barnes *et al.*, 1996: 218; Barnes *et al.*, 2015: 268). The 'structure' of knowledge and memory is often metaphorically described as 'schemata'. Knowledge that is encoded in detailed schemata, consisting of many connections between components, is much more accessible than knowledge with few connections (Kispaal, 2008: 14). For example, if a text mentions a waiter and a menu, the reader's 'restaurant' schemata should be activated, enabling him or her to use prior knowledge about restaurants to generate inferences that will maintain coherence and aid in comprehension of the text. Furthermore, if the schemata in question is detailed, grounded in experience

and logically organised, much of its content can be activated automatically, with very little impact on cognitive processing resources such as working memory (Graesser *et al.*, 1994: 374).

Due to the complexity of memory structures like schemata, teaching the necessary background knowledge prior to testing comprehension is unlikely to level the playing field. It takes time to encode a functional schema with sufficient links between components that are reinforced through repeated application (Barnes *et al.*, 1996: 218); therefore, the schema of a completely novel concept that has been introduced fairly recently is likely to be inert and of little use to a struggling reader whose cognitive processes are already working at capacity (Kispaal, 2008: 35). On the other hand, a student who is already in possession of some prior knowledge on the topic being introduced will be able to integrate the new information into existing and functional schemata much more easily and, thus, will gain more from attempts to teach background knowledge prior to reading comprehension tests and exercises (Gilabert *et al.*, 2005: 47-48). Prior knowledge is one of several aspects that contribute to reading comprehension and inference generation, yet there are no easy ways to successfully teach this to all students equally, and attempting to do so could just end up widening the gaps between more capable and less capable readers. Moreover, the types of expository texts students encounter at tertiary level frequently introduce them to subjects they know very little about; a capable reader should still be able to comprehend such texts (refer to Figure 3.8. for a mental modelling example of this type of comprehension process).

#### 2.6.4.2 Working memory, accuracy and fluency

Working memory can broadly be defined as a cognitive system that is responsible for temporarily storing and manipulating a limited amount of information which is required for tasks such as reasoning, comprehending and linguistic processing. The information is typically only available for manipulation for a few seconds. During reading, the reader must record, process and integrate information while simultaneously monitoring comprehension (Oakhill & Cain, 2012: 96). The more information a reader is able to process and integrate, the more detailed his or her mental model will be which, in turn, will aid comprehension and memory (Cain *et al.*, 2001).

The amount of information a reader is able to process is ultimately a function not just of working memory, but also of reading accuracy and fluency. With increased accuracy comes increased reading speed, resulting in more automatised decoding processes that free up working memory for reading comprehension. Readers with larger working memory spans generally perform better in reading

comprehension tests; they are also capable of generating more inferences than readers with lower memory spans (Calvo, 2005: 55). However, if decoding is not sufficiently fluent and accurate, these lower-level processes will be taxing on working memory, leaving little capacity for higher-order processes; in other words, decoding issues such as poor accuracy and speed are strongly related to poor comprehension. If one considers the additional demands of reading in an L2, as is the case for many students in South Africa – where less than 10% of the population listed English as their first language in the most recent census (Lehohla, 2012: 24) – the combined impact of working memory and fluent decoding becomes apparent. Inferences that impose significant burdens on working memory are rarely generated by less-proficient readers who tend to struggle even with straightforward inference (refer to Section 2.6.4.2). These inferences include those that require the connection of information across several clauses or sentences as well as those that require complex analytical reasoning (Barnes *et al.*, 2015: 268). It is difficult to improve students' working memory in a short period of time, although it is necessary to bear in mind the influence of working memory, as well as the fluency and accuracy of decoding, when providing inference training.

#### 2.6.4.3 Vocabulary

Vocabulary refers to the size and depth of the collection of words known and understood by a particular language user. Overall size of vocabulary relates to general intelligence and language proficiency (Smith, Smith, Taylor & Hobby, 2005) and plays a significant role in both reading comprehension (Kispal, 2008) as well as inferencing (Calvo, 2005; Cromley & Azevedo, 2007). Skilled comprehenders are capable of attending to denotative and connotative meaning while also keeping track of the influence of individual lexical items when it comes to the construction of meaning (Kispal, 2008: 27). For example, when reading the verb *outsource*, a capable reader would be aware of its denotative meaning (to give some of the work to another person or company) as well as negative connotative associations of cutting costs by using cheap labour, which might also lead to job losses for the company doing the outsourcing. As a very basic example of the influence of individual lexical items in the construction of meaning, consider the following sentence: *Harold limped home after yet another devastating defeat*. A skilled and actively engaged comprehender with the necessary cultural and linguistic knowledge would infer that *Harold* is male, that the word *limped* suggests that the altercation that resulted in his defeat was of a physical nature and that the phrase *yet another* suggests that this type of altercation had happened previously. Even if the word *devastating* is not known by the reader, actively attending to explicit and implicit information in adjacent sentences could help to inform an educated guess which aids comprehension. Even readers as young as seven can

benefit from being taught to attend to individual word meanings, with positive effects on their reading comprehension (Beishuizen *et al.*, 1999: 43).

Much like the relationship between vocabulary and comprehension, the relationship between vocabulary and inferencing has been researched. In one study dealing with primary-school readers, students were taught how to deconstruct meaning in a text by acting as ‘word detectives’ who identified key words and inferred implicit information conveyed by these words (McGee & Johnson, 2003: 50-51). Both Calvo’s (2004) as well as Cromley and Azevedo’s (2007: 5) studies worked with older students (undergraduate and high school students, respectively) and both studies found some evidence suggesting that sufficient vocabulary knowledge is a prerequisite for inference generation (refer to Section 2.6.4.3 for a brief discussion on vocabulary thresholds). Conversely, Cain, Oakhill and Lemmon (2004) posited that both reading comprehension and vocabulary development are the products of skilled inferencing. In other words, being able to infer meaning from surrounding textual context can lead to increases in vocabulary size and depth. The intervention that formed part of the current study included teaching students to attend to individual word meaning in order to make inferences about the meaning of unfamiliar words, drawing on McGee and Johnson’s (2003) study but adapting it to university students.

#### 2.6.4.4 Metacognitive awareness and active reading

Metacognition is, simply put, ‘thinking about thinking’. Metacognitive awareness involves a regulation and awareness of one’s own thinking and learning processes, making these processes more active and effective. During a study that investigated the relationship between inferencing and reading comprehension, Cain and Oakhill (1999: 500) found that less skilled comprehenders were capable of generating text-connecting inferences with the same degree of accuracy as more skilled comprehenders, provided that their initial mistakes were pointed out to them and they were allowed to re-attempt the question. The authors concluded that the less capable comprehenders were able to generate these inferences, but failed to do so largely due to ineffective metacognition during reading, i.e. their ineffective approach to reading in general (Cain & Oakhill, 1999: 501). Such readers likely do not regard reading as an active and constructive process and instead probably perceive it as a task to be passively completed without much cognitive engagement (Cain & Oakhill, 1999: 501; Kispal, 2008: 16). Unfortunately, the prevalence of basic information-retrieval questions in most reading tests throughout their school career will do little to change their minds (Simpson & Nist, 2002: 369).

On the other hand, skilled comprehenders who are actively engaged in the reading process tend to employ a variety of reading strategies and may even be consciously aware of their reading approach and cognitive processes (Cekiso, 2012: 1). Such awareness enables readers to engage in comprehension monitoring. Comprehension monitoring facilitates the regulation of cognitive processing, detects the need for inference generation and is the first step in repairing comprehension if it starts breaking down (Haller, Child & Walberg, 1988: 5; Oakhill & Cain, 2012: 95). Due to the essential role played by metacognitive awareness when dealing with challenging reading material in reading-to-learn scenarios, this study endeavoured to train students to become active readers who attain metacognitive awareness.

#### 2.6.4.5 Text type: narrative versus expository text

Improving reader-based factors, like inferencing, is the main focus of this study. However, it is worth mentioning that text-based factors will inevitably also influence comprehension when reading. For instance, a text on a particularly abstract topic which also contains a large number of low frequency words will likely pose more of a challenge than a text on a familiar topic which is also written using mostly high frequency words. In addition to the content of the text, the way in which the text is structured also constitutes a text-based factor which has the potential to influence comprehension. The use of headings, accompanying diagrams or graphs and other text-based visual elements can all aid in comprehension. While these elements fall outside the scope of this study, text type does play a role in the choice of material used and the content taught in this intervention.

Text type influences the type and number of inferences a reader is likely to draw; for instance, narrative texts (like short stories and novels) and expository texts (informative text) vary considerably in this aspect. One of the many contributing factors to reading comprehension difficulties, especially those experienced by high school and university students, is the tendency of educators and parents to rely largely on narrative texts during the formative years of reading instruction. According to Marzban and Seifi (2013: 1044), “children are fed a steady diet of once-upon-a-time stories during the infant, toddler and learning-to-read years”. Narrative stories tend to adhere to predictable patterns, generally introduce limited unfamiliar concepts and structurally mimic events in daily life (Singer *et al.*, 1997: 202; Kispal, 2008: 41; Nel, 2011: 43). As a result, narrative texts tend to elicit inferences more easily (Narvaez, 2002).

Expository texts, on the other hand, often deal with unfamiliar topics, are structured very differently from narrative texts and are more likely to include technical terms (Graesser *et al.*, 1994: 372; Singer *et al.*,

1997: 202-203; Graesser & Bertus, 1998; Kispal, 2008: 41; Nel, 2011: 43). These characteristics make expository texts much more demanding on working memory and, therefore, require readers to engage in more complex analytical thinking than they would when reading narrative texts, leaving little mental processing capacity for generating inferences that may not seem necessary for struggling readers (Graesser *et al.*, 1994: 372; Singer *et al.*, 1997: 202-203; Graesser & Bertus, 1998; Kispal, 2008: 41; Nel, 2011: 43; Oyetunji, 2013: 42). For example, a study by Narvaez (2002: 166) found that readers generated as many as nine times more inferences (such as the reasons for characters' behaviours and what might happen next) when reading narrative texts, compared to expository texts with more explicitly stated information. Moreover, since elaborative inferences are non-essential and resource demanding (Calvo, 2004: 54), they are rarely made during the reading of expository texts which is itself resource demanding. Instead, the mental model resulting from an expository text will be more dependent on text-connecting inferences than elaborative inferences. On average, expository texts are more challenging to comprehend than narrative texts, but the vast majority of reading at university level is expository, and students who fail to transfer reading strategies learnt from narrative texts (possibly due to not being aware of them in the first place) to reading-to-learn expository texts can be greatly disadvantaged (Kispal, 2008: 41; Nel, 2011: 43).

As can be seen from the preceding discussion, there are a number of factors that affect inference generation which can be categorised into reader-based factors and text-based factors. First, background knowledge enables the integration of incoming textual information into existing schemata which, in return, activate and provide information required for knowledge-based inferences. Furthermore, readers' decoding need to be sufficiently accurate and fluent so as not to overburden their working memory and commit cognitive resources to higher-order processes like inferencing. Vocabulary and metacognitive awareness are other reader-based factors that can contribute to comprehension and inference generation.

## **2.7 Teaching reading – a theoretical framework**

In order to situate this study within a broader theoretical framework based on work done in reading as well as education, the influence of constructivism as a general learning theory on theories of reading will first be discussed. This will be followed by a consideration of the possible pitfalls of constructivist approaches to strategy instruction and the ways in which a combination of social cognitivist theories of learning might be able to ameliorate these drawbacks.



### 2.7.1 Constructivist approaches learning and reading

Before notions of reading as an interactive process of top-down and bottom-up cognitive processes that actively work together to construct meaning became influential between the 1970 and 1990s, behaviourist and structuralist theories of reading were popular until the 1960s. These earlier theories assumed that essentially all the meaning and information to be understood by the reader resides in the text. Since the text was perceived as having a single fixed meaning, the reader was constructed as a passive recipient of information whose understanding is completely constrained by the text (Stanovich, 1994: 269). Similarly, approaches to instruction saw learners passively receiving information from teachers who were considered the only viable source of knowledge in the classroom (Brown & Campione, 1990: 112). The metaphor used to describe this type of instruction is that of information being transmitted, unaltered, from the instructor to the students (Pressely, Harris & Marks, 1992: 26).

Constructivist theories of learning developed in opposition to the perspective of the student as a passive receiver of the information in the text or the instructor. It is in this reconsideration of the student's role in the learning process that constructivist theories of learning provide a valuable contribution to the theoretical framework of this study, even if traditional applications of constructivism in the classroom have significant shortcomings. Instead of regarding the learner as a passive recipient, constructivism is based on the epistemological assumption that knowledge is actively constructed in distinctly individual ways by individual learners and skills are downplayed as a by-product of meaning and learning. According to such theories, there are no "immutable objective Truths" that could be theorised and taught as "observer-independent" knowledge (von Glasersfeld, 1998: 12); on the contrary, our individual mental representations are greatly influenced by our prior knowledge, goals and approaches to the learning process.

In practice, the rejection of "immutable, objective Truths" can lead to extreme relativism; however, the notion that the learner or reader is an active participant in the construction of knowledge and understanding is essential to this study's approach to conceptualising the role of inference generation in reading comprehension. Specifically, constructivist perspectives of reading comprehension emphasise the need for active participation from the reader in constructing meaning for him- or herself. Moreover, the understanding that the text does not offer a single, true meaning but that meaning is constructed partially through the application of the reader's prior knowledge promotes the acceptance of a wider (but not

unlimited) range of individual interpretations of the text and emphasises the importance of inferences and active participation from the reader.

Apart from these two key principles of active participation in the learning or reading process and the individuality of the resultant knowledge structures, constructivist theories can vary greatly and often run into limitations when it comes to bridging the gap between pedagogical theory and instructional practice. In theory, a constructivist approach to learning can play an important role in shaping the learning environment by rejecting the transmission model of instruction (Windschitl, 2002: 136) and instead investigating approaches to learning that result in the construction of knowledge that is both accessible and lasting (Pressley *et al.*, 1992: 5). Translated into practical terms, this philosophy might be implemented by teachers encouraging autonomous and reflective thinking and providing students with the opportunity to engage in complex problem-based activities that approximate 'real-world' scenarios (Pressley *et al.*, 1992: 16; Windschitl, 2002: 137). During the learning process, instructors and students regularly engage in discussions that emphasise the process of learning rather than the final product, with the intention of enabling students to construct the knowledge themselves. Therefore, explicit instruction is not incorporated.

Although the learning environment described above is preferable to instructional practices that place the learner in a passive role, it is exceptionally difficult to implement successfully and is not equally well suited to all subjects (compare, for example, poetry and chemistry) or to all students. Constructivist instructors are required to anticipate learners' level of expertise and misconceptions about the content while maintaining some insight into their individual thought processes in order to continuously adapt classroom activities and assessment accordingly (Windschitl, 2002: 144). Especially when learning is heavily reliant on students' own discovery of knowledge, with limited intervention from instructors, a significant portion of the acquired knowledge structures can be expected to be inaccurate (Pressley *et al.*, 1992: 19; Mundy & Potgieter, 2019). When considering the act of reading specifically, it also becomes apparent that certain types of text, like fiction, are much more amenable to individual interpretation, while others, like instructions, are much more dependent on the author's intended message being transmitted relatively unaltered to the reader (Stanovich, 1994: 270). This suggests one of the main limitations of constructivism: it fails to distinguish between knowledge and mere belief or misinterpretation, and there is a difference.

Furthermore, this difference is particularly pertinent in certain fields of knowledge, such as mathematics, accounting and the sciences, where learning to arrive at the appropriate answer is often imperative or in any instance where knowing a set of currently established facts about phenomena in specific fields is important. Mistakes and misconceptions are a valuable part of the learning experience but correcting them is time-consuming and when this process is insufficient it can result in students who know less than they did before the intervention (Kirschner, Sweller & Clark, 2006: 90). Lastly, constructivist approaches with a strong focus on student-based discovery also tend to be inappropriate when working with vulnerable students (Mundy & Potgieter, 2019: 155) or students with learning disabilities (Stanovich, 1994: 264) as these populations generally require more involved support.

### **2.7.2 Social cognitivist approaches to learning**

In a diverse classroom with fifty-plus students who need to acquire sufficient academic literacy levels to enable them to successfully navigate university education in less than a year, a strict constructivist approach is simply not tenable. Such an approach to instruction could perhaps serve as an abstract, theoretical ideal to be aimed for but cannot be applied to most tertiary education classrooms and does not have a strong evidence base in reading pedagogy. For these reasons, I turn instead to social cognitive theories of learning and instruction that can be viewed as being complementary to constructivism. There are certainly some of Vygotsky's (1962) tenets for the sociocultural model of learning that are relevant to the development of reading comprehension instructional content and interventions, such as the role of social interaction in the development of cognition, and the role of the community in the process of meaning-making. For instance, one study of a similar population from the same university, which was influenced by the sociocultural model of learning, found that socio-affective factors can have a large impact on reading ability and performance (Boakye, 2012: 35). However, the focus of this study is not so much the factors that influence reading (although these were also discussed in Sections 2.4 and 2.6) as the optimal instructional approach used when targeting one specific aspect of reading comprehension. For this reason, social cognitivist theories of learning are drawn from as they foreground mental modelling by and expert during the early stages of learning, which is something that is often missing from reading instruction.

Social cognitivism, which is based on the premise that we learn from others through observation (Bandura, 1977), places a great deal of emphasis on modelling and explicit instruction. Based on the prominence of mental modelling in reading strategy instruction (see Section 3.9.3), social cognitivism

might be better suited to inform the instructional intervention of this study, without dismissing the valuable theoretical contributions made by constructivism regarding reading and learning as an active process which is centred on the student.

Social cognitivism developed from Albert Bandura's theory that sociocognitive factors (such as interest and aptitude), behaviour and environment operate as interconnected determinants that influence the learning process (Bandura, 1988: 276); at the same time, it is influenced by Vygotsky's (1962) sociocultural theory that socially-mediated activity has a significant influence on thought. In the classroom, this understanding translates into modelling by the instructor in the initial phases of instruction, followed by guided practice in a simulated environment and, finally, students applying the skills and strategies they have learned in an authentic environment in order to make apparent their usefulness so that students are motivated to continue to use them (Bandura, 1988: 276). In other words, the learning process follows the gradual release model of teaching by moving along the teacher-learner continuum, gradually releasing or shifting the responsibility for learning from teacher to learner (Maynes, Julien-Schultz & Dunn, 2010: 67). Social cognitivists are invested in the development of self-regulation in learners (Horner & O'Connor, 2007a: 2), who should become "metacognitively, motivationally, and behaviourally active participants in their own learning process" (Zimmerman, 1989: 329).

In fact, both constructivist and social cognitivist approaches have active and self-regulated learners as their end-goal. A key difference between them is that social cognitivist instruction gradually builds up towards active and independent learning on the students' part, while constructivist instruction aims to start off as such. When dealing with students who experience any form of academic difficulties, strict forms of constructivism like discovery teaching are tantamount to expecting students to construct their own knowledge without providing them with the necessary tools, since these students typically require extensive, structured and explicit instruction in order to develop complex strategies (Zito, Adkins, Gavins, Harris & Graham, 2007: 79). Even when dealing with more academically capable students, discovery learning is often inefficient as many procedures (including strategic reading, certain memory tactics as well as procedural mathematical knowledge) are simply not learned spontaneously by most students (Hilden & Pressley, 2007: 51; Pressley *et al.*, 1992: 19). Therefore, if complex strategies are to be taught successfully, especially to academically vulnerable students, an established instructional model that accommodates modelling is needed.

Social cognitivist theory has been consolidated by Schunk and Zimmerman (1997) as well as by Harris and Graham (1996) into adaptable instructional models for the development of self-regulated strategy use. These models view learning as a multi-faceted process and work to affect changes in learners' domain-specific knowledge, self-regulated strategy usage as well as their motivation. Schunk and Zimmerman's model consists of four levels of self-regulated competence, namely observation, emulation, self-control and self-regulation. Briefly, the observation level sees students observing models; secondly, during emulation, students approximate the thought processes and behaviours of the model; thirdly, during the self-control level, students start to internalise the new strategy while still relating it to the model's strategy usage; finally, when they achieve full self-regulation, students have complete ownership of the strategies and can adapt them independently and intentionally to a variety of situations (Schunk & Zimmerman, 1997: 199; Horner & O'Connor, 2007a: 2). Harris and Graham's model is most often used when teaching academic writing, although it could be adapted to other forms of strategy instruction (Zito *et al.*, 2007: 79; 88-91). Due to their sturdy foundation in explicit instruction and gradual scaffolding towards independent application, these models are well adapted to complex strategy instruction such as inferencing, even when dealing with academically vulnerable learners.

Apart from developing higher order cognitive processes, another significant goal of both Schunk and Zimmerman's as well as Harris and Graham's models is to assist students in developing and maintaining self-regulation strategies to monitor their own performance (Zito *et al.*, 2007: 80). Self-regulation is a "process whereby students activate and sustain cognitions, behaviours and affects which are systematically oriented towards attainment of their goals" (Schunk & Zimmerman, 1994: 309). Much like reading comprehension, self-regulation is a strong predictor of academic success, provided that the necessary foundational skills and domain knowledge are in place. Self-regulated students stay on task and persevere; they are capable of realistic goal-setting, self-evaluation, effective strategy usage and self-evaluation of their own understanding (Horner & O'Connor, 2007a: 1). In other words, self-regulated learners are active participants in their learning who display internal loci of control instead of being entirely reliant on instructors for the conveyance of knowledge (Zito *et al.*, 2007: 78). Learning active and strategic reading is inherently self-regulated due to the fact that strategies in general, and reading comprehension strategies in particular, cannot effectively be consciously proceduralised (see Section 2.8). Effective and self-regulated comprehenders construct meaning from a text by accessing relevant schemas, inferring information, constructing mental models and employing metacognitive repair strategies when needed (Hilden & Pressley, 2007: 51). In short, to succeed academically, it is imperative that students

master the type of self-regulation that social cognitive modelling aims to develop (Schunk & Zimmerman, 2007: 8).

When modelling is used effectively in instruction, students ‘pattern’ their thinking processes and behaviours to resemble those displayed by a competent model (Schunk & Zimmerman, 2007: 11). Eventually, the learner is no longer merely replicating the model’s actions without thought, but starts to understand the general patterns involved and emulates these (Schunk & Zimmerman, 2007: 13). Modelling works best if models actively affirm the usefulness of the behaviour and are seen to achieve some sort of successful outcome as a result of the modelled behaviour since students are more likely to assimilate behaviour they believe will assist them in achieving their goals (Horner & O’Connor, 2007b: 100; Schunk & Zimmerman, 2007: 11). In addition to needing to be convinced of the usefulness of modelled behaviour, students also need to believe that they can master the behaviour themselves; this belief is strengthened when they observe the behaviour being modelled by their peers who can take on the role of co-instructors in a social cognitive learning environment (Schunk & Zimmerman, 2007: 9). Such developments take advantage of the inherent benefits of a social learning environment instead of relying solely on the motivation of learners left to their own devices by many constructivist approaches. In an illustration of the complementary relationship between constructivist and social cognitivist instructional approaches, Pressley *et al.* (1992: 19) suggest that students ought to be encouraged to construct their own knowledge, but when they fail to do so sufficiently, it is the responsibility of the instructor to augment their understanding through more explicit instructional procedures.

## **2.8 Teaching inferencing**

While inferencing in particular and reading comprehension in general are clearly essential skills that have significant effects on literacy and academic achievement, how to go about improving these skills in academically vulnerable students at tertiary level is less clear. Thus, the following section considers inferencing and reading from a pedagogical perspective in an attempt to establish best practices for the inferencing strategies intervention that forms part of this study.

### **2.8.1 Why should inferencing be taught?**

As the last three reports of the PIRLS test have shown without any doubt, South African Grade 4 learners have tremendous difficulty when it comes to reading comprehension, which has led to enquiries about how this fundamental skill is being taught (Pretorius & Lephala, 2011: 4). The PIRLS tests assess four

types of reading comprehension processes: students' ability to retrieve explicitly stated information, infer information, integrate information and evaluate text. South African students lag behind global standards in all four areas, but they performed particularly poorly in the higher-order processes such as inferencing (Pretorius & Lephala, 2011: 4). Reading comprehension forms part of the syllabus for English as well as other languages taught in South African schools, throughout most of primary and all of high school. The CAPS (Curriculum Assessment Policy Statements) document prescribes the teaching of inference-based reading strategies, such as predicting, making connections and monitoring connections (Department of Basic Education, 2011: 22), yet it is unclear if these strategies are actively taught or if classes dealing with reading comprehension consist mostly of 'doing' comprehension, i.e. assigning a text to students and requiring them to answer questions on it (often requiring only information retrieval). The fact that assigning exercises does not amount to actually teaching a strategy has been pointed out by various researchers for several decades (Durkin, 1987; Duffy & Roehler, 1989: 143; Simpson & Nist, 2002: 372), yet complex comprehension processes like inferencing are still rarely taught effectively in many South African schools. Fortunately, despite all these challenges, reading comprehension, and inferencing specifically, can be taught (Haller *et al.*, 1988: 8).

### **2.8.2 What aspects of inferencing should be taught?**

Only a small portion of the research conducted on inferencing has included inference training interventions and of these, most have been done with younger learners. In fact, the systematic literature review put together by Kispal (2008: 4) on the subject of teaching inferencing found the lack of inference training interventions to be noteworthy, stating that "not much direct testing of inference training has been carried out". Kispal's literature review only considered research from the United Kingdom and the United States of America and is by now a decade old, but the conclusion still holds true: of the existing interventions dealing with the teaching of reading comprehension in general, relatively few focus on inferencing specifically, and of those, hardly any are done using participants older than 18. Nevertheless, valuable insight can still be gleaned from inference training interventions using younger learners and from reading comprehension interventions in general. There have been a handful of successful instructional interventions conducted locally and internationally that can give some insight into which inferencing and comprehension strategies can be taught to improve students' reading.

Reading comprehension instruction has come a long way since the extensive reading programmes of the 1970s (see Pressley, 2000: 554-555 for a brief overview). The realisation that extensive reading

programmes would not automatically create active readers led to a number of studies dealing with the teaching of individual comprehension strategies such as prior knowledge activation, question generation, visualisation and summarising (Pressley, 2000: 554). Subsequently, more sophisticated models which included several strategies were developed. Of these, one of the most influential was Palinscar and Brown's (1987) reciprocal teaching model, which also relied on explicit instruction and mental modelling techniques (refer to Section 2.7.2). The reciprocal teaching model teaches students to predict what was going to happen next in a story, ask themselves questions about what they read, seek clarification when necessary and summarise what they have read (Palinscar & Brown, 1987; Williams, 2010: 278). Not long thereafter, one of the first studies that focused specifically on inference training was conducted by Yuil and Oakhil (1991), using very small groups of seven-year-old learners who were taught to identify key words and the meaning contributed by each key word in a passage. Another particularly successful intervention that focused on inference training specifically was conducted by McGee and Johnson (2003) and saw learners in the experimental group's reading level increase significantly after an intervention consisting of six training sessions. The subjects were young, between six and ten years, but the instructional model, which consisted of lexical training, question-generation and prediction, could easily be adapted to older students. The researchers concluded that a significant contributing factor to the study's success was the fact that the inference training enhanced the learners' enjoyment of reading as well as their confidence in their own reading abilities (McGee & Johnson, 2003: 58). This change in the learners' perception of and attitude towards reading is particularly valuable as such changes are likely to affect lasting positive change, something that is not always achieved by merely being taught new reading strategies.

There are also a handful of studies conducted in Africa dealing with older students. One local study with Grade 11 Xhosa HL English L2 learners, significantly improved participants' reading comprehension compared to a control group through a three month-long reading comprehension strategy instruction intervention (Cekiso, 2012). This intervention included a large number of reading strategies (14 in total) including scanning, skimming, identifying the relationship between ideas, using background knowledge, making predictions, inferring the meaning of unknown words, visualising, question-asking, comprehension monitoring and summarising (Cekiso, 2012: 5) which were explicitly taught to the intervention group while the control group received the established reading comprehension syllabus. Similarly, Oyetunji's (2013) study adopted an established transactional teaching model, called the SAIL (Students Achieving Independent Learning) reading intervention, which focuses on reading strategies (the



use of background knowledge, self-questioning, inferencing, rereading, drawing conclusions, identifying main ideas and summarising). The subjects, second year English L2 Education students from a college in Botswana, showed improvement reading comprehension. Locally, Parkinson, Jackson, Kirkwood and Padayachee's (2008) academic literacy module which formed part of the extended curriculum programme for BSc students at the University of Kwazulu-Natal appears to have an equal focus on writing and reading skills. Their reading comprehension instruction included prior knowledge-activating group discussions and other pre- and post-reading strategies such as skimming and summarising (Parkinson *et al.*, 2008: 15-16). Their study revealed that, after two semesters, roughly two-thirds of the students enrolled in the programme had reading abilities that were adequate for undergraduate-level reading demands, although only the top third of the academic literacy students' reading skills were on par with those students entering BSc mainstream courses (Parkinson *et al.*, 2008: 24).

As can be discerned from these studies, reading comprehension and inferencing instruction are types of strategy instruction. Whether teaching one strategy or 14, there is evidence suggesting that these studies were successful in improving students' reading abilities because they actively equipped them with useful tools with which to tackle complex texts instead of assuming that students would pick up these strategies automatically. Various strategies appear repeatedly in the studies discussed above, regardless of the subjects' age. This suggests that the teaching of a useful strategy can be tailored to suit students of a variety of ages. However, not all the strategies that have been mentioned are appropriate for the reading of expository texts; for example, predicting what will happen next is much more conducive to narrative texts that follow a familiar pattern. Furthermore, some strategies are less likely to induce inferential thinking. One such strategy is summarising which can consist mostly of information retrieval. Others, such as scanning and skimming, are already being taught as part of the LST 133 and 143 curriculum. Consequently, for the specific purposes of this study, the focus was on activating prior knowledge, word-level inferences (including anaphoric and vocabulary inferences), inferring the relationships between ideas (particularly cause and effect relationships and contrastive relationships) and question-generation for the purpose of comprehension monitoring.

### **2.8.3 How should inferencing be taught?**

In addition to the content being taught, the instructional approach used when teaching inferencing also requires careful consideration. By far the most commonly used instructional approach in inference and comprehension strategy instruction is explicit instruction with a strong emphasis on mental modelling.

Instead of merely providing students with ample opportunity to practise inference generation, instructors should first make students aware of the need for inferences, explicitly teach them strategies for generating inferences and, in doing so, model their own thinking processes while applying these strategies using the ‘think-aloud’ method (Pretorius & Lephala, 2011: 4; Cekiso, 2012: 2). When demonstrating reading strategies using mental modelling, instructors make otherwise invisible cognitive processes visible to students and provide them with insight into the thinking practices of expert readers (Hansen & Pearson, 1982: 6; Dewitz, Carr & Patberg, 1987: 101; Duffy & Roehler, 1989: 146; Beishuizen *et al.*, 1999: 42; McMackin & Lawrence, 2001: 135; Kispal, 2008: 4; Pretorius & Lephala, 2011: 4). During this process of explicitly teaching and modelling reading strategies, instructors and students also set up a shared vocabulary and discourse that allow students to discuss their own thinking processes; this, in turn, fosters greater awareness and interest in their own learning development (Hansen & Hubbard, 1984: 586-587; McMackin & Lawrence, 2001: 136; Pretorius & Lephala, 2011: 5). After a particular strategy has been explained, modelled and discussed, it is necessary to give students sufficient opportunity to apply it in order to see for themselves that reading actively and strategically is beneficial, ultimately culminating in students who are confident in their abilities and accept responsibility for applying their knowledge independently (Raphael, George, Weber & Nies, 2014: 453).

Before attempting inference exercises on their own, there are several activities that students can engage in in order to stimulate inferential thinking. Firstly, since expository texts are generally less conducive to inference generation than narrative texts, it might be useful for a reading intervention to start with exercises that deal with narrative texts in order to demonstrate to students that they are already capable of inferring information when reading stories (Narvaez, 2002: 166), before moving on to popular science and, eventually, academic writing. For similar reasons, it might be worthwhile to start working with a different medium altogether, such as an audio clip or a short video, which is much less draining on cognitive resources than reading (particularly when reading in L2) (Kispal, 2008: 36). Once students are confident in their ability to infer information and aware of their own thinking processes when doing so, they should find transferring these strategies to expository texts more manageable. Before they start reading a particular text, students can also discuss the topic informally in order to promote the activation of prior knowledge, which will improve their ability to generate knowledge-based inferences while reading (Hansen & Pearson, 1982: 12; Beishuizen *et al.*, 1999: 41).

Once students start with exercises dealing with expository texts, the type of exercises used during the intervention also require careful consideration. Although question-asking by the instructor alone is unlikely to lead to active reading, initially prompting students to infer information from expository texts by asking them questions about the text and their thought processes can help to stimulate metacognitive awareness and help to draw students' attention to implicit information that they might otherwise have missed. Asking students 'How do you know this?' once they have generated an inference as well as asking them to identify any information in the text that contradicts their prior knowledge or the inference they have drawn have proven valuable (Kispaal, 2008: 29-31). However, Van den Broek *et al.* (2001: 522, 527) have cautioned against excessive question-asking by the instructor as too many questions asked during the reading process can overburden the cognitive processing capacities of less capable readers, while questions asked after the reading process will not influence online inference generation. Hannon and Daneman (1998) dealt with the potential risks of question-asking by integrating the questions into the text itself. They did this by changing key sentences into questions in order to emphasise certain relationships and prompt online inference generation (Hannon & Daneman, 1998: 160-161). When coupled with more time being allowed for the reading task, the integrated questions assisted less capable comprehenders in generating more inferences (Hannon & Daneman, 1998: 169). Moreover, students can also be taught to continuously ask themselves questions as they read in order to stimulate inferential thinking and monitor comprehension (Pressley, 2000: 553; McGee and Johnson, 2003: 52; Kispaal, 2008: 32).

Other exercises that help students to develop inferential thinking include the use of graphic organisers, cloze exercises, structured overviews and self-monitoring checklists. Elbro and Buch-Iversen (2013: 440) used graphic organisers with empty boxes that required students to fill in the necessary information in order to make students aware of the fact that they need to contribute information sourced from their own prior knowledge in order to make knowledge-based inferences. Dewitz *et al.* (1987) considered several formats (modified cloze exercises, structured overviews and self-monitoring checklists), and ultimately found modified cloze exercises to be the format that had the biggest positive impact on students' inferential thinking. They reasoned that this result was obtained since "[t]he process of completing cloze exercises is analogous to that of answering inferential questions... [since] the reader becomes accustomed to looking at text carefully while monitoring knowledge and searching for additional information across text" (Dewitz *et al.*, 1987: 102). They also gave students a self-monitoring checklist to use in order to crystalize the cognitive processes involved in inference generation; the checklist included

questions such as “Does the answer make sense in the sentence?” and “Is the answer based upon a combination of knowledge you had before you read the passage and clues in the passage?” (Dewitz *et al.*, 1987: 107). The researchers found that providing students with a structured overview of information had very little effect on their comprehension and inferential abilities; however, they concluded that guiding students in creating their own structured overview instead of merely providing them with an existing overview would yield better results (Dewitz *et al.*, 1987: 117). Similar, more recent studies have found positive effects when training various types of readers to use graphic organisers, including English L2 (Praveen & Rajan, 2013) and those with learning disabilities (Kim, Vaughn, Wanzek & Wei, 2004).

Finally, many studies involving inference or comprehension instruction emphasise the importance of gradual release, progressing from instructor-directed to self-directed thinking during the course of the intervention. Initially, the classes can be highly regulated, with a lot of repetition and guidance from the instructor (McGee & Johnson, 2003: 58). Gradually, the instructor should transfer responsibility to the students, stepping back to enable them to take on more active roles as independent learners (Richards & Anderson, 2003: 292; McGee & Johnson, 2003: 58). This process can be framed as *I do it, we do it together, you do it on your own*; in practical terms, this could include demonstrations from the students, reciprocal teaching and pair-teaching, which have the added benefit of quickly revealing to students any gaps in their understanding (Beishuizen *et al.*, 1999: 42; Simpson & Nist, 2002: 370). By the end of the intervention, the instructor should merely act as a consultant (Beishuizen *et al.*, 1999: 42).

This study drew on the abovementioned strategies and approaches for the inference training intervention. In short, an explicit instructional approach with a strong emphasis on mental modelling was employed. Moreover, students practised the strategies they had been taught using cloze exercises, graphic organisers and structured overviews. Finally, throughout the intervention students were expected to read with increasing independence, ultimately choosing the correct types of strategies to use when tackling a particular text and employing them successfully.

#### **2.8.4 How should inferencing be tested?**

One of the features that complicates reading research is that it is difficult to impossible to test reading comprehension processes directly since they are internal mental processes invisible to the naked eye (Nel *et al.*, 2012: 210; Andrianatos, 2018: 5). Instead, this type of research deals with the products of comprehension and then uses this data to gain insight into a complex cognitive process which cannot be

directly observed. When analysing inferencing, in particular, causes of apparent failure to draw inferences can be difficult to pinpoint as there are so many factors involved (refer to Section 2.6.4).

Reading researchers have attempted to shed light on this process by analysing the relationship between some of the competencies required to draw inferences. Nassaji (2003) found that even in the case of adult readers, lower-level processes such as word-recognition and graphophonic processes can distinguish between skilled and less-skilled comprehenders. Several studies have noted the correlation in background knowledge and inferencing in both primary school and high school readers (Oakhill, Barnes & Bryant, 2001; Bowyer-Crane & Snowling, 2005; Cromley & Azevedo, 2007). However, it is not always possible to ascertain whether a reader fails to draw a knowledge-based inference due to lack of background knowledge, unavailability of such knowledge, lack of awareness for the need to draw an inference, or even issues with identifying the relevant textual information. Oakhill, Barnes and Bryant (2001) attempted to control for background knowledge by teaching the necessary content to the participants of their study prior to administering tests and still found statistically significant differences in the number of knowledge-based inferences that skilled and less-skilled comprehenders draw. While attempting to control for one of the factors that influence a reader's ability to infer information while reading does potentially narrow the playing field, there are methodological issues with the manner in which this study tried to ensure all participants possess the necessary background knowledge, as novel concepts that have recently been introduced are unlikely to be accessible to struggling readers (Kispal, 2008: 35).

The instruments used by reading researchers to test participants' proficiency in various component skills that influence comprehension can also be problematic. Bowyer-Crane and Snowling (2005: 189) note, for instance, the different foci of two comprehension tests that were widely used in the United Kingdom since the early nineties, stating "[t]he NARA II was heavily reliant on the generation of knowledge-based inferences"; in contrast, "the WORD comprehension subtest was biased towards the retention of literal information", meaning that two comprehension tests targeted at the same level could be assessing different competencies. In a study that analysed the metacognitive monitoring in the processing of anaphors in skilled and less skilled comprehenders, Ehrlich, Remond and Tardieu (1999) were similarly limited by their instruments. The researchers provided participants with two texts, one cohesive and one containing anaphoric inconsistencies, and then compared the reading times of skilled and less-skilled readers while also taking into consideration their performance on a comprehension test that assessed the ability to resolve anaphoric inferences. Upon finding that both groups read more slowly when confronted

with an inconsistent text but that only the stronger group were able to reliably infer content from the text, the researchers concluded that the less-skilled readers were sensitive to the inconsistencies but were unable to repair comprehension due to lack of explicit metacognitive strategies. While this may well be the case, and the influence of metacognition in inference generation is well established (Haller *et al.*, 1988: 5; Cekiso, 2012: 1; Oakhill & Cain, 2012: 95), this study once again illustrates the difficulty in measuring cognitive processes like inferring information, the limitations of the instruments used to do this, and the assumptions reading researchers end up making when deducing one ability (in this case metacognitive repair strategies) from a distinct result (in this case reading speed and comprehension test scores).

Fortunately, experimental studies that assess the effect of inference training interventions on reading comprehension tend to obtain relatively consistent results when deploying a pre- and post-test for both an intervention group and a control/baseline group and then determining the effect size of the intervention. Whether working with primary school (Hansen & Pearson, 1982; McGee & Johnson, 2010; Elbro & Buch-Iverson, 2013) or high school students (Haller *et al.*, 1988), whether the intervention lasts four hours or 20 hours, these studies have consistently found that training in inference generation, metacognition and reading comprehension strategies can have a meaningful effect size; moreover, irrespective of the nature and condition of the intervention, less-skilled readers tend to show the most improvement. In short, it is difficult to assess cognitive processes like inferencing with complete certainty. However, testing readers' improvement in generating inferences by means of a reliable and internally consistent pre- and post-test is feasible.

While there already exists a wealth of research on reading competencies and literacies of learners at primary school level, both in South Africa and globally, more research is urgently needed on reading and literacy at tertiary level. This study contributes to this need and also starts to consider the next step in the process of improving reading and literacy at tertiary level: how best to respond pedagogically. Practical resources such as the worksheets have also been produced, and the effects of these resources, when used in an existing academic literacy intervention, have been evaluated.

## 2.9 Conclusion

This chapter presented a review of literature relating to core concepts of reading comprehension, reading in a second language and inferring information from text. Inferencing was found to play a key role in reading comprehension which, in turn, is essential for academic success. The relationship between

reading competencies and academic success can help to inform initiatives to improve academic literacies and thus reduce attrition at universities. To this end, a number of theoretical perspectives and models were investigated to determine the optimal theoretical approach to reading comprehension instruction in the context of the South African higher education environment. Gradually progressing from instructor-directed to self-directed thinking during the course of the intervention has been established as a necessary approach to higher-level reading strategy instruction. Consequently, strictly “student-centred”, inquiry-based approaches influenced by constructivist conceptions of the learning process are not appropriate for reading comprehension strategy instruction. Instead, social-cognitivism has been found to be better suited to informing this type of education as it allows for explicit instruction. In the next chapter, the methodological framework and research design will be provided for this study which aimed to design and evaluate a reading comprehension intervention focusing on inferences in expository text for extended curriculum programme students.

## CHAPTER 3: Methodology

### 3.1 Introduction

This chapter discusses the design process and methodology used during the four phases of this study. It begins by considering the research context and design in light of the research questions and with specific reference to the influence of the COVID-19 pandemic. Next, ethical considerations are reported on; thereafter, the pilot phase during which the main instrument was developed is described. This is followed by a discussion of the four phases of the main study, namely 2018 (Phase 1), 2019 (Phase 2), 2021 (Phase 3) and 2022 (Phase 4), including the sampling methods, instruments, data collection procedures and data analyses processes used in each of these phases. Finally, the chapter provides an overview of the three interventions assessed, with a focus on the self-developed inferencing competencies intervention that took place during the last phase of the main study.

### 3.2 Research design

Due to the impact of the COVID-19 pandemic, the research design changed during the course of the study. In order to avoid confusion, the changes are discussed early in this chapter. First, the original research design is discussed; then, the revised design is described along with the factors that necessitated these methodological changes.

#### 3.2.1 The original research design

The original aim of this study was to determine the effect of an inference training intervention on the ability of a group of Extended Curriculum Programme (ECP) students to infer information from texts. This group of students was already participating in a credit-bearing academic literacy intervention; however, during the first two years of working with these students as an ECP lecturer, I became concerned about their poor reading comprehension capabilities, especially when drawing inferences was required. The academic literacy intervention did not include any content on reading beyond two weeks on the processes of skimming, scanning, critical reading and study reading, and so it was not surprising that the participants' reading proficiencies did not appear to improve as much as their writing proficiencies (which received substantially more attention throughout the intervention). This deserved more rigorous attention, which led me to explore whether an additional intervention that focussed explicitly on inferencing could improve



this ability. However, there were no appropriate materials or tests, so these materials first had to be developed.

The original quasi-experimental, quantitative study was structured in three parts as follows:

- *2018*: Development of inferencing materials, i.e. inferencing test instrument, relevant texts and activities for inferencing intervention, and pilot study to test the AIT. This took place during 2018.
- *2019*: Collection of pre- and post-baseline group data in 2019 to serve as counterfactual data. These groups completed the first semester of the credit-bearing academic literacy intervention, in addition to a further 14 hours of instruction on summarising, referencing and grammar to account for additional teaching time on inferencing that would occur in 2020.
- *2020*: Collection of pre- and post-intervention group data to assess impact of whole class face-to-face inferencing intervention of 14 hours, supplementing the existing first-semester academic literacy intervention. This started in 2020 but was interrupted by the impact of COVID-19 and abandoned.

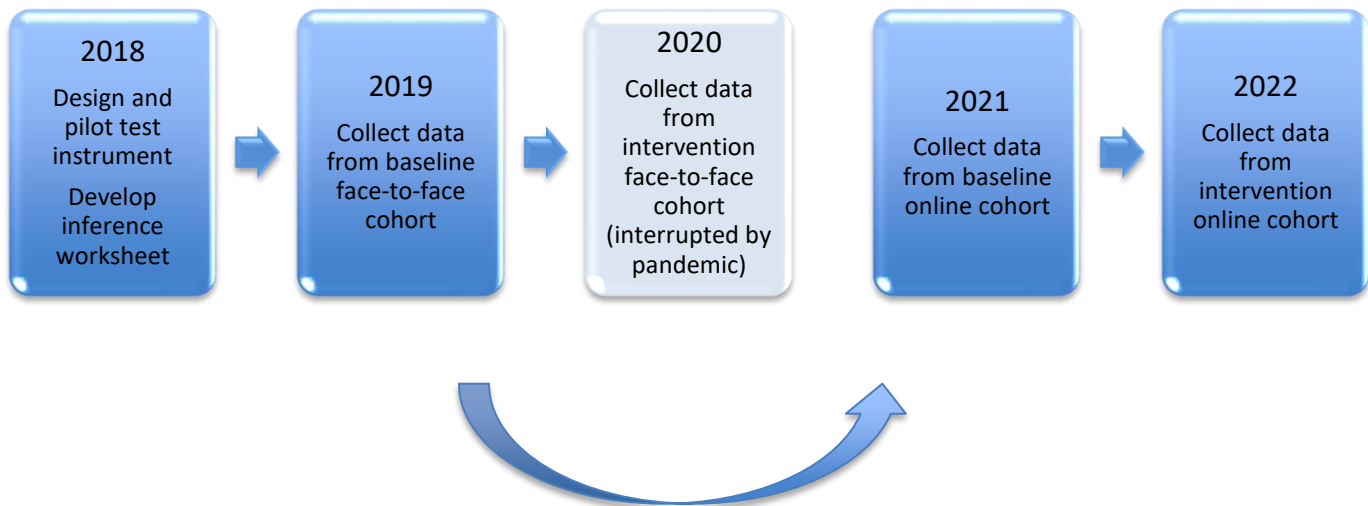
To allow for valid statistical analysis, due to limited student numbers, the intervention group and the counterfactual group had to be sampled from two different years' cohorts. Each cohort would have received face-to-face instruction twice a week, starting with the baseline group in 2019. For the 2019 group, this instruction included only the established, writing-focused academic curriculum. In 2020, an inferencing intervention would then have been undertaken with another group of students, replacing the additional instruction on summarising, referencing and grammar that was undertaken in 2019 to ensure each group receives the same amount of face-to-face instruction, with statistical measures put in place to indicate that these two groups were comparable. The original plan was to use both a reliable self-developed instrument which measured students' inferencing abilities (the Academic Inferencing Test) as well as an existing standardised instrument measuring students' academic literacy levels (the Test of Academic Literacy Levels [TALL]), to test both groups' improvement in two metrics, namely academic literacy and inferencing.

However, due to the outbreak of the COVID-19 pandemic the study was interrupted half-way during the intervention group's data-collection stage, which would have taken place in the first semester of 2020, by the sudden move from face-to-face instruction to online instruction in March 2020. There was great uncertainty about whether students would return to classes after the initial lockdown period instituted by the South African government.

Although the university's instruction eventually continued online in May 2020, it was initially decided to postpone the rest of the reading intervention until after contact classes were expected to resume in the second semester of 2020. At that stage, it was decided that the students would not be able to cope with the complexity of the intervention if it were presented online in a format they were unfamiliar with and had no time to prepare for, in an extraordinarily stressful time for all involved, due to the sudden upheavals caused by the pandemic. Moreover, since the students were scattered throughout the country during the lockdown, their access to computers and reliable Internet connections was uncertain. Therefore, the only feasible option appeared to be to wait for contact classes to resume. Since it was initially assumed that contact classes would eventually resume during the 2020 academic year, provision was made for an extra recap session with the participants before they would continue with their worksheets and complete the post-test. Unfortunately, the date for the return to campus kept being extended. Consequently, the study's research design needed to be adapted significantly. Furthermore, the opportunity to use the TALL as instrument was lost during the revised online sections of the study (discussed in Section 3.2.1), as the conditions for using this test included that it be administered securely under controlled conditions in a face-to-face environment.

In sum, the COVID-19 pandemic significantly impacted on the design of the study. The original research design involved a much more straightforward comparison of the improvement demonstrated by one baseline group (in 2019) and one intervention group (2020). Both of these groups were expected to receive face-to-face instruction as had been the case until the pandemic. However, when strict lockdown measures were implemented six weeks after the 2020 academic year commenced, the intervention group had only completed pre-tests and two out of eight intervention classes. Hopes of continuing with the original research design with a face-to-face intervention group in 2021 also came to nothing, as most South African universities announced early in 2021 that tuition would remain online for the foreseeable future. Since face-to-face classes never recommenced in 2020 or in 2021, baseline and intervention groups were no longer comparable, forcing a different approach to the study. However, certain aspects of the original research design were included in the new design. Specifically, the content that was developed in 2018 was retained and adapted, and the data collected from the 2019 baseline group was incorporated into the new design, which now also compares two versions of the same academic literacy intervention presented in two modalities, face-to-face instruction and online instruction. Figure 3.1 below summarises the vicissitudes in the study design in response to the COVID-19 pandemic.

Figure 3.1: Revision of the research design in response to COVID-9 lockdown



### 3.2.2 An introduction to the revised research design

When it became apparent that contact classes were unlikely to resume in 2021, the decision was made to adapt the intervention to online instruction. All content used in this study, including the instruments for data collection, had been developed assuming face-to-face instruction; thus, it was necessary to adapt the instruments to accommodate online instruction, revise the intervention phase of the original three-phase research design and add another phase to collect data from an online baseline group. In other words, a decision was made to make use of existing data, where possible, and to integrate these into the new research design. While the focus of some research questions shifted, the new research design remained quantitative and quasi-experimental. The new research design consisted of four phases, which are described below.

- *2018 (Phase 1):* Material development and pilot  
Texts were sourced and adapted; test instruments were developed and analysed for reliability; questionnaire and worksheets were developed for the inferencing intervention (assuming face-to-face instruction).
- *2019 (Phase 2):* Face-to-face academic literacy intervention  
Data were collected from one baseline group that received face-to-face instruction (as per the original research design). Both the self-designed Academic Inferencing Test (AIT) and the TALL were used to collect data from the 2019 group.

- *2021 (Phase 3): Online academic literacy intervention*

Data were collected from a second baseline group that received online instruction in 2021, after adapting the instruments for online use. Only the self-designed AIT was used for the 2021 group. It was administered as an online test. Intervention worksheets were adapted for online instruction.

- *2022 (Phase 4): Online academic literacy and inferencing interventions*

The online version of the original inferencing intervention was conducted. Data were collected from this intervention group sampled from the same 2022 cohort. The AIT and Reading Habits were used in this phase.

It was possible to convert the intervention's introduction, worksheets and feedback to the online learning management system used by the University of Pretoria; however, there were significant limitations to adapting the intended test instruments. The Academic Inferencing Test was developed to be written in-person under supervision, and was piloted as such. While the majority of this test's questions could be converted to online questions, some questions were excluded from the online version of the Academic Inferencing Test due to the fact that a quick online search could provide the correct answer, and there was no means to prevent this. Moreover, the TALL could not be reproduced online due to copyright restrictions. Therefore, it was excluded from the 2021 and 2022 phases of the study. Consequently, during Phases 2 and 3, only the Academic Inferencing Test was used with the 2021 online baseline group and the 2022 online intervention group.

This new version of the original study still looked at ECP students' ability to resolve anaphoric ties and infer text-semantic relationships while reading, and how that ability improved over a period of time, but it was no longer possible to draw comparisons between this ability and academic literacy (beyond the 2019 baseline group, which is still included) due to the absence of the TALL in Phases 2 and 3. Thus, instead of comparing growth in inferencing and academic literacy over two separate years, under two conditions, the new study compares growth in inferencing over three separate years, under three conditions.

### **3.3 Research context**

This study assessed the impact of various iterations of an academic literacy course (in Phases 2 and 3), and the same academic literacy course combined with an inferencing intervention (Phase 4) on

participants' proficiencies in inferencing. Specifically, it compared students' inferencing abilities under various conditions. See Section 3.2.2 for a more comprehensive description of the phases.

The credit-bearing compulsory academic literacy intervention in question is one of two successive intensive semester-long courses specifically developed for students in an ECP; these students were unable to meet the entrance requirements for their chosen degree programmes, and can thus be considered as being academically vulnerable. The syllabus of the existing academic literacy intervention includes practical academic literacy competencies such as conducting research, writing structured paragraphs and essays, referencing sources, synthesising information and taking notes. In addition, it includes targeted grammar instruction that addresses key grammatical issues frequently encountered by undergraduate students, such as linking ideas with discourse markers and using pronouns correctly. The intervention also contains a brief section on reading strategies such as scanning and critical reading; however, explicit instruction in how to improve reading *comprehension* through strategy instruction is not included. Rather, the assumption is that students will acquire reading comprehension abilities through the process of becoming increasingly academically literate.

As briefly explained in Chapter 1 (cf. Section 1.2.3), the University of Pretoria's ECP provides academically vulnerable students with the opportunity of accessing their chosen degree programmes by completing an extra foundational year of instruction before they enrol in mainstream undergraduate degree programmes. The ECP students are diverted to the ECP if their Grade 12 marks are above the minimum requirements for university admission but not high enough to meet the entry requirements for their chosen degree programme. They are then able to re-apply to their chosen degree programme with a slightly reduced course load after completing the ECP.

In addition to academic literacy, ECP students complete modules in computer literacy, mathematics and, depending on their chosen area of specialisation, other content modules such as accounting, business management, biology, chemistry, statistics and physics. The current study was focused only on those students in the Bachelor of Commerce (BCom) leg of the ECP; therefore, those who selected accounting, business management and statistics as major subjects.

### **3.3.1 Aim of the study and research questions**

To recap, the aim of this study is to determine the extent to which the inferencing proficiencies of ECP students improved in three different phases, each of which provided a different instructional context.

This overarching aim was addressed using a quasi-experimental, quantitative research design, with the following research questions. The phase in which each of these questions is addressed is indicated in brackets at the end of each sub-question.

**Research Question 1: What is the effect of an intervention on the academic inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

- 1a A 78-hour face-to-face academic literacy intervention (Phase 2 in 2019)
- 1b A 78-hour online academic literacy intervention (Phase 3 in 2021)
- 1c A 78-hour online academic literacy and inferencing intervention (Phase 4 in 2022)

**Research Question 2: What is the effect of an intervention on the anaphoric inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

- 2a A 78-hour face-to-face academic literacy intervention (Phase 2 in 2019)
- 2b A 78-hour online academic literacy intervention (Phase 3 in 2021)
- 2c A 78-hour online academic literacy and inferencing intervention (Phase 4 in 2022)

**Research Question 3: What is the effect of an intervention on the causal inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

- 3a A 78-hour face-to-face academic literacy intervention (Phase 2 in 2019)
- 3b A 78-hour online academic literacy intervention (Phase 3 in 2021)
- 3c A 78-hour online academic literacy and inferencing intervention (Phase 4 in 2022)

**Research Question 4: What is the effect of an intervention on the contrastive inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

- 4a A 78-hour face-to-face academic literacy intervention (Phase 2 in 2019)
- 4b A 78-hour online academic literacy intervention (Phase 3 in 2021)
- 4c A 78-hour online academic literacy and inferencing intervention (Phase 4 in 2022)

**Research Question 5: What is the effect of an intervention on the general inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

- 5a A 78-hour face-to-face academic literacy intervention (Phase 2 in 2019)
- 5b A 78-hour online academic literacy intervention (Phase 3 in 2021)
- 5c A 78-hour online academic literacy and inferencing intervention (Phase 4 in 2022)

**Research Question 6: What is the effect of a 78-hour academic literacy intervention on ECP students' academic literacy proficiencies, overall and according to stratified ability groups?**

**Research Question 7: What is the relationship between ECP students' inferencing proficiencies and their academic literacy proficiencies during a 78-hour face-to-face academic literacy intervention? (Phase 2 in 2019)**

**Research Question 8: What are ECP students' reading habits, and what are the relationships between these habits and students' inferencing proficiencies, overall and according to stratified ability groups?**

### **3.4 Research design: Phases 1 to 4**

The design for this study is based within the positivist research paradigm. According to Park, Konge and Artino (2020: 690), “studies aligned with positivism generally focus on identifying explanatory associations or causal relationships through quantitative approaches”. In this study, the changes in inference and academic literacy performance in the context of different interventions were investigated. At the same time, associations between factors like reading habits, language profiles, entry-level proficiencies and rate of improvement were examined in order to identify risk factors for sub-optimal development in inferencing during an academic literacy intervention which includes direct instruction on inferring information from expository text. A quantitative quasi experimental design was selected for this study in order to investigate the abovementioned questions. Pre- and post-tests were used to collect data on the effect of three different interventions, namely a face-to-face academic literacy intervention, an online academic literacy intervention and an online academic literacy intervention supplemented by an inferencing intervention.

The practical application of the study was completed in phases, over a period of four years, as follows:

*2018 Phase 1:*

During the first phase, two test instruments (AIT and Reading Habits questionnaire) and inference worksheets for the intervention were developed. was piloted with a group of 53 participants from the 2018 cohort.

*2019 Phase 2:*

During the second phase, 51 participants from the 2019 cohort of BCom ECP students provided baseline data for a cohort receiving face-to-face instruction. These participants received an additional 14 hours of instruction during the first semester (when the inferencing intervention in Phase 3 also took place) to control for contact time to match that of the intervention group, for a total of 78 hours of instruction. However, for the 2019 cohort this time was not spent on reading instruction but a broader variety of academic literacy competencies, including grammar, punctuation, referencing and summarising. Their academic literacy levels and inferencing abilities were tested before the commencement of the intervention and at the end of the first semester.

*2021 Phase 3:*

In the third phase, 54 students from the 2021 cohort formed the baseline group which received the online version of the standard academic literacy intervention, along with the online version of the extra 14 hours of instruction in a broad variety of academic literacy competencies, for a total of 78 hours. Their inferencing abilities were tested before the commencement of the intervention and at the end of the first semester.

*2022 Phase 4:*

In the fourth phase, 77 participants from the 2022 cohort of BCom ECP students received an additional 14 hours of instruction on inferencing that was integrated into their existing academic literacy intervention, for a total of 78 hours of instruction. In addition to the Academic Inferencing Test, the participants from the 2022 intervention group completed a questionnaire about reading habits, called the Reading Habits questionnaire. This group's inferencing abilities were tested before the commencement of the intervention and at the end of the first semester.



In order to strengthen confidence in the findings of the research, this study analysed triangulated data from more than one source. Triangulation involves using more than one type of methodology (for example, quantitative and qualitative methodologies) or more than one source of data (for instance, collecting data from different test instruments) (Alderson, 1992: 285); the latter option is used in the current study. Triangulation strengthens cross-validation when distinct methodologies of collection, or sources of data, yield congruent results (Noble & Heale, 2019: 67). Thus, it acts against the possible bias of relying on only one source or method (Lynch, 1996: 60), meaning that this approach ultimately has the ability to yield more credible and reliable results (Patton, 2002: 93). Throughout the last three phases, this study made use of triangulation, specifically by adopting varied data collection protocols (both face-to-face and online tests) and varied instruments (the TALL, the AIT and a questionnaire about reading habits and language profiles) when assessing the effect of different interventions on participants' ability to infer information from texts.

### **3.5 Ethical considerations**

Ethical clearance for this study was obtained from the Faculty of Humanities and the Faculty of Economics and Management Science at the University of Pretoria (see Appendix A). Students were invited to sign an informed consent letter at the beginning of the study which informed them of their right to withdraw their participation from the study at any stage; during the online phases, the consent letter was provided in digital format. No students were disadvantaged in any way for choosing to withdraw from the study. Two ethical factors were taken into consideration for this study, namely anonymity and voluntary participation. The identity of all students who were involved in the study were protected during and after the study. To this end, there has been no identification of any student by name or any other defining characteristics in this dissertation. Students were assigned numbers for the purpose of statistical analysis of the data collected from the various tests.

### **3.6 The pilot study: instrument and material development in Phase 1**

The first phase was the pilot study. The aim of the pilot was to design and test an inference instrument for assessing the students' inference competencies during reading, and to design appropriate material, namely the AIT instrument, the Reading Habits questionnaire and the worksheets used in Phase 4. Since

no appropriate subject-specific inferencing test for BCom students at university level exists to my knowledge, a test was developed specifically for this study.

### 3.6.1 Design of the Academic Inferencing Test

The Academic Inferencing Test used in this study was developed in consultation with a subject expert (Elizabeth Pretorius) who had previously developed a similar test, although the test used in that study was subject-specific to medical students. A statistician at the University of Pretoria was also consulted in order to address issues related to the reliability of the AIT (refer to Section 4.2 for a discussion of the AIT's reliability and validity).

The Academic Inferencing Test was designed to measure three inferencing constructs: anaphoric inferences, text-semantic inferences (consisting of contrastive as well as causal inferences), and general inferences (consisting of knowledge-based and elaborate inferences – see Section 2.6.1). It has a total score of 55.

A variety of question types are featured in this test. Two of these were influenced by Pretorius' (2000) inferencing test, specifically questions relating to anaphoric questions and questions dealing with causal relationships. The Academic Inferencing Test's anaphoric questions are based on underlined anaphors (individual words or short phrases) in a paragraph. In the hard-copy version of the test (see Appendix B), participants had to correctly identify the referent that the underlined anaphor refers to, underline the referent and connect the two with an arrow. In the online version of the test, they had to copy and paste the referent into a text-box. Questions that dealt with causal relationships were sometimes structured as visual organisers with either the cause or the effect left out, as this type of format is particularly useful in depicting causal relationships. When the test was administered online, these questions were set up as 'short answer' questions with accompany visual.

Apart from the visual organisers and the anaphoric questions, the rest of the test consists of multiple-choice questions with four distractors or cloze questions with four options provided (which ultimately function much like the multiple-choice questions) as these question types are the most familiar to students. The questions were developed in accordance with the guidelines for writing multiple-choice items as put forward by Haladyna, Downing and Rodriguez (2002). These guidelines were based on a meta-analysis of 54 textbooks and research studies on educational testing, and they endeavoured to

provide educators with a framework for setting up reliable and valid test items. Specifically, these authors concluded that effective multiple-choice items must be written in plain, clear language, with the central idea preferably contained in the stem of the question, while the distractors ought to be similar in length, detail and syntactical structure with as little content overlap between the distractors as possible (Haladyna *et al.*, 2002). While the authors note that the research suggests that three distractors are sufficient, four distractors are commonly used in high-stakes or large-scale assessment and so were consistently used throughout the Academic Inferencing Test. Finally, the authors warn against developing distractors that are either copiously correct or blatantly absurd, arguing instead for distractors that represent common errors while still remaining plausible (Haladyna *et al.*, 2002: 312).

Examples of the different types of questions are provided in Figure 3.5.1, which depicts an excerpt from the Academic Inferencing Test exemplifying an anaphoric question (Question 3.1), a causal relationship question (Question 3.2), a contrasting relationship question (Question 3.3) and a general inference question (Question 3.4) along with the accompanying text on which the questions are based. The complete test can be found in Appendix B.

As this test was designed to be written exclusively by BCom students, and since domain-specific knowledge plays an important role in inference generation (see Section 2.6.4.1), only texts dealing with commerce-related subject matter were used. Typical topics included market research, managerial styles and features of successful companies. Texts were chosen with care to ensure that the content was sufficiently general and therefore likely to be something about which all BCom students have at least some background knowledge.

Next, to ensure some consistency across the texts in terms of readability, the difficulty of these test texts was assessed using the Flesch-Kincaid Grade Level analysis. Where necessary, alterations were made to the texts to ensure an appropriate reading level, with Grade 10 and Grade 13 forming the lower and upper limits of the paragraphs that were adapted for the test. While Grade 13 is the level at which students enrolled for their first year of university should be reading, based on research findings (see Section 1.2.1), the range of reading levels was lowered somewhat in order to be more representative of the level at which the students *do* read, rather than the level at which they *should* read. I worked from the assumption that it would likely be more feasible to expect students to apply newly learned skills to texts that are at or even slightly below their reading level rather than being confronted with texts pitched above their reading

level. Moreover, the population includes students who passed Grade 12 English at FAL level, which has been found to use texts that are on average two grades lower in difficulty (thus, Grade 10) based on the Flesch-Kincaid scale (Sibeko, 2021: 51).

The reliability of the test as a whole and its subcomponents were determined. The reliability of an instrument describes the stability and consistency of the instrument; in other words, a reliable instrument will obtain similar scores if repeated (Bandalos, 2018: 115). The reliability of the Academic Inferencing Test is further discussed in Section 4.2.

### **3.6.2 Sampling**

All participants for this pilot study were drawn from BCom ECP students at the University of Pretoria. During the pilot phase, 110 ECP BCom students who were enrolled in the programme in 2018 were invited to participate in two rounds of inference tests as an alternative to another reading assignment. Some of these students were excluded from the final sample due to missing a test or because they did not consent to their data being used. Ultimately, data from 53 participants were used.

### **3.6.3 Procedure**

The Academic Inferencing Test was piloted in 2018, in order to assess its reliability and to determine appropriate test protocol, such as the amount of time students needed to complete the test.

Figure 3.2: Excerpt from the Academic Inferencing Test

**Excerpt from the Academic Inferencing Test**

**QUESTION 3** **(4 marks)**

The arrival of the Internet as a significant channel for consumption should, arguably, have helped many businesses shake off their reliance on asking customers what they think. With such a wealth of real-time behavioural data available and far easier ways to test alternative approaches, there should be no need to ask people what they think they think, and it should be immediately evident when such testimony proves to be inaccurate. However, the overall trend has been for more market research, not less. Many Internet retailers cannot resist including a pop-up that invites visitors to complete a short survey. More broadly, the ease, speed, and relative low cost of surveys sent out by email have created a new medium for soliciting opinion. It says much about the strength of faith in market research and the ease with which believers overlook its inaccuracies that, rather than having its shortcomings highlighted, it has prospered online.

**3.1 In Paragraph 3, underline the words/phrases/sentences that you think the underlined pronoun or noun refers to, and draw in an arrow to link them, as you did in the previous section. (1)**

**3.2 Paragraph 3 describes the reason why there is no need to use surveys and questionnaires to ask consumers what they think they think. Identify this reason and use it to complete the following diagram. (1)**

Now that many people use the Internet to browse for products and make purchases,

---



---

→ as a result →

there is no need to ask consumers what they think they think.

**3.3 Carefully read Paragraph 3 again and select the option below that accurately states some of the information provided in the paragraph. (1)**

- A. The increasing popularity of online shopping has made it even more pertinent for companies to know what their potential customers think; therefore, survey-based market research is increasing.
- B. Most people believe that survey-based market research is reliable; however, the increasing popularity of online shopping has made it much more difficult to find customers willing to be interviewed.
- C. The increasing popularity of online shopping has made it very easy for market researchers to access more reliable data on shoppers' preferences, yet survey-based research is as prevalent as ever.
- D. The prevalence of survey-based research has decreased now that customers are able to do their shopping online; this is as a result of the strength of faith in market research.

**3.4 Based on the information provided in Paragraph 3, how can we describe businesses' relationship with market research? (1)**

- A. They still rely on old-fashioned methods to implement market research.
- B. They rarely use market research now that more efficient methods are available.
- C. They have adapted market research over the years to make it more reliable.
- D. They still find it difficult to overcome their reliance on market research.

### 3.6.3.1 Administration

Four separate inference tests based on different texts but containing similar questions across the different inference components were written by the same group of BCom ECP students over the course of the 2018 academic year. These tests were written under standard university test conditions in the ‘normal’ group contact teaching context, thus ensuring that external variables were controlled for as far as possible. Each of these pen-and-paper tests were written on campus during class time. They were administered in a lecture hall, by myself, after which I also gave brief verbal instructions on how to answer the multiple-choice questions and gap-fill questions. The questions dealing with anaphoric inferences had more complex instructions and therefore required a demonstration on how to answer these questions using an example that had been prepared beforehand. I used an over-head projector or a laptop connected to the data projector for this demonstration. Once the demonstration had been completed, the participants were given 100 minutes (later reduced to 90 minutes) to complete each test. There were no serious complications during the pilot. During the first test, it became apparent that one question referred to the wrong paragraph as a reference. This was pointed out by a student, and I made an announcement to the group. One of the students who participated in the pilot was severely visually impaired; consequently, her test had to be printed in a larger font size.

### 3.6.3.2 Marking, scoring and data analysis

I collected and marked the tests, which were moderated by two other subject experts. Item scores were captured and analysed by means of a Rasch analysis.

### 3.6.4 Pilot results

For the four pilot tests, test score means ranged from 55.83 to 68.26%, and standard deviations ranged from 12.05 to 18.45. The descriptive statistics of these tests are given in Table 3.1

Table 3.1: Pilot Test descriptive statistics

Test	Sample size	Mean test score%	Std Dev
Pilot 1	53	73.76	10.87
Pilot 2	53	68.26	18.45
Pilot 3	53	55.83	12.05
Pilot 4	53	60.54	13.16

For a visual representation of the distribution of the data for the pilot tests, refer to the box and whisker graphs in Figures 3.3 to 3.6. These figures and Table 3.1 provide a basic understanding of each test before unsuitable items were deleted. Across the four pilot tests, a total of 155 items were tested. In total, 39 items out of 155 were removed after the pilot, based on the results of a Rasch analysis. Of those, 34 items were found to either have a low correlation with the construct (PT measure corr.  $< 0.2$ ), which rendered them unreliable, or were found to score outside of the acceptable range for the infit and outfit measures ( $0.5 \geq \text{MNSQ} \leq 1.5$ ;  $-1.9 \geq \text{ZSTD} \leq 1.9$ ), meaning that these items did not accurately and predictably fit the construct. Five additional items were excluded due to item levels that were either too low or too high. Two of these items were excluded due to the item difficulty not being reflective of students' ability; in other words, the item was found to be too difficult (the item measure was close to 3). Three more items were excluded for being too easy (the item measure was close to -3), since such items cannot differentiate between the participants' abilities. Of the remaining 116 items, 55 were selected for the AIT which, in turn, was split into two halves to be written in separate sessions. At this stage, the selection of items was made based on the number of reliable items attached to each excerpt. In order to maximise test efficiency, excerpts with more items were selected over those with fewer items, until the required number of items per construct was reached. This ensured that the test was as efficient as possible since reading the paragraph on which the questions are based takes time, and paragraphs with only one item would take up a lot of test time and produce very little data.

The final tests' reliability (calculated as a Cronbach Alpha score) varied between 0.71 and 0.83, while the reliability scores of each of the three constructs varied between 0.61 and 0.79. Refer to Table 3.2 for a breakdown of the final test according to construct. Although the AIT has a strong correlation with the TALL (see Section 4.3.7), which has been found to be both reliable and valid in a variety of contexts, future research could work to further determine and strengthen the construct validity of the AIT. Currently, the test's face validity is strengthened by the implementation of feedback from other content-experts as well as by established research on the topic of testing reading comprehension. The development of test items was influenced by Pagé's (1990) examination of criterion validity when assessing inferencing and comprehension in a variety of formats, which found that certain types of questions (such as sentence-reinsert questions) have high psychometric value, while others (such as those requiring summarisation) are less able to distinguish between less-proficient and more-proficient readers. Further insight was derived from Pretorius's (2000) study which provided an accessible question structure for anaphoric inferences (see Section 3.6.1).

Table 3.2: Number of items per construct in Academic Inferencing Test

Construct		Number of items
Anaphors		25
Causal inferences	Text-semantic inferences	10
Contrasting inferences		10
General inferences		10

### 3.6.5 Changes made after pilot study

The first alteration to the Academic Inferencing Test concerned the time participants were given to complete each half of the test. They were initially given 100 minutes to complete each test, but this time was reduced to 90 minutes after the first test when it became apparent that the majority of the students did not require the full 100 minutes.

The memorandum for the Academic Inferencing Test was also adapted after the pilot phase where necessary to improve the extent to which individual items were able to discern between more-capable and less-capable readers. Such adjustments were made after consultation with two subject experts. Especially in the case of anaphor or graphic organiser questions where answers were much more varied than for multiple choice questions, a detailed memorandum which accounts for a wide variety of answers was developed. The accompanying memorandum that was finalised during the pilot was used when marking the tests written by participants in all four phases of the main study.

## 3.7 The main study: assessing the effect of academic literacy interventions in Phase 2 to 4

As explained in Section 3.2.2, the main study took place over three years. Table 3.3 provides an overview of the different treatment and test combinations for each cohort in Phases 2, 3 and 4.



Table 3.3: Overview of study, Phases 2 to 4

Year and phase	Mode	No of participants	Academic literacy intervention	Inferencing intervention	TALL	AIT	Reading Habits questionnaire
Phase2 (2019 cohort, Sem 1)	Face-to-face baseline	51	x		x	x	
Phase 3 (2021 cohort, Sem 1)	Online baseline	54	x			x	
Phase 4 (2022 cohort, Sem 1)	Online intervention	77	x	x		x	x

### 3.7.1 Sampling and participants

According to Hanneman, Kposowa and Riddle (2013: 282), random sampling should ideally be used in order to accurately test for a difference between the performance of different groups. However, this is not always possible and other sampling procedures can also be used, and typically are in the field of education. For this study, a purely random sampling method was not feasible. In all four phases, a sample of convenience was used, involving a quasi-experimental study with established classes, as only those students who were assigned to classes taught by myself were able to participate given the time constraints. Students are randomly allocated to these classes at the beginning of the year, based on student number rather than surname (which in South Africa can sometimes cluster groups from certain cultural backgrounds together), academic ability or any other similar factors. Thus, while I was not able to use statistical means with which to randomly allocate students, the assumption is that students were not grouped together based on any common characteristics. While using a sample of convenience has the potential to present certain biases, no other method was feasible in this particular research context. Fortunately, quasi-experimental research designs such as the one used here are not unusual in educational settings (which tend to have the same sampling limitations discussed here) and have been found to “uncover clear causal patterns” in such settings (Gopalan, Rosinger & Ahn, 2020: 232).

Figure 3.3: Box and whisker graph for Pilot Test 3

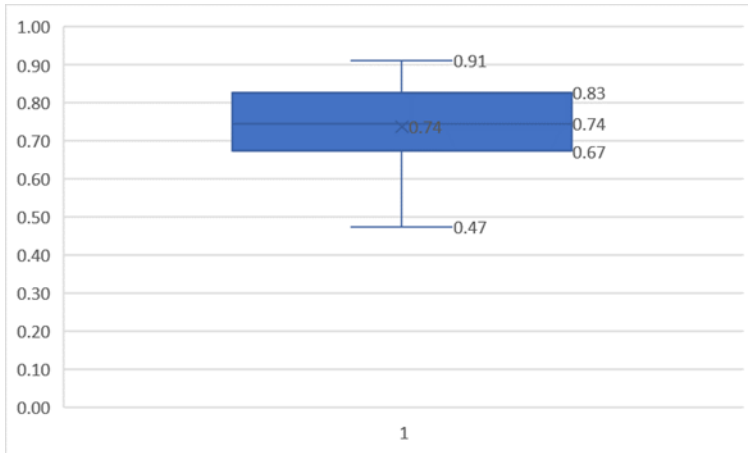


Figure 3.4: Box and whisker graph for Pilot Test 3

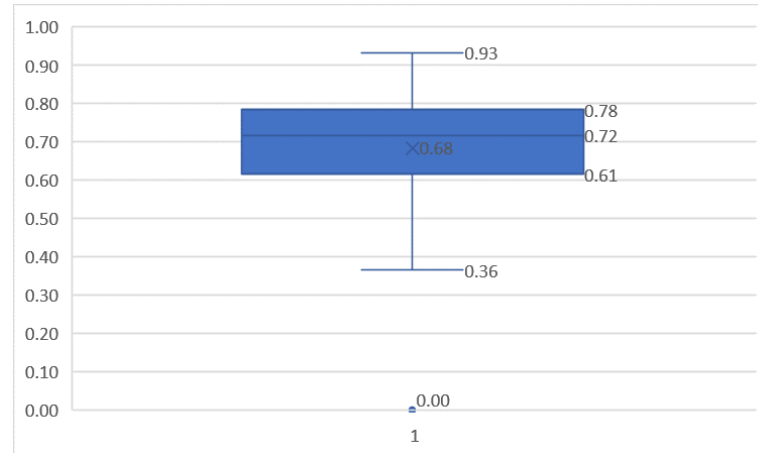


Figure 3.5: Box and whisker graph for Pilot Test 3

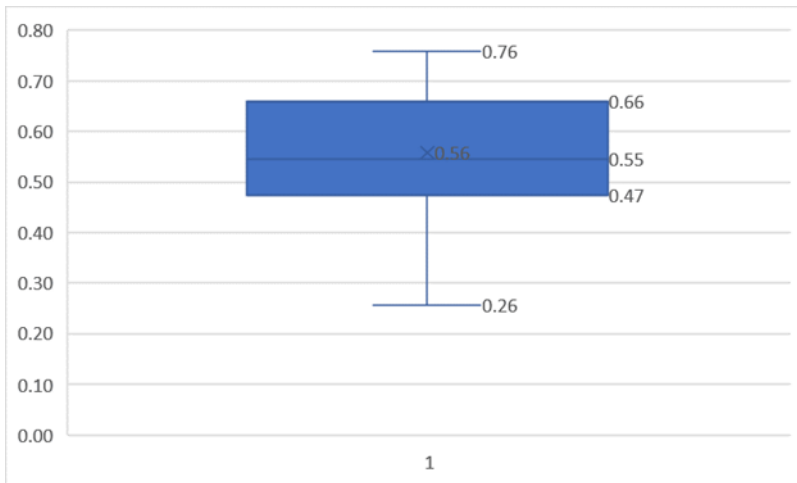
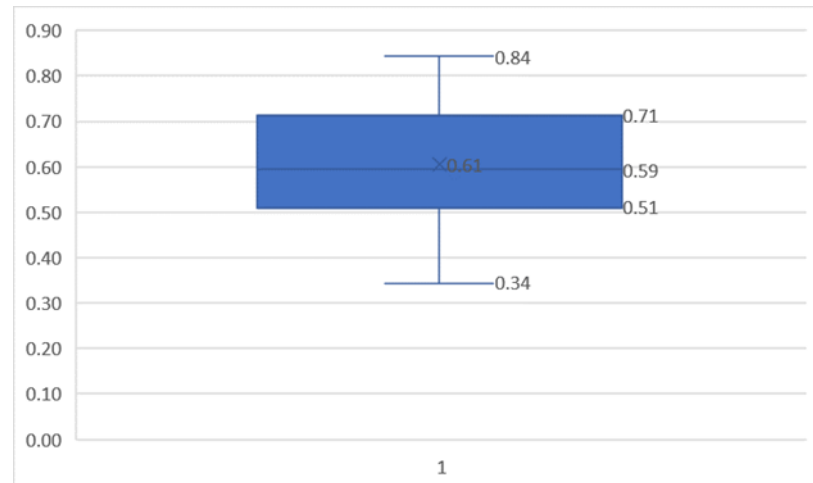


Figure 3.6: Box and whisker graph for Pilot Test 4



Firstly, I had to be able to schedule the additional 14 hours of contact time with the students from each of the three cohorts (2019, 2021 and 2022) and re-schedule when clashes occurred. This amount of leeway can only feasibly be attained when using students in the same class in this specific research context, as it is impossible to find free time on students' busy schedules if various students from several classes are randomly assigned to an intervention group. Secondly, it was essential to sample participants from the BCom stream of the ECP only, as the BSc ECP students also hosted on the Mamelodi campus, and who take parallel academic literacy courses, have different entry requirements, and BCom subject-specific texts were used in both the tests and the worksheets. All of this placed further restrictions on the sampling of participants which would have been doubly complicated if students from another lecturer were involved.

Finally, the study had to control for the LST instructor. During the face-to-face iteration of the academic literacies intervention each group of roughly 50 students gets taught by one lecturer for the full year, much like classes at school, with up to four contact hours per week. When there is this much contact time, a particular lecturer's experience and subject knowledge can sometimes have a noticeable effect on his or her students' performance when compared to the students of another lecturer who is significantly less or more experienced and knowledgeable. Therefore, when the study was designed (and contact classes were assumed to continue being the norm at the University of Pretoria), it was decided to use a baseline counterfactual group in the subsequent year rather than a control group in the same year since it was not possible for one lecturer to teach more than two groups of students at a time.

Students who registered for the BCom ECP at the University of Pretoria and had been assigned to my groups for the academic literacy intervention in 2019, 2021 and 2022 were used in this study. This intervention ran from February to June each year, with an additional module, called LST 143, running from July to October; this additional module was not considered as part of this study, and post-tests were conducted in June of each year, after the conclusion of the first semester interventions. Since students may not repeat the extended curriculum programme, there was no risk of any students participating as part of both a baseline group and an intervention group.

While all students over the three years were invited to participate in the study, some declined participation and some were excluded for missing one of the pre-tests or post-tests. The sample sizes for each of the two data-collection phases were as follows:

*Phase 2:* Fifty-one students who were registered for the academic literacy intervention in 2019 formed the face-to-face baseline group, who received the face-to-face academic literacy intervention.

*Phase 3:* Fifty-four students who were registered for the academic literacy intervention in 2021 formed the online baseline group, who received the online academic literacy intervention.

*Phase 4:* A total of 77 students comprised the 2022 intervention group and thus participated in the online inference training and strategies instruction intervention which was integrated into the existing academic literacy intervention.

Participants varied in terms of their home language (see Section 4.4), their English language ability and their literacy skills. For each cohort, the majority of the participants were Black South African students, as indicated in Table 3.4. Overall, the number of male and female participants were more or less equal, but there were more female students in the pre-pandemic cohort and more male students in the two post-pandemic cohorts. Interestingly, while the dominant demographic in most of the stratified groups was Black female students, the dominant demographic of the 2021 Borderline group (and no other group) was White male students. The 2021 Borderline group was the best-performing group from the cohort that would have been the most impacted by the pandemic. The sample sizes of these groups are too small to provide definitive data, but it is likely that this unusual change in demographics reflects the disproportionate effect of a large-scale crisis like the Covid-19 pandemic on Black students, particularly Black female students. This discrepancy is not surprising, given South Africa's history of racial inequality (see Section 1.2.2), but it is still worth noting that the ECP students at the University of Pretoria are predominantly middle-class students with fairly good educations by local standards (see Section 4.4), irrespective of their race (Ogude & Rollnick, 2022), suggesting that racial inequalities are still present, even within relatively privileged middle-class cohorts such as these reported on in this study.

Table 3.4: Cohort demographic information

Cohort	Black students	White students	Coloured students	Asian students	Female students	Male students
2019	46	5	0	0	37	14
2021	34	14	2	4	25	29
2022	74	1	0	2	36	41

Table 3.5: Dominant demographic in each stratified group per cohort

Cohort and group	High-Risk <30%	At-Risk 30-49%	Borderline 50-59%	Moderate >60%	TOTAL
2019	-	92% Black, 92% Female	86% Black, 71% Female	94% Black, 59% Female	90% Black, 73% Female
2021	64% Black, 55% Female	66% Black, 59% Male	67% White male	-	63% Black, 54% Male
2022	100% Black, 52% Female	95% Black, 69% Male	100% Black, 57% Female	75% Black, 50% Female	96% Black, 53% Male

### 3.7.2 Instruments

As already explained, three instruments were used to collect data before and after the three interventions assessed in this study. The self-developed Academic Inferencing Test formed the main instrument, which was complemented by the TALL in Phase 2, and a Language and Reading Habits questionnaire in Phase 4. These instruments are discussed in detail below.

#### 3.7.2.1 Academic Inferencing Test

As already explained, the Academic Inferencing Test was developed specifically for this study and was piloted prior to the main study (cf. Section 3.6). The hard-copy version of the test, consists of 55 questions that test proficiency in three types of inferencing, viz. drawing general inferences (10 questions), text-semantic inferences (20 questions) and anaphoric inferences (25 questions). Moreover, it consists of roughly 25 paragraphs (ranging between 85 and 350 words and all relating to topics that could reasonably be expected to BCom students), each with a set of questions relating to a particular paragraph. In order to counteract test fatigue, the test was split into two halves (one containing 27 questions and the other 28), written on two separate days. The hard-copy version of the AIT can be found in Appendix B.

Cronbach's Alpha was used to determine reliability. While a Cronbach alpha score of 0.7 or higher is desirable, 0.6 is considered adequate (Taber, 2016: 1281). Table 3.6 provides the Cronbach Alpha for the Academic Inferencing Test as a whole, as well as the constructs that make up the test.

The original Academic Inferencing Test was also converted into an online version of the test with two notable changes. Firstly, two of the items in the general inferences construct were excluded as having access to the Internet while writing the test would invalidate the inferences that needed to be drawn in order to answer these questions. Thus, the online AIT contained only eight general inferencing questions, rather than the full complement of ten items that formed part of the hard-copy test. Secondly, the online anaphor questions involved copying and pasting the referent, instead of underlining it as was done in the hard copy test.

Table 3.6: Reliability of pilot tests and constructs using Chronbach's alpha

Test/Construct	Date of Collection	Reliability
Inference Test	Pre-test (February)	0.71
Inference Test	Post-test (May)	0.81
Anaphors	Pre-test	0.67
Anaphors	Post-test	0.70
Text-semantic inferences	Pre-test	0.65
Text-semantic inferences	Post-test	0.68
General inferences	Pre-test	0.70
General inferences	Post-test	0.64

### 3.7.2.2 Test for Academic Literacy Levels (TALL)

In Phase 2, data collected from the Academic Inferencing Test were augmented by data collected using the TALL, developed by the Inter-Institutional Centre for Language Development and Assessment (ICELDA). This test consists of 64 questions and counts 100 marks. The TALL is often used as a placement test by South African universities and has an exceptionally high reliability and construct validity for a language test (Le, du Plessis & Weideman, 2011). Using Cronbach's alpha, the TALL shows an average reliability measure of 0.94 across several versions of the test between 2004 and 2010 (Van Dyk, 2010). The TALL therefore boasts an excellent reliability level. It is particularly useful in this study, firstly, because it has been developed specifically for the South African context and, secondly, because data collected using this test can be used to triangulate the data collected from the Academic Inferencing Test in order to compare participants' development in academic literacy in general to their development in inferring information from text. The TALL assesses students' general academic literacy, including identifying main

ideas, categorising text types, generating inferences, identifying text relations, reading comprehension and vocabulary. The test also contains a short section dealing with aspects of numeracy relating to visual literacy, mostly in the form of graph interpretation questions. Most questions are multiple choice questions.

### 3.7.2.3 Reading Habits questionnaire

As discussed in Section 1.2.2, South African students face a variety of challenges when developing literacies; in fact, many can be described as ‘non-traditional’ (see Section 2.4.3). In order to complement the inference test instruments, in Phase 4, a questionnaire was developed and administered to 55 participants in the 2022 intervention group. This questionnaire consisted of 20 questions relating to reading habits (see Appendix C), and was administered and completed online. The aim of the questionnaire was to gain insight into participants’ language profiles and reading habits and how these habits relate to performance in academic literacy, reading comprehension and inferencing. Consequently, participants were asked about the languages used by their caretakers, their schools and themselves in order to gain insight into the ways in which their language profiles and histories were shaping their literacy practices and proficiencies. They were also asked to rate their own reading competencies and provide further information on the type of reading they engage in and the amount of reading they do in order to ascertain what their relationship to reading looked like. Some questions (such as ‘What is your HL?’) were coded according to discrete categories, such as specific languages, while other questions that measured degree of participation in various activities (such as ‘How much time do you spend reading online?’) were coded using a three-point Likert scale.

### 3.7.3 Data collection procedure

Data were collected during the first semester of the academic year in Phases 2-4, in Week 1 and 14 of the intervention. The following protocols were used to collect the data.

#### 3.7.3.1 Academic Inferencing Test and TALL (Phase 2, face-to-face)

The hard-copy version of this test was written in controlled conditions; in other words, participants were supervised and strictly timed. During the in-person baseline assessment phase in 2019, participants wrote this test twice: during Weeks 2 and 14 of the academic literacy intervention. On both occasions, the tests were administered by me during class-time on campus. Students were instructed how to answer the

questions with an example and a demonstration provided by me. I collected the tests after the allotted 90 minutes had passed.

#### 3.7.3.2 Academic Inferencing Test (Phases 3 and 4, online)

The online version of this test was administered on the Blackboard online learning management system used for instruction by the University of Pretoria. Participants were provided with a link to the test as well as a link to a videoconferencing meeting on the same platform where the lecturer provided instructions and remained available to assist participants throughout the test. Once participants clicked on the link, they would be presented with written instructions on how to complete the test. Thereafter, they would be presented with one question at a time (along with the paragraph of text on which the question is based). The test settings prohibited backtracking to previous questions and presented the questions in a random order. This was done to discourage two participants from working their way through the test together. The test submitted automatically after 90 minutes if participants were still busy writing at that time (they could see a timer counting down the remaining time during the test).

#### 3.7.3.3 TALL (Phase 2, face-to-face)

Students who participated in the in-person baseline assessment phase in 2019 wrote this test on campus in Weeks 2 and 14. The test was written according to ICELDA's guidelines, in 55 minutes without the use of a calculator. Participants were supervised by me, and I administrated the test.

#### 3.7.3.4 Reading Habits questionnaire (Phase 4, online)

The questionnaire was administered online to the 2022 intervention group during Phase 4. Participants could access the questionnaire on the university's online learning management system, and they could complete it in their own time. The results were downloaded to be processed for analysis.

### **3.8 Data analysis**

The TALL and Academic Inferencing tests written by the participants were marked by myself, with the assistance of an experienced research assistant, before capturing and processing the data for analysis. The memorandum that had been developed along with the AIT during the pilot phase (see Section 3.6) was used to mark the AIT. Results were captured on an Excel spreadsheet and imported into SPSS for



analysis. The research assistant marked the TALL as it is a multiple-choice test which does not require any subject-specific knowledge, and I captured the results.

Tests of normality were conducted in order to determine if parametric or non-parametric tests should be used when analysing the data. As can be seen in Table 3.7, Shapiro-Wilk tests produced non-significant p-values for the AIT pre-test and post-test totals for all three cohorts, thus confirming the assumption of normality (Pallant, 2016: 144).

Table 3.7: Results of Shapiro-Wilk test

AIT test	Statistic	df	Sig.
2019pre	0.971	52	0.228
2019post	0.981	52	0.558
2021pre	0.976	52	0.366
2021post	0.976	52	0.377
2022pre	0.962	52	0.093
2022post	0.986	52	0.816

Sig. = Significance as indicated by p-value: \* 0.05 confidence interval; \*\* 0.01 confidence interval; \*\*\* 0.001 confidence interval.

In order to determine whether the cohorts' mean AIT scores were significantly different at the pre-test stage, an independent samples t-test was conducted. Only the two post-pandemic, online cohorts were compared in this way, as the 2019 group was clearly stronger than the other two (see Table 4.2), likely due to the adverse effects of the hastily-implemented online instruction that the 2021 and 2022 cohorts experienced in their penultimate or final year at high school due to the Covid-19 pandemic. As can be seen in Table 3.8, there was no significant difference between the pre-test scores of the 2021 and 2022 cohorts, which indicates that these two groups' inferencing abilities at the commencement of their studies were comparable. This also allows us to make certain assumptions about the potential effectiveness of the type of instruction each cohort received in their respective years.

Table 3.8: Results of independent t-test

Cohort	N	Mean	$\Delta\bar{X}$	StDev	t	df	Sig.
2021	54	33.43	2.83	10.14	1.32	129	.095
2022	77	36.26		13.31			

StDev = Standard Deviation.  $\Delta\bar{X}$  = mean gains; t = t-test value. Sig. = Significance as indicated by p-value: \* 0.05 confidence interval; \*\* 0.01 confidence interval; \*\*\* 0.001 confidence interval.

Next, the participants were stratified according to their AIT pre-test scores in each of the three intervention phases. Specifically, the data collected from participants in each of these phases were analysed per group in order to determine if the trends and rates of improvement differed for stronger and weaker students (see Section 4.2 for a breakdown of the groups for each cohort). Consequently, the performance of each stratified group was analysed independently; the performance of the cohort as a whole was also analysed.

Descriptive and inferential statistical analyses were employed during this study. The descriptive statistics report on the measures of central tendency and dispersion. These findings were augmented by inferential statistics, a more powerful tool for “letting us assess how much confidence we have in reaching conclusions that sample results are, or are not, consistent with the predictions of theories” (Hanneman *et al.*, 2013: 302). Both t-tests and effect size were used to determine the outcome of the interventions. Paired t-tests were used to analyse the improvement, over time, of each individual group; in addition, as discussed above, independent samples t-tests were used to compare the two online cohorts (2021 and 2022) at the pre-test stage to determine whether there is a statistically significant difference between the means of the two groups at the commencement of their studies.

In order to assess the magnitude of any statistically significant change in performance after participating in the intervention, effect size was also calculated. Hanneman *et al.* (2013: 307) warn that a statistically significant result is no sure indication of an ‘important’ result, even if a sound research design has been used. While there is no certain route for concluding whether a statistically significant result is also an important result, “examining the effect sizes is a good approach to help make a judgement about importance” (Hanneman *et al.*, 2013: 307). An effect size gives an indication of the magnitude of change. In this case Cohen’s *d* was used (Brace, Kemp & Snelgar, 2012: 11). As with the reliability tests, the effect size was calculated for each of the inference constructs (namely anaphors, contrastive inferences, causal inferences and general inferences), as well as the data obtained from the test as a whole, for each of the stratified groups. In addition, effect sizes were also calculated for data obtained through the TALL, also according to stratified groups.

Within this study, effect sizes are categorised into four types: trivial ( $d < 0.1$ ), small ( $d = 0.1-0.29$ ), medium ( $d = 0.3-0.5$ ), and large to extra-large ( $d > 0.5$ ). The numerical ranges that are represented by each category were chosen with reference to two different established scales which were synthesised and slightly

adapted to the current research context. The first of these two scales is Cohen's (1988) own set of suggested benchmarks, which can be found in the first column of Table 3.9. The second scale is Hattie's (2009) barometer of 'zones' which are provided in the middle column of the same table, while the third column lists the category types and ranges used to interpret the results of this study. Cohen's benchmarks provided a useful reference but are limited by being static points, rather than a range of values. Hattie's zones are based on a meta-analysis of hundreds of educational interventions and are therefore particularly useful to this study. It is interesting to note the discrepancies between these two research-based scales. However, Lakens (2013: 3) explains that these categories should not be rigidly applied when interpreting effect sizes; instead, researchers are encouraged to adapt their interpretation to the relevant context while keeping the practical consequences of the effect size in mind. Consequently, I have developed a scale that takes into consideration the research context involving an extensive programme with ample support. For this reason, only effect sizes of 0.5 or more are considered to be in the zone of desired effects, as Hattie would phrase it. In this study, I use the category 'large to extra-large' to refer to this category. The lowest category aligns with Hattie's zone of developmental effects and is labelled as 'trivial' effects. The two middle categories used here, called 'small' and 'medium' effects align somewhat with Hattie's zone of teacher effects but splits it into two separate categories to more accurately distinguish between mid-range performances.

Table 3.9: Development of effect size categories

<b>Cohen (1988)</b>	<b>Hattie (2009)</b>	<b>Own categories</b>
Small = 0.2	Developmental: 0.0-0.1	Trivial: <0.1
Medium = 0.5	Teacher: 0.1-0.4	Small: 0.1-0.29
Large = 0.7	Desired: >0.4	Medium: 0.3-0.5
		Large: >0.5

The data from the Reading Habits questionnaire was analysed quantitatively. Specifically, after separating participants into stratified groups, a frequency analysis was conducted in order to determine if different stratified groups had different patterns of reading habits or language profiles.

### 3.9 Interventions

As discussed in Section 3.7, three interventions were assessed during the course of this study, namely the face-to-face version of the academic literacy intervention (LST 133), the online version of the same course, and the self-developed inferencing intervention in combination with the online academic literacy intervention.

#### 3.9.1 2019 (Phase 2), face-to-face academic literacy intervention

This intervention comprised the first semester of the established academic literacy intervention that forms the core module of the ECP as it was presented before shifting to online instruction due to the COVID-19 pandemic. Table 3.10 provides an overview of each week of the semester-long academic literacy intervention when contact classes took place.

Table 3.10: Overview of 2021 academic literacy intervention

Week	Content	Week	Content
1	Introduction to and overview of course	8	Peer editing – Individual Research Assignment
	Referencing skills (bibliography)		Linear note-taking
2	Referencing skills (in-text), summarising and paraphrasing	9	Linear note-taking
	Individual Research Assignment introduced		Group Research Assignment peer editing
3	Discourse markers	10	Word building
	Topics, main ideas and topic sentences		Dictionary skills
4	Topics, main ideas and topic sentences	11	Revision
	Building paragraphs		Definitions
5	Pronouns, time management	12	Physical description paragraph
	Planning Group Research Project		Revision
6	Intro to writing LST tests	13	Revision
	Reading		Revision
7	Individual Research Assignment first draft	14	Revision
	Feedback		Revision

The main resource used in this intervention was the LST Workbook. The workbook was developed specifically for the ECP's academic literacy course by course lecturers in 2008; it is updated yearly, and thus both the content and the structure have been revised significantly over the years. The majority of the book consists of scaffolded tasks; these are interspersed with brief sections of expository texts explaining the various concepts and giving advice on how to approach the tasks. Table 3.11 provides a condensed version of the workbook's table of contents.

The students each received a workbook as well as a license to access a commercial online learning management system upon registering for the intervention. Even before COVID-19 necessitated instruction to move to the online platform, the lecturing team developed vocabulary and grammar exercises on this platform which students were required to complete roughly every two weeks.

During this intervention, participants had three to four hours of contact time every week. In addition, there were weekly optional extra classes as well as regular instruction sessions dealing with topics such as navigating the online platform and submitting assignments. Students were also encouraged to consult with tutors and lecturers when they felt they required one-on-one assistance.

Table 3.11 LST 133 Workbook condensed table of contents

Section	Contents
1	<b>Referencing, Summarising and Paraphrasing</b> <ul style="list-style-type: none"> <li>● Bibliographic referencing</li> <li>● In-text referencing</li> <li>● Summarising, paraphrasing and quoting</li> </ul>
2	<b>Building Paragraphs</b> <ul style="list-style-type: none"> <li>● Topics, main ideas and topic sentences</li> <li>● Process description paragraphs</li> </ul>
3	<b>Time Management</b>
4	<b>Reading</b> <ul style="list-style-type: none"> <li>● Scanning, skimming, study reading and critical reading</li> </ul>
5	<b>Note-taking</b>
6	<b>The Meaning of Words</b> <ul style="list-style-type: none"> <li>● Word-building</li> <li>● Dictionary skills</li> <li>● Definitions</li> <li>● Physical description paragraphs</li> </ul>

The lectures took place twice a week for 90 to 120 minutes in groups of roughly 50 students who stayed with the same lecturer throughout the semester. Since the intervention dealt with the development of skills and proficiencies, the students spent the majority of each workshop-style lecture completing tasks with assistance from the lecturer and their peers. These classes were interspersed with information dissemination by the lecturer and peer- or self-marking of completed tasks facilitated by the lecturer.

### 3.9.2 2021 (Phase 3), online academic literacy intervention

After 2020, the LST133 course was taught online. This second intervention was the online version of the intervention discussed in Section 3.9.1 and was therefore very similar in its content and structure.

The 2021 online academic literacy intervention spanned 16 weeks, from mid-February to late June. Table 3.12 provides a basic overview of the content covered in this intervention, whereas Appendix D contains a detailed overview, including information about lecture presentation, homework and assessments.

Table 3.12: Overview of the 2021 online academic literacy intervention

Week	Content	Week	Content
1	Introduction to and overview of course	9	Test feedback
	Referencing skills (bibliography)		Linear note-taking
2	Referencing skills (in-text)	10	Linear note-taking
	Summarising and paraphrasing		Word-building
3	Summarising and paraphrasing	11	Dictionary skills
	Reading Report revision		Dictionary skills
4	Discourse markers	12	Definitions
	Pronouns		Test prep
5	Topics, main ideas and topic sentences	13	Test week
	Building paragraphs		Semester Test 2
6	Intro to writing LST tests	14	Physical description paragraph
	Test week		Physical description paragraph
7	Time management	15	Test feedback
	Feedback		Revision
8	Building paragraphs	16	Revision
	Process description paragraphs		Revision

The LST Workbook discussed in Section 3.9.1 remained the main source for the online version of the intervention; participants either bought the book in hard-copy format or used the PDF version of the book which was provided to them. It was augmented by a collection of narrated slideshows and memorandums for key tasks in the workbook. The narrated slideshows were specifically developed by the instructors of the module with the intention of keeping the files as small as possible in order to accommodate students who had limited access to the Internet. Consequently, the slideshows were split into one PDF document and one accompanying MP3 audio recording as well as a script for the recording. Participants were given access to one folder at a time which contained the material for that section.

The online academic literacy intervention took a flipped-classroom approach to instruction. The participants were required to work through the narrated slideshows in their own time and then to spend

a short period in an interactive collaborative online videoconferencing meeting with their lecturer addressing questions and working through examples together. These interactive periods occurred twice a week for roughly 30 minutes. Each session was recorded, and these recordings were shared with the participants who could watch them as part of their revision or catch up any sessions they might have missed due to poor Internet connectivity.

### **3.9.3 2022 (Phase 4), online academic literacy and inferencing intervention**

During Phase 4 of the study, in 2022, the online academic literacy intervention was augmented by a 14-hour, online intervention that introduced additional content on inferencing.

The final phase of this study centred around an inference training intervention that was integrated into the existing academic literacy curriculum. The intervention took place over a period of 14 weeks, during the first semester of 2022. Table 3.13 gives an overview of the intervention's content and timeframe; worksheets can be found in Appendix E.

Since no appropriate material was available for BCom students specifically, all the material used in the intervention was self-developed (refer to Appendix E for material used in the intervention). Although the aim of the intervention was to improve participants' ability to infer information from expository texts, there is some research suggesting that inference generation tends to be more readily applied when dealing with fiction (refer to Section 2.6.4.5). Thus, one excerpt was adapted from a popular crime novel and a short exercise were developed accordingly. This fiction-based exercise was used as a warmer activity in the first lesson in order to first establish inferencing skills with more familiar, fictional texts before moving on to expository texts which were sourced from popular science books, a progression which mirrored the gradual shift of responsibility (as discussed in Section 2.7.2) from the instructor, to the group, and then to the individual who becomes more comfortable with less familiar text types as his or her competency grows.

Table 3.13: Overview of intervention

Week	Activity
1	Pre-tests
2-3	1. Introduce terminology: <ul style="list-style-type: none"> <li>● Inference</li> <li>● Background knowledge</li> <li>● Textual evidence</li> <li>● Anaphor</li> <li>● Textual relationships:               <ul style="list-style-type: none"> <li>○ Cause and effect</li> <li>○ Contrast</li> </ul> </li> </ul> 2. Warm-up activity: Inferring information from fictional, narrative text while listening to the audiobook ( <i>Men at Arms</i> , Terry Pratchett)
4	3. Mental modelling: Inferences drawn while reading 'The Scent of Money', Y.N. Harrari (using document reader)
4	Complete <b>Worksheet 1.1 'History's Biggest Fraud'</b> in ( <i>ideally in groups of 4-5 students</i> ) online. Worksheet marked by researcher. Feedback and memorandum made available to participants.
5	Discuss feedback on any critical issues from <b>Worksheet 1.1</b> . Complete <b>Worksheet 2.1 'Always Connected'</b> ( <i>ideally in pairs</i> ) online. Worksheet marked by researcher. Feedback and memorandum made available to participants.
6	Discuss feedback on any critical issues from <b>Worksheet 2.1</b> . Complete <b>Worksheet 2.2 'Always Connected'</b> ( <i>ideally in pairs</i> ) online. Worksheet marked by research assistant. Feedback and memorandum made available to participants.
7	Provide feedback on any critical issues from <b>Worksheet 2.2</b> . Complete <b>Worksheet 3.1 'How Legalisation Threatens Drug Lords'</b> ( <i>ideally in pairs</i> ) online. Worksheet marked by research assistant. Feedback and memorandum made available to participants.
8	Provide feedback on any critical issues from <b>Worksheet 3.1</b> . Complete <b>Worksheet 3.2 'How Legalisation Threatens Drug Lords'</b> ( <i>ideally in pairs</i> ) online. Worksheet marked by research assistant. Feedback and memorandum made available to participants.
9	Provide feedback on any critical issues from <b>Worksheet 3.2</b> . Complete <b>Worksheet 4.1 'McDonald's Didn't Create a Better Burger'</b> ( <i>ideally individually</i> ) online. Worksheets marked by research assistant. Feedback and memorandum made available to participants.
10	Provide feedback on any critical issues from <b>Worksheet 4.1</b> . Complete <b>Worksheet 4.2 'McDonald's Didn't Create a Better Burger'</b> ( <i>ideally individually</i> ) online. Worksheets marked by research assistant. Feedback and memorandum made available to participants.
11	Overall feedback and recap presented to students by researcher.
12-13	Complete <b>Worksheet 5.1 'Question Generation Exercise'</b> ( <i>ideally individually</i> ) online. In this worksheet students are each given one of two short texts and required to write their own short worksheet. Worksheets marked by researcher.
14	Post-tests

The texts were selected based on the following requirements:



1. Texts had to focus on content that the average participant would be moderately familiar with, while still introducing complex ideas that were likely to be novel. For instance, one text dealt with branding and reputation (familiar topics for BCom students) but introduced relatively abstract concepts relating to asymmetry of information and adverse selection.
2. Text comprehension had to require a relatively large amount of inference generation from the reader. This could be due to a foreign context, assumed prior knowledge, or a writing style that strongly features implied information.
3. The text had to deal with content that many participants would likely find interesting, so that their efforts in constructing meaning would be as rewarding as possible. For instance, one of the texts dealt with the legalisation of cannabis and another with the effects of social media. These are fairly popular topics in which the average undergraduate student has at least some interest.

Each text was split into sections of approximately 1200 words each. Then, a range of questions were developed that focused on inference generation, including anaphoric inferences and text-semantic inferences, thus providing multiple opportunities to practise recognising and making these kinds of inferences. These worksheets were given to reading and academic literacy experts to complete prior to the intervention, and their feedback was integrated. Thereafter, a memorandum was developed. Since the eight worksheets (refer to Table 3.8 and Appendix E) are learning tools, not testing instruments, they were not piloted with a sample of ECP students before being used in the intervention.

The inference training intervention took place over a period of 14 weeks. The first week and the last weeks were used for pre- and post-tests, while the remaining 12 weeks were dedicated to instruction and worksheets.

The intervention started with a brief introduction (Weeks 2 to 3) to reading comprehension strategies which emphasised the importance of reading in academic success, required students to reflect on their attitudes towards reading and reading habits, and, finally, stressed the need for an active approach to reading comprehension. During this stage, terminology was taught in an attempt to foster a meta-discourse about reading and the cognitive processes involved in inference generation. In order to demonstrate to students that they were already competent at inferring information, the strategy instruction started with a couple of brief exercises and required students to draw inferences from non-

text-based media like video clips and audio books. These exercises were also used to introduce the use of prior knowledge and to demonstrate to students that comprehension is often dependent on two sources of information: the text/media and the reader/observer's prior knowledge. In order to consolidate the new information provided in the lesson, the instructor used a short expository text and mental-modelling protocol to explicitly demonstrate the thinking processes involved in comprehending a text that require a large amount of inference generation, with specific focus on the function of text-semantic and anaphoric inferences.

*Figure 3.7: Excerpt used for mental modelling*

**THE SCENT OF MONEY (original text)**

In 1519 Hernán Cortés and his conquistadors invaded Mexico, hitherto an isolated human world. The Aztecs, as the people who lived there called themselves, quickly noticed that the aliens showed an extraordinary interest in a certain yellow metal. In fact, they never seemed to stop talking about it.

The native people were not unfamiliar with gold – it was pretty and easy to work, so they used it to make jewellery and statues, and they occasionally used gold dust as a medium of exchange. But when an Aztec wanted to buy something, he generally paid in cocoa beans or bolts of cloth. The Spanish obsession with gold thus seemed inexplicable. What was so important about a metal that could not be eaten, drunk or woven, and was too soft to use for tools or weapons?

When the natives questioned Cortés as to why the Spaniards had such a passion for gold, the conquistador answered, 'Because I and my companions suffer from a disease of the heart which can be cured only with gold.' In the Afro-Asian world from which the Spaniards came, the obsession for gold was indeed an epidemic.

Since what is expected of participants is the execution of a complex process, the process should be explicitly taught and opportunities for subsequent practice should be provided. Therefore, classes typically started with a detailed mental modelling protocol demonstration, often as a way to provide feedback on a section of the previous worksheet that many found challenging. These demonstrations were recorded and made available to participants in MP4 format so that they could watch them in their own time. In accordance with the gradual release model of instruction (see Section 2.7.2), the demonstrations became gradually less involved as the intervention progressed and participants were encouraged to approach the task at hand with greater independence. An example of a short expository text used on such an occasion as well as a script of the accompanying mental modelling demonstration can be found in Figures 3.7 and 3.8.

Figure 3.8: Mental modelling example

### THE SCENT OF MONEY (mental modelling)

In 1519 Hernán Cortés and his conquistadors invaded Mexico, hitherto an isolated human world. (Okay, I don't know anything about the 1500s, and I don't know much about Mexico or the people who invaded it. However, I could probably make an educated guess. I know that the people living in Mexico speak Spanish, because movies and series set in America sometimes have Mexican characters. Spanish is a European language, and I know that Europeans invaded and colonised many parts of the world; for instance, the Dutch and the British people colonised South Africa. So, based on the information provided, I would infer that 'Hernán Cortés and his conquistadors' are Spanish people who invaded Mexico. I can't be 100% sure, so I will keep an eye out for information that either confirms or contradicts this educated guess.) The Aztecs, as the people who lived there (I know that 'there' is an anaphor referring to a place, and the only place that has been mentioned is Mexico) called themselves, quickly noticed that the aliens ('Aliens' is in the plural form, so I know it refers to a group. Based on the first sentence and this most recent sentence, I understand that we are dealing with two groups of people: the conquistadors and the Aztecs. The conquistadors invaded Mexico, meaning that they were foreigners, possibly from Spain. I know that 'aliens' can be used to refer to foreigners, as in the phrase 'illegal aliens', so I am inferring that 'the aliens' refers to the conquistadors.) showed an extraordinary interest in a certain yellow metal (The only metal I know of that is yellow is gold, and it would certainly make sense for the conquistadors to be interested in it, as gold is very valuable.) In fact, they never seemed to stop talking about it. (I know that 'it' is an anaphor which refers to a single thing or idea. Here 'it' is something that the aliens won't stop talking about, and previously in this paragraph, it stated that the aliens were interested in 'a certain yellow metal' (possibly gold). If people are interested in something, they probably like to talk about it, so it would make sense here that 'it' refers to the yellow metal.)

The native people were not unfamiliar with gold (Ah-ha! Now I can confirm that the 'yellow metal' is, in fact, gold.) – it was pretty and easy to work, so they used it to make jewellery and statues, and they occasionally used gold dust as a medium of exchange. But when an Aztec wanted to buy something, he generally paid in cocoa beans or bolts of cloth. The Spanish obsession with gold thus seemed inexplicable. (This sentence confirms my first inference: I know that 'the aliens' = 'the conquistadors', and that these people are interested in gold. Here, I am told that the Spaniards are obsessed with gold, which confirms that 'the aliens' = 'the conquistadors' = the Spaniards; in other words, all these terms refer to the same group of people). What was so important about a metal that could not be eaten, drunk or woven, and was too soft to use for tools or weapons? (From this paragraph, I can infer additional information about the Spaniards and the Aztecs. There is a contrast in the way the groups view gold. The Aztecs evaluate gold based on its material properties: it is pretty and malleable, but that's about it. Therefore, it is less valuable than materials that can help to sustain or protect them. However, the Spaniards have a different perspective on gold: for them gold is currency (the title which mentions money also helped me to come to this conclusion) and therefore its value extends far beyond its material properties because it can be used to buy almost anything.)

When the natives questioned Cortés as to why the Spaniards had such a passion for gold, the conquistador answered, 'Because I and my companions suffer from a disease of the heart which can be cured only with gold.' ('Disease of the heart' sounds like a desire for something, but it is not a good thing if it is called a disease. The idea that gold cures this desire makes me think that it is probably greed, as greed is a type of selfish/problematic desire, specifically for money or material goods.) In the Afro-Asian world from which the Spaniards came, the obsession for gold was indeed an epidemic. (The Spaniards' greed being compared to an epidemic makes me more certain about my inference that the greed is a bad thing, and it makes me think that, like an epidemic, it impacted a lot of people.)

Note that uncertainty is always pointed out and addressed with metacognitive awareness, employing prediction, comprehension-monitoring, confirmation, and repair strategies. Furthermore, strategies that are tested in the study, such as resolving anaphoric ties and inferring contrasting or causal relationships, are emphasised. Examples of background knowledge are always accessible and understandable, such as Mexican-American TV characters speaking Spanish (refer to Figure 3.8 for the mental modelling demonstration used in the third class), and conclusions are drawn incrementally. Often participants were able to jump ahead and draw the necessary inference while the mental modelling is still in process, which they found very encouraging.

The next stage of the intervention, Weeks 4 to 11, provided guided practice in a simulated environment. Students developed and consolidated their own active reading and inferencing abilities by completing worksheets while being guided by frequent mental modelling demonstrations and regular feedback (refer to Appendix E for material used in the intervention). Over the course of the intervention, students were taught a limited number of strategies particularly suitable to expository texts, including anaphoric and vocabulary inferences, inferring causal and contrastive relationships between ideas (collectively termed ‘text-semantic’ inferences) as well as question-generation for the purpose of comprehension monitoring. Participants practised these reading strategies by completing worksheets that were specifically developed for the intervention (refer to Appendix E). I was also available via email and in the module’s online videoconferencing meeting space for assistance where needed during the completion of the exercises. Participants completed and submitted their worksheets on the online learning platform.

The worksheets consisted of short inferential questions based on an expository text, and they became more complex throughout the intervention. For instance, the four examples in Figure 3.9 show the progression of cause and effect inference questions from the first to the fourth worksheet. In the first worksheet, the questions clarify the relationship and also narrow the focus by providing either the cause or effect as well as the discourse marker. In the second worksheet, the questions are still very structured and focused, but the cues are somewhat reduced. By the third worksheet, the participants are expected to infer the structure independently while still being guided to an instance of a cause and effect relationship in the text. In the last worksheet, the only cues are those directing participants to a specific paragraph. Participants are expected to identify cause and effect relationships themselves. Finally, after having completed all the worksheets, the participants were asked to develop their own worksheet and

accompanying memorandum based on a suitable text in order to apply their inferencing skills completely independently.

As indicated in Table 3.8, students were encouraged to work in groups. In a face-to-face intervention, these groups would have been set up and moderated by the instructor. In the online intervention, participants were merely encouraged to start working in small groups (if they could negotiate co-working despite the lockdown), then pairs and, eventually, individually, although the grouping were not monitored in any way. Even if working in a group, each participant still had to complete his or her own worksheet. The participants were aware of the fact that they would eventually be expected to complete the worksheets on their own and were encouraged to take advantage of sessions where they worked together to identify and clarify aspects about which they were uncertain

*Figure 3.9: Scaffolding of causal inference questions in worksheets*

**Worksheet 1:** Re-read Paragraph 2, and complete the following cause and effect sentence:

Humans worked hard to cultivate crops and animals because \_\_\_\_\_.

**Worksheet 2:** Read Paragraph 1 and complete the following sentence:

One of the worst forms of punishment is solitary confinement, since \_\_\_\_\_.

**Worksheet 3:** Why did Bill Clinton think that the Hope Scholarships mentioned in the first paragraph would work? Provide your answer as a cause and effect sentence, using the discourse marker 'for this reason'.

**Worksheet 4:** Write two cause and effect sentences and two contrasting sentences using information from Paragraphs 4 to 6. Write the sentences in your own words and use a suitable discourse marker for each sentence.

While the first two worksheets were marked by me, the rest were marked by a research assistant using a detailed rubric that was set up by me. This was mainly due to the fact that marking 100 worksheets per week in addition to existing teaching, marking and administration was not possible. The memorandum was also shared with the participants after submission and included examples of mental modelling which demonstrated the cognitive process that resulted in the model answer. In addition, the instructor briefly analysed the completed worksheets each week in order to identify critical questions and areas of confusion. These were then discussed with the participants either by adding additional content to the memorandum before releasing it to the students or through mental modelling demonstrations during

regular online lecture sessions. The participants were encouraged to ask for individual feedback from the instructor during the intervention if they felt that there was a point of confusion that had not been addressed during the general feedback discussion.

Finally, during the last two lessons, in Week 12 to 13, the participants were tasked with creating their own worksheets in order to give them an opportunity to consolidate and apply the skills they were taught. Specifically, each student was provided with roughly two pages of text that were adapted from one of the same sources used for the worksheets. Thus, while these two pages were not part of any of the existing worksheets, the participants were familiar with the content. For this final task, they were required to develop two questions (plus a memorandum) for each of the three types of inferences they were taught: anaphoric, text-semantic and general. These questions were marked by the researcher. In line with social cognitivist approaches to learning (see Section 2.7.2), participants progressed from observation to self-regulated production, but they were not expected to complete this process without active guidance and frequent demonstrations of what successful inferencing looks like through mental modelling.

### **3.10 Conclusion**

This chapter laid out the methodological framework and research design of this study which aims to assess and improve ECP students' proficiency in inferring information from expository text. First, it established the relationship between research questions and research design as well as the consequent three-phase approach to data collection. Thereafter, the development, piloting and analysis of the main instrument, the Academic Inferencing Test, was discussed. Next, the four phases of the main study were discussed in greater detail. Phase 1 dealt with the development and piloting of the Academic Inferencing Test. Phase 2 focused on assessing the effectiveness of the existing academic literacy intervention in the pre-pandemic face-to-face format in improving participants' ability to draw inferences while reading. This chapter described the participants, procedures, and instruments used to capture and analyse data during all four phases. It concludes with a brief discussion of the established academic literacy intervention that was evaluated during Phases 2 and 3 and a detailed discussion of the inference training intervention that formed part of Phase 4. In the next chapter, the collected data from the four phases is presented.

## CHAPTER 4: Results and Discussion

### 4.1 Introduction

Chapter 4 presents the results and discussion of each of the three intervention phases of the study, and the effect they had on different aspects of inferencing overall, and on different ability groups. To recap, there were three interventions, each with slightly different iterations of the same content: firstly, a 78-hour face-to-face general academic intervention in 2019; a 78-hour online general academic intervention in 2021; and, thirdly, a 78-hour online general academic literacy intervention with 14 hours of explicit inferencing intervention built into it in 2022 (see Section 3.9). The five specific inferencing competencies investigated in this study across these interventions were anaphoric inferences, causal inferences, contrastive inferences, general inferences, and a consolidated category called academic inferences (i.e. a total mean inferencing score for each student across the four inference components). In addition, academic literacy was also assessed (using the TALL) alongside inferencing ability, but only in the 2019 intervention. Although academic literacy was originally included in the original study design, the lockdown during COVID-19 made it impossible to assess the academic literacy of the subsequent cohorts because the TALL could not be converted to an online format due to copyright restrictions. A third instrument, the Reading Habits questionnaire, was also used to collect data relating to the 2022 cohort's reading habits and language profiles.

This chapter starts by outlining the different distributions of stratified groups for each phase. Thereafter, it provides the results obtained using the AIT, for each cohort, stratified group and inference construct. This is followed by the results of the Reading Habits questionnaire. The Discussion section draws comparisons between the three different interventions by comparing two interventions at a time in order to more clearly ascertain the impact of a specific variable on the cohorts as a whole and on the stratified groups. First, 2019 (Phase 2) and 2021 (Phase 3) are compared, in order to determine the effect of mode of instruction, face-to-face (as in Phase 2), or online (as was the case in Phase 3). A second comparison is drawn between the 2021 (Phase 3) intervention and the 2022 (Phase 4) intervention to clarify the impact of including direct instruction on inferencing (which only Phase 4 received) when both cohorts received online instruction. Thereafter, the relationship between academic literacy and inferencing is discussed.

The last section discusses the reading habits and language profiles of the 2022 (Phase 4) participants before the conclusion provides a summary of the main trends observed in this study.

## 4.2 Test reliability

A total of 182 participants across all three interventions wrote the full AIT, consisting of 55 questions on four different types of inferences. In order to determine if the interventions had differential effects on the students, based on their initial inferencing ability at the onset of each intervention, participants of each phase were stratified according to their performance in the Academic Inferencing pre-test. Overall, there were four groups across the three years, viz. the High-Risk group (with scores <30%), the At-Risk group (with scores of 30%-49%), the Borderline group (with scores of 50%-59%) and the Moderate group (with scores of >60%), which were decided upon after consultation with subject-experts with experience in the field. The passing grade for all modules in the ECP is 50%, which made this percentage an important boundary. Students were therefore categorised according to whether their pre-test score was a passing or failing grade. These two groups were further subdivided for more precise labelling. Specifically, students who achieved less than 30% in the pre-test were separated from those who achieved a mark between 30% and 50%, as any mark of less than 30% really is extremely low for a multiple choice quiz with four distractors per question, thus indicating that students who fall into this bottom category would likely struggle to complete a degree programme without considerable assistance, whereas those who made up the At-Risk group (30%-49%) might still be able to use the ECP as a springboard to academic success at tertiary level. The distinction between the top two groups (Borderline and Moderate), although less pertinent, was added to distinguish a typical ECP student (who might achieve a mark between 50% and 59%) from a student who performs unusually well for this population, as would be indicated by a pre-test mark of more than 60%. Thus, the top section of each sample was further subdivided to form the Borderline (50%-59%) and Moderate (scores above 60%) groups.

However, these groups emerged differentially across the years: in 2019 there was no High-Risk group, while in 2021 there was no Moderate group since not enough participants scored less than 30% in 2019 or more than 60% in 2021. Table 4.2 provides information about each of the stratified groups as well as the size of the groups for each phase.



Table 4.2: Number of students in each stratified group for Phases 2, 3 and 4

Phase and year	High-Risk <30%	At-Risk 30-49%	Borderline 50-59%	Moderate >60%	TOTAL
2 (2019) 78-hour F2F AL	-	13	21	17	51
3 (2021) 78-hour online AL	22	29	3	-	54
4 (2022) 78-hour online AL + inferencing	29	37	7	4	77

All interventions were 78 hours in total, as discussed in Section 3.4. During 2019 (Phase 2) and 2021 (Phase 3), these 14 hours were spent covering existing competencies in the curriculum, such as summarising, referencing and basic grammar. In contrast, in 2022 (Phase 4), the participants engaged with the inferencing content developed for this study.

## 4.3 Results of the interventions

The results of Phases 2 to 4 (2019, 2021 and 2022) of the study are organised according to construct and linked to the relevant research questions. Each construct-based section starts by listing the relevant research questions, followed by a table showing the results for Phases 2 to 4 as well as a section allocated to each of the three different interventions investigated in these phases.

### 4.3.1 Performance in academic inferencing

The overall academic inferencing ability of the three cohorts is first presented. This overall score was obtained by adding and then aggregating the inferencing scores for each student from the four inferencing subtests, thus reflecting a comprehensive score of inferencing ability during reading. Data from 2019, 2021 and 2022 are used to address the following research question (see Section 3.3.1):

**Research Question 1: What is the effect of an intervention on the academic inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

Table 4.3 shows statistical significance of differences in the pre- and post-intervention data of participants across all three interventions from 2019 to 2022 and according to the different ability groups. It is clear

that the 2019 cohort was the strongest academically with regard to inferencing ability, whereas the 2021 cohort was the weakest. Although all the interventions showed an impact on academic inferencing abilities from pre- to post-test, this was most strongly observed in the 2022 cohort.

*2019 (Phase 2), face-to-face academic literacy intervention*

During 2019, the group as a whole obtained a mean score of 56.1% before the intervention started, as can be seen in the left-hand column of Table 4.3. This score increased to 59.6% by the end of the intervention. This improvement for the group as a whole was statistically significant and yielded a medium effect size ( $\Delta\bar{X} = 3.5$ ;  $t = 2.9$ ,  $p = .003$ ;  $d = 0.41$ ). However, when one disaggregates the results according to the stratified groups, it is evident that effect sizes differed across groups, sometimes substantially.

Participants in the lower groups demonstrated greater improvement and showed stronger effect sizes over the course of the intervention than those in the higher group. The effect size per group therefore decreased as ability increased. The At-Risk group had the largest effect size ( $\Delta\bar{X} = 6.6$ ,  $p = .009$ ,  $d = 0.76$ ), while the Borderline group showed a moderate effect size ( $\Delta\bar{X} = 3.7$ ,  $p = .048$ ,  $d = 0.38$ ), and the Moderate group showed hardly any effect size ( $\Delta\bar{X} = 0.9$ ;  $p = .283$ ,  $d = 0.14$ ).

*2021 (Phase 3), online academic literacy intervention*

During 2021, the group as a whole made a statistically significant improvement in academic inferencing that corresponded with a medium effect size ( $\Delta\bar{X} = 4.0$ ;  $p = .003$ ,  $d = 0.38$ ), similar to what was observed in 2019. The full cohort obtained an overall academic inferencing mean score of 33.4% in the pre-test, as can be seen in the middle column of Table 4.3 and a post-test score of 37.4%. While the effect sizes of the 2019 and 2021 cohorts are comparable, it is worth noting that the 2021 cohort started and ended their intervention with mean scores that were almost 20% lower than the mean scores obtained from the 2019 cohort.

The High-Risk students had the strongest response to the intervention ( $\Delta\bar{X} = 9.5$ ,  $p < .001$ ;  $d = 0.88$ ). The At-Risk group showed minimal growth ( $\Delta\bar{X} = 0.6$ ,  $p = .360$ ,  $d = 0.07$ ) and the Borderline group actually performed worse at post-test time ( $\Delta\bar{X} = -3.5$ ).

*2022 (Phase 4), online academic literacy and inferencing intervention*

In 2022, the full cohort increased its initial mean score of 36.3% by 8.5% over the course of the intervention ( $\Delta\bar{X} = 8.5$ ,  $t = 9.2$ ,  $p = <.001$ ;  $d = 1.04$ ), as shown in the right-hand column of Table 4.3. While this improvement was statistically significant and corresponded with a very large effect size (the largest of all three phases), the post-test mark remained low, at 44.7%, and was more than 10% lower than the pre-test mean score for the 2019 cohort.

As was seen with the 2019 and 2021 phases, the less-proficient groups demonstrated more improvement over the course of the intervention than the more proficient groups. The High-Risk group had the largest effect size ( $\Delta\bar{X} = 11.3$ ;  $p <.001$ ,  $d = 1.32$ ), the At-Risk group had the second-largest effect size ( $\Delta\bar{X} = 7.6$ ;  $p <.001$ ,  $d=1.02$ ), while the Borderline group obtained an effect size of 0.58 ( $\Delta\bar{X} = 5.5$ ;  $p = .064$ ). The Moderate group made the smallest improvement of all the stratified groups but inferential statistics could not be provided due to its small sample size.

In sum, while all three interventions helped participants improve their overall ability to draw inferences, the weakest students made the most improvement while the stronger students showed small or no improvement. The 2022 intervention showed the largest effect size overall even though it started and ended at a much low mean base than the 2019 cohort.

I turn now to a more fine-grained examination of performance results in the different subcomponents of inferencing.

#### 4.3.2 Performance in anaphoric inferences

Data from 2019, 2021 and 2022 address the following research question (see Section 3.3.1):

**Research Question 2: What is the effect of an intervention on the anaphoric inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

Table 4.3: Academic Inferencing performance 2019, 2021, 2022

2019	Academic Inferencing						2021	Academic Inferencing						2022	Academic Inferencing					
	Mean	StDev	$\Delta\bar{X}$	t	Sig.	d		Mean	StDev	$\Delta\bar{X}$	t	Sig.	d		Mean	StDev	$\Delta\bar{X}$	t	Sig.	d
Whole cohort (n=51)							Whole cohort (n=54)							Whole cohort (n=77)						
Pre	56.1	11.9	3.5	2.9	.003**	0.41	33.4	10.1	4.0	2.8	.003**	0.38	36.3	13.3	8.5	9.2	<.001***	1.04		
Post	59.6	12.7					37.4	10.9					44.7	12.8						
Group 1: High-Risk (n=13)							Group 1: High-Risk (n=22)													
							24.2	3.8	9.5	4.1	<.001***	0.88	23.3	3.7	11.3	7.1	<.001***	1.32		
						33.8	9.9	34.5					8.1							
Group 2: At-Risk (n=13)							Group 2: At-Risk (n=38)							Group 2: At-Risk (n=45)						
Pre	42.5	5.9	6.6	2.8	.009**	0.76	38.0	5.6	0.6	0.35	.360	0.07	39.7	6.2	7.6	6.2	<.001***	1.02		
Post	49.0	10.3					38.5	10.1					47.3	9.3						
Group 3: Borderline (n=21)							Group 3: Borderline (n=3)							Group 3: Borderline (n=7)						
Pre	53.3	2.7	3.7	1.6	.048*	0.38	57.1	8.2	-3.5				53.9	3.5	5.5	1.8	.064	0.58		
Post	57.0	9.6					53.6	11.3		59.4	6.3									
Group 4: Moderate (n=17)							Group 4: Moderate (n=4)													
Pre	69.9	6.5	0.9	0.6	.283	0.14							67.9	5.3	1.4					
Post	70.8	8.9									69.4	5.3								

StDev = Standard Deviation.  $\Delta\bar{X}$  = mean gains; t = t-test value. Sig. = Significance as indicated by p-value: \* 0.05 confidence interval; \*\* 0.01 confidence interval; \*\*\* 0.001 confidence interval. Effect sizes: <.10: trivial; .10 .29: small; .30 - .49: medium; >.50: large to very large

The AIT contained 25 questions on anaphoric inferences. Table 4.4 shows statistical significance of differences in the pre- and post-intervention data of participants from 2019 to 2022 in this construct. The 2019 cohort was again the strongest in anaphoric inferencing, but the 2022 cohort made the biggest improvement. The 2021 cohort started with very low scores and showed minimal improvement.

*2019 (Phase 2), face-to-face academic literacy intervention*

During 2019, the group as a whole obtained a moderate effect size ( $\Delta\bar{X} = 4.3$ ;  $p = .007$ ,  $d = 0.35$ ). The 2019 cohort started with a pre-test anaphoric mean of 57.6% which increased to 61.9%, as seen in the left-hand column of Table 4.4.

When considering the stratified performance, the weaker students showing greater improvement can be observed here as well. The At-Risk students achieved a very large effect size ( $\Delta\bar{X} = 7.5$ ;  $p < .001$ ,  $d = 1.09$ ). The Borderline and Moderate groups did not make any statistically significant improvement in anaphoric inferences and produced small effects sizes ( $p = .135$ ;  $d = 0.25$ , and  $p = .190$ ;  $d = 0.22$ , respectively).

*2021 (Phase 3), online academic literacy intervention*

During 2021, this cohort's overall anaphoric performance decreased over the course of the intervention from 46.7% to 45%, although this change was not statistically significant ( $\Delta\bar{X} = -1.8$ ,  $t = 0.8$ ,  $p = .217$ ;  $d = 0.11$ ). This data can be found in the middle column of Table 4.4.

There was no consistent trend for the stratified groups from the 2021 cohort. The High-Risk group increased their mean score slightly, but it was not statistically significant. Even more concerning, the means of both the At-Risk and Borderline groups decreased from the pre-test to the post-test.

*2022 (Phase 4), online academic inferencing intervention*

The anaphoric mean of the 2022 cohort as a whole increased significantly from 37.5% to 45.2%, demonstrating a large effect size ( $\Delta\bar{X} = 7.7$ ,  $p = .001$ ;  $d = 0.61$ ), as shown in the right-hand column of Table 4.4.

Table 4.4: Anaphoric inferencing performance 2019, 2021, 2022

2019	Anaphors (n=51)						2021	Anaphors (n=54)						2022	Anaphors (n=77)					
	Mean	StDev	$\Delta\bar{X}$	t	Sig.	D		Mean	StDev	$\Delta\bar{X}$	t	Sig.	d		Mean	StDev	$\Delta\bar{X}$	t	Sig.	d
Whole cohort (n=51)							Whole cohort (n=54)							Whole cohort (n=77)						
Pre	57.6	15.8	4.3	2.5	.007**	0.35	46.7	13.3	-1.8	0.8	.217	0.11	37.5	16.2	7.7	5.4	<.001***	0.61		
Post	61.9	17.0					45.0	14.8					45.2	14.6						
Group 1: High-Risk (n=13)							Group 1: High-Risk (n=22)													
							39.0	13.6	3.2	0.8	.220	0.16	22.6	7.4	12.4	4.9	<.001***	0.91		
							42.3	15.2					35.0	13.0						
Group 2: At-Risk (n=13)							Group 2: At-Risk (n=38)							Group 2: At-Risk (n=45)						
Pre	43.1	15.1	7.5	3.9	<.001** *	1.09	51.1	10.3	-5.3	2.0	.030**	0.37	42.6	11.4	5.8	3.2	.002**	0.52		
Post	50.6	17.7					45.8	14.8					48.4	10.7						
Group 3: Borderline (n=21)							Group 3: Borderline (n=3)							Group 3: Borderline (n=7)						
Pre	54.8	9.6	3.8	1.1	.135	0.25	60.8	8.6	-4.6				56.6	6.7	3.4	0.7	.255	0.17		
Post	58.5	12.8					56.2	7.9		59.9	9.5									
Group 4: Moderate (n=17)							Group 4: Moderate (n=4)													
Pre	72.2	9.2	2.4	0.90	.190	0.22							65.2	10.8	-1.0					
Post	74.6	13.0															64.2	8.8		

StDev = Standard Deviation.  $\Delta\bar{X}$  = mean gains; t = t-test value. Sig. = Significance as indicated by p-value: \* 0.05 confidence interval; \*\* 0.01 confidence interval;

\*\*\* 0.001 confidence interval. Effect sizes: <.10: trivial; .10 - .29: small; .30 - .49: medium; >.50: large to very large.

In 2022, the weaker stratified groups consistently had larger effect sizes than the stronger groups. The High-Risk group demonstrated a significant improvement with a large effect size ( $\Delta\bar{X} = 12.4$ ;  $p < .001$ ,  $d = 0.91$ ), while the At-Risk group also had a large effect size ( $\Delta\bar{X} = 5.8$ ;  $p = .002$ ,  $d = 0.52$ ). In contrast, the Borderline group did not show any statistically significant improvement ( $\Delta\bar{X} = 3.4$ ;  $p = .255$ ). The Moderate group decreased its mean from 65.2% to 64.2%.

None of the interventions resulted in a sufficient amount of improvement after relatively low pre-test scores for such a basic inference (see Section 2.6.1.1) to be considered proficient in this construct. More than half of the participants across all three years ended their intervention with a post-test score of less than 50%, and only the 2019 Moderate group began and ended with a post-test mean of more than 70%. The 2021 intervention was particularly ineffective at improving participants' anaphoric inferencing proficiencies, yet the other two interventions were not able to bridge the gap either. While more research needs to be conducted before exact benchmarks can be set for the AIT, 50% accuracy in resolving anaphoric ties is certainly insufficient for such a basic reading proficiency.

### 4.3.3 Performance in causal inferences

Data from 2019 to 2022 address the following research question (see Section 3.3.1):

**Research Question 3: What is the effect of an intervention on causal inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

Table 4.5 shows statistical significance of differences in the pre- and post-intervention data of participants from 2019 to 2022 (Phases 2 to 4) in this construct. The 2019 cohort started off strong, but made very little progress. In contrast, the 2021 and 2022 cohorts both made large improvements but still ended their respective interventions with mean scores of less than 50%.

#### *2019 (Phase 2), face-to-face academic literacy intervention*

As can be seen in the left-hand column of Table 4.5, there was very little improvement in causal inferences for the 2019 cohort during the face-to-face academic literacy intervention, with this group's average increasing by only 1% from 52.7% to 53.6% ( $\Delta\bar{X} = 1.0$ ,  $t = 0.3$ ,  $p = .367$ ;  $d = 0.05$ ) – a nominal improvement

that is not statistically significant. This was the intervention with the smallest effect on causal inferences compared to the two online interventions.

There is no clear trend for the 2019 participants' improvement in drawing causal inferences. As seen in the table, none of the three stratified groups demonstrated statistically significant improvement, and effect sizes remained low.

#### *2021 (Phase 3), online academic literacy intervention*

As can be seen in the middle column of Table 4.5, the 2021 cohort's mean for causal inferences improved significantly from 26.9% to 36.7% ( $\Delta\bar{X} = 9.4$ ,  $t = 4.5$ ,  $p < .001$ ;  $d = 0.61$ ). Despite a large effect size of 0.61, this cohort still ends up with a post-test mean of only 36.7%, which is almost 16% less than the 2019 cohort's pre-test score.

Consistent with the trend that has emerged thus far, the weakest group that started with the lowest mean made the most progress. The High-Risk group started with a mean of 15.5% and achieved a very large effect size ( $\Delta\bar{X} = 16.5$ ;  $p < .001$ ,  $d = 1.36$ ). The At-Risk group increased by 6.3% and had a medium effect size ( $p < .001$ ,  $d = 0.36$ ) while the Borderline group dropped in performance from 63.6% to 58.6%.

#### *2022 (Phase 4), online academic inferencing intervention*

In 2022, the intervention group as a whole initially scored 33.5% on average for causal inferencing, as can be seen in the right-hand column of Table 4.5. Over the course of the intervention, they improved significantly ( $\Delta\bar{X} = 11.8$ ,  $p = <.001$ ), scoring an average of 45.2% in the post-test. This improvement corresponds with a large effect size ( $d = 0.91$ ).

When comparing the three stratified groups within 2022, a new pattern emerges in contrast to the pattern observed in 2019 and 2021. Specifically, there is more consistency in improvement made by each group. The High-Risk and At-Risk groups made similar significant progress with large effect sizes ( $\Delta\bar{X} = 11.8$ ;  $d = 0.98$ , and  $\Delta\bar{X} = 13.1$ ;  $d = 0.99$ , respectively), and their p-values were the same ( $p < .001$ ). The Borderline group also showed a large effect size ( $\Delta\bar{X} = 10.6$ ;  $p = .042$ ,  $d = 0.81$ ). However, the Moderate group only improved their mean score by 3.5%, not nearly as much as the other groups, although no inferential analyses could be performed for this group due to its small size.



Table 4.5: Causal inferencing performance 2019, 2021, 2022

2019	Causal (n = 51)						2021	Causal (n = 54)						2022	Causal (n = 77)					
	Mean	StDev	$\Delta\bar{X}$	T	Sig.	d		Mean	StDev	$\Delta\bar{X}$	t	Sig.	d		Mean	StDev	$\Delta\bar{X}$	t	Sig.	d
Whole cohort (n=51)							Whole cohort (n=54)							Whole cohort (n=77)						
Pre	52.7	17.4	1.0	0.3	.367	0.05	26.9	15.6	9.4	4.5	<.001***	0.61	33.5	14.7	11.8	8.2	<.001***	0.94		
Post	53.6	18.8					36.7	14.5					45.2	14.6						
Group 2: At-Risk (n=13)							Group 1: High-Risk (n=13)							Group 1: High-Risk (n=22)						
							15.5	9.19	16.5	6.4	<.001***	1.36	23.4	7.6	11.5	5.2	<.001***	0.98		
							32.0	11.0					34.9	10.0						
Group 2: At-Risk (n=13)							Group 2: At-Risk (n=38)							Group 2: At-Risk (n=45)						
Pre	35.8	14.7	6.5	0.9	.197	0.25	31.8	11.1	6.3	2.0	.030*	0.36	35.8	12.2	13.1	6.0	<.001***	0.99		
Post	42.3	19.3					38.1	14.7					48.9	12.7						
Group 3: Borderline (n=21)							Group 3: Borderline (n=3)							Group 3: Borderline (n=7)						
Pre	51.7	10.9	-1.9	0.5	.320	0.10	63.6	3.9	-4.9				43.4	12.4	10.6	2.1	.042*	0.81		
Post	49.8	15.5					58.6	16.2		54.0	9.1									
Group 4: Moderate (n=17)														Group 4: Moderate (n=4)						
Pre	66.8	13.9	0.3	0.1	.473	0.02							67.5	6.6	3.5					
Post	67.1	14.6															71.0	10.4		

StDev = Standard Deviation.  $\Delta\bar{X}$  = mean gains; t = t-test value. Sig. = Significance as indicated by p-value: \* 0.05 confidence interval; \*\* 0.01 confidence interval; \*\*\* 0.001 confidence interval. Effect sizes: <.10: trivial; .10 - .29: small; .30 - .49: medium; >.50: large to very large.

In conclusion, the two online interventions appear to have been more effective at improving causal inferencing than the face-to-face intervention, which did not result in statistically significant improvements for any of the groups or the full cohort. The 2022 intervention had the most success of the three, and was able to produce a statistically significant improvement for less-proficient and more-proficient participants, whereas the 2021 intervention was better suited to less-proficient students than more-proficient students. However, it is worth noting that the differences between the face-to-face and the two online cohorts were already evident at pre-test level, which makes it difficult to tell if the online interventions genuinely were more effective at improving causal inferencing overall or just particularly effective for the weaker students. The factors that may have contributed to these results are further discussed in Section 4.5.

#### 4.3.4 Performance in contrastive inferences

Data from 2019 to 2022 address the following research question (see Section 3.3.1):

**Research Question 4: What is the effect of an intervention on contrastive inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

Table 4.6 shows statistical significance of differences in the pre- and post-intervention data of participants from 2019, 2021 and 2022 in this construct. Based on this information, the 2019 cohort started with a very low mean score but made a very large improvement. The 2022 cohort started with the highest mean score but made the least improvement of all three cohorts. The cohort in 2021 started with a larger mean than the 2019 group and demonstrated more improvement than the 2022 group.

##### *2019 Phase 2, face-to-face academic literacy intervention*

Curiously, the 2019 cohort performed unusually poorly in the pre-test contrastive inferencing component of the AIT (19.2%) than in all the other AIT components; the reason for this is not clear. However, the contrastive mean for the 2019 cohort as a whole improved substantially from 19.2% to 57.3%. The data for this phase can be found in the left-hand column of Table 4.6. This was by far the biggest improvement demonstrated by any of the cohorts from any of the phases ( $\Delta\bar{X} = 38.0$ ,  $p = < .001$ ;  $d = 2.05$ ).

When comparing the three stratified groups of 2019, an unusual pattern emerges. This is one of the only instances in which the more-competent students made slightly bigger gains than the less-competent students. In fact, both the Borderline and Moderate groups made similar gains (38.1% and 38.9%, respectively) with very strong size effects ( $d = 1.75$  and  $d = 2.68$ , respectively) and they had the same  $p$ -value ( $p < .001$ ). Similarly, the At-Risk group improved significantly after starting the intervention with a mean of 16.6% ( $\Delta\bar{X} = 34.9$ ,  $p < .001$ ;  $d = 2.95$ ). The improvement demonstrated by all of the stratified groups was statistically significant.

#### *2021 (Phase 3), online academic literacy intervention*

As can be seen in the middle column of Table 4.6, the 2021 cohort improved from a mean score of 30.8% to 43.1% ( $\Delta\bar{X} = 12.3$ ,  $p < .001$ ;  $d = 0.68$ ).

In this phase, a return to the established trend of less-capable students showing greater improvement in scores from pre- to post-test than more-capable ones can be observed. The High-Risk group produced a very large effect size ( $\Delta\bar{X} = 19.9$ ;  $p < .001$ ,  $d = 1.41$ ) and the At-Risk group obtained a medium effect size ( $\Delta\bar{X} = 7.8$ ;  $p < .001$ ,  $d = 0.40$ ). In contrast, the Borderline group made no improvement; their mean score for the pre-test as well as the post-test was 64.9%.

#### *2022 (Phase 4), online inference-focused intervention*

The 2022 cohort started their intervention with a mean score of 37.3% (the highest pre-test mean for contrastive inferences) and only increased their mean to 42.5%, with a small effect size ( $\Delta\bar{X} = 5.3$ ;  $p = .005$ ,  $d = 0.30$ ). This data can be perused in greater detail in the right-hand column of Table 4.6.

Table 4.6: Contrastive inferencing performance 2019, 2021, 2022

2019	Contrastive (n = 51)						2021	Contrastive (n = 54)						2022	Contrastive (n = 77)					
	Mean	StDev	$\Delta\bar{X}$	T	Sig.	D		Mean	StDev	$\Delta\bar{X}$	t	Sig.	d		Mean	StDev	$\Delta\bar{X}$	t	Sig.	d
Whole cohort (n=51)							Whole cohort (n=54)						Whole cohort (n=77)							
Pre	19.2	6.4	38.0	14.6	<.001***	2.05	30.8	16.5	12.3	5.0	<.001***	0.68	37.3	18.2	5.3	2.7	.005**	0.30		
Post	57.3	20.0					43.1	15.5					42.5	18.7						
Group 1: High-Risk (n=13)							Group 1: High-Risk (n=22)													
							19.1	9.4	19.9	6.6	<.001***	1.41	24.9	11.5	8.5	2.5	.008**	0.47		
						39.0	14.2	33.4					14.2							
Group 2: At-Risk (n=13)							Group 2: At-Risk (n=38)						Group 2: At-Risk (n=45)							
Pre	16.6	7.8	34.9	7.0	<.001***	1.95	36.1	13.3	7.8	2.2	<.001***	0.40	38.8	14.5	3.8	1.4	.093	0.22		
Post	51.5	17.3					43.9	15.3					42.7	16.4						
Group 3: Borderline (n=21)							Group 3: Borderline (n=3)						Group 3: Borderline (n=7)							
Pre	19.1	5.6	38.1	8.0	<.001***	1.75	64.9	12.2	0.0				59.4	7.9	0.0	0.0	.500	0.04		
Post	57.1	21.7					64.9	6.1		59.4	17.9									
Group 4: Moderate (n=17)							Group 4: Moderate (n=4)													
Pre	22.8	5.4	38.9	11.1	<.001***	2.68							73.7	7.4	3.9					
Post	61.8	17.0															77.6	2.6		

StDev = Standard Deviation.  $\Delta\bar{X}$  = mean gains; t = t-test value. Sig. = Significance as indicated by p-value: \* 0.05 confidence interval; \*\* 0.01 confidence interval; \*\*\* 0.001 confidence interval. Effect sizes: <.10: trivial; .10 - .29: small; .30 - .49: medium; >.50: large to very large.

The established trend of less-capable students outperforming more-capable students in terms of improvement measured by effect size can be observed in the 2022 cohort, with the High-Risk group showing the greatest change ( $\Delta\bar{X} = 8.5$ ;  $p = .008$ ,  $d = 0.47$ ). The At-Risk group did not improve much ( $\Delta\bar{X} = 3.8$ ;  $p = .093$ ,  $d = 0.22$ ). The mean score of the Borderline group improved by less than a percent in the post-test ( $\Delta\bar{X} = 0.0$ ,  $p = .5$ ;  $d = 0.04$ ). However, the standard deviation increased from 7.9 to 17.9, indicating more variance in this group at the end of the intervention than at the start or potential outliers. The Moderate group was too small to calculate effect size or significance, although their mean score improved by 3.9% from 73.7% to 77.6%.

Based on the results of this study, face-to-face instruction appears to be the best mode for teaching and learning to draw contrastive inferences. The 2019 face-to-face intervention was the only one to consistently improve participants' proficiency in drawing contrastive inferences. The 2021 intervention did produce large effect sizes, but most participants still had post-test scores of less than 45%. Strangely, the 2022 participants fared worst of all; therefore, the inference-inclusive online intervention was not successful in reliably improving ECP students' contrastive inferencing proficiencies.

#### 4.3.5 Performance in general inferences

Data from 2019, 2021 and 2022 address the following research question (see Section 3.3.1):

**Research Question 5: What is the effect of an intervention on general inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

The academic AIT contained ten questions that were designated general inferences. Table 4.7 shows statistical significance of differences in the pre- and post-intervention data of participants from 2019, 2021 and 2022 in this construct. The first cohort, in 2019, started with relatively high scores for general inferences but did not improve over the course of their intervention. In contrast, the 2021 and 2022 cohorts both made large improvements, although they still concluded their interventions with much lower scores than the 2019 cohort in their pre-tests.

Table 4.7: General inferencing performance 2019, 2021, 2022

2019	General (n = 51)						2021	General (n = 54)						2022	General (n = 77)					
	Mean	StDev	$\Delta\bar{X}$	t	Sig.	D		Mean	StDev	$\Delta\bar{X}$	t	Sig.	d		Mean	StDev	$\Delta\bar{X}$	t	Sig.	d
Whole cohort (n=51)							Whole cohort (n=54)							Whole cohort (n=77)						
Pre	62.6	19.5	-0.4	0.2	.437	0.02	34.6	20.2	10.9	3.6	<.001***	0.49	34.7	19.7	10.2	5.1	<.001***	0.58		
Post	62.2	17.0					45.5	18.5					44.9	20.7						
Group 1: High-Risk (n=13)							Group 1: High-Risk (n=13)						Group 1: High-Risk (n=22)							
							23.2	16.1	19.2	5.0	<.001***	1.07	23.5	13.4	10.0	2.8	.004**	0.53		
						42.4	14.8	33.5					15.0							
Group 2: At-Risk (n=13)							Group 2: At-Risk (n=38)						Group 2: At-Risk (n=45)							
Pre	48.5	18.2	0.77	0.14	.447	0.04	40.2	18.4	5.8	1.3	.110	0.24	35.6	17.2	10.1	3.6	<.001***	0.59		
Post	49.2	15.0					46.0	19.9					45.7	19.1						
Group 3: Borderline (n=21)							Group 3: Borderline (n=3)						Group 3: Borderline (n=7)							
Pre	57.1	15.0	3.3	0.8	.216	0.17	63.0	17.0	0.00				54.5	11.7	14.3	2.4	.026*	0.92		
Post	60.5	15.0					63.0	25.7		68.8	11.6									
Group 4: Moderate (n=17)							Group 4: Moderate (n=4)						Group 4: Moderate (n=4)							
Pre	80.0	11.7	-5.9	1.9	.038*	0.46							72.7	14.8	4.5					
Post	74.1	12.8					77.3	11.7												

StDev = Standard Deviation.  $\Delta\bar{X}$  = mean gains; t = t-test value. Sig. = Significance as indicated by p-value: \* 0.05 confidence interval; \*\* 0.01 confidence interval;

\*\*\* 0.001 confidence interval. Effect sizes: <.10: trivial; .10 - .29: small; .31 - .49: medium; >.50: large to very large.

### *2019 (Phase 2), face-to-face academic literacy intervention*

The general inferencing mean of the 2019 cohort remained static (62.6% to 62.2%) as can be seen in the left-hand column of Table 4.7. They also started with a standard deviation of 19.5, suggesting that this was one of the more varied groups at the pre-test stage.

No consistent trend was detected when analysing the three stratified groups for 2019. All three groups made very little improvement, with no statistically significant improvement for any of the groups and trivial or no effect sizes. Even though the Moderate group started with a high mean of 80%, this decreased by 5.9% to 74.1% over the course of the intervention ( $\Delta\bar{X} = -5.9$ ).

### *2021 (Phase 3), online academic literacy intervention*

The 2021 cohort increased their mean from 34.6% to 45.5% in the post-test ( $\Delta\bar{X} = 10.9$ ,  $p = <.001$ ;  $d = 0.49$ ). Compared to the group as a whole from 2019, the sample from 2021 showed much more improvement throughout the intervention, yet still fell short of the pre-test mean obtained by the previous phase (refer to the middle column of Table 4.7) which illustrates how much lower their starting point was.

During 2021, the dominant trend of weaker students improving more than stronger students can be observed. The High-Risk group started with a low mean of 23.2% but improved significantly, with a large effect size ( $\Delta\bar{X} = 19.2$ ,  $p <.001$ ;  $d = 1.07$ ). In contrast, the At-Risk group did not demonstrate a statistically significant improvement ( $\Delta\bar{X} = 5.8$ ,  $p = .110$ ;  $d = 0.24$ ) and, not unusually, the Borderline group did not improve at all ( $\Delta\bar{X} = 0.0$ ).

### *2022 Phase 4, online inference-focused intervention*

The 2022 cohort improved significantly from a mean of 34.7% to 44.9%, with a large effect size ( $p <.001$ ,  $d = 0.58$ ) as can be seen in the right-hand column of Table 4.7. In both the pre-test mean and effect size, this group resembles the 2021 cohort but not the 2019 cohort.

When comparing the stratified groups, the established trend is inverted: stronger students improved more than weaker students did, although all the groups made large, significant gains. The Borderline group performed unusually well. They had the largest effect size, after starting with a mean of 54.5% ( $\Delta\bar{X} = 14.3$ ,  $p = .026$ ;  $d = 0.92$ ). The High-Risk and At-Risk groups also had medium to large effect sizes ( $\Delta\bar{X} =$

10.0,  $p = .004$ ;  $d = 0.53$ , and  $\Delta\bar{X} = 10.1$ ,  $p < .001$ ;  $d = 0.59$ , respectively). Even the Moderate group performed slightly better than usual, improving their mean by 4.5%, from 72.7 to 77.3%.

In sum, the 2019 intervention was not able to improve the participants' abilities to draw general inferences, whereas the 2022 inference-inclusive intervention managed to deliver relatively consistent improvements. The more-proficient students (those from either the Borderline or Moderate group, depending on the cohort) did not appear to engage much with this construct in any of the interventions, other than the 2022 intervention, while the less-proficient students (those from the High-Risk group) performed comparatively well, at least in the two online interventions, in 2021 and 2022.

Table 4.8 provides a summary of the three cohorts' performance. The 2021 and 2022 cohorts had much lower means overall than the 2019 cohort had: whereas the 2019 mean scores typically ranged between low fifties to low sixties (although there were exceptions), the 2021 and 2022 cohorts tended to start with mean scores in the thirties and then conclude their interventions with scores in the forties, also with some exceptions. The pre-COVID cohort was therefore a much stronger ECP cohort than the two post-COVID ECP cohorts. The 2021 cohort was a bit more varied at both the pre-test and post-test stage, but the mean scores evened out a bit in 2022, becoming more consistent across the different constructs. When comparing the different types of inferences, certain types – like general inferences – appear to be easier for ECP students than others, like the text-semantic inferences, namely causal and contrastive inferences. For instance, the 2021 cohort started with very low scores in causal inferences, whereas the 2022 cohort had very low pre-test scores for contrastive inferences. Even if the intention of an ECP academic literacy intervention is just to regain the ground lost since the pandemic, the last two interventions were not sufficiently successful. More research is needed to establish academic reading and literacy benchmarks necessary for academic success in the form of completing a degree programme, but it is already starting to emerge that many academically vulnerable students need more effective academic reading and literacy interventions than what they are currently receiving.



Table 4.8: Summary of performance for 2019, 2021 and 2022 cohorts

	2019		2021		2022	
	Pre	Post	Pre	Post	Pre	post
<b>Academic inferences</b>	56.1	59.6	33.4	37.4	36.3	44.7
<b>Anaphors</b>	57.6	61.9	46.7	45.0	37.5	45.2
<b>Causal</b>	52.7	53.6	26.9	36.7	33.5	45.2
<b>Contrastive</b>	19.2	57.3	30.8	43.1	37.3	42.5
<b>General</b>	62.6	62.2	34.6	45.5	34.7	44.9

#### 4.3.6 Performance in academic literacy

Data from 2019 address the following research question:

**Research Question 6: What is the effect of a 78-hour academic literacy intervention on ECP students' academic literacy proficiencies, overall and according to stratified ability groups? (Phase 2 in 2019)**

To recap, only 51 participants from 2019 wrote the TALL. Although the academic literacy variable was intended to be a consistent part of the study design, the participants from 2021 and 2022 could unfortunately not write the TALL due to the unanticipated move to online learning. Table 4.9 provides descriptive and inferential information on this cohort's performance in both academic literacy (measured by the TALL and available in the right-hand column) and inferencing (measured by the Academic AIT and available in the left-hand column). The AIT data is the same as in Table 4.3 but is repeated here for the sake of comparison.

The profiles for both the AIT and the TALL were similar. The 2019 cohort obtained a mean of 55.2% in the TALL pre-test, which improved slightly albeit significantly to a mean of 59.9% in the post-test, yielding a medium effect size ( $\Delta\bar{X} = 4.7$ ,  $p = .002$ ;  $d = 0.43$ ). The same cohort started the intervention with 56.1% in the AIT pre-test and 56.6% in the post-test, again yielding a medium effect size ( $\Delta\bar{X} = 3.5$ ;  $t = 2.9$ ,  $p = .003$ ;  $d = 0.41$ ).

When comparing the three stratified groups to each other, it is interesting to note relatively little difference among these groups in terms of improvement shown over the course of the intervention in terms of their change in mean. However, only the Borderline group demonstrated statistically significant improvement and showed the strongest effect size ( $\Delta\bar{X} = 5.0$ ;  $d = 0.54$ ). In contrast, the At-Risk and Moderate students did not make any significant improvement.

Table 4.9: Academic inferencing and academic literacy performance 2019

2019	Academic Inferencing (overall Academic AIT) (n = 51)						2019	Academic Literacy (TALL) (n = 51)					
	Mean	StDev	$\Delta\bar{X}$	T	Sig.	D		Mean	StDev	$\Delta\bar{X}$	T	Sig.	d
Whole cohort (n=51)													
Pre	56.1	11.9	3.5	2.9	.003**	0.41	55.2	14.1	4.7	3.1	.002**	0.43	
Post	59.6	12.7					59.9	15.0					
Group 1: High-Risk													
Group 2: At-Risk (n=13)													
Pre	42.5	5.9	6.6	2.8	.009**	0.76	46.9	9.9	4.6	1.4	.101	0.38	
Post	49.0	10.3					51.5	13.7					
Group 3: Borderline (n=21)													
Pre	53.3	2.7	3.7	1.8	.048*	0.38	51.7	11.8	5.0	2.5	.012*	0.54	
Post	57.0	9.6					56.7	12.5					
Group 4: Moderate (n=17)													
Pre	69.9	6.5	0.9	0.6	.283*	0.14	65.9	13.3	4.3	1.5	.080	0.36	
Post	70.8	8.9					70.2	13.6					

StDev = Standard Deviation.  $\Delta\bar{X}$  = mean gains; t = t-test value. Sig. = Significance as indicated by p-value: \* 0.05 confidence interval; \*\* 0.01 confidence interval; \*\*\* 0.001 confidence interval. Effect sizes: <.10: trivial; .10 - .29: small; .30 - .49: medium; >.50: large to very large.

None of the groups obtained effect sizes larger than 0.54. Considering that these participants had completed an intensive, face-to-face academic literacy intervention with ample class time and plenty of opportunity for individual consultation, larger effect sizes were expected.

#### 4.3.7 Relationship between academic literacy and inferencing

Data from 2019 addresses the following research question (see Section 3.3.1):

**Research Question 7: What is the relationship between ECP students' inferencing proficiencies and their academic literacy proficiencies during a 78-hour face-to-face academic literacy intervention? (Phase 2 in 2019)**

Table 4.10 provides correlation coefficients between academic literacy and inferencing. The Pearson correlation coefficient was used to assess the linear relationship between academic literacy and each inferencing construct tested in 2019 as well as overall, at the pre-test and post-test stage. There was a strong, significant correlation (0.65) between academic literacy and overall Inferencing at pre-test time, dropping slightly to 0.55 at post-test time. All of the other inferencing constructs also correlated significantly with academic literacy, with coefficients ranging from 0.324 to 0.601. Anaphors varied the most overall and tended to have a noticeable drop in correlation from the pre-test to the post-test. Causal, contrastive and general inferences were more stable in their correlation to academic literacy, as measured by the TALL.

Table 4.10: Correlation between inferencing and academic literacy

	Academic Lit pre-test (TALL)	Academic Lit post-test (TALL)
<b>Pre-test</b>		
Anaphors	0.510**	0.324*
Causal inferences	0.401**	0.393**
Contrastive inferences	0.385**	0.433**
General inferences	0.458**	0.469**
Full AIT	0.647**	0.549**
<b>Post-test</b>		
Anaphors	0.601**	0.442**
Causal inferences	0.435**	0.474**
Contrastive inferences	0.401**	0.416**
General inferences	0.478**	0.542**
Full AIT	0.707**	0.641**

Pearson correlation coefficient; Significance as indicated by p-value \* 95% confidence interval; \*\* 99.9% confidence interval.

## 4.4 Results from the Reading Habits questionnaire

Data from 2022 address the following research question:

**Research Question 8: What are ECP students' reading habits, and what are the relationships between these habits and students' inferencing proficiencies, overall and according to stratified ability groups?**

The questionnaire was answered by 55 participants from 2022 in the third and fourth week of the intervention. Thirteen respondents were in the High-Risk group, 20 were At-Risk and 22 were in the Borderline group (of which two were technically Moderate students but were included in the Borderline group to avoid having such a small group). Table 4.11 provides the raw scores and percentages for items relating to spoken language from the Reading Habit questionnaire.

The language profile section of the questionnaire revealed a diverse student body with a variety of relationships to the English language, as shown in Table 4.11. Only 41% of participants regarded English as the language in which they felt most proficient, with the rest mostly listing isiZulu (19%), Setswana (11%), Sesotho (6%), Sepedi (5%), and Xhosa (5%). Of the Borderline students, 50% regarded English as their most proficient language, the largest percentage of the stratified groups. Interestingly, only 4% of participants listed English as their home language, suggesting that some students who did not grow up speaking English at home now consider it to be their most used language. As indicated in Table 4.11, it is also worth noting that 11% of the participants stated that they can speak only one language, even though the vast majority of schools in South Africa require students to study two languages, as that is a requirement for a South African National Senior Certificate. Another 38% can speak two languages, while the majority (51%) of participants reported being able to speak three or more languages.

Table 4.11: Language use

Group	Number of languages (speak)			Language in which most proficient			Home language		
		raw	%		raw	%		raw	%
Whole group	1 language	6	11	English	21	38	English	2	4
	2 languages	21	38	Not English	34	62	Not English	37	67
	3 or more	28	51				More than one	16	29
	Total	55	100	Total	55	100	Total	55	
High-Risk	1 language	1	8	English	3	23	English	0	0
	2 languages	6	46	Not English	10	77	Not English	8	62
	3 or more	6	46				More than one	5	38
	Total	13	100	Total	13	100	Total	13	100
At-Risk	1 language	1	5	English	7	35	English	2	10
	2 languages	6	30	Not English	13	65	Not English	14	70
	3 or more	13	65				More than one	4	20
	Total	20	100	Total	20	100	Total	20	100
Borderline	1 language	4	18	English	11	50	English	0	0
	2 languages	9	41	Not English	11	50	Not English	15	68
	3 or more	9	41				More than one	7	32
	Total	22	100	Total	22	100	Total	22	100

Table 4.12 shows that a surprisingly large number (20%) reported being able to read in only one language, considering that all South African learners are required to take two languages up to Grade 12. A further 45% could read two languages, while 35% reported being able to read three or more languages. When asked about the language in which they can read the most proficiently, 78% reported it to be English, whereas all other languages made up only 22% of the responses. This ratio was again a little different for the Borderline group, in which 91% of students listed English as the language they can read the best.

Table 4.12: Reading languages

Group	No of languages read			Strongest language for reading		
		raw	%		raw	%
Whole group	1 language	11	20	English	43	78
	2 languages	25	45	Not English	12	22
	3 or more	19	35			
	Total	55		Total	55	
High-Risk	1 language	2	15	English	9	69
	2 languages	7	54	Not English	4	31
	3 or more	4	31			
	Total	13	100	Total	13	100
At-Risk	1 language	4	20	English	14	70
	2 languages	8	40	Not English	6	30
	3 or more	8	40			
	Total	20	100	Total	20	100
Borderline	1 language	5	23	English	20	91
	2 languages	10	45	Not English	2	9
	3 or more	7	32			
	Total	22	100	Total	22	100

As indicated in Table 4.13, 78% of the cohort had attended schools where English was the Language of Learning and Teaching (LoLT) in Foundation Phase. Moreover, 16% experienced a change in LoLT after completing their Foundation Phase education, mostly from isiZulu or Afrikaans to English, while another 6% continued schooling in a language other than English.

Table 4.13: Language of Teaching and Learning (LoLT)

Group	LoLT Gr. 1-3			LoLT change between Gr. 3 and Gr. 4		
		raw	%		raw	%
Whole group	English	43	78	No change	46	84
	Not English	12	22	Change	9	16
	Total	55		Total	55	
High-Risk	English	9	69	No change	10	77
	Not English	4	31	Change	3	23
	Total	13	100	Total	13	100
At-Risk	English	15	75	No change	17	85
	Not English	5	25	Change	3	15
	Total	20	100	Total	20	100
Borderline	English	19	86	No change	19	86
	Not English	3	14	Change	3	14
	Total	22	100	Total	22	100

The reading habits section of the questionnaire indicated a worryingly low volume of reading. As shown in Table 4.14, the majority of the cohort (58%) reported that they had never been a member of a public library, with a further 15% being uncertain. Only 24% were sure of having had library membership at some stage during their lives; in the High-Risk group only 8% were certain, compared to 32% in the Borderline group. When asked to name their favourite book, 38% of the respondents either did not answer the question or provided the name of a prescribed book which they likely read in high school. Of the remaining 62%, a non-fiction book was favoured by 13%.

Participants were also asked to indicate how much they read various types of sources, such as magazines and online sources, as reflected in Table 4.15. Their responses indicated that very little reading seems to occur, even when taking popular sources like magazines into consideration. Moreover, the participants in the less-proficient groups tended to read less than their more-proficient peers. They also reported more frequent interaction with fictional texts than non-fictional texts. A limitation of the questionnaire was that the question was not very specific in whether this included academic reading, or just reading for leisure, and students might have discounted assigned reading from school and university.

Table 4.14 Library membership and favourite book

Group	Library membership			Favourite book		
		raw	%		raw	%
Whole group	No	32	58	Prescribed or none	21	38
	Not sure	8	15	Non-fiction	7	13
	Yes	13	24	Fiction	27	49
	Total			Total		
High-Risk	No	8	62	Prescribed or none	6	46
	Not sure	4	31	Non-fiction	2	15
	Yes	1	8	Fiction	5	38
	Total	13	100	Total	13	100
At-Risk	No	11	55	Prescribed or none	7	35
	Not sure	2	10	Non-fiction	1	5
	Yes	7	35	Fiction	12	60
	Total	20	100	Total	20	100
Borderline	No	13	59	Prescribed or none	8	36
	Not sure	2	9	Non-fiction	4	18
	Yes	7	32	Fiction	10	45
	Total	22	100	Total	22	100

Students were also asked about their online reading habits, as shown in Table 4.16. Sixty-seven percent of the cohort stated that they do most of their reading online, and there was a noteworthy difference between less-proficient and more-proficient participants in this regard. The High-Risk and At-Risk groups had relatively high percentages of students (69% and 80%, respectively) who did most of their reading online, whereas the Borderline students tended to engage slightly more with hard-copy text, with only 55% doing most of their reading online. When asked to quantify the amount of time spent reading online, the majority (53%) reported spending less than ten hours per week reading online, with 20% spending more than 20 hours on this activity each week. Only 8% of the High-Risk students stated that they spend more than 20 hours per week reading online. Since there is plenty of opportunity to read short pieces of information, participants were also asked about the length of the texts that they read online; 67% reported spending at least half of their time reading online engaging with short pieces of text, like Tweets.



Table 4.15: Sources and variety

Group	Magazines no/year			Books no/year			Amount of non-fiction reading		
		raw	%		raw	%		raw	%
Whole group	0-3 magazines	36	65	0-2 books	23	42	Mostly fiction	23	42
	4-6 magazines	9	16	2-3 books	17	31	About 50/50	23	42
	More than 6	10	18	More than 3	15	27	Mostly non-fiction	9	16
	Total	55	100	Total	55	100	Total	55	100
High-Risk	0-3 magazines	9	69	0-2 books	8	62	Mostly fiction	4	31
	4-6 magazines	2	15	2-3 books	3	23	About 50/50	6	46
	More than 6	2	15	More than 3	2	15	Mostly non-fiction	3	23
	Total	13	100	Total	13	100	Total	13	100
At-Risk	0-3 magazines	13	65	0-2 books	6	30	Mostly fiction	10	50
	4-6 magazines	2	10	2-3 books	7	35	About 50/50	8	40
	More than 6	5	25	More than 3	7	35	Mostly non-fiction	2	10
	Total	20	100	Total	20	100	Total	20	100
Borderline	0-3 magazines	14	64	0-2 books	9	41	Mostly fiction	9	41
	4-6 magazines	5	23	2-3 books	7	32	About 50/50	9	41
	More than 6	3	14	More than 3	6	27	Mostly non-fiction	4	18
	Total	22	100	Total	22	100	Total	22	100

Table 4.16: Reading online

Group	Amount of reading online			Online reading hours/week			Amount of short info reading online		
		raw	%		raw	%		raw	%
Whole group	Less than half	6	11	Less than 10h	29	53	Less than half	20	36
	About 50/50	12	22	10-20 hours	15	27	About 50/50	15	27
	Majority	37	67	More than 20h	11	20	Most of the time	20	36
	Total	55	100	Total	55		Total	55	
High-Risk	Less than half	1	8	Less than 10h	8	62	Less than half	4	31
	About 50/50	3	23	10-20 hours	4	31	About 50/50	5	38
	Majority	9	69	More than 20h	1	8	Most of the time	4	31
	Total	13	100	Total	13	100	Total	13	100
At-Risk	Less than half	2	10	Less than 10h	12	60	Less than half	8	40
	About 50/50	2	10	10-20 hours	1	5	About 50/50	5	25
	Majority	16	80	More than 20h	7	35	Most of the time	7	35
	Total	20	100	Total	20	100	Total	20	100
Borderline	Less than half	3	14	Less than 10h	9	41	Less than half	8	36
	About 50/50	7	32	10-20 hours	10	45	About 50/50	5	23
	Majority	12	55	More than 20h	3	14	Most of the time	9	41
	Total	22	100	Total	22	100	Total	22	100

Participants also reported their perception of their own reading proficiency as is shown in Table 4.17. Strikingly few (4%) felt that they were not good at reading, with 24% perceiving themselves as somewhat good at reading, and 73% seeing themselves as good at reading. It is also worth noting that a substantial section (69%) of High-Risk students reported being good at reading. When asked about using strategies while reading, the majority (84%) reported at least some strategy use; however, 14% of Borderline students reported not using any strategies while reading, although they may have misunderstood the question as no examples of strategies were provided. Surprisingly, most of the participants said they enjoy reading, at least somewhat, with only 7% stating that they do not enjoy reading at all; in fact, of the three stratified groups, the Borderline group had the largest percentage (9%) who claimed they did not like reading at all.

Table 4.17: Own perception of reading

Group	Enjoy reading			Good at reading			Uses reading comprehension strategies		
		raw	%		raw	%		raw	%
Whole group	No	4	7	No	2	4	No	9	16
	Somewhat	24	44	Somewhat	13	24	Somewhat	18	33
	Yes	27	49	Yes	40	73	Yes	28	51
	Total	55	100	Total	55	100	Total	55	100
High-Risk	No	1	8	No	1	8	No	2	15
	Somewhat	8	62	Somewhat	3	23	Somewhat	4	31
	Yes	4	31	Yes	9	69	Yes	7	54
	Total	13	100	Total	13	100	Total	13	100
At-Risk	No	1	5	No	1	5	No	4	20
	Somewhat	7	35	Somewhat	5	25	Somewhat	7	35
	Yes	12	60	Yes	14	70	Yes	9	45
	Total	20	100	Total	20	100	Total	20	100
Borderline	No	2	9	No	0	0	No	3	14
	Somewhat	9	41	Somewhat	5	23	Somewhat	7	32
	Yes	11	50	Yes	17	77	Yes	12	55
	Total	22	100	Total	22	100	Total	22	100

## 4.5 Discussion

Inferencing is an integral part of reading comprehension and of academic literacy, but it is seldom taught explicitly. In order to consider the impact of the COVID-19 lockdown in 2020 and the different resulting modes of instruction, this study examined what effect three different types of ECP academic literacy interventions had on different aspects of inferencing, for each cohort as a whole, and when participants are disaggregated according to levels of proficiency. The language uses and reading habits of ECP students were also investigated to determine the relationships between these factors and levels of proficiency. In order to evaluate the impact of the different interventions, a two-pronged approach was used, where performance in inferencing while reading academic text served as the dependent variable in each case, but the nature of the independent variable, the intervention, varied.

- First, the two academic literacy interventions are compared to each other with mode of instruction (face-to-face versus online) as a criterion of the independent variable.
- Secondly, the two online interventions are compared to each other with content (with or without explicit inferencing instruction) as a criterion of the independent variable.

During these two comparisons, the impacts of the interventions on the different kinds of inferencing are discussed as well as the differential effects of the interventions on less and more proficient students. The relationship between academic literacy and academic inferencing is discussed with regard to Research Questions 6 and 7. Finally, the results of the Reading Habits questionnaire are discussed in order to determine if there are any relationships between inferencing proficiency and reading habits or language profiles that could be leveraged to predict or address potential challenges and to address Research Question 8.

Inferencing proficiencies are critical to reading, academic literacy and learning at tertiary level, but academically vulnerable students tend to struggle with inferencing. These proficiencies can develop incidentally, through exposure to reading and writing as part of an academic literacy module, but as pointed out in the literature review in Section 2.8.3, research has shown that direct instruction and enough time on task can improve inferencing abilities (Hansen & Pearson, 1982: 6; Dewitz *et al.*, 1987: 101; Duffy & Roehler, 1989: 146; Beishuizen *et al.*, 1999: 42; McMackin & Lawrence, 2001: 135; Kispal, 2008: 4; Pretorius & Lephalala, 2011: 4). At the same time, a large improvement in performance does not necessarily mean sufficient improvement. South African students in general, and ECP students in

particular, tend to enter university with very poor reading competencies, and spending one semester on reading comprehension is unlikely to be sufficient intervention for vulnerable students who require additional assistance to keep up with the academic demands of a degree programme, as reading skills take time to develop. Moreover, academic literacy and reading are not regularly tested in ECP programmes, or at universities in general; formal assessment is necessary for monitoring the levels of these competencies in undergraduate students. At the same time, the academic literacy modules themselves need more rigorous evaluation. Formalised academic literacy interventions at university level can be valuable tools for responding to low literacy levels and unequal educational opportunities, but then they need to be better informed by the research.

As summarised in Table 4.8, all three interventions showed some impact on the students' inferencing abilities, but the effects varied across different types of inferences and different levels of proficiency in the participants, while the different cohorts were also quite diverse. These variations are discussed in Sections 4.5.2 to 4.5.4

#### 4.5.1 University responses to the COVID-19 lockdown in 2020

Although the sudden move to online education in 2020 caused significant obstacles to the original teaching plan, as discussed in Section 3.2, it also gave unexpected opportunities in terms of data collection. For instance, it was possible to compare an ECP sample sourced from a 'normal' face-to-face group to a sample sourced from a cohort which had recently experienced a significant upheaval at a critical point in their education, and which had to acquire academic literacy competencies through online instruction as a continued result of this upheaval. The difference between these two cohorts, 2019 and 2021, was immediately apparent when considering their respective pre-test scores. On average, the participants from 2021 ( $m = 33.4\%$ ) performed much worse than those from 2019 ( $m = 56.1\%$ ), so much so that an additional group with a lower range of pre-test marks (the High-Risk group) was created in order to accommodate a sub-section of this cohort that performed at a lower level than any of the students in the 2019 cohort. This was not part of the original research design; before the pandemic occurred, there was no need to create a group for students who obtained less than 30%, but both post-2020 cohorts contained a significant portion of students in this category. Compared to the 2019 cohort, the 2021 cohort did at times make a more pronounced improvement (generally in the weaker groups, but also with causal inferences), but their post-test means were often still very low, almost always less than the pre-test scores of the corresponding group from 2019.

The COVID-19 pandemic and the subsequent closure of schools and universities had a significant impact on education across the world. Up to 91% of school learners globally had to adapt to remote learning, as over 180 countries were forced to close their schools at the height of the pandemic (Maree, 2022). For many of these learners, their return to school was repeatedly delayed, so much so that almost half of these learners were still dealing with blended or fully remote instruction a full year after the outbreak of the disease (UNESCO, 2021). Schools in developing countries struggled much more to adapt to the sudden restrictions placed on them than schools in developed countries (United Nations, 2020). Even within the same country, there could be significant discrepancies in the quality of education received by different learners, as poorer schools simply could not produce accessible online content at such short notice, and learners from these school often did not have the necessary literacy and resources for online learning. Thus, one of the most concerning effects of the pandemic in South Africa was the extent to which the existing gaps between affluent schools and poorer schools widened, especially in terms of quality of schooling (Dube 2020; Maree, 2022).

One study by Ardington, Wills and Kotze (2021a) compared the reading competencies of Grade 2 and Grade 4 learners from no-fee paying schools across South Africa during the pandemic to the reading competencies of their pre-pandemic peers. The researchers found learning losses (defined as the learning students would have gained over a typical year of schooling if schools were not disrupted) of between 57% and 80% among these learners. They also noted that girls who had to complete part of their education at home tended to have greater losses than boys in the same situation, even when controlling for student's baseline reading performance (Ardington *et al.*, 2021a). The disproportionate impact of the move to remote education on more vulnerable students was visible even in affluent countries like the Netherlands, where documented losses were, on average, 60% larger for learners with less-educated parents than for their peers (Engzell, Frey & Verhagen, 2021). For a country like South Africa which was already battling with severe socio-economic inequality, the impact of the move to remote learning was devastating. According to Ardington *et al.* (2021: 2a), "South Africa simply has no option but to engage in significant remediation efforts in the coming years and to avoid future school disruptions as much as possible." The 2021 cohort, which would have experienced extreme upheavals in their Grade 12 2020 school year, would not yet have received any remediation efforts by the time they started participating in this study, and their low pre-test scores attest. Based on pre-test scores, the same appears to be the case for the 2022 cohort.

#### 4.5.2 Face-to-face vs online instruction on inferencing ability

The main focus in this subsection is a comparison of the effects of a general academic literacy intervention on ECP students' inferencing proficiencies in two different modalities, face-to-face and online. As already pointed out, even though both cohorts were ECP students and hence academically vulnerable, their academic inferencing skills were vastly different, both at initial and end-line positions. This calls for some caution when interpreting the outcomes of the two interventions. Of the five inferencing constructs that were assessed during a general academic literacy intervention across two modalities, three saw greater improvement (measured as the change in mean pre- and post-test scores and effect size) in the face-to-face intervention, while the other two corresponded with larger effect sizes in the online version. Even though both interventions produced essentially the same overall effect size, when considering both the performance of all stratified groups as well as the full cohort, performance in overall academic inferences, anaphors and contrastive inferences fared better in face-to-face instruction, but causal inferences and general inferences showed greater improvements in the online intervention. In short, the face-to-face intervention was the most successful for the majority of constructs, when the 2019 and 2021 cohorts are compared, although it is worth noting that the online interventions that were assessed were implemented in unforeseen circumstances surrounding the COVID-19 pandemic. In other words, this particular approach to online learning may not have been optimal and does not offer an accurate representation of all online instruction.

##### 4.5.2.1 Inferencing abilities that improved more in 2019 (Phase 2, face-to-face)

The 2019 cohort generally tended to perform better than the 2021 cohort. Specifically, face-to-face participants demonstrated greater improvement than online participants in the majority of the constructs (academic inferences, anaphoric inferences and contrastive inferences). This is most easily observable when comparing the data obtained from the full AIT, termed academic inferences. Both cohorts had a medium effect size (0.41 and 0.38, respectively) for the academic inferences construct. However, the online cohort's growth is concentrated in the High-Risk group ( $d = 0.88$ ), as has been the trend throughout this study, with the other 2021-cohort groups showing little to no improvement. When considering the stratified groups from 2019 (face-to-face), on the other hand, there is more evidence of improvement across the whole cohort.

Neither the face-to-face cohort nor the online cohort made large improvements in resolving anaphoric inferences over the course of the intervention. However, there was generally more improvement in the 2019 face-to-face cohort than in the 2021 online cohort, as can be seen when comparing the results obtained from the full cohort as well as from the At-Risk group; in both cases, there was improvement in 2019 (face-to-face) while the participants in 2021 (online) tended to achieve lower marks in the post-test than in the pre-test. In fact, this was one of only two instances in which the full cohort's mean score went down ( $\Delta\bar{X} = -1.8$ ) over the course of the intervention. Section 4.5.4 discusses the potentially different needs of less-proficient and more-proficient students and how these needs interacted with different inferencing constructs, such as anaphors.

The improvement made in contrastive inferencing during 2019 (face-to-face) was the biggest of all constructs across all years. All the stratified groups as well as the full cohort showed statistically significant improvements with large effect sizes. In fact, both the full cohort and the Moderate group had effect sizes of more than 2.00. In comparison, the participants in 2021 (online) did not perform poorly per se; they simply did not improve as much as the face-to-face cohort.

#### 4.5.2.4 Advantages of face-to-face instruction

The fact that most of the stratified groups from 2019 showed statistically significant improvement coupled with moderate to high effect sizes in both academic literacy and inferencing is encouraging. Furthermore, the improvement in inferencing suggests that even academically vulnerable students can transfer knowledge and skills under the right circumstances, as this skill was a never explicitly taught during the 2019 intervention, suggesting that xxx. While the same skills would likely have been transferred in the 2021 intervention, the impact tended to be smaller.

There are several reasons why the face-to-face intervention may have had a bigger impact than the online intervention. First, as ECP students, the participants from both cohorts were academically vulnerable and therefore understandably needed accessible content and responsive guidance, even more so than the average first-year student. The content of the academic literacy interventions, both face-to-face and online, was designed to meet students where they were, and was carefully scaffolded to improve accessibility. However, workshop-style, face-to-face lessons made it much easier for students to get immediate input or feedback on their work, in a way that the online platform could not entirely replicate. It was not always possible to provide sensitive, individualised guidance on a case-by-case basis to online

instruction groups of fifty students at a time without ever seeing their faces or getting to know them individually. Furthermore, ECP students can sometimes show a lack of awareness of the ways in which their reading and literacy competencies can still improve, as was seen in the data collected with the Reading Habits questionnaire in 2022 (Section 4.4) and so may not initially be invested in an intervention they may deem unnecessary. Such issues with motivation are more problematic in online teaching environments as these tend to rely more on self-driven students than is the case in traditional face-to-face instruction (Omodan & Ige, 2021; Dankers, Stoltenkamp & Donson).

The second potential area of concern that likely influenced some participants' ability to engage with the online intervention was access to digital infrastructure. Students might have faced difficulties with access to a device, a quiet space in which attend online classes, access to the Internet, or they might have had low computer literacy levels. Moreover, students with lower literacy levels often use oral interaction and oral discourse to strengthen understanding. Therefore, more-proficient readers may also be digitally more literate and thus feel more at ease with online tuition than less skilled readers, who may be further disadvantaged in an online environment. These potential stumbling blocks can also affect students' motivation, especially if they occur for reasons outside of students' control. The online interventions tried to take these potential limitations into consideration by giving extra time and assistance wherever possible, but frequent technological challenges could easily have detracted from a participant's learning experience. All of this points to an argument to be made that face-to-face classes might be more effective for teaching and learning inferencing skills than online classes are – an important factor to take into consideration when policy-makers increasingly call for more blended and online learning, as has been the case in South Africa – see for example Nzimande (2020).

These challenges were not unique to the ECP students; many studies that investigated students' ability to engage in online learning during the pandemic came to similar conclusions, especially when the students came from developing countries. They found that students lacked certain resources and competencies that are necessary for online learning. Fouche and Andrews (2022) noted that disruptive home environments and unfamiliarity with online learning methods were significant obstacles for some students. Krull and De Klerk (2021) found that a lack of study space and unreliable electricity were common challenges faced by students during this time. Moreover, Omodan and Ige (2021) noted that many students lacked the required devices and that psycho-social issues like isolation, and poor time management contributed additional pressure. Without access to the necessary resources and



competencies, vulnerable students soon fell behind, while more affluent students could often rely on material and emotional support from families that were generally more educated and thus more capable of assisting them (Dube, 2020). While some South African universities found ways to provide data and laptops to students in need (Chaka, 2020; Pather, Brown & Lawack 2021; Dankers *et al.*, 2021), the reality of unequal access exacerbating systemic inequalities was decried by many (Jappie, 2020; Motaung & Dube, 2020; Motala & Menon, 2020). Unsurprisingly, university students across the world who were surveyed after the shift to different modes of instruction voiced their preference for face-to-face instruction. In South Africa, 67% of those surveyed preferred face-to-face instruction, 5% wanted to continue with online instruction, while 28% liked the idea of blended instruction which combines elements of both (Dankers *et al.*, 2021).

#### 4.5.2.2 Inferencing skills that improved more in the online intervention

Across the cohorts, causal inferences seemed to pose challenges for the students (cf. Table 4.5). The participants from the online cohort generally improved their ability to draw causal inferences to a greater extent than the face-to-face cohort. The full online cohort achieved a large effect size ( $p < .001$ ;  $d = 0.61$ ) for causal inferences, while the full face-to-face cohort only managed a nominal improvement that was not statistically significant ( $p = .367$ ;  $d = 0.05$ ). This difference was seen mainly in the High-Risk group in the 2021 cohort, which improved significantly in the 2021 online phase ( $d = 1.36$ ). There was no High-Risk group in the 2019 face-to-face group, as this cohort started with much higher pre-test scores than the cohort in 2021 (online).

There was greater improvement in the general inferences construct in 2021, when the academic literacy intervention was taught online. During 2019 (face-to-face), all but the Moderate group consistently showed very little evidence of any improvement in this construct. In contrast, during 2021 (online), the majority of participants consistently improved their ability to draw general inferences.

Since there was no High-Risk group in 2019, a comparison between the two interventions has certain limitations which impact the validity of these results. In 2021, the High-Risk group benefitted the most from the intervention, although the average performance for the High-Risk group in the post-test for this cohort remained problematically low (mean = 33.8%) after they started with very low pre-test marks (mean = 24.2%). In fact, considering that there were so many High-Risk participants in 2021, one would have expected the 2021 cohort to have made even larger improvements, as the High-Risk students' ability

to make significant gains has been regularly observed during this study. Thus, the absence of more substantial growth is noteworthy. It is also possible that writing the pre-test may have been quite challenging for the online participants, especially the weaker students, and that discrepancies in computer literacy may be a contributing factor to their pre-test performance in particular. The online platform was unfamiliar, and navigating it could have been difficult for some. If so, then the 2021 pre-test scores may have been artificially lowered, thus making the online cohort's improvement appear more substantial than it is. Therefore, it is difficult to say whether differences in improvement really reflect the impact of the instructional mode or are, in fact, the result of comparing two very different cohorts.

#### 4.5.3 Academic literacy only vs explicit inference instruction on inferencing ability

Attention now shifts to the next pair of interventions to be compared, namely the two online interventions: the 2021 general academic literacy intervention, and the 2022 academic literacy with explicit inferencing intervention. This comparison focuses on the impact of an intervention that includes direct instruction on inferencing within a general academic literacy programme. Of the five inferencing constructs that were assessed, four saw more growth in 2022 (which included inferencing instruction), while one of the constructs (contrastive inferences) demonstrated more growth in 2021 (which did not include direct instruction on inferencing). In 2021, four of the five inferencing constructs had effect sizes of between 0.38 and 0.68 (with an average effect size of 0.54), whereas one construct (anaphoric inferences) saw no statistically significant improvement. In 2022, all five inferencing constructs had effect sizes ranging between 0.30 and 1.04 (with an average effect size of 0.69). Despite these differences in improvement as indicated by effect sizes, the post-test mean scores for the two cohorts were very similar in three constructs (anaphors, contrastive inferences and general inferences), while two constructs (causal inferences as well as the full AIT) had higher mean scores in the 2022 post-test.

##### 4.5.3.1 Inferencing proficiencies that improved more during 2021 (no inferencing instruction)

The 2021 intervention produced better results than the 2022 intervention in only one of the constructs, namely contrastive inferences. Not only did the 2021 participants demonstrate a large improvement ( $d = 0.68$ ) in this construct, but the 2022 students performed unusually poorly. The 2022 participants managed to make statistically significant but ultimately insufficient improvement in this construct as a cohort ( $d = 0.30$ ), while there was little to no improvement to be observed when the cohort was divided into stratified groups. The picture was much more positive in 2021 when all possible stratified groups improved significantly and the weaker students achieved a very large effect size ( $d = 1.41$ ). It is not immediately

apparent why the participants who received targeted, inference-inclusive instruction made less improvement in the contrastive inferences construct than those who did not receive any explicit instruction on inferencing; therefore, further research is required.

#### 4.5.3.2 Inferencing proficiencies that improved more during 2022 (with inferencing instruction)

In all other constructs, the 2022 participants (who received the intervention which included inferencing) outperformed the 2021 participants (who received the intervention that did not include inferencing). The most representative metric for the discrepancy between the two cohorts is the mean for the full AIT, also known as the academic inferences construct. Whereas the 2021 cohort only managed to produce an effect size of 0.38, the 2022 cohort improved much more, resulting in an effect size of 1.04. The 2022 cohort also managed to increase their mean score by 9.2%, which meant that they moved from a pre-test mark in the thirties to a post-test mark in the forties, the only such instance in all three phases. When considering the stratified groups' performance in the academic inferences construct, the impact of the inference-inclusive intervention is even more apparent, especially in the case of stronger students. The dominant trend of weaker students making larger gains than stronger students can be observed in 2021, whereas the 2022 cohort made consistent improvement across almost all of the stratified groups, including those containing the stronger students.

In terms of anaphoric inferences, the 2022 intervention had a greater impact than the 2021 intervention. The 2021 participants performed so poorly in their post-test that their mean was lower than the pre-test mark for two of the three stratified groups as well as the full cohort ( $\Delta\bar{X} = -1.8\%$ ). In contrast, all but the top 11 participants in 2022 made large, statistically significant improvements in their ability to resolve anaphoric inferences.

The improvement seen in causal inferencing made by the 2022 cohort is encouraging. The difference between the full 2021 cohort and the 2022 cohort is not especially striking since both made large, significant improvements. However, when comparing the stratified groups, the 2022 participants who received direct instruction on inferencing were at a clear advantage over the students from 2021 whose intervention only dealt with academic literacy more broadly. This is evident in the consistently large effect sizes from three out of four stratified groups in 2022. Conversely, the results from the 2021 cohort followed the dominant trend of smaller effect sizes for stronger students.

Both the 2021 cohort and the 2022 cohort made large, significant improvements in general inferences. The common trend observed in this study of weaker students improving more than stronger students can be seen again in 2021, but this trend is unexpectedly inverted for the 2022 cohort. In 2022, the stronger students outperformed their peers in terms of improvement over the duration of the intervention, so much so that the Borderline group (Group 3) produced a very large effect size of 0.9 after increasing their mean score by 14.3%. In comparison, during 2021, the Borderline group obtained exactly the same mean score of 63.0% in both the pre-test and the post-test. None of the Borderline groups across the three intervention phases started with a mean of more than 63%; there was clearly plenty of room for improvement, but only the 2022 Borderline group made significant improvement. Thus, it would appear as though the academic intervention with inferencing instruction was better able to address the needs of the stronger students with regards to challenge and novelty, while at the same time being sufficiently accessible to the weaker students in the High-Risk group (Group 1) who also managed to improve substantially.

It is worth noting, however, that the inferencing competencies of the majority of the students, in all cohorts, did not reflect the advanced levels of performance that is expected of skilled reading at university level. These students will likely continue to need assistance throughout their university careers and will be at high risk of dropping out if it is not provided. Overall, even the 2022 groups still performed about 15% lower than their 2019 counterparts at post-test level. Therefore, the remediation offered here has started to mitigate the additional academic risks that academically vulnerable students have been facing since the COVID-19 lockdown, but even those pre-2020 levels of already vulnerable ECP students have not yet been reached, and this will have serious implications for these students' university careers.

#### 4.5.3.3 Advantages of including inference-focused direct instruction

There were several factors that potentially contributed to the relative success of the 2022 intervention (which included direct instruction on inferencing). One reason why the 2022 intervention may have had a more substantial impact (in terms of magnitude of improvement between pre- and post-tests) than the other interventions is because of its foregrounding of inferences through explicit instruction. In other words, it was informed by socio-cognitivist theories of learning that emphasize demonstration and modelling, not by constructivist theories of learning that prioritise student-driven exploration (see Section 2.7.1). By emphasising the integral nature of inferences in reading comprehension, coupled with providing opportunity to engage with interesting (but accessible) texts, the intervention was able to sustain interest

and motivation long enough that the same skills could be repeatedly practised and thus become more automatized. Another positive outcome of the 2022 intervention was the extent to which it was apparently able to appeal to participants across the entire spectrum of proficiency instead of only the weaker students.

Another potential contributing factor to the relative effectiveness of the inference-inclusive intervention is the scaffolding of the intervention. The gradual scaffolding with frequent input through mental modelling gave participants the opportunity to become more self-regulated in their strategy use as their existing competency was acknowledged before moving on to more complex tasks. This approach to instruction is aligned with socio-cognitivist theories of learning such as those put forward by Schunk and Zimmerman (1997) as well as by Harris and Graham (1996), as discussed in Section 2.7.2. The length of time set aside to focus intensively on this one discrete proficiency (i.e. inferencing) was essential to the impact of the intervention. This allowed me to scaffold the worksheet questions very gradually after starting with a simple worksheet that most of the participants could be expected to complete relatively successfully. In short, being able to start at such a low level and increase the difficulty of the learning materials so gradually contributed to participants' confidence in their own abilities and allowed for plenty of opportunity to address points of confusion which reduced the chances of struggling readers falling behind the rest of the group.

#### 4.5.4 Inferencing abilities in less-capable versus more-capable students

Changes in performance, whether measured in terms of statistical significance or magnitude of change, were more readily apparent among the less-capable students than more-capable students, although there are exceptions that will be discussed. This was particularly true for the 2021 and 2022 cohorts (both online), which contained the weakest group, the High-Risk group, although the trend can still be observed to a lesser degree in 2019 (face-to-face), which had an At-Risk but not a High-Risk group. When comparing the lowest group of a particular phase with the most-proficient group of the same phase, there were often large differences in improvement as can be seen in effect sizes. For instance, in 2019 (face-to-face), the At-Risk group contained the least-proficient students of that cohort. They produced a large effect size in academic inferences ( $d = 0.76$ ), but their more-proficient peers in the Moderate group made no significant improvement.

This trend can also be observed in the other cohorts from 2021 and 2022 (both online). The less-proficient participants from these two phases made up the High-Risk group; in the academic inferences construct they managed statistically significant improvements which corresponded with very large effect sizes. In contrast, the Borderline group from 2021 (online) saw their mean score reduced by almost 4%, and there was no statistically significant improvement in the more proficient Moderate participants from 2022. The picture is similar for the other inference constructs, although for some phases none of the stratified groups managed statistically significant improvements, most notably anaphoric inferences in 2021 (online) and causal inferences in 2019 (face-to-face). These are the two most basic inferences tested in this study, which may suggest complacency on the part of the stronger students who find themselves temporarily surrounded by the most vulnerable undergraduates and may thus overestimate their own abilities relative to their peers. Since 2019 (face-to-face) contained a larger number of more-proficient participants, who tended to engage less with the easier inferences, this phase would have been most affected by this potential lack of interest.

The data suggests that the interventions are not addressing the needs of the more-competent students, who might, at times, be disinterested or unaware of their own need to improve. There was still much room for improvement for these students; their pre-test means were in the mid-sixties to mid-seventies at best, whereas skilled readers would be able to maintain results between 80% and 100% across all constructs. Considering all this room for improvement, it is concerning that participants in the Borderline and Moderate groups rarely made any significant progress. This was the case particularly with anaphoric inferences (the most basic inferential construct tested), although there were some exceptions with text-semantic inferences (both causal and contrastive) and general inferences, perhaps suggesting a greater willingness to engage with these more difficult inferences. These findings align with those of previous studies by Ludidi (2015), Mutakwa and Mhakure (2019), and Prince, Frith, Steyn and Cliff (2021), all of which found that less-proficient students tended to make larger gains in undergraduate-level literacy interventions than their more-proficient peers. Similarly, the problem of many participants still not meeting the necessary literacy requirements even after they made progress in an academic literacy module was observed at another South African university by Parkinson, Jackson, Kirkwood and Padayachee (2008).

Although contrastive relations, because of their discontinuative nature, are usually more challenging during reading (Pretorius, 2006: 437), this trend did not consistently occur in this study. For the most

part, the dominant trend described above also applies to the contrastive inferences construct, with a noteworthy exception which could give some insight into the needs of the stronger students. The trend is inverted for contrastive inferences in the case of face-to-face instruction. There is less consistency with this construct in general, but more-proficient students did seem to engage with it more than they did with the other constructs. All three stratified groups in 2019 (face-to-face) made significant strides in resolving contrastive inferences, but the Moderate group stood out for two reasons. Firstly, it was the only instance where this group made a statistically significant improvement. Secondly, the very large effect size of 2.68 that the Moderate group obtained in 2019 indicates an improvement of more than two standard deviations (LeCroy & Krysik, 2007); this was the only instance of such a large effect size for the entire study. The most likely explanation for this unusual growth by the Moderate group in contrastive inferences is that the greater degree of difficulty appealed to them. Contrastive inferences are typically only mastered after causal inferences (Pretorius, 2006), so it makes sense that the weaker participants would have struggled more with them, considering that they may not yet have reached the causal inferences threshold when dealing with complex academic texts.

One possible explanation for the difference in growth between weaker and stronger students is that weaker students may have been less aware of the need to actively draw inferences while reading (Bowyer-Crane & Snowling, 2005; Kispal, 2008). A number of studies (Cain & Oakhill, 1999; Cain, Oakhill, Barnes & Bryant, 2001; Barnes *et al.*, 2015) have found that weaker readers were found to be less inclined to infer information from the text they were provided, even when their domain knowledge was determined to be sufficient and they were given the opportunity to refer back to the text. Thus, a lack of awareness can be considered a possible stumbling block. If so, then the act of foregrounding and repeatedly discussing inferences in an accessible manner, over a period of time, could potentially already have a positive effect. Initial lack of awareness might also explain why the weakest students tended to demonstrate large and significant improvements: the lack of awareness may have constituted a significant barrier to learning; once that barrier was cleared by gaining the necessary awareness, a drastic improvement in inferencing competency occurred. Stronger students, on the other hand, might have already possessed this awareness and therefore did not improve as drastically.

Overall, these results are encouraging, but the improvement made by the less-proficient participants may not be sufficient in the long term. It is possible that one of the reasons that they made such impressive improvements at times is the fact that they started from an extremely low base, often with means of less

than 30%. Consequently, post-test means for the lower groups rarely exceeded 50%. While no specific benchmarks have been set for the self-developed AIT, it is reasonable to assert that a post-test score of below 50% in any of the constructs tested designates insufficient proficiency for the reading requirements that are an inevitable part of university study, especially when considering the importance of anaphoric and text-semantic inferences in maintaining basic coherence within the text-base and situation model (see Section 2.5) when comprehending text (Graesser *et al.*, 2003; Perfetti and Adolf, 2012). As a point of reference, decoding research has found that reading comprehension becomes possible once 90-95% accuracy has been reached (Neuman & McCormick, 1995). It is worth noting, however, that the participants of this study wrote post-tests at roughly the middle of a year-long academic literacy module. They still have time to improve these proficiencies before they will be expected to enter an undergraduate degree programme, yet there is a limit to the improvement that can be made in the second semester. Any student scoring less than 50% in the AIT post-test requires urgent and individualised attention if he or she is to be given a realistic chance of completing a degree. Further research is needed to establish thresholds for academic literacy at university level, where performing below the threshold predicts academic failure, while performing at or beyond the threshold makes academic success possible but not guaranteed. In addition to being a valuable diagnostic tool to determine which ECP students need more assistance, such a threshold could also be leveraged to assess the efficacy of the interventions themselves.

#### 4.5.5 Relationship between academic literacy and inferencing

Only students from the 2019 cohort were tested in both academic literacy and inferencing. The effect sizes of these two constructs after the intervention were very similar for the 2019 cohort; however, there are some differences when considering the stratified groups. In terms of academic literacy, the three stratified groups all had medium effect sizes; in other words, students with different levels of proficiency appeared to benefit equally in their academic literacy from the intervention. This was not the case with academic inferencing. In this construct the dominant pattern of less-competent participants increasing significantly while more-competent participants stagnate can be observed. While it is encouraging to see such improvement from the less-competent students, none of them left the intervention with a post-test mark of more than 60% in both the AIT and the TALL, which calls into question their ability to meaningfully engage with the written content they will encounter during their studies. In other words, participating in a writing-intensive academic literacy intervention is not sufficient for developing reading comprehension proficiencies such as inferencing for weaker or stronger ECP students, even when there is some content



overlap. Instead, ECP students require direct reading instruction in order to improve their ability to infer information from text.

Further insight can be gained by considering the correlation between the 2019 cohort's TALL scores and AIT scores. As discussed in Section 4.3.7, the correlation of 0.6 between these two tests indicates that a linear relationship between the academic literacy construct and the academic inferencing construct is strong and positive. In other words, proficiency in the one could be considered an indication of proficiency in the other. When separating the AIT results into specific constructs, similarly robust correlations emerge. There are no set benchmarks for the TALL. Instead, participants are divided into four quartiles (Van Dyk & Weideman, 2004) depending on the ranking of their scores. A student's membership to one of these four groups is a metric that can then be used by his or her institution to decide on matters such as whether or not the student should be required to complete an academic literacy module. Even though there are no benchmarks, other studies using the TALL as an instrument have published their results which can serve as a basis for comparison. For instance, one study used a large sample of 13,764 participants with a variety of first languages selected from a specific South African university between 2005 and 2008; these participants were found to have mean scores ranging from 44% to 81% at the beginning of their university careers, with the majority of the students scoring at least 69% in the TALL (Van der Slik, & Weideman, 2010).

As has been discussed in Section 2.6.2, inferencing is an essential prerequisite for comprehension and learning (Cain & Oakhill, 1999: 500; Kispal, 2008: 2; Barnes *et al.*, 2015: 269). Inferencing also forms an important part of the academic literacy construct. To be able to read fluently and with meaning, an academically literate student must "understand relations between different parts of a text (...) and know how to use language that serves to make the different parts of a text hang together" while at the same time being able to "extrapolate from information by making inferences, and apply the information or its implications to other cases" (Van Dyk and Weideman 2004: 10). Without the ability to quickly and easily resolve basic cohesion inferences, students cannot reliably learn through reading as their cognitive resources are overburdened.

#### 4.5.6 Responses from the questionnaire: reading habits and language profiles

When considering the 2022 students' perspectives of their own reading habits, a relatively pervasive lack of insight about their reading competencies was shown by the participants. Only two participants

reported that they do not consider themselves to be good at reading, despite the very low pre-test scores on the AIT of the vast majority of the cohort. Participants in all of the stratified groups were also about twice as likely to select the 'good at reading' option than the 'somewhat good at reading' option for this question. The mismatch between participants' perceived competencies and their actual competencies could be attributed to the Dunning-Kruger effect, a cognitive bias which is often observed in people with limited proficiency in a specific domain who overestimate their own abilities in this domain relative to the population in general. Dunning (2011: 248) refers to this as "meta-ignorance" or "being ignorant about one's ignorance". Part of the problem with students who overestimate their own abilities is that it takes time for them to realise that they might not meet the standard.

The participants appear to not engage much with expository writing, which is not ideal, considering the predominance of expository reading which is required at university level and the fact that the students might therefore have been fairly unfamiliar with long expository texts at the start of their university studies. It is worth noting that the questionnaire was administered early in the academic year, which means only the first three weeks of their tertiary education were being considered by participants who answered this question; in other words, the results do not accurately reflect the time spent on prescribed academic reading. By the end of their first academic semester, the participants were likely spending more time on reading, and dealing with expository texts more often.

Lastly, most of the participants who were surveyed (67%) reported that they do the majority of their reading online. The preference of online reading is not surprising or necessarily problematic, but there were some observable differences between weaker and stronger readers when it came to this kind of reading. For instance, weaker students were more likely to spend the majority of their time reading online engaging with short pieces of text, like Tweets. They also spent less time overall on reading online than their stronger peers do. At least two thirds of the High-Risk and At-Risk groups reported spending less than ten hours per week reading online content, while only 40% of the Borderline group spend that little time. These findings align with those of other researchers, such as De Jongh and Milton, (2022) who found that South African undergraduates do very little reading for pleasure online, and do not engage with online magazines and newspapers on a regular basis.

When considering the ECP students' engagements with hard-copy magazines, newspapers and books, the situation does not look much better. The majority of the participants stated that they read fewer than

three magazines each year as well as fewer than two full books. When asked about ever obtaining membership at a public library, most respondents (58%) stated that they had never joined a library, and some students were unable or unwilling to provide the title of their favourite book. Moreover, many of the weaker students listed the titles of books that were likely prescribed as part of their high school English curriculum, suggesting little to no reading for pleasure.

Finally, it is worth noting that the majority of students (93%) claimed that they enjoy reading, although the weaker students were more inclined than the stronger students to select this option in the survey. This suggests a possible social desirability bias, which is the tendency of respondents to present a favourable image of themselves in self-report instruments (Van de Mortel, 2008). A questionnaire-based study by Boakye and Southey (2008) also found that students from the University of Pretoria who were enrolled in a different academic literacy module apparently had very positive attitudes towards reading but were not engaging in reading for pleasure, which contradicted their self-reported claims of enjoying reading. Lukhele (2013) came to a similar conclusion when an analysis found no correlation between the reading attitudes and reading competencies of a sample of Education students in Eswatini. Southern African students seem to be aware of the importance of reading, but that awareness is not currently translating into action.

As can be expected from a country with 11 official languages, most of the 2022 participants could speak at least two languages. Although 21 participants reported that English was the language they could speak the best, only two participants (both in the At-Risk group) grew up in a home where their parents spoke mostly English. Interestingly, the other 19 therefore claimed that their strongest language was not the language they grew up speaking at home. This could indicate that they did such a good job mastering English over their 12 years at school that they simply now speak English particularly well, while at the same time also being proficient in their home language. However, in addition to the results of this study, the fact that they are enrolled in the Extended Curriculum Programme does potentially indicate that these students are unlikely to have strong English language competencies. Therefore, the shift from their home language to English as their strongest language could just as well be an indication of how poor their proficiency is in their home language. As discussed in Section 2.4.3, a poor home language foundation can have cumulative effects on subsequent L2 development. It is possible that weak home-language foundations could be one of the various factors (along with poor quality schooling and literacy-poor home

environments) that contribute to ECP students' challenges in developing the necessary English language academic literacies.

When asked about the language they feel most proficient in reading, the majority (78%) chose English, but many of these participants then listed a different language as their best language for speaking, again reflecting the linguistic complexity of many South African classes at school and at university (Bangeni & Kapp, 2007). It was also quite worrying to see 20% of participants claiming to be able to read in one language only, considering that South African students are required to study two languages until Grade 12 for a National Senior Certificate. While it is possible that some participants attended private schools that had different curriculum requirements, it is unlikely that so many would have attended a private school as these are often very expensive. Another possible scenario would involve socio-affective factors, particularly attitudes and stigmas related to certain languages. Since Afrikaans is so closely linked to apartheid in the cultural memory of South Africa (De Wet & Wolhuter, 2009), black learners who were forced to take it as a subject for most of their school careers may want to negate the language and not consider it a part of their repertoire, even if they can speak and read it. Some students may also experience the stigmatisation of certain languages that they do speak and so opt to not report being able to speak them. This phenomenon has been reported in the literature and has been observed in ECP students before, especially in students from other African countries who fear provoking a xenophobic response from their South African peers (Monkhe, 2012; Gopal, 2013).

Although they were never explicitly asked about the quality of the schools they attended, many participants likely attended fairly good Quintile 4 or 5 schools. The University of Pretoria's ECP students appear to come from Quintile 4 or 5 schools in general, although the evidence for this trend is anecdotal (Ogude & Rollnick, 2022: 234). Moreover, most participants (78%) attended schools which had English as the Language of Learning and Teaching (LoLT) in the Foundation Phase (Grades 1 to 3); this feature is more common in higher quintile schools than in lower quintile schools as higher quintile schools tend to be former 'Model C' schools in urban areas that were racially segregated during apartheid and have continued to use English or Afrikaans as the LoLT even as their demographics diversified post-apartheid (Mchwango, 2009). Thus, while the data suggests that participants whose self-reported strongest language is English generally performed better in inferencing, this trend is possibly more likely an indication of students with better socio-economic circumstances outperforming their peers because of access to better schooling, rather than simply a reflection of English-language proficiency (Spaull, 2015: 34). In fact, despite

the fact that the ECP programme was developed to assist weaker students from disadvantaged backgrounds, the majority of the ECP students appear to come from Quintile 4 or 5 schools – those from poorer schools rarely gain access to the ECP programme, which is academically or financially out of reach for them. For instance, in 2017 only 496 matriculants from schools in Mamelodi (the township in which the campus which houses the ECP programme is situated) gained access to university study (based on their Grade 12 marks); in turn, only about 295 of these matriculants gained admission to the University of Pretoria overall (Ogude & Rollnick, 2022: 233).

There are some features in terms of language profiles and reading habits that tend to distinguish stronger and weaker students. Stronger students are more likely than weaker students to have attended a school with English as the LoLT from Grade 1 and consider English as the language they can speak and read best. In contrast, weaker students are more likely to have attended a school with a language other than English as the LoLT or to have changed LoLT between the Foundation Phase (Grades 1 to 3) and Intermediate Phase (Grades 4 to 7); therefore, these participants were less likely than the stronger students to list English as their strongest language for reading or writing.

Practitioners in the field of academic literacy need to be cognisant of the profiles and perspectives of their students, especially those that are the most vulnerable. Going forward, it is important to understand that ECP students are often poor readers who may overestimate their own reading abilities and who may do relatively little reading for pleasure. For struggling readers, much of the reading encountered during their university career will be challenging, and if their reading tasks are too far removed from the students' actual proficiencies, then they are likely to become demotivated over time.

## 4.6 Conclusion

This chapter presented the data from the three intervention phases of this study which assessed ECP students' proficiency in inferring information from expository texts over multiple phases. These phases were 2019 (Phase 2), 2021 (Phase 3) and 2022 (Phase 4). During 2019, 51 participants received a 78-hour face-to-face academic literacy intervention; 2021 delivered an online version of the same academic literacy intervention to 51 participants. Finally, in 2022, 77 students participated in another 78-hour online academic literacy intervention, although this time 14 hours of direct instruction on inferencing were included.

Across each intervention, the participants were divided into three or four stratified groups based on their pre-test scores. This chapter started by describing these stratified groups as well as the variations observed in the three different phases. Thereafter, it provided the results from each intervention, organised according to construct. These constructs are academic inferencing, anaphoric inferencing, causal inferencing, contrastive inferencing, general inferencing and academic literacy. Next, the results of a survey focused on reading habits were presented. Afterwards, the results were discussed.

The discussion started with an evaluation and comparison of the three interventions, before moving on to consider the different needs of less-proficient students and more-proficient students. Then, the relationship between academic literacy was reviewed, followed by a discussion of the implications of the survey results. It was determined that face-to-face instruction appears to be more effective than online instruction for teaching reading and academic literacy to ECP students and that including direct instruction on inferencing made a significant positive difference in the majority of cases. It was not possible to test the impact of the inferencing instruction on participants' general academic literacy abilities, but robust correlations between these two constructs were established.

In the next chapter, the aims of the study are reviewed, and the research questions answered. Finally, the pedagogical implications of the results are considered, before recommendations for further research are provided.

## Chapter 5: Conclusions and recommendations

### 5.1 Introduction

In this chapter, the research aims and design of this study are briefly revisited, followed by a summary of the main findings which are organized according to research question. Next, the study's contribution to the field is highlighted, and then pedagogic recommendations are made based on the findings. Finally, a discussion of the limitations of this study leads to suggestions for further research related to reading comprehension and academic literacy interventions for academically vulnerable undergraduate students.

### 5.2 Review of research aims and phases

Academic literacy encompasses both reading and writing competencies that are required at tertiary level. Many of the reading competencies rely on making connections and drawing inferences and thus require active participation from the reader. Since the academically vulnerable students who are the focus of this study enter university studies with reading levels far below what are required for adequate engagement with academic content, it is vital that tertiary academic support programmes pay significant attention to this important aspect of academic literacy. However, some academic literacy modules designed specifically to assist students with their literacy development are predominantly focused on writing-based output, while the more invisible competencies relating to reading can remain unaddressed.

This study's main goal was to assess the effect of three different academic literacy interventions on ECP students' ability to draw inferences while reading, a critical aspect of academic literacy. If ECP students can become more aware of this subtle but important aspect of reading comprehension, then they could be encouraged to approach reading in a manner that helps them actively engage with the text.

The study comprised four phases, after adaptations from the original research plan necessitated by the COVID-19 pandemic (see Section 3.2). These phases were as follows:

- 2018 (Phase 1) concerned the piloting and adapting of the main instrument. This instrument was the AIT, which assesses four distinct categories of inferences, namely anaphoric, causal, contrastive and general inferences. The instrument was piloted with 53 ECP students during the course of 2018, and was subsequently refined based on feedback from this pilot study. In addition,

the reading questionnaire as well as the intervention material required for the study (both used in Phase 4) were also developed.

- 2019 (Phase 2) comprised 78 hours of general academic literacy instruction, delivered in face-to-face lectures and workshops. These 78 hours include a 64-hour general academic literacy intervention that the University of Pretoria has been offering to ECP students for over ten years, supplemented by 14 hours of additional tuition on referencing, summarising and grammar. The 54 participants from the 2019 cohort were assessed on two tests, both before and after this intervention (which did not include explicit instruction in inferencing), namely the AIT and the TALL.
- 2021 (Phase 3) served as an online counterfactual group. During this phase, 51 participants received the same 78-hour academic literacy intervention (the standard 64-hour academic literacy intervention supplemented by 14 hours of additional tuition on referencing, summarising and grammar, which contained no explicit instruction relating to inferring information from text), although this time the intervention was delivered online. Using the AIT, participants' inferencing proficiencies were tested before and after the intervention. The TALL was not used in this phase because it could not be administered online.
- In 2022 (Phase 4), 77 participants received the same 64-hour online academic literacy intervention as the previous phase, but this time supplemented by 14 hours of explicit instruction focusing on inferences, once again bringing the total tuition time of the intervention to 78 hours. The inferencing content included the inferencing texts and worksheets which were designed during the pilot phase in 2018. The participants were also tested before and after the intervention, using the Academic Inferencing Test (AIT), just like their predecessors from 2019 (Phase 2) and 2021 (Phase 3). In addition, these participants also completed a survey called the Reading Habits questionnaire, that dealt with reading habits and language proficiencies.

### 5.3 Research questions and main findings

Three interventions were assessed to determine how content and mode of instruction for an academic literacy intervention affected students' inferencing skills. Of particular interest was whether the



intervention that included direct inferencing instruction was more effective at improving the students' inferencing abilities than the interventions that only dealt with academic literacy more broadly. The findings showed that all three interventions were able to produce some improvement in students' inferencing abilities. However, the 2019 and the 2021 interventions generally displayed limited improvement and also tended to result in large gains for the weaker students and little to no improvement for the stronger students. The 2022 intervention generally resulted in larger effect sizes overall and a more balanced outcome for the different stratified groups.

### 5.3.1 Research questions

The eight research questions that informed the study are briefly revisited below. Each question is accompanied by the key findings relating to it.

#### **Research Question 1: What is the effect of an intervention on the academic inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

This question is addressed by using the aggregated inference mean from all the subcomponents of the AIT as an overall inference measure. Using the full AIT as a metric, the 2019 and 2021 cohorts produced medium effect sizes of 0.41 and 0.38 respectively. In contrast, the 2022 online intervention with explicit inferencing instruction included had a bigger effect on participants' overall inferencing competencies, with an effect size of 1.04.

There were also some noteworthy differences between the three different interventions when considering the results according to stratified groups. In the 2019 and 2021 cohorts, the overall improvements were largely observed in the weaker groups (High-Risk and At-Risk), with less or no improvement observed in the Borderline groups, whereas the improvement observed in the 2022 cohort is distributed more evenly across the different stratified groups, with the Borderline group showing an effect size of 0.58. None of the interventions shifted the performance of the Moderate group in any obvious way. Given the more consistent effect across three of the groups in the 2022 cohort, in addition to the very large effect size it yielded, this intervention ultimately had the most desirable effect in shifting low inferencing abilities to slightly higher levels.

**Research Question 2: What is the effect of an intervention on the anaphoric inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

This question is addressed using the anaphoric inferences construct from the AIT. The 2019 and 2022 interventions produced effect medium and large effect sizes of 0.34 and 0.61, respectively. The 2021 cohort made no statistically significant improvement. None of the cohorts had post-test mean scores above 62% for anaphors; in fact, both the 2021 and 2022 cohort had means under 50%. This indicates that there is still much room for improvement for resolving anaphors while reading for all cohorts, and that further research is needed to determine how students can be assisted to become more competent in drawing anaphoric inferences.

Performance in anaphoric inferencing also differed across the stratified groups from each cohort. For both the 2019 and the 2022 interventions, the improvement was concentrated in the weaker High-Risk and At-Risk groups who all had effect sizes above 0.5, with the stronger Borderline and Moderate groups making no statistically significant gains. In contrast, the 2021 online intervention had no statistically significant effect on any of the stratified groups. Given the slightly more consistent effect across some of the stratified groups as well as the slightly higher effect size for the full cohort, the 2022 intervention ultimately had the most desirable effect of the three interventions. However, none of the interventions were able to develop participants' anaphoric inferencing competencies to the level likely required for successful engagement with tertiary level texts.

**Research Question 3: What is the effect of an intervention on the causal inferencing abilities of ECP students in three different intervention contexts overall and according to stratified ability groups?**

This question is addressed using the causal inferences constructs from the AIT. The 2021 and 2022 intervention produced very large effect sizes of 0.61 and 0.94. The 2019 cohort showed no statistically significant improvement, although it still had the highest post-test mean (53.6%) of the three. It was the only cohort that produced a post-test mean of more than 50%.

When considering the stratified groups from each cohort, further trends can be observed. For the 2021 and 2022 interventions, there was generally more improvement in the weaker High-Risk and At-Risk groups than in the stronger Borderline and Moderate groups. However, this distinction was less

pronounced in 2022 when the intervention contained direct inferencing instruction, with the Borderline group obtaining an unusually large effect size of 0.8. In the case of causal inferences, it was the 2019 cohort that made no statistically significant improvement. This was the case for the full cohort as well as the stratified groups. Based on having a more consistent effect across the majority of its stratified groups than the 2021 intervention, as well as a slightly better effect size for the full cohort, the 2022 intervention had the most desirable impact on the ECP students' causal inferencing proficiencies, although the post-test scores of this cohort remained low, with the majority of participants scoring less than 50% in the post-test – a level once again unlikely to be sufficient for students to effectively identify causal inferences in academic texts for degree purposes.

**Research Question 4: What is the effect of an intervention on the contrastive inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

This question is addressed using the contrastive inferences construct from the AIT. All three cohorts demonstrated statistically significant improvement in contrastive inferences, but the magnitude of improvement varied. The 2019 and 2021 cohorts both had very large effect sizes of 2.05 and 0.68 respectively. In contrast, the 2022 cohort only produced a medium effect size of 0.3. Neither of the two online interventions in 2021 and 2022 resulted in post-test mean scores of 50% or above, whereas the 2019 cohort ended with 57.3%.

In terms of stratified group performance, the performances of the 2019 and 2021 cohorts were more consistent across the various levels of proficiency than they have been in the other constructs, with almost all of the groups in these two cohorts producing very large effect sizes, between 1.4 and 2.4. The 2022 cohort, on the other hand, had its much more limited improvement concentrated in the weakest High-Risk group. It remains unclear why the 2022 cohort, which received explicit instruction on contrasting inferencing abilities as part of the inferencing intervention, showed so little improvement in comparison to the other two cohorts. This is an aspect of this study that warrants further investigation.

**Research Question 5: What is the effect of an intervention on the general inferencing abilities of ECP students in three different intervention contexts, overall and according to stratified ability groups?**

This question is addressed using the general inferences construct from the AIT. The 2021 and 2022 cohorts produced large effect sizes of 0.5 and 0.6 but still ended with post-test mean scores of less than 50%. The 2019 cohort made no significant improvement as a whole. Despite this lack of improvement, the 2019 cohort still managed to conclude their intervention with a much higher mean score (62.2%) than the 2021 and 2022 cohorts, demonstrating again how diverse the groups were in terms of ability.

Interestingly, this time it was the stronger students who tended to make the biggest gains in general inferencing, rather than the weaker students as has been the trend. In both 2019 and 2022, the strongest groups produced the biggest effect size for that cohort – 0.46 for the Moderate group in 2019 and 0.92 for the Borderline group in 2022. In 2021, however, the established trend of weaker students improving more than stronger students can be observed.

**Research Question 6: What is the effect of a 78-hour academic literacy intervention on ECP students' academic literacy proficiencies?**

All three groups from the 2019 cohort showed effect sizes of between 0.4 and 0.5 for this construct – the only instance where the stratified groups were so consistent in their growth. It should be noted though that of these three groups, only the Borderline group showed a statistically significant improvement.

**Research Question 7: What is the relationship between ECP students' inferencing proficiencies and their academic literacy proficiencies during a 78-hour face-to-face academic literacy intervention? (Phase 2 in 2019)**

There was a strong, positive correlations between participants' academic literacy proficiencies (measured by the TALL) and their inferencing proficiencies (measured by the AIT) at the pre-test (0.65) and the post-test stage (0.55). Since there is this strong association between performance on the AIT and TALL, both instruments may be tapping into similar cognitive-linguistic skills – poor performance on one instrument thus suggests that a student will likely also perform poorly in the other.

**Research Question 8: What are ECP students' reading habits, and what are the relationships between these habits and students' inferencing proficiencies, overall and according to stratified ability groups?**

Only the 2022 cohort completed the Reading Habits questionnaire. The language profile section of this questionnaire revealed a linguistically diverse cohort who had a variety of relationships with the English language. Very few spoke it at home while growing up, yet most attended English LoLT schools from Grade 1, with about two-thirds considering English to be their strongest language for speaking (in a university context, presumably), and a slightly larger majority (78%) reporting that it is the language which they can read most proficiently. Most participants were bilingual or multilingual, although a surprisingly large percentage (11%) reported being able to speak only one language, which suggests that some may have 'lost' the language they grew up speaking at home or may be disregarding the value of their mother tongue, since only 4% spoke English at home, growing up. The causes for such inconsistencies are not entirely clear, but they do indicate potentially diverse language profiles with varying configurations of linguistic strengths and weaknesses, depending on the function each known language serves in a particular context. Section 2.4.3 provides a discussion of the implications of HL shortcomings.

The most striking result of the Reading Habits questionnaire was how little the ECP students in this cohort read. Despite many claiming to like reading and perceiving themselves as being good at reading, the 2022 participants did not do so very often. The majority spent most of their reading time engaging with online texts (typically about ten hours per week), and at least half of their time doing online reading was spent reading short pieces of text, like Tweets. Furthermore, the time spent engaging with hard-copy texts yielded, on average, only about two books (mostly fictional) and three magazine per year. Participants who were more proficient at drawing inferences were slightly more likely than their peers to have had library membership at some stage in their lives, to have a non-fiction favourite book, to spend a smaller percentage of their total reading time online, and generally read more than the weaker participants.

### 5.3.2 Main trends

There are several trends that can be identified based on the findings of this study. When comparing the three different cohorts, it is striking how much stronger the pre-COVID cohort was compared to the two post-COVID cohorts, despite all of them being ECP students. Of the two post-COVID cohorts, the one immediately following the hard lockdown in South Africa was the weakest, with the 2022 cohort at least starting to narrow the gap between pre-COVID and post-COVID performance, at least in terms of their performance in inferencing competencies.

The 2022 intervention that included direct inferencing instruction was the most effective of the three interventions in this study at improving the inferencing proficiencies of ECP students. Overall, the 2022 intervention tended to produce larger effect sizes for the full cohort than the other interventions as well as more consistent improvement across the stratified groups. The 2019 face-to-face intervention did at times produce very large effect sizes in some of the inferencing constructs but, like the 2021 intervention after it, the improvement was disproportionately concentrated in the weaker groups.

Both weak and strong students made significant improvement at times, but they tended to follow different trends. In the majority of cases, the weaker students improved more than their stronger peers. However, the less-proficient participants started the intervention with such low scores that, even after making large gains, they were still not in a position to engage meaningfully with the expository texts required in their studies without assistance. Unfortunately, the stronger participants often made no significant improvement. The stronger students were particularly unresponsive to the anaphoric inferences content, but sometimes made large and significant improvements in the other constructs, such as causal inferences in 2022), contrastive inferences in 2019 and general inferences in 2022.

## 5.4 Implications for instructional practices and interventions

Based on the results of this study, academic literacy interventions for ECP students do have some positive effects; participants can potentially improve their general academic literacy during such interventions, and some can even improve related proficiencies like inferencing even when these are not explicitly taught. However, these gains tend to be small as well as inconsistent when comparing weaker students and stronger students, who appear to have different needs and who may need differently nuanced types of instruction, practice opportunities, feedback and mentoring. Specific reading comprehension competencies, like inferencing are necessary for the type of advanced reading in which university students are required to engage. These competencies do not typically improve much without targeted, direct instruction. Academic literacy interventions at university tend to focus more on writing outcomes than on reading, but academically vulnerable students often need intensive reading interventions due to South Africa's legacy of poor reading. Therefore, reconfiguration of academic literacy modules at university and more rigorous assessment of the effectiveness of these modules are required. Finally, the mode of instruction also requires consideration, since there are serious limitations to online instruction for academically vulnerable students.

There is evidence of some improvement in ECP students' reading and inferencing competencies even during writing-focused academic literacy interventions (see Section 4.5.2). The two academic literacy interventions from 2019 and 2021 did show improvements in overall AIT performance, as indicated by the moderate effect sizes (0.41 and 0.38, respectively) that both of these cohorts produced. However, considering the worryingly low reading levels with which students enter university, this improvement in skills is likely not sufficient for successful engagement in tertiary education. Ultimately, many participants still concluded the intervention with very low post-test scores, while at the same time, the stronger students tended to make very little improvement. Although it is too early to set reliable thresholds or benchmarks for academic literacy levels at university, the post-test scores produced by most participants are unlikely to reflect the level of proficiency required to cope with the academic demands of university study.

While the improvement measured during 2022 of this study was encouraging, it may still not have been sufficient for what is required of university students, as post-test scores remained low. Potential extensions of the intervention are thus discussed in Section 5.6, but for now there is at least some indication that ECP students are capable of improving their reading comprehension competencies like inferencing, if they are provided with an accessible opportunity to do so. The results of this study align with other similar investigations into university-level reading instruction (Parkinson *et al.*, 2008; Cekiso, 2012; Oyetunji, 2013), which all found evidence of improvement in various reading comprehension strategies. An important feature of these studies is the inclusion of direct instruction on reading comprehension, not merely assigning reading or giving students access to reading resources. Reading interventions tend to be more effective with younger learners, and therefore funds and other resources are better spent on early-grade reading instruction where they are sorely needed, but that does not mean that it is too late for undergraduate students to make significant improvements. In fact, if universities accept academically vulnerable students, it is their responsibility to provide these students with the necessary support to empower them to successfully obtain their degrees.

Academic literacy instructors at South African universities need to recognise the need for intensive reading instruction at undergraduate level and use evidence-based pedagogic approaches, like explicit instruction within a socio-cognitivist framework that foregrounds modelling (as discussed in Section 2.7.2), to address students' urgent need for reading comprehension instruction. Identifying and addressing low reading proficiency can be challenging, and in an ideal world would not be the purview of

university-level instructors, but students without the necessary reading proficiencies are highly unlikely to succeed in their university studies. Therefore, this proficiency needs urgent attention.

Another important implication of this study is that there is a lot of variation, even with students in ECPs – less-proficient and more-proficient readers have different needs when it comes to reading instruction. This is something that academic literacy interventions should cater for in order to be able to accommodate different students equally. Lecturers need to meet the students where they are, before increasing the difficulty at a manageable pace with sufficient feedback that provides a realistic sounding board for students to accurately estimate their own competency.

Finally, the results of the study had certain implications for the mode of instruction used to deliver academic literacy interventions. Online instruction appears to negatively affect most students, but especially less-proficient students and those who come from lower socio-economic backgrounds. According to the literature (see Section 1.2.2), these are the students who are most likely to be overwhelmed or discouraged, and the least likely to have adequate support when taken out of the university environment. If they also experience challenges with technological accessibility and literacy, instructors will find it particularly difficult to offer the necessary assistance, which further increases the chances of these most vulnerable students falling behind and eventually giving up on their university studies. Online instruction can contribute to the widening of the gaps that already exist in such an unequal society as South Africa, making it much more challenging for disadvantaged students to complete the qualifications they need to start redressing the endemic poverty they face.

## 5.5 Limitations of study

The study has several limitations that need to be acknowledged. Firstly, the research design had certain inherent limitations. Baseline counterfactual groups are not as reliable as control groups as it is difficult to know to which extent the Commerce ECP population might have changed over the duration of the study, other than the finding from this study that, on average, weaker cohorts of students entered the Commerce ECP programme in 2021 and 2022 than in 2019. The unprecedented changes brought about by the COVID-19 pandemic and the subsequent move to online instruction increased the possibility of such changes, because many learners, specifically those with poor socio-economic statuses, received reduced high school instruction in the first two years of the pandemic (Jappie, 2020; Motaung & Dube, 2020; Motala & Menon, 2020). This inherently limits the certainty of any findings about the success of the



interventions themselves as there are probably too many variables affecting the performance and behaviour of the two online groups due to the complexities of life during the COVID-19 pandemic. Although these two cohorts were found to have no statistically significant differences at the pre-test stage (see Section 3.8), it would be difficult to account for all of the possible variables during such an unprecedented time and therefore to be able to make strong claims about the intervention. In other words, the mode of teaching is not the only variable that impacts performance on the AIT; however, what strongly emerges from all three cohorts is that students' inferencing skills are insufficient, and that students need support in order to improve these sufficiently in order to meaningfully engage in higher education.

Secondly, all of the instruments used in the study had certain inherent limitations. For instance, the Academic Inferencing Test was self-developed. While the reliability coefficient for the full AIT was acceptable, more research is needed to strengthen the reliability metrics of the component inferencing sections of the AIT (cf. Section 5.6.1). The absence of other studies using the same instrument limits comparisons to similar populations outside the ECP. The other self-developed instrument was a self-report questionnaire, which could have been influenced by social desirability effects and Dunning-Kruger effects (see Section 4.5.6). Moreover, it is possible that the respondents misunderstood some of the questions in the Reading Habits questionnaire. Without any empirical data on the participants' language profiles or reading habits, the questionnaire results should be interpreted with caution.

Furthermore, the sample sizes for each cohort were relatively small, and became even smaller when the participants were divided into stratified groups. This was difficult to avoid as, like many studies at tertiary level, this study had to work with designated groups. It was not possible to conduct inferential analyses for two of the Borderline and Moderate groups in different phases as they had fewer than five students each. The insights gained relating to the stronger students are therefore especially limited as both of these small groups contained the top participants of their cohort. Consequently, the findings of the study need to be interpreted and applied with caution. The data was also obtained from a very specific population, namely the Commerce ECP students at the University of Pretoria. It is possible that the findings may only reflect the performance of this specific population and not the performance of ECP students with different areas of focus (such as the Natural Sciences) or ECP students from other universities.

The third limitation relates to the consequences of the COVID-19 pandemic on the design of the study. One consequence of the move to online instruction was the exclusion of administering the TALL to post-2020 cohorts. This significantly limited the data that could be collected and the comparisons that could be drawn between ECP students' inferencing and academic literacy competencies. Moreover, the move to online instruction also introduced unforeseen variables that were not taken into consideration when the study was first designed in 2018. For instance, computer literacy and access to the Internet and compatible devices likely affected some of the 2021 and 2022 participants negatively and thus resulted in online test scores that might not accurately reflect their ability. It is impossible to control for these factors that inevitably affected some students more than others.

## 5.6 Recommendations for further research

As this was a small study, more research, larger samples and more powerful statistical tools are needed for corroboration of the results. Future research on the topic of academic literacy and reading instruction (including, but not limited to inferencing) could consider the following recommendations.

### 5.6.1 Revisions to the Academic Inferencing Test

Reliability is an indication of the quality of research, and data have to be collected using reliable instruments in order to draw valid conclusions. The AIT as a whole can be considered to be a reliable instrument (with an overall reliability coefficient that varied between 0.71 and 0.83). However, with increased piloting on different groups of students this can be improved. Furthermore, some of the individual constructs had reliability coefficients between 0.61 and 0.79, which are not ideal. Therefore, some revision to the test is needed going forward in order to increase the reliability of individual constructs. The validity of the test must similarly be established in order to clarify whether the items from a particular construct from the AIT consistently map onto this factor within the overall construct of the test. At the same time, developing different versions of the test with texts relating to different areas of expertise would enable students from other faculties to be tested.

### 5.6.2 Replication of the study

This study should be replicated in other, similar contexts in order to ascertain if the findings are replicable. For reasons beyond my control, the 2021 cohort performed particularly poorly after the recent upheaval caused by tuition being moved online during the pandemic. Therefore, they were not necessarily

representative of 'typical' ECP students, which means conclusions should be drawn with caution until more data are available. Where possible, the sample sizes should be increased and the inferencing data augmented with data on the participants' academic literacy levels or other related features that are discussed below. The 2019 cohort would offer the most representative data of South African ECP students and therefore would likely be the most useful to future studies that measure inferencing proficiencies in a similar population. Such comparisons would aid in determining whether the significant changes in inferencing skills observed in 2019 was primarily due to the nature of face-to-face teaching or the intervention itself or due to another, currently unknown, variable.

### 5.6.3 Revising and extending the intervention

Improving one's reading competencies takes time. It is possible that extending the current inferencing intervention would yield better results, especially for the weaker students. The academic literacy module that housed the inferencing intervention continues for an additional 14 weeks after the current study concluded. It would be interesting to see if spreading the worksheets out a bit more by increasing the time between them would result in larger gains. At the same time, extending the length of the intervention would probably not address the needs of stronger ECP students, so this is not a one-size-fits-all solution. Alternatively, other reading comprehension strategies could be included to broaden the scope of the intervention. Tertiary-level literacy interventions have not received much rigorous evaluation and could possibly benefit from some reconfiguration that foregrounds more basic skills like reading fluency and digital literacy before moving on to more advanced competencies like inferencing.

### 5.6.4 Include assessment of academic literacy for all cohorts

The original design included the use of the TALL, an established instrument to assess participants' academic literacy. The TALL remains a reliable instrument for measuring academic literacy in general; it is a good yardstick with which to measure and compare the effect of interventions that fall under the umbrella of academic literacy in general, by means of pre- and post-assessment. For instance, using the TALL throughout this intervention could have given some insight into the effect of the inclusion of direct inferencing instruction in Phase 4 on the 2022 cohort's academic literacy. Using the TALL concurrent with the AIT would also aid in determining the nature of any improvement in inferencing, as the TALL consists of a number of discrete constructs, such as vocabulary, genre and visual literacy. It would then be possible to see if some of these literacy constructs benefit more than others from inferencing instruction.

Moreover, the TALL would be a valuable instrument with which to monitor and evaluate the efficacy of academic literacy modules at South African universities. If large cohorts of students are tested before and after they complete academic literacy modules or ECP programmes, curriculum developers and instructors would have a better understanding of the specific needs of different cohorts as well as being able to track changes in the larger educational context over time.

### 5.6.5 Include assessment of reading fluency

Being able to read quickly and fluently is essential for the use of more advanced comprehension strategies such as inferencing. If readers are lacking in these fundamental competencies, their working memories are too overburdened to spare much cognitive capacity for additional processes (Wills *et al.*, 2022a). Converging evidence from many studies (both internationally and in South Africa) has consistently indicated that strong comprehenders have strong decoding proficiencies whereas poor comprehenders read slowly and inaccurately. Consequently, if students have not met the relevant decoding threshold for the level of reading they are engaging in, attempts to improve comprehension competencies yield limited results as they are not targeting the right areas of development (Wang *et al.*, 2019; Ardington *et al.*, 2021b). For instance, one group of researchers using a data set of 20,000 learners found that if Grade 6 L2 learners could not read at least at 100 WCPM (words correct per minute), they struggled with basic comprehension (Wills *et al.*, 2022b). Similarly, Grade 8 HL English readers should be averaging 150 WCPM (Hasbrouck & Tindall, 2007). Learners reading below the relevant decoding threshold need to be taught how to improve their fluency first, before attention is given to higher-order proficiencies such as inferencing.

At this stage, there is not enough clear evidence confirming that reading fluency detracts significantly from ECP students' ability to use comprehension strategies like inferencing. However, studies with similar populations (Pretorius 2000; Cliff, 2014; Andrianatos, 2018) have found that undergraduate students do not always have the appropriate reading speed for their maturation level. Considering all the research on the various aspects of reading that South African students struggle with, it would be unwise to discount the potential impact of reading speed. Empirical assessment of the reading fluency of academically vulnerable students would make a valuable contribution to this under-researched field as well as the prevailing issues concerning attrition rates at South African universities.

Moreover, testing reading speed along with inferencing – or reading comprehension in general – could give further insight into the relationship between these proficiencies. If fluency were found to play a significant role in tertiary level academic literacy, then it could be used for early detection of struggling readers so that these students can receive targeted, research-based intervention.

### 5.6.7 Expanding the sample to include different types of students

Further research on the inferencing proficiencies of other populations could also increase our understanding of the challenges faced by South African university readers and their educational needs. For instance, by expanding the study sample to include more traditional, non-ECP students from South African universities, it would be possible to further investigate the dominant trend observed in this study of stronger readers gaining very little from this particular inferencing intervention despite noticeable room for improvement. Such results could provide insight into the needs and motivations of different types of students and how these motivations interact with the educational environment.

## 5.7 Contribution of study

This study contributes resources and research to the field of academic literacy in general and inferencing specifically. Firstly, and most importantly, it provides insight into the inferencing abilities of undergraduate students. This is a topic on which little research has been conducted but that is nonetheless vital, especially considering attrition rates at South African universities. Most of the research concerning reading and reading instruction, both in South Africa and globally, is focused on learners in primary school. This is as it should be, since early identification of reading problems and appropriate interventions are more effective than later interventions at improving reading skills. However, the reading crisis in South Africa needs to be addressed at all levels of education, and for many years to come. Based on the results discussed in Chapter 4, writing-centred academic literacy interventions do have the potential to somewhat improve the inferencing proficiencies of ECP students, although providing the students with explicit reading instruction has a significantly larger effect. Despite this large effect, the majority of students' inferencing abilities still seems too low after a 6-month intervention to engage fully with tertiary level content without assistance. Further research (see Section 5.6) is therefore necessary to optimally equip students with the abilities they need to successfully navigate the reading demands of higher education.

Secondly, the study provides resources for the testing and teaching of inferencing competencies as a subset of reading comprehension at tertiary level. These include the inferencing worksheets used in one of the interventions that were assessed in the study as well as the Academic Inferencing Test and the Reading Habits questionnaire. Thus, the main practical contribution is the development of an inferencing competencies intervention targeted at academically vulnerable students enrolled in an extended curriculum programme at the University of Pretoria. As discussed in Section 5.6.2, this intervention and the instruments that accompany it can be used as is with relatively similar populations, such as undergraduate Commerce students at other South African universities.

## 5.8 Final thoughts

South African students need to improve their academic literacy and reading proficiencies. These are basic, essential competencies that can severely limit students' chances of succeeding academically and professionally if they remain underdeveloped. Too often, both lecturers and students themselves overestimate undergraduates' reading proficiencies, which limits learning opportunities and can negatively impact on students' motivation levels. All tertiary education instructors, particularly those involved in literacy modules, should recognise the challenges many of their students face when it comes to reading and the consequences for these students' ability to learn effectively from text. Completing high school and gaining entry to university study does not necessarily indicate that students can read well enough to complete their degree programmes without assistance. ECP students, in particular, can gain access to the programme with a Grade 12 English mark of as low as 50%. Universities therefore have a responsibility to adequately support the students they accept for undergraduate studies.

Reliable instruments (such as the TALL) are available and must be used to identify students in need of literacy interventions. The AIT (which correlates strongly with the TALL) and reading fluency tests can be used to determine which students require reading intervention. At the same time, early detection is not worth much without evidence-based teaching and learning practices. Reading is a complex process which requires explicit instruction. Providing students with reading tasks is not enough; they have to be taught, through modelling, repetition, feedback and sufficient time on task.

Although the research into reading instruction for adults is not nearly as plentiful as research into early-grade reading instruction, there is evidence of improvement for older readers when they are given access to the necessary interventions. It is not too late for undergraduate students to develop their reading

proficiencies, and spending an extra year in an Extended Curriculum Programme with targeted and evidence-based interventions is likely to be less costly than entering into an expensive multiple-year degree programme for which many students are unprepared. South African universities' attrition rates are a clear indication of the severity of the problem. While all participants did not demonstrate equal growth in all the inferencing constructs, a focused inferencing intervention as part of an academic literacy intervention did lead to a substantial improvement in the overall cohort's ability to infer information from text. The findings thus indicate that academically vulnerable ECP students are capable of improving their inferencing competencies when provided with the necessary instruction. Future research will hopefully indicate how the insights gained from this study could be applied towards sufficiently equipping students with the abilities they need to successfully engage with the reading demands of higher education.

## 6. References

Alderson, J.C. 1992. Guidelines for the evaluation of language education. In: C.J. Alderson & A. Beretta (eds). *Evaluating second language education*. Cambridge: Cambridge University Press, pp. 274-304.

Al-Issa, A2006. Schema theory and L2 reading comprehension: implications. for teaching. *Journal of College Teaching and Learning*, 3(7): 41-48.

Al-Qahtani, A.A. 2015. The effect of explicit instruction of textual discourse markers on Saudi EFL learners' reading comprehension. *English Language Teaching*, 8(4): 57-66.

Andrianatos, K. 2018. *First year university students' reading strategies and comprehension: implications for academic reading support*, Doctoral dissertation. Potchefstroom: North-west University.

Archer, A. 2008. Investigating the effect of writing centre interventions on student writing. *South African Journal of Higher Education*, 22(2): 248-264.

Ardington, C., Wills, G. & Kotze, J. 2021a. COVID-19 learning losses: Early grade reading in South Africa. *International Journal of Educational Development*, 86: 102480.

Ardington, C., Wills, G., Pretorius, E., Mohohlwane, N. & Menendez, A. 2021b. Benchmarking oral reading fluency in the early grades in Nguni languages. *International Journal of Educational Development*, 84(102433): 1-19.

August, G. 2006. So, what's behind adult English second language reading? *Bilingual Research Journal*, 30(2): 245-264.

Bandalos, D.L. 2018. *Measurement theory and applications for the social sciences*. Guilford: Guilford Publications.



Bandura, A. 1977. *Social learning theory*. Englewood Cliffs NJ: Holt, Rinehart, and Winston.

Bangeni, B. & Kapp, R. 2007. Shifting language attitudes in linguistically diverse learning environment in South Africa. *Journal of Multilingual and Multicultural Development*, 28(4): 253-269.

Barnes, M.A., Ahmed, Y., Barth, A. & Francis, D.J. 2015. The relation of knowledge-text integration processes and reading comprehension in 7th-to 12th-grade students. *Scientific Studies of Reading*, 19: 253-272.

Barnes, M.A., Dennis, M. & Haefele-Kalvaitis, J. 1996. The effects of knowledge availability and knowledge accessibility on coherence and elaborative inferencing in children from six to fifteen years of age. *Journal of Experimental Child Psychology*, 61: 216-241.

Barth, A.E., Barnes, M., Francis, D., Vaughn, S. & York, M. 2015. Inferential processing among adequate and struggling adolescent comprehenders and relations to reading comprehension. *Reading and Writing*, 28: 587-609.

Beishuizen, J., Le Grand, J. & Van Der Schalk, J. 1998. No correlation between inferencing causal relations and text comprehension? *Learning and Instruction*, 9: 37-56.

Bharuthram, S. 2012. Making a case for the teaching of reading across the curriculum in higher education. *South African Journal of Education*, 32(2): 205-214.

Boakye, N. 2012. *A socio-affective approach to improving students' reading comprehension abilities*. Doctoral dissertation. Pretoria: University of Pretoria.

Boakye, N. & Southey, L. 2008. Investigating students' motivations and attitudes towards reading. *Journal for Language Teaching= Ijenali Yekufundzisa Lulwimi= Tydskrif vir Taalonderrig*, 42(2): 7-24.

Boakye, N., Sommerville, J. & Debusho, L. 2014. The relationship between socio-affective factors and reading proficiency: Implications for tertiary reading instruction. *Journal for Language Teaching*, 48(1): 173-213.

Bohlmann, C.A. & Pretorius, E.J. 2002. Reading skills and mathematics. *South African Journal of Higher Education*, 16(3):196-206.

Bowyer-Crane, C. & Snowling, M.J. 2005. Assessing children's inference generation: What do tests of reading comprehension measure? *British Journal of Educational Psychology*, 75: 189-201.

Brace, N., Kemp, R. & Snelgar, R. 2012. *SPSS for psychologists*, 5th ed. London: Palgrave Macmillan.

Brown, A.L. & Campione, J.C. 1990. Interactive learning environments and the teaching of science and mathematics. *Toward a Scientific Practice of Science Education*, (1990): 111-139.

Brown, A.L. & Palincsar, A.S. 1987. *Reciprocal teaching of comprehension strategies: A natural history of one program for enhancing learning*. New York: Ablex Publishing.

Butler, G. 2013. Discipline-specific versus generic academic literacy intervention for university education: An issue of impact? *Journal for Language Teaching= Ijenali Yekufundzisa Lulwimi= Tydskrif vir Taalonderrig*, 47(2): 71-87.

Cain, K. & Oakhill, J. V. 1999. Inference making ability and its relation to comprehension failure in young children. *Reading and Writing*, 11: 489-503.

Cain, K., Oakhill, J.V., Barnes, M.A. & Bryant, P.E. 2001. Comprehension skill, inference-making ability, and their relation to knowledge. *Memory & Cognition*, 29(6): 850-859.

Cain, K., Oakhill, J. & Lemmon, K. 2004. Individual differences in the inference of word meanings from context: The influence of reading comprehension, vocabulary knowledge, and memory capacity. *Journal of Educational Psychology*, 96: 671.

Calvo, M.G. 2005. Relative contribution of vocabulary knowledge and working memory span to elaborative inferences in reading. *Learning and Individual Differences*, 15: 53-65.

Carstens, A. 2009. *The effectiveness of genre-based approaches in teaching academic writing: Subject-specific versus cross-disciplinary emphases*. Doctoral dissertation. Pretoria: University of Pretoria.

Carver, R.P. 1994. Percentage of unknown vocabulary words in text as a function of the relative difficulty of the text: Implications for instruction. *Journal of Reading Behavior*, 26(4): 413-437.

Castles, A., Rastle, K. & Nation, K. 2018. Ending the reading wars: Reading acquisition from novice to expert. *Psychological Science in the Public Interest*, 19(1): 5-51.

Cekiso, M. 2012. Reading comprehension and strategy awareness of Grade 11 English second language learners. *Reading & Writing*, 3: 1-8.

Cekiso, M., Rabelemane, T., Jadezweni, J., Mandende, I.P. & Dieperink, M. 2022. Factors affecting Grade 6 learners' reading performance in a rural school in Maluti, South Africa. *Reading & Writing*, 13(1): 9-18.

Chaka, C. 2020. Higher education institutions and the use of online instruction and online tools and resources during the COVID-19 outbreak - An online review of selected US and SA's universities. *Research Square*. [Online]. Available: <https://doi.org/10.21203/rs.3.rs-61482/v1> [Accessed 15 August 2022].

Chall, J.S., Jacobs, V.A. & Baldwin, L.E. 1990. *The reading crisis: Why poor children fall behind*. Cambridge, MA.: Harvard University Press.

Cliff, A. & Yeld, N. 2006. Academic literacy. In: H. Griesel (ed.). Access and entry level benchmarks: The national benchmark tests project. Pretoria: *Higher Education South Africa*, pp. 19-27.

Cliff, A. 2014. Entry-level students' reading abilities and what these abilities might mean for academic readiness. *Language Matters*, 45(3): 313-324.

Cohen, J. 1988. *The effect size index: d. Statistical power analysis for the behavioural sciences*. Abingdon-on-Thames: Routledge Academic.

Coetzee-Van Rooy, S. 2010. Evaluation of the Cummins theoretical framework for higher education in South Africa. *Southern African Linguistics and Applied Language Studies*, 28(1): 25-38.

Colins, J.C. & Porras, J.I. 1994. *Built to last: Successful habits of visionary companies*. New York: Harper Collins Publishers.

Cook, A.E. 2014. Processing anomalous anaphors. *Memory & Cognition*, 42(7): 1171-1185.

Cromley, J.G. & Azevedo, R. 2007. Testing and refining the direct and inferential mediation model of reading comprehension. *Journal of Educational Psychology*, 99: 311.

Cummins, J. 1979. Linguistic interdependence and the educational development of bilingual children. *Review of Educational Research*, 49(2): 222-251.

Cummins, J. 1983. Bilingualism and special education: program and pedagogical issues. *Learning Disability Quarterly*, 6(4): 373-386.

Cummins, J. 2001. The influence of bilingualism on cognitive growth: a synthesis of research findings and explanatory hypotheses. In: C. Baker & N. Hornberger (eds). *An introductory reader to the writings of Jim Cummins*. Clevedon: Multilingual Matters, pp. 26-55.

Dankers, P., Stoltenkamp, J. & Donson, T., 2022. The perception of digital academic literacy tutors during the COVID-19 pandemic at the University of the Western Cape. [Online]. Available: [https://repository.uwc.ac.za/bitstream/handle/10566/7404/dankers\\_the%20pereception%20of%20digi%20academic%20literacy\\_2022.pdf?sequence=1&isAllowed=y](https://repository.uwc.ac.za/bitstream/handle/10566/7404/dankers_the%20pereception%20of%20digi%20academic%20literacy_2022.pdf?sequence=1&isAllowed=y) [Accessed 15 August 2022].

Degand, L. & Sanders, T. 2002. The impact of relational markers on expository text comprehension in L1 and L2. *Reading and Writing*, 15(7-8): 739-757.

De Jongh, M. & Milton, C. 2022. Students' perceptions of online reading behaviour at an institution of higher learning in South Africa: a pilot project. *South African Journal of Higher Education*, 36(3): 32-53.

De Klerk, D., Krull, G. & Maleswena, T. 2021. Rapid orientation of students for emergency remote learning during the COVID-19 lockdown. *Journal of Student Affairs in Africa*, 9(1): 61-75.

Department of Basic Education. 2011. *Curriculum and Assessment Policy Statement: Further Education and Training Phase, Grades 10-12*. Cape Town: Department of Basic Education.

Department of Basic Education. 2014. *Report on the Annual National Assessments of 2014*. Pretoria: Department of Basic Education.

Department of Basic Education. 2017. *Report on implementation evaluation of CAPS: Summary Report*. Pretoria: Department of Basic Education.

Department of Basic Education. 2018. *General household survey 2016: Focus on schooling*. Pretoria: Department of Basic Education.

De Wet, C. & Wolhuter, C. 2009. A transitiological study of some South African educational issues. *South African Journal of Education*, 29(3).

Dewitz, P., Carr, E.M. & Patberg, J.P. 1987. Effects of inference training on comprehension and comprehension monitoring. *Reading Research Quarterly*: 99-121.

Dreyer, C. 1998. Improving students' reading comprehension by means of strategy instruction. *Journal for Language Teaching*, 31(1): 18-29.

Droop, M. & Verhoeven, L. 2003. Language proficiency and reading ability in first- and second-language learners. *Reading Research Quarterly*, 38(1): 78-103.

Dube, B. 2020. Rural online learning in the Context of COVID-19 in South Africa: Evoking an inclusive education approach. *Multidisciplinary Journal of Educational Research*, 10(2): 135-157.

Duffy, G.G. & Roehler, L.R. 1989. Why strategy instruction is so difficult and what we need to do about it. In: C.B. McCormick, G.E. Miller & M. Pressley (eds). *Cognitive strategy research*. New York: Springer, pp. 133-154.

Dunning, D. 2011. The Dunning–Kruger effect: On being ignorant of one's own ignorance. In: M.P. Zanna (ed.). *Advances in experimental social psychology* (Vol. 44). Cambridge, MA: Academic Press, pp. 247-296.

Durkin, D. 1978. What classroom observations reveal about reading comprehension instruction. *Reading Research Quarterly*: 481-533.

Dweck, C. 2007. *Mindset: The new psychology of success*. New York: Ballentine Books.

Ehrlich, M.F., Remond, M. & Tardieu, H. 1999. Processing of anaphoric devices in young skilled and less skilled comprehenders: differences in metacognitive monitoring. *Reading and Writing*, 11(1): 29-63.

Elbro, C. & Buch-Iversen, I. 2013. Activation of background knowledge for inference making: Effects on reading comprehension. *Scientific Studies of Reading*, 17: 435-452.

Engzell, P., Frey, A. & Verhagen, M.D. 2021. Learning loss due to school closures during the COVID-19 pandemic. *Proceedings of the National Academy of Sciences*, 118(17): 1-7.

Fender, M. 2001. A review of HL and L2/ESL word integration skills and the nature of L2/ESL word integration development involved in lower-level text processing. *Language Learning*, 51: 319–396.

Fleisch, B. 2008. *Primary education in crisis: Why South African School children underachieve in reading and mathematics*. Cape Town: Juta.

Fouché, I. 2016. *Assessing the impact of academic literacy interventions in higher education: An evaluation design*, Doctoral thesis Potchefstroom: North-West University.

Fouché, I. & Andrews, G. 2022. “Working from home is one major disaster”: An analysis of student feedback at a South African university during the COVID-19 lockdown. *Education and Information Technologies*, 27(1): 133-155.

García, J.R., Bustos, A. & Sánchez, E. 2015. The contribution of knowledge about anaphors, organisational signals and refutations to reading comprehension. *Journal of Research in Reading*, 38(4): 405-427.

Gilabert, R., Martínez, G. & Vidal-Abarca, E. 2005. Some good texts are always better: Text revision to foster inferences of readers with high and low prior background knowledge. *Learning and Instruction*, 15: 45-68.

Goodman, K.S. 1967. Reading: A psycholinguistic guessing game. *Literacy Research and Instruction*, 6(4): 126-135.

Gopalan, M., Rosinger, K. & Ahn, J. B. 2020. Use of quasi-experimental research designs in education research: Growth, promise, and challenges. *Review of Research in Education*, 44(1): 218–243.

Grabe, W. 1991. Current developments in second language reading research. *TESOL Quarterly*, 25(3): 375-406.

Grabe, W.P. & Stoller, F.L. 2013. *Teaching and researching: Reading*. Oxford: Routledge.

Graesser, A.C. & Bertus, E.L. 1998. The construction of causal inferences while reading expository texts on science and technology. *Scientific Studies of Reading*, 2: 247-269.

Graesser, A.C., McNamara, D.S. & Louwse, M.M. 2003. What do readers need to learn in order to process coherence relations in narrative and expository text. In: C.E. Snow & A.P. Sweet (eds). *Rethinking reading comprehension*. New York: Guilford Publications, pp. 98 – 125.

Graesser, A.C. Singer, M. & Trabasso, T. 1994. Constructing inferences during narrative text comprehension. *Psychological Review*, 101(3): 371.

Graham, S. & Harris, K.R. 1996. Self-regulation and strategy instruction for students who find writing and learning challenging. *The Science of Writing: Theories, Methods, Individual Differences, and Applications*: 347-360.

Graves, P. 2010. *Consumerology*. Boston: Nicholas Brealey Publishing.

Gopal, N.D. 2013. 'They call us Makwerekweres': foreign learners speak out against xenophobia. *Alternation*, 7(2013): 125 - 144

Guo, Y. & Roehrig, A.D. 2011. Roles of general versus second language (L2) knowledge in L2 reading comprehension. *Reading in a Foreign Language*, 23(1): 42-64.

Haladyna, T.M., Downing, S.M. & Rodriguez, M.C. 2002. A review of multiple-choice item-writing guidelines for classroom assessment. *Applied Measurement in Education*, 15(3): 309-333.

Haller, E.P., Child, D.A. & Walberg, H.J. 1988. Can comprehension be taught? A quantitative synthesis of "metacognitive" studies. *Educational Researcher*, 17: 5-8.

Halliday, M.A.K. & Hasan, R. 1976. *Cohesion in English*. London: Longman.

Hanneman, R.K., Kposowa A.J. & Riddle, M. 2013. *Basic statistics for social research*. New York: John Wiley & Sons.

Hannon, B. & Daneman, M. 1998. Facilitating knowledge-based inferences in less-skilled readers. *Contemporary Educational Psychology*, 23: 149-172.

Hansen, J. & Hubbard, R. 1984. Poor readers can draw inferences. *The Reading Teacher*, 37(7): 586-589.

Hansen, J. & Pearson, P.D. 1982. An instructional study: Improving the inferential comprehension of good and poor fourth-grade readers. *Journal of Educational Psychology*, 75(6): 821.

Hara, A. & Tappe, H. 2016. Inference generation and text comprehension in bilingual children: A case study. *Literator*, 37: 1-12.

Hasbrouck, J. & Tindal, G.A. 2006. Oral reading fluency norms: A valuable assessment tool for reading teachers. *The Reading Teacher*, 59(7): 636-644.

Hattie, J. 2009. *Visible learning: a synthesis of over 800 meta-analyses relating to achievement*. London: Routledge.



Hattie, J. 2015. The applicability of Visible Learning to higher education. *Scholarship of Teaching and Learning in Psychology*, 1(1): 79-91.

Hilden, K.R. & Pressley, M. 2007. Self-regulation through transactional strategies instruction. *Reading and Writing Quarterly*, 23(1): 51-75.

Hoadley, U. 2012. What do we know about teaching and learning in South African primary schools? *Education as Change*, 16(2): 187-202.

Horner, S.L. & O'connor, E.A. 2007. Helping beginning and struggling readers to develop self-regulated strategies: A reading recovery example. *Reading & Writing Quarterly*, 23(1): 97-109.

Howie, S.J., Combrinck, C., Roux, K., Tshele, M., Mokoena, G.M. & McLeod Palane, N. 2017. *PIRLS Literacy 2016: South African Highlights Report*. Pretoria: Centre for Evaluation and Assessment.

Innajih, A. 2007. The effect of conjunctive types on the English language reading comprehension of Libyan university students. *Annual Review of Education, Communication and Language Sciences*, 4.

Jappie, N. 2020. Education researchers respond to the COVID-19 Pandemic. *Jet Education Services*. [Online]. Available: [https://www.jet.org.za/resources/theme-8\\_governance-management-in-higher-education-14-05-finaHL.pdf/download](https://www.jet.org.za/resources/theme-8_governance-management-in-higher-education-14-05-finaHL.pdf/download) [Accessed 15 August 2022].

Jeon, E.H. & Yamashita, J. 2014. L2 reading comprehension and its correlates: a meta-analysis. *Language Learning*, 64(1): 160-212.

Jeon, E.H. 2012. Oral reading fluency in second language reading. *Reading in a Foreign Language*, 24(2): 186–208.

Jiang, B. & Kuehn, P. 2001. Transfer in the academic language development of post-secondary ESL students. *Bilingual Research Journal*, 25: 417–436.

Kendeou, P. & Van Den Broek, P. 2007. The effects of prior knowledge and text structure on comprehension processes during reading of scientific texts. *Memory & Cognition*, 35(7): 1567-1577.

Kern, R.G. 2000. *Literacy and language teaching*. London: Oxford University Press.

Kern, R.G. 1989. Second language reading strategy instruction: Its effects on comprehension and word inference ability. *The Modern Language Journal*, 73(2):135-149.

Khatib, M. 2011. Comprehension of discourse markers and reading comprehension. *English Language Teaching*, 4(3): 243-250.

Kim, J.S. 2008. Research and the reading wars. *Phi Delta Kappan*, 89(5): 372-375.

Kim, A.H., Vaughn, S., Wanzek, J. & Wei, S., 2004. Graphic organizers and their effects on the reading comprehension of students with LD: A synthesis of research. *Journal of Learning Disabilities*, 37(2): 105-118.

Kintsch, W. 1998. *Comprehension: A paradigm for cognition*. Cambridge: Cambridge University Press.

Kirschner, P., Sweller, J. & Clark, R.E. 2006. Why unguided learning does not work: An analysis of the failure of discovery learning, problem-based learning, experiential learning and inquiry-based learning. *Educational Psychologist*, 41(2): 75-86.

Kispal, A. 2008. *Effective teaching of inference skills for reading*. Berkshire: National Foundation for Educational Research.

Koda, K. 2007. Reading and language learning: crosslinguistic constraints on second language reading development. *Language Learning*, 57(1): 1-44.

Lakens, D. 2013. Calculating and reporting effect sizes to facilitate cumulative science: a practical primer for t-tests and ANOVAs. *Frontiers in Psychology*, 4: 863.

Laufer, B. & Sim, D. 1985. Measuring and explaining the reading threshold needed for English for Academic Purposes texts. *Foreign Language Annals*, 18(5): 405-411.

Le, P.L., du Plessis, C. & Weideman, A. 2011. Test and context: The use of the Test of Academic Literacy Levels (TALL) at a tertiary institution in Vietnam. *Journal for Language Teaching*, 45(2): 115-131.

LeCroy, C.W. & Krysik, J. 2007. Understanding and interpreting effect size measures. *Social Work Research*, 31(4): 243-248.

Lehohla, P. 2012. *Census 2011: census in brief*. Pretoria: Statistics South Africa.

Leki, I. 2017. *Undergraduates in a second language challenges and complexities of academic literacy development*. London: Routledge.

Lindstrom, M. 2008. *Buy-ology: Truth and lies about why we buy*. New York: Crown.

Ludidi, Y.Y. 2015. *Evaluating the effect of academic literacy intervention programme on the SATAP English scores of first year students at a university in the Eastern Cape Province, South Africa*, Doctoral dissertation. Pretoria: Unisa.

Lukhele, B.B.S. 2013. Exploring relationships between reading attitudes, reading ability and academic performance amongst primary teacher trainees in Swaziland', *Reading & Writing* 4(1): 1-28.

Lynch, B.K. 1996. *Language program evaluation: Theory and practice*. Cambridge: Cambridge University Press.

Maphoto, K. 2022. First-year students at an open distance and e-learning institution: Perceptions, expectations and challenges associated with academic writing feedback. *Journal for Language Teaching*, 56(1): 1-19.

Maree, J.G. 2022. Managing the COVID-19 pandemic in South African Schools: turning challenge into opportunity. *South African Journal of Psychology*, 52(2): 249-261.

Marzban, A. & Seifi, S. 2013. The effect of genre structure on reading comprehension ability of Iranian EFL learners. *Procedia-Social and Behavioral Sciences*, 83: 1043-1048.

Matjila, D.S. & Pretorius, E.J. 2004. Bilingual and biliterate? An exploratory study of Grade 8 reading skills in Setswana and English. *Per Linguam: A Journal of Language Learning= Per Linguam: Tydskrif vir Taalaanleer*, 20(1): 1-21.

Maynes, N., Julien-Schultz, L. & Dunn, C. 2010. Modeling and the gradual release of responsibility: What does it look like in the classroom? *Brock Education: A Journal of Educational Research and Practice*, 19(2): 65-77.

McCormick, D.E. 1997. *Using questions to scaffold language learning in an ESL classroom: A sociocultural case study*, Doctoral dissertation. Pittsburgh: University of Pittsburgh.

Mcgee, A. & Johnson, H. 2003. The effect of inference training on skilled and less skilled comprehenders. *Educational Psychology*, 23: 49-59.

Mckoon, G. & Ratcliff, R. 1992. Inference during reading. *Psychological Review*, 99: 440.

Mckoon, G. & Ratcliff, R. 2017. Adults with poor reading skills and the inferences they make during reading. *Scientific Studies of Reading*, 21: 292-309.

Mcmackin, M.C. & Lawrence, S. 2001. Investigating inferences: Constructing meaning from expository texts. *Reading Horizons*, 42: 4.

Mncwango, E.M. 2009. Language and the current challenges in the South African school system. *Inkanyiso: Journal of Humanities and Social Sciences*, 1(1): 51-54.

Mohohlwane, N.L. 2019. How language policy and practice sustain inequality in education. In: N. Spaul & J.N. Jansen, *South African schooling: The enigma of inequality*. Cham: Springer, pp. 127-146.

Monkhe, M. 2015. *The impact of the xenophobia phenomenon of international students at a selected institution of higher learning in the Western Cape*, Doctoral dissertation. Cape Town: Cape Peninsula University of Technology.

Motala, S. & Menon, K. 2020. In search of the 'new normal': Reflections on teaching and learning during Covid-19 in a South African university. *Southern African Review of Education*, 26(1): 80–99.

Motaung, L.B. & Dube, B. 2020. WhatsApp messenger as a mediating tool in times of COVID-19 for enhancing student engagement in e-tutorials at a rural South African university. *Journal of Educational and Social Research*, 10(6): 214-214.

Mundy, C. & Potgieter, M. 2019. Refining process-oriented guided inquiry learning for chemistry students in an academic development programme. *African Journal of Research in Mathematics, Science and Technology Education*, 23(2): 145-156.

Mutakwa, D.T. & Mhakure, D. 2019. Tracking students' performance in higher education: The transition from national benchmark tests to quantitative literacy intervention course. *South African Journal of Higher Education*, 33(4): 203-218.

Nagy, W., Herman, P., & Anderson, R. 1985. Learning words from context. *Reading Research Quarterly*, 20: 233–253.

Narvaez, D. 2002. Individual differences that influence reading comprehension. *Comprehension Instruction: Research-based Best Practices*: 158-175.

Nassaji, H. 2003. Higher-level and lower-level text processing skills in advanced ESL reading comprehension. *The Modern Language Journal*, 87(2): 261-276.

Nation, I.S.P. 2006. How large a vocabulary is needed for reading and listening? *Canadian Modern Language Review*, 63: 59–82.

Nation, K. & Angell, P. 2006. Learning to read and learning to comprehend. *London Review of Education*, 4: 77-87.

Nel, C., Dreyer, C. & Klopper, M. 2004. An analysis of reading profiles of first-year students at Potchefstroom University: a cross-sectional study and a case study. *South African Journal of Education*, 24: 95-103.

Nel, C. 2011. Classroom assessment of reading comprehension: how are pre-service foundation phase teachers being prepared? *Per Linguam: A Journal of Language Learning*, 27: 40-63.

Neuman, S.B. & McCormick, S. 1995. *Single-subject experimental research: Applications for literacy*. Newark NJ: International Reading Association.

Noble, H. & Heale, R. 2019. Triangulation in research, with examples. *Evidence-Based Nursing*, 22(3): 67-68.

Noordman, L.G., Vonk, W. & Kempff, H.J. 1992. Causal inferences during the reading of expository texts. *Journal of Memory and Language*, 31: 573.

Ntshikila, N., Condy, J.L., Meda, L. & Phillips, H.N. 2022. Five Grade 7 learners' understanding of comprehension skills at a quintile 5 school in South Africa. *Reading & Writing*, 13(1): 324-339.

Nzimande, B. 2020. Higher Education and Training response to coronavirus COVID-19 epidemic lockdown Level 1. [Online]. Available: <https://www.gov.za/speeches/education-sector-response-covid-19-epidemic-lockdown-30-sep-2020-0000> [Accessed 12 September 2022].

Oakhill, J.V. & Cain, K. 2012. The precursors of reading ability in young readers: Evidence from a four-year longitudinal study. *Scientific Studies of Reading*, 16: 91-121.

Ogude, N.A. & Rollnick, M. 2022. Ideological positioning of Extended Curriculum Programmes – a case study of a large South African research university. *South African Journal of Higher Education*, 36(2): 222–238

Omodan, B.I. & Ige, O.A. 2021. Re-constructing the tutors-tutees relationships for better academic performance in universities amidst COVID-19 new normal. *Mediterranean Journal of Social Sciences*, 12(2): 30-40.

Owen-Smith, M. 2010. The language challenge in the classroom: A serious shift in thinking and action is needed. *Focus*, 56: 31-37.

Oyetunji, C. 2013. Does reading strategy instruction improve students' comprehension? *Per Linguam: a Journal of Language Learning*, 29: 33-55.

Pagé, M. 1990. Methodological issues in testing comprehension of texts. In: M. Spoelders (ed.). *Literacy acquisition*. Lier: Van In and C&C.

Palincsar, A.S. & Brown, A.L. 1987. Peer interaction in reading comprehension instruction. *Educational Psychologist*, 22(3-4): 231-253.

Pallant, J. 2016. *SPSS survival manual*, 6<sup>th</sup> ed. London: Allen & Unwin.

Park, Y.S., Konge, L. & Artino, A.R. 2020. The positivism paradigm of research. *Academic Medicine*, 95(5): 690-694.

Parkinson, J., Jackson, L., Kirkwood, T. & Padayachee, V. 2008. Evaluating the effectiveness of an academic literacy course: do students benefit? *Per Linguam: a Journal of Language Learning*, 24: 11-29.

Pather, S., Brown, V. & Lawack, V. 2021. An evidence-based approach to learning and teaching during the 2020 COVID-19 pandemic. *University of the Western Cape*. [Online]. Available: <https://repository.uwc.ac.za/bitstream/handle/10566/6015/learning%20and%20teaching.pdf?sequence=1&isAllowed=y> [Accessed 15 August 2022].

Patton, M.Q. 2002. *Qualitative research and evaluation methods*. Thousand Oaks: Sage.

Pearson, P.D. & Cervetti, G.N. 2015. Fifty years of reading comprehension theory and practice. In: P.D. Pearson & E.H. Hiebert (eds). *Research based practices for teaching common core literacy*. New York: Teachers' College Press, pp. 2-40.

Perfetti, C.A. 1998. Two basic questions about reading and learning to read. In: P. Reitsma & L. Verhoeven (eds). *Problems and interventions in literacy development*. Dordrecht: Springer, pp. 15-47.

Perfetti, C. & Adolf, S. 2012. Reading comprehension: A conceptual framework from word meaning to text meaning. In: I.J. Sabatini, E. Albro, & T.O'Reilly (eds). *Measuring up: Advances in how to assess reading ability*. Lanham, MD: Rowman & Littlefield, pp. 3-20.

Perfetti, C. & Stafura, J. 2014. Word knowledge in a theory of reading comprehension. *Scientific Studies in Reading*, 18(1): 22-37.

Pigada, M. & Schmitt, N. 2006. Vocabulary acquisition from extensive reading: A case study. *Reading in a Foreign Language*, 18(1): 1-28.

Praveen, S.D. & Rajan, P., 2013. Using Graphic Organizers to Improve Reading Comprehension Skills for the Middle School ESL Students. *English Language Teaching*, 6(2): 155-170.

Pressley, M., Harris, K.R. & Marks, M.B. 1992. But good strategy instructors are constructivists! *Educational Psychology Review*, 4(1): 3-31.

Pressley, M. 2000. What should comprehension instruction be the instruction of? In: M.L. Kamil, P. Mosenthal, P.D. Pearson & R. Barr (eds). *Handbook of reading research*, Vol. 3. Mahwah, NJ: Erlbaum, pp. 545-561.

Pretorius, E.J. 2000. Reading and the Unisa student: Is academic performance related to reading ability? *Progressio*, 22(2): 35-48.



Pretorius, E. J. 2002. *Inference generation in the reading of expository texts by university students*, Doctoral dissertation. Pretoria: UNISA.

Pretorius, E. J. 2002. Reading ability and academic performance in South Africa: Are we fiddling while Rome is burning? *Language Matters*, 33: 179-208.

Pretorius, E. J. 2005. English as a second language learner differences in anaphoric resolution: Reading to learn in the academic context. *Applied Psycholinguistics*, 26: 521-539.

Pretorius, E.J. 2006. The comprehension of logical relations in expository texts by students who study through the medium of ESL. *System*, 34(3): 432-450.

Pretorius, E.J. & Mampuru, D.M. 2007. Playing football without a ball: language, reading and academic performance in a high-poverty school. *Journal of Research in Reading*, 30(1): 38-58.

Pretorius, E. J. & Currin, S. 2010. Do the rich get richer and the poor poorer? The effects of an intervention programme on reading in the home and school language in a high poverty multilingual context. *International Journal of Educational Development*, 30(1): 67-76.

Pretorius, E. J. & Lephala, M. 2011. Reading comprehension in high-poverty schools: How should it be taught and how well does it work? *Per Linguam: a Journal of Language Learning*, 27: 1-24.

Pretorius, E. J. 2015. Failure to launch: Matching language policy with literacy accomplishment in South African schools. *International Journal for the Sociology of Language*, 234: 47-76.

Pretorius, E.J. & Spaul, N. 2016. Exploring relationships between oral reading fluency and reading comprehension amongst English second language readers in South Africa. *Reading and Writing*, 29(7): 1449-1471.

Pretorius, E.J. 2019. Getting it right from the start: Early reading instruction in African languages. In: N. Spaul & J.P. Comings (eds). *Improving early literacy outcomes: Curriculum, teaching and assessment*. Leiden: Brill, pp. 63-80.

Prince, R.N., Frith, V., Steyn, S. & Cliff, A. 2021. Academic and quantitative literacy in higher education: Relationship with cognate school-leaving subjects. *South African Journal of Higher Education*, 35(3): 163-181.

Proctor, C.P., August, D., Carlo, M.S. & Snow, C. 2006. The intriguing role of Spanish language vocabulary knowledge in predicting English reading comprehension. *Journal of Educational Psychology*, 98(1): 159-169.

Raphael, T.E., George, M., Weber, C.M. & Nies, A. 2014. Approaches to teaching reading comprehension. In: S.E. Israel & G.G. Duffy (eds). 2014. *Handbook of research on reading comprehension*. London: Routledge, pp. 449-472.

Raphael, T., Highfield, K. & Au, K.H. 2006. *Question-answer relationships*. New York: Scholastic.

Richards, J.C. & Anderson, N.A. 2003. How do you know? A strategy to help emergent readers make inferences. *The Reading Teacher*, 57: 290-293.

Royer, J.M. & Carlo, M. 1991. Transfer of comprehension skills from native to second language. *Journal of Reading*, 34(6): 450-455.

Rudwick, S. 2005. Township language dynamics: isiZulu and isiTsoetsi in Umlazi. *Southern African Linguistics and Applied Language Studies*, 23:3: 305-317.

Rumelhart, D.E. 1977. Toward an interactive model of reading. In: S. Dornic & P. Rabbitt (eds). *Attention and performance*, Vol. 6. New York: Academic Press, pp. 573-603.

Sampa, F.K., Ojanen, E., Westerholm, J., Ketonen, R. & Lyytinen, H. 2018. Literacy programs efficacy for developing children's early reading skills in familiar language in Zambia. *Journal of Psychology in Africa*, 28(2): 128-135.

Schaefer, M. & Kotzé, J. 2019. Early reading skills related to Grade 1 English Second Language literacy in rural South African schools. *South African Journal of Childhood Education*, 9(1):1-13.

Schmitt, N., Jiang, X. & Grabe, W., 2011. The percentage of words known in a text and reading comprehension. *The Modern Language Journal*, 95(1): 26-43.

Schunk, D.H. & Zimmerman, B.J. 1997. Social origins of self-regulatory competence. *Educational Psychologist*, 32(4): 195-208.

Schunk, D.H. & Zimmerman, B.J. 2007. Influencing children's self-efficacy and self-regulation of reading and writing through modelling. *Reading & Writing Quarterly*, 23(1): 7-25.

Scott, I. 2009. First-year experience as terrain of failure or platform for development? Critical choices for higher education. *Focus on First-Year Success: Perspectives Emerging from South Africa and Beyond*, 17-36.

Sebolai, K. 2022a. The Academic Development approach to academic literacy in higher education South Africa: A disconnect between teaching and assessment. *Journal for Language Teaching*, 56(2): 1-16.

Sebolai, K. 2022b. Determining the faculty specific academic literacies needs of first year university students: A mixed methods approach. *Journal for Language Teaching*, 56(2): 1-20.

Seidenberg, M. 2017. *Language at the speed of sight: How we read, why so many can't, and what can be done about it*. New York: Basic Books.

Share, D.L. 1995. Phonological recoding and self-teaching: Sine qua non of reading acquisition. *Cognition*, 55(2): 151-218.

Sibeko, J. 2021. A comparative analysis of the linguistic complexity of Grade 12 English Home Language and English First Additional Language examination papers. *Per Linguam*, 37(2): 50-64.

Simpson, M.L. & Nist, S.L. 2002. Encouraging active reading at the college level. *Comprehension Instruction: Research-based Best Practices*: 365-379.

Singer, M., Harkness, D. & Stewart, S.T. 1997. Constructing inferences in expository text comprehension. *Discourse Processes*, 24: 199-228.

Smith, B.L., Smith, T.D., Taylor, L. & Hobby, M. 2005. Relationship between intelligence and vocabulary. *Perceptual and Motor Skills*, 100(1): 101-108.

Spaull, N. 2015. Schooling in South Africa: How low-quality education becomes a poverty trap. *South African Child Gauge*, 12(1): 34-41.

Spaull, N. 2016. Serious technical concerns about SACMEQ IV results presented to parliament. [Online]. Available: <https://nicspaull.com/2016/09/14/serious-technical-concerns-about-sacmeq-iv-results-presented-to-parliament/> [Accessed 20 October 2018].

Spaull, N. & Pretorius, E. 2019. Still falling at the first hurdle: Examining early grade reading in South Africa. In: N. Spaull & J.D. Jansen (eds). *South African schooling: The enigma of inequality*. Cham: Springer, pp. 1-24.

Spaull, N. 2019. Equity: A price too high to pay? In: N. Spaull & J.D. Jansen (eds). *South African schooling: The enigma of inequality*. Cham: Springer: pp. 1-24.

Spear-Swerling, L. 2006. Children's reading comprehension and oral reading fluency in easy text. *Reading and Writing*, 19: 199–220.

Stanovich, K.F. 1982. Individual differences in the cognitive processes of reading. *Journal of Learning Disabilities*, 15: 485-493.

Stanovich, K.E. 1994. Constructivism in reading education. *The Journal of Special Education*, 28(3): 259–274.

Stanovich, K.E. 2009. Matthew effects in reading: Some consequences of individual differences in the acquisition of literacy. *Journal of Education*, 189: 23-55.

Stevenson, M., Schoonen, R. & Glopper, K.D. 2003. Inhibition or compensation? A multidimensional comparison of reading processes in Dutch and English. *Language Learning*, 53(4): 765-815.

Sundbye, N. 1987. Text explicitness and inferential questioning: Effects on story understanding and recall. *Reading Research Quarterly*, 82-98.

Taber, K.S. 2016. The use of Cronbach's alpha when developing and reporting research instruments in science education. *Research in Science Education*, 48(6): 1273-1296.

Tan, L.H., Spinks, J.A., Feng, C.M., Siok, W.T., Perfetti, C.A., Xiong, J., Fox, P.T. & Gao, J.H. 2003. Neural systems of second language reading are shaped by native language. *Human Brain Mapping*, 18(3): 158-166.

Taylor, N. 2016. Thinking, language and learning in initial teacher education. *Perspectives in Education*, 34(1): 10–26.

Taylor, S. & von Fintel, M. 2016. Estimating the impact of language of instruction in South African primary schools: A fixed effects approach. *Economics of Education Review*, 50: 75-89.

Taylor, N. 2019. Inequalities in teacher knowledge in South Africa. In: N. Spaull & J.D. Jansen (eds). *South African schooling: The enigma of inequality*. Cham: Springer, pp. 263-282.

Taylor, S. & Coetzee, M. 2013. Mother-tongue classrooms give a better boost to English study later. *Mail & Guardian*, 18 October. [Online]. Available: <https://mg.co.za/article/2013-10-18-mother-tongue-classrooms-give-a-better-boost-to-english-study-later> [Accessed 16 July 2019].

Taylor, A., Stevens, J.R. & Asher, W.A. 2006. The effects of explicit reading strategy training on L2 reading comprehension. In: J.M. Norris & L. Ortega (eds). *Synthesizing research on language learning and teaching*, Vol. 13. Amsterdam: John Benjamins Publishing, pp. 213-244.

Taylor, S. & Yu, D. 2009. *The importance of socio-economic status in determining educational achievement in South Africa. Stellenbosch Economic Working Papers*. Stellenbosch: Research on Socio-Economic Policy.

Taylor, S. & von Fintel, M. 2016. Estimating the impact of language of instruction in South African primary schools: a fixed effects approach. *Economics of Education Review*, 50: 75-89.

United Nations. 2017. Population facts. [Online]. Available: [https://www.un.org/en/development/desa/population/publications/pdf/popfacts/PopFacts\\_2017-5.pdf](https://www.un.org/en/development/desa/population/publications/pdf/popfacts/PopFacts_2017-5.pdf) [Accessed 18 July 2019].

Vadasy, P.F., Sanders, E.A. & Abbott, R.D. 2008. Effects of supplemental early reading intervention at 2-year follow up: Reading skill growth patterns and predictors. *Scientific Studies of Reading*, 12(1): 51-89.

Van Broekhuizen, H. & Spaul, N., 2017. The 'Martha Effect': The compounding female advantage in South African higher education. Unpublished manuscript, Stellenbosch University. Stellenbosch: South Africa.

Van de Mortel, T.F. 2008. Faking it: social desirability response bias in self-report research. *Australian Journal of Advanced Nursing*, 25(4): 40-48.

Van Den Broek, P., Tzeng, Y., Risdien, K., Trabasso, T. & Basche, P. 2001. Inferential questioning: Effects on comprehension of narrative texts as a function of grade and timing. *Journal of Educational Psychology*, 93(3): 521.

Van der Slik, F. & Weideman, A. 2010. Examining bias in a test of academic literacy: Does the Test of Academic Literacy Levels (TALL) treat students from English and African language backgrounds differently? *Journal for Language Teaching= Ijenali Yekufundzisa Lulwimi= Tydskrif vir Taalonderrig*, 44(2): 106-118.

Van Dyk, T. 2010. *Konstitutiewe voorwaardes vir die ontwerp van 'n toets van akademiese geletterdheid*. Ongepubliseerde PhD dissertasie. Bloemfontein: Universiteit van die Vrystaat.

Van Dyk, T., Zybrands, H., Cillié, K. & Coetzee, M. 2009. On being reflective practitioners: The evaluation of a writing module for first-year students in the health sciences. *Southern African Linguistics and Applied Language Studies*, 27(3): 333-344.

Van Dyk, T. 2011. Ondersoek na die impak van 'n akademiese geletterdheidsintervensie op eerstejaargestudente se akademiese taalvermoë. *Litnet Akademies*, 8(3):487-506.

Van Dyk, T. & Van de Poel, K. 2013. Towards a responsible agenda for academic literacy development: Considerations that will benefit students and society. *Journal for Language Teaching*, 47(2): 43-69.

Van Dyk, T., Van de Poel, K. & Van der Slik, F. 2013. Reading ability and academic acculturation: The case of South African students entering higher education. *Stellenbosch Papers in Linguistics*, 42: 353-369.

Van Dyk T. & Weideman, A. 2004. Switching constructs: on the selection of an appropriate blueprint for academic literacy assessment. *Journal for Language Teaching*, 38(1): 1-13.

Van Gelderen, A., Schoonen, R., de Glopper, K., Hulstijn, J., Snellings, P., Simis, A. & Stevenson, M. 2003. Roles of linguistic knowledge, metacognitive knowledge and processing speed in L3, L2 and L1 reading comprehension: a structural equation modelling approach. *The International Journal of Bilingualism*, 7(1): 7-25.

Verhoeven, L. & Van Leeuwe, J. 2008. Prediction of the development of reading comprehension: A longitudinal study. *Applied Cognitive Psychology: The Official Journal of the Society for Applied Research in Memory and Cognition*, 22(3): 407-423.

Von Glasersfeld, E. 1998. Cognition, construction of knowledge, and teaching. In: M.R. Matthews (ed.). *Constructivism in science education*. Berlin: Springer, pp. 11-30.

Vygotsky, L.S. 1962. *Thought and language*. Cambridge, MA: MIT Press.

Wang, Z., Sabatini, J., O'reilly, T. & Weeks, J. 2019. Decoding and reading comprehension: A test of the decoding threshold hypothesis. *Journal of Educational Psychology*, 111(3): 387-401.

Williams, J. A. 2010. Taking on the role of questioner: revisiting reciprocal teaching. *The Reading Teacher*, 64(4): 278–281.

Wills, G., Ardington, C., Pretorius, E. & Sebaeng, L. 2022a. *Benchmarking early grade reading skills: English first additional language. Summary report*. Johannesburg: Khulisa Management Services.

Wills, G., Ardington, C., Pretorius, E., Pope, E. & Ramagoshi, R. 2022b. *Benchmarking early grade reading skills: Setswana and English first additional language technical report*. Stellenbosch: Research on Socio-Economic Policy.

Wilsenach, C. 2016. Identifying phonological processing deficits in Northern Sotho-speaking children: The use of non-word repetition as a language assessment tool in the South African context. *South African Journal of Communication Disorders*, 63(2): 1-11.

Wilsenach, C. 2019. Phonological awareness and reading in Northern Sotho—Understanding the contribution of phonemes and syllables in Grade 3 reading attainment. *South African Journal of Childhood Education*, 9(1): 1-10.

Wolf, M. & Katzir-Cohen, T. 2001. Reading fluency and its intervention. *Scientific Studies of Reading*, 5(3): 211–239.

Wurr, A. J. 2003. Reading in a second language: a reading problem or a language problem? *Journal of College Reading and Learning*, 33(2): 157-169.

Yuill, N. & Oakhill, J. 1991. *Children's problems in text comprehension: An experimental investigation*. London: Cambridge University Press.

Zenex Foundation. 2019. Module A1 reading: Important things to know about it. Johannesburg: Zenex Foundation.



Zhang, D. & Koda, K. 2011. Contribution of morphological awareness and lexical inferencing ability to L2 vocabulary knowledge and reading comprehension among advanced EFL learners: testing direct and indirect effects. *Reading and Writing*, 25(5): 1195-1216.

Zimmerman, L. & Smit, B. 2014. Profiling classroom reading comprehension development practices from the PIRLS 2006 in South Africa. *South African Journal of Education*, 34.

Zito, J.R., Adkins, M., Gavins, M., Harris, K.R. & Graham, S. 2007. Self-regulated strategy development: Relationship to the social-cognitive perspective and the development of self-regulation. *Reading & Writing Quarterly*, 23(1): 77-95.

## Appendix A: Ethical clearance and informed consent



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA



Research Ethics Committee

16 April 2019

Dear Ms Weder

**Project:** Improving undergraduate students' inferential skills through a reading intervention dealing with expository texts  
**Researcher:** N Weder  
**Supervisor:** Dr I Fouche  
**Department:** Afrikaans  
**Reference number:** 29003114 (GW20181139HS)

Thank you for the response to the Committee's correspondence.

I have pleasure in informing you that the above application was approved by the **Research Ethics Committee** and the Dean of Humanities on 4 March 2018 and by the Registrar on 10 April 2018. Data collection may therefore commence.

Please note that this approval is based on the assumption that the research will be carried out along the lines laid out in the proposal. Should your actual research depart significantly from the proposed research, it will be necessary to apply for a new research approval and ethical clearance.

We wish you success with the project.

Sincerely

**Prof Maxi Schoeman**  
Deputy Dean: Postgraduate and Research Ethics  
Faculty of Humanities  
UNIVERSITY OF PRETORIA  
e-mail: [PGHumanities@up.ac.za](mailto:PGHumanities@up.ac.za)

cc: Dr I Fouche (Supervisor)

Prof W Burger (HoD)

Faculty of Humanities  
Fakulteit Geesteswetenskappe  
Lefapha la Bomotheo

Research Ethics Committee Members: Prof MME Schoeman (Deputy Dean); Prof KL Harris; Mr A Bizos; Dr L Blokland; Dr K Booyens; Dr A-M de Beer; Ms A dos Santos; Dr R Fasselt; Ms KT Govinder Andrew; Dr E Johnson; Dr W Kelleher; Mr A Mohamed; Dr C Puttergill; Dr D Reyburn; Dr M Soer; Prof E Taljard; Prof V Thebe; Ms B Tsebe; Ms D Mokalapa



UNIVERSITEIT VAN PRETORIA  
UNIVERSITY OF PRETORIA  
YUNIBESITHI YA PRETORIA

**UP Extended Programmes  
Mamelodi Campus**

**Dear Student**

You are kindly requested to take part in a research project which focuses on improving the reading skills of students enrolled in the foundation programme. The research results will contribute towards a PhD degree in Linguistics and will be applied towards improving the teaching of reading as part of the Language and Study Skills curriculum. The results may be also be converted to conference presentations or research articles.

At the beginning of the first semester, you will be tested to determine your reading comprehension ability, specifically in your ability to infer information (“read between the lines”) as well as your academic literacy. You will again be tested at the end of the first semester and the end of the second semester to determine how much your reading and academic literacy abilities have improved.

If you choose to participate, you will attend a weekly hour-long class during one of your free periods which will teach you various reading strategies that will help you to become a better reader. These classes will only take place between March and May.

Your participation does not involve any risks or disadvantages. At no stage will your real name or student number be used; in fact, your participation in this study will be completely anonymous. The statistical analysis of results will also only consider the averages obtained by the group as a whole. No individual marks will be published. If you wish to withdraw your input at any time during the research process, you will not be penalised in any way and the data you provided will be destroyed. You may contact the researcher (Ms Nandi Weder) or the research assistant if you have any questions about the study or if you wish to discuss your results.

Sincerely,

Nandi Weder

Researcher, course coordinator and lecturer: Language and Study Skills – Mamelodi Campus  
nandi.weder@up.ac.za  
012-4842-3645

[The contact details of the research assistant will also be added to this letter once he or she has been appointed.]

I \_\_\_\_\_ hereby consent to participate  
(First name and surname)

in this research project and understand what that participation entails.

Administration Building D219  
Mamelodi Campus  
University of Pretoria  
Private bag X20, Hatfield 0028  
Republic of South Africa

Telephone number (012) 842 3645

nandi.weder@up.ac.za

www.up.ac.za

Signature: \_\_\_\_\_

Student number: \_\_\_\_\_

Date: \_\_\_\_\_

## Appendix B: Academic Inferencing Test


 UNIVERSITEIT VAN PRETORIA  
 UNIVERSITY OF PRETORIA  
 YUNIBESITHI YA PRETORIA

### Academic Inferencing Test 1/2

Surname, Initials	Name	Student number

SECTION	MARKS
Section A	/6
Section B	/21
Section C	/1
<b>Total</b>	<b>/28</b>
<b>Percentage</b>	<b>%</b>

#### Instructions

- Answer all questions.
- Write in pencil.
- No teaching materials may be used in the test.
- Rough work may be done on the test paper.
- Please write clearly and neatly.

SECTION A

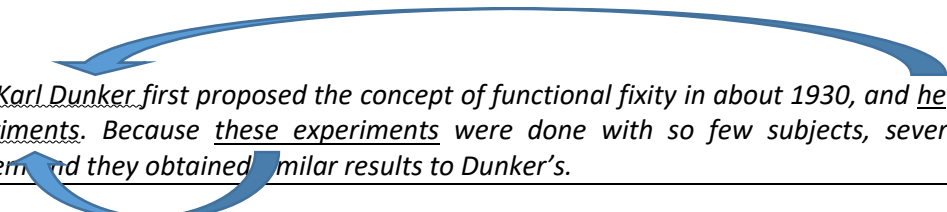
(6 marks)

Each of the paragraphs below has words and phrases that are underlined. Each of these underlined words and phrases refers to something that is mentioned in the paragraph, called the referent. Here is an example:

*The German psychologist Karl Dunker first proposed the concept of functional fixity in about 1930, and he illustrated it with a few simple experiments. Because these experiments were done with so few subjects, several American psychologists repeated them and they obtained similar results to Dunker's.*

In each paragraph, underline the referent of each underlined word or phrase, using a wavy line. Then, draw an arrow linking the underlined word/phrase with its referent. Here is an example:

*The German psychologist Karl Dunker first proposed the concept of functional fixity in about 1930, and he illustrated it with a few simple experiments. Because these experiments were done with so few subjects, several American psychologists repeated them and they obtained similar results to Dunker's.*



Now, in the paragraphs below, underline the words/phrases/sentences that you think each underlined word or phrase refers to, and draw in an arrow to link them, as shown in the example above.

1. Every day we are all bombarded with dozens, if not hundreds, of messages from marketers and advertisers. With all this advertising we are exposed to every day, how can we be expected to remember any of it? Our brains are constantly in the process of collecting and filtering information. Some bits of information will make it into long-term storage – in other words, memory – but most will become extraneous clutter, dispensed with into oblivion. The process is unconscious and instantaneous, but it is going on every second of every minute of every day. (1)

(Adapted from Lindstrom, 2008: 2)

2. It is my belief that by better understanding our own behaviour as consumers we actually gain more control, not less of it. Because the more we know about why we fall prey to the tricks and tactics of advertisers, the better we can defend ourselves against them. And the more companies know about our subconscious needs and desires, the more useful, meaningful products they will bring to the market. (1)

(Adapted from Lindstrom, 2008: 5)

3. By understanding and responding to how women think and shop, marketers can begin to transparently tailor a shopping experience so that it seamlessly delivers on their preferences. Research shows that companies that elevate their customer service to meet women's higher standards deliver better shopping experiences. These companies also increase their appeal and sales to both women and men. (1) (Adapted from Johnson & Learned, 2004: 19)

4. It can be intimidating to make a bold, wholesale commitment to a market where few seem to know the rules. In many cases, companies genuinely want to respond to women's needs, but they also hope that a small change will suffice, and that a more in-depth change with bigger budgets will not have to be pursued. **This quick-fix attitude** rarely gives results. In the case of marketing to women, these cursory efforts are like piling up sandbags against a hundred-year flood and hoping that a small amount of preparation will do the job. (1)

*(Adapted from Johnson & Learned, 2004: 24)*

5. Just how much of what we do as consumers is unconsciously driven? This is the point where the case for consumer insights that are not dependent on people's ability to explain themselves becomes particularly compelling. It is also the point at which elements that can be leveraged to connect with the unconscious mind of the shopper emerge. Traditional marketing theory preoccupies itself with meeting customers' needs, but market research can only identify those needs of which customers are conscious. When my computer breaks, I know I need a new replacement. But the vast majority of products are not consumed out of **such necessity**. Frequently an emotional desire drives people to spend and we are beginning to identify some of **the elements that trigger the feeling of 'want'**. (2)

*(Adapted from Graves, 2010: 19)*

## SECTION B

(21 marks)

Carefully read the following paragraphs and then answer the questions that follow.

### QUESTION 1

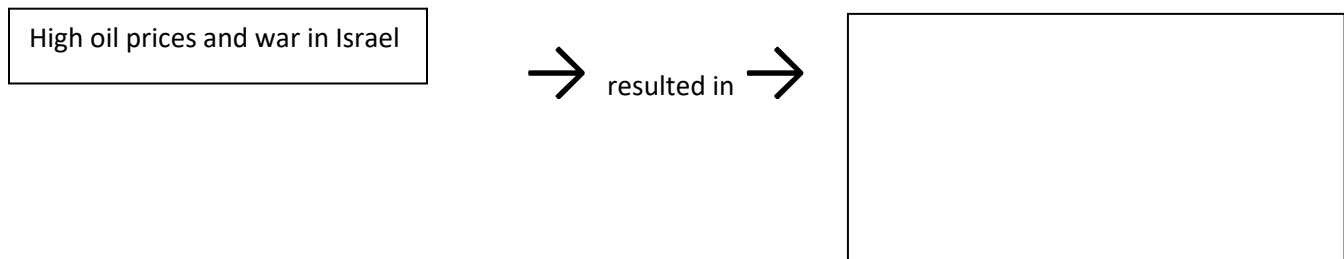
(5 marks)

- 1 Israel had incredibly high inflation from 1973 to 1985. After 1985, it had one of the most successful treatments of high inflation in the world. In the mid-1980s, after the country had suffered from high inflation because of war and oil price hikes, Michael Bruno was appointed as the governor of the Central Bank of Israel and tasked with preparing a comprehensive stabilisation package. Bruno and his colleagues helped reduce inflation rates in Israel. They froze prices at the exchange rate and got the labour unions to agree to freeze wages. They also got a reduction in the budget deficit from the government, as one of Bruno's chief fears during the plan's preparation was that the United States would prematurely give aid to the government. This assistance would have lessened the urgency of reducing this deficit. The budget deficit fell from 17 percent of GDP between 1973 and 1984 to 1 percent of GDP between 1985 and 1990. Inflation fell from 445 percent in 1984, to 185 percent in 1985, to 20 percent in 1986.

*(Adapted from Easterly, 2001: 219)*

1.1 In Paragraph 1, underline the words/phrases/sentences that you think the underlined pronoun or noun refers to, and draw in an arrow to link them, as you did in the previous section. (1)

1.2 Paragraph 1 describes something that happened as a result of high oil prices and war in Israel. Identify this result and use it to complete the following diagram. (1)



1.3 Choose the correct word or phrase from the following list and write it in the space provided. (1)

*As a result / For example / However / More importantly / In addition*

Bruno and his colleagues froze prices at the exchange rate, got the labour unions to agree to a freeze of wages, and they got a steep reduction in the budget deficit from the government. \_\_\_\_\_, the budget deficit and the rate of inflation declined.



**1.4 The sixth and seventh sentences in Paragraph 1 state:** *They also got a reduction in the budget deficit from the government, as one of Bruno’s chief fears during the plan’s preparation was that the United States would prematurely give aid to the government. This assistance would have lessened the urgency of reducing the deficit.*

**Carefully read the sentences again and select the option below that best completes the following statement. (1)**

**From the information provided in the paragraph, we can conclude that:**

- A) Bruno was afraid of what the United States would do to Israel if they found out about the inflation.
- B) Getting help from the United States too soon would negatively affect Israel’s economy.
- C) The Israeli economy will not recover from high inflation without aid from the United States.
- D) Bruno’s plan for reducing the deficit was dependent on assistance from the United States.

**1.5 Based on the information from Paragraph 1, what does it mean to “freeze” wages? “Freezing” wages means: (1)**

- A) to keep wages at a fixed level.
- B) to reduce wages temporarily.
- C) to increase wages periodically.
- D) to stop paying wages to workers.

## QUESTION 2

**(3 marks)**

2 Market research emerged during the media and advertising boom of the 1950s, when an understandable desire to know who was listening to or watching a particular program evolved into a desire to know what those people thought. “This seems useful,” these new market researchers thought, “if we just ask them, people to tell us what they want, what they like and what they think. All we have to do then is do whatever they say.” Either by asking a few hundred people to complete a questionnaire or taking a far smaller number and really grilling them, the theory goes that useful, dependable insights can be garnered this way. You can see how stressed executives would be grateful to hear that corporate decision-making was about to get a whole lot easier. *(Adapted from Graves, 2010: 1)*

**2.1 In Paragraph 2, underline the words/phrases/sentences that you think the underlined pronoun or noun refers to, and draw in an arrow to link them, as you did in the previous section. (1)**

**2.2 Carefully read Paragraph 2 again and select the option below that accurately states some of the information provided in the paragraph. (1)**

- A) In the mid-20<sup>th</sup> century, marketing executives wanted information about their viewers and listeners; as a result, market research was invented.
- B) Stressed marketing directors thought that people would be able to tell them what they want by filling out a questionnaire; subsequently, they thought questionnaires were useful.
- C) Although reliable insights can be achieved through asking viewers and listeners what they want and like, market executives created market research in the 1950s.
- D) Due to the invention of market research in the marketing and advertising boom of the 1950s, stressed executives believed that by asking people what they like valuable data can be collected.

**2.3 Carefully read Paragraph 2 again and select the option below that accurately states some of the information provided in the paragraph. (1)**

- A) During the 1950s, market researchers learned that consumers like to talk about their opinions which, in turn, can provide access to a wealth of untapped information.
- B) Although there are many ways to conduct market research, the two most commonly used approaches in the 1950s entailed using surveys or conducting in-depth focus-group interviews.
- C) In the first half of the 20<sup>th</sup> century, executives were obsessed with customers' opinions about their products; however, by the 1950s the market research fad started to lose its appeal.
- D) Advertising executives in the 1950s knew that market research was unreliable, but they were under so much pressure to increase sales that they continued using this established approach nevertheless.

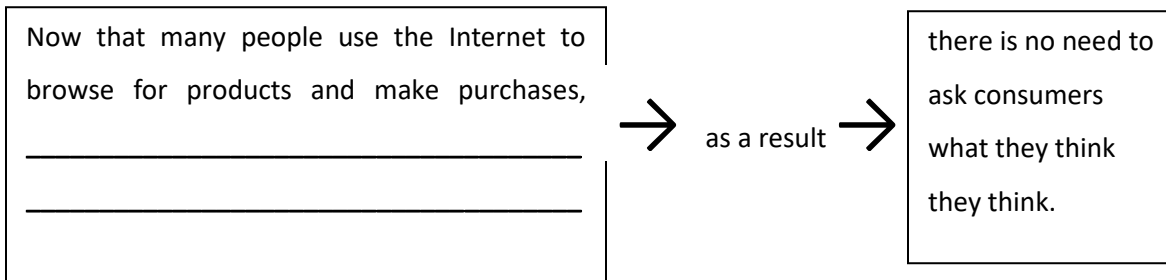
**QUESTION 3**

**(3 marks)**

3 The arrival of the Internet as a significant channel for consumption should, arguably, have helped many businesses shake off their reliance on asking customers what they think. With such a wealth of real-time behavioural data available and far easier ways to test alternative approaches, there should be no need to ask people what they think they think, and it should be immediately evident when such testimony proves to be inaccurate. However, the overall trend has been for more market research, not less. Many Internet retailers cannot resist including a pop-up that invites visitors to complete a short survey. More broadly, the ease, speed, and relative low cost of surveys sent out by email have created a new medium for soliciting opinion. It says much about the strength of faith in market research and the ease with which believers overlook its inaccuracies that, rather than having its shortcomings highlighted, it has prospered online.

*(Adapted from Graves, 2010: 7)*

**3.1 Paragraph 3 describes the reason why there is no need to use surveys and questionnaires to ask consumers what they think they think. Identify this reason and use it to complete the following diagram. (1)**



**3.2 Carefully read Paragraph 3 again and select the option below that accurately states some of the information provided in the paragraph. (1)**

- A) The increasing popularity of online shopping has made it even more pertinent for companies to know what their potential customers think; therefore, survey-based market research is increasing.
- B) Most people believe that survey-based market research is reliable; however, the increasing popularity of online shopping has made it much more difficult to find customers willing to be interviewed.
- C) The increasing popularity of online shopping has made it very easy for market researchers to access more reliable data on shoppers' preferences, yet survey-based research is as prevalent as ever.
- D) The prevalence of survey-based research has decreased now that customers are able to do their shopping online; this is as a result of the strength of faith in market research.

**3.3 Based on the information provided in Paragraph 3, how can we describe businesses' relationship with market research? (1)**

- A) They still rely on old-fashioned methods to implement market research.
- B) They rarely use market research now that more efficient methods are available.
- C) They have adapted market research over the years to make it more reliable.
- D) They still find it difficult to overcome their reliance on market research.

## QUESTION 4

**(5 marks)**

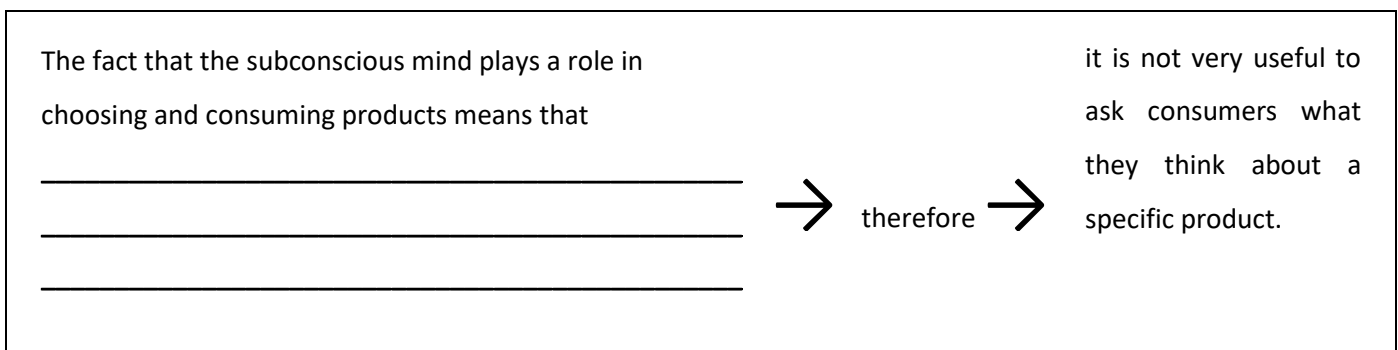
4 The unconscious mind is the real driver of consumer behaviour. Understanding consumers is largely a matter of understanding how the unconscious mind operates; the first obstacle in to this is recognising how we frequently react without conscious awareness. Most people can identify with that moment of driving a car when they realise that, for some indiscernible amount of time, they have been driving without conscious awareness. The section of journey has been uneventful; they have progressed without incident or harm, but they have no recollection of what has occurred or for how long they have been consciously absent from the driving process. Contrast this experience with the first time you sat in a car and attempted to coordinate the actions of steering, depressing the clutch, balancing the clutch and accelerator, selecting a gear, timing the release of the handbrake, and so on. By the time we master driving, **an extraordinary array of actions** has been learned and assimilated, to the extent that we can drive safely and accurately without conscious thought. And there can be no suggestion that this is an innate skill: cars have only been around for a century or so and evolutionary development cannot work quite so swiftly! What would it mean if this phenomenon were not unique to matters of transportation? What if we often do things without being aware that we are doing them? What if **that** is often the case when we are choosing or consuming products? How useful would it be to ask consumers what they think about a brand, product, or service if the unconscious mind plays a part in their consumption? We are surrounded by examples of how the unconscious mind and conscious mind behave very differently, examples that show the contributions that each makes to the way we behave. One function of the unconscious mind is its ability to screen out information, enabling us to focus on one area more effectively. A two year old who has yet to develop **these powers** will find a shop far more distracting (as any parent in a hurry will testify). *(Adapted from Graves, 2010: 10-12)*

**4.1 In Paragraph 4, underline the words/phrases/sentences that you think the underlined pronoun or noun refers to, and draw in an arrow to link them, as you did in the previous section. (3)**

**4.2 Carefully read Paragraph 4 again and select the option below that accurately states some of the information provided in the paragraph. (1)**

- A) Since the unconscious mind has become so effective at screening out unimportant information, it is very difficult for advertisers to get the attention of potential customers who are constantly being bombarded with excessive amounts of information.
- B) It is best to ask consumers what they think about a product before they use it as the unconscious mind, which behaves differently from the conscious mind, plays a bigger role in guiding their decisions at this stage.
- C) The unconscious mind enables you to filter out unimportant information so that you are able to concentrate on one thing at a time, but when you were younger and yet to develop this ability, you got distracted more easily.
- D) Because the conscious mind and the unconscious mind behave completely differently and have a tremendous effect on how we go about choosing and consuming products, we can be certain that this phenomenon is unique to matters of transportation.

**4.3 Paragraph 4 describes the reason why it is not very useful to ask consumers what they think about a specific product. Identify this reason and use it to complete the following diagram. (1)**



## QUESTION 5

(3 marks)

5 The more familiar and efficient a process is, the more likely it is to be driven by mental processes outside of conscious awareness. How much of a consumer's decision about which bottle of wine to buy is likely to be conscious? Evolution has equipped us with the capacity to make such decisions automatically. There is no need for us to look at every option, scrutinise the list of ingredients, and question whether the experience will be positive before selecting the bottle we want to buy. Centuries ago, eating a distinctive berry from the same bush that other people ate from sustained our ancestors; similarly, we 'know' that this particular drink is safe and enjoyable from our initial, cautious, and deliberate encounters. Now we can simply take one as we pass, directing our attention elsewhere (whether we want the sun lounger that we have just seen is on offer in the next isle or making sure we do not get eaten by a sabre-toothed tiger). (*Adapted from Graves, 2010: 13*)

**5.1 In Paragraph 5, underline the words/phrases/sentences that you think the underlined pronoun or noun refers to, and draw in an arrow to link them, as you did in the previous section. (1)**

**5.2 Choose the correct word or phrase from the following list and write it in the space provided. (1)**

*Although / And / As / Even though*

We do not have to carefully consider all the options and weigh them up against our particular needs each time we make a purchase, \_\_\_\_\_ we are programmed to make such choices without thinking.

**5.3 Carefully read Paragraph 5 again and select the option below that accurately states some of the information provided in the paragraph. (1)**

- A) The first time we try a new product, for example a bottle of wine, we are likely to give the choice some thought; secondly, once we know that that particular wine is enjoyable, we will select it again without careful consideration.
- B) The first time we try a new product, for example, a bottle of wine, we are likely to give the choice some thought; moreover, once we know that that particular wine is enjoyable, we will select it again without careful consideration.
- C) The first time we try a new product, for example a bottle of wine, we are likely to give the choice some thought; in fact, once we know that particular wine is enjoyable, we will select it again without careful consideration.
- D) The first time we try a new product, for example a bottle of wine, we are likely to give the choice some thought; however, once we know that particular wine is enjoyable, we will select it again without careful consideration.

## QUESTION 6

(2 marks)

6 We all experience moments when we cannot quite grasp something we feel sure we know. This is because our mind does not store the information we reference from our memory in an absolute way. In his infamous ‘known knowns’ speech, former US Defence Secretary Donald Rumsfeld forgot to mention that there are things we know that we cannot recall at that moment, what he might have called ‘unknown knowns’ if he had remembered them. Researchers have used fMRI scans to explore this phenomenon. Asking participants to remember unusual word pairings such as ‘alligator’ and ‘chair’ by putting them into a sentence, they tested their recall of individual words from a list containing a mixture of individual words they had been shown and others they had not, while scanning which regions of the brain were active. Only when the second word was provided as a cue did one area, the hippocampus, become involved, at which point participants were able to recall their sentence with much greater detail. Our unconscious minds have vast amounts of data that we regularly rely on to make decisions, but we have no direct, conscious access to those processes. And that is a problem if a business is expecting customers to respond accurately in research. *(Adapted from Graves, 2010: 14-15)*

**6.1 In Paragraph 6, underline the words/phrases/sentences that you think the underlined pronoun or noun refers to, and draw in an arrow to link them, as you did in the previous section. (1)**

**6.2 Carefully read Paragraph 6 again and select the option below that accurately states some of the information provided in the paragraph. (1)**

- A) Although they were shown a list of words which included both ‘alligator’ and ‘chair’, participants in a study could not remember their sentences.
- B) Participants in a study could recall pairs of unrelated words, yet they were unable to remember the sentences in which these words were used.
- C) Participants in a study could remember sentences containing two unrelated words as a result of being shown the two unrelated words as part of a list.
- D) During a study conducted using fMRI scans, participants were taught various techniques for remembering words, for example making lists and using sentences.

## SECTION C

(1 mark)

- 1 The following sentence has been omitted (left out) from the paragraph below.

***These are undoubtedly crucial goals, but they are not the primary focus of visionary companies.***

Indicate in the paragraph, by means of a symbol like this  $\checkmark$ , where in the paragraph you would insert the omitted sentence. (1)

Many companies want to distinguish themselves from other companies and establish a unique brand that sets them apart. They focus primarily on beating the competition and perceive becoming the leaders in their field as the ultimate finish line. Instead, for visionary companies, success and beating competitors comes not so much as the end goal, but as a result of constantly striving to outperform themselves. They constantly ask the question: 'How can we do better tomorrow than we did today?' Consequently, visionary companies thrive on discontent. They understand that contentment leads to complacency, which inevitably leads to decline, and they remain self-disciplined even once the company has attained success or become number one in its field. In short, instead of focusing on the competition, truly visionary companies focus on beating themselves. *(Adapted from Collins & Porras, 1994: 10; 185-187)*



## Academic Inferencing Test 2/2



UNIVERSITEIT VAN PRETORIA  
 UNIVERSITY OF PRETORIA  
 YUNIBESITHI YA PRETORIA

Surname, Initials	Name	Student number

SECTION	MARKS
Section A	/8
Section B	/20
Section C	/2
<b>Total</b>	<b>/30</b>
<b>Percentage</b>	<b>%</b>

### Instructions

- Answer all questions.
- Write in pencil.
- No teaching materials may be used in the test.
- Rough work may be done on the test paper.
- Please write clearly and neatly.

## SECTION A

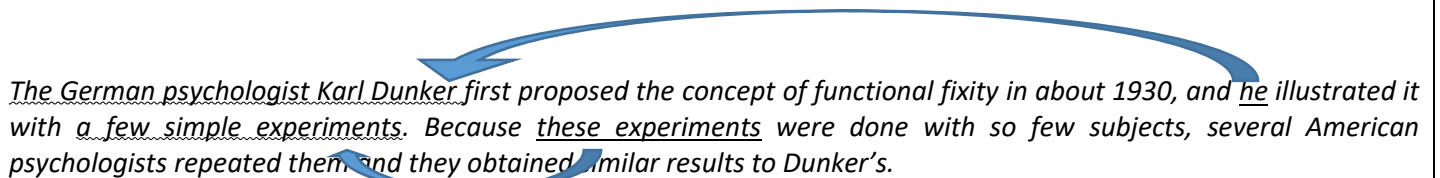
(8 marks)

Each of the paragraphs below has words and phrases that are underlined. Each of these underlined words and phrases refers to something that is mentioned in the paragraph, called the referent. Here is an example:

*The German psychologist Karl Dunker first proposed the concept of functional fixity in about 1930, and he illustrated it with a few simple experiments. Because these experiments were done with so few subjects, several American psychologists repeated them and they obtained similar results to Dunker's.*

In each paragraph, underline the referent of each underlined word or phrase, using a wavy line. Then, draw an arrow linking the underlined word/phrase with its referent. Here is an example:

*The German psychologist Karl Dunker first proposed the concept of functional fixity in about 1930, and he illustrated it with a few simple experiments. Because these experiments were done with so few subjects, several American psychologists repeated them, and they obtained similar results to Dunker's.*



Now, in the paragraphs below, underline the words/phrases/sentences that you think each underlined word or phrase refers to, and draw in an arrow to link them, as shown in the example above.

1. Shelley once praised poets for being 'the unacknowledged legislators of mankind'. Today that honour belongs to management theorists. Names such as Drucker and Peters may not have the same ring as Wordsworth and Keats, but, wherever we look, the management theorists are reshaping institutions, refashioning our language and, above all, reorganising people's lives. Indeed, at its most extreme fringe, where management theory merges with the self-help industry, these theorists are actually teaching people how to think about everything from organising their desk to reassessing their love-life. (2)

(Adapted from Micklethwait & Wooldridge, 1997: 5)

2. Neuromarketing is an intriguing marriage of marketing and science. It is also the key to unlocking our ‘buy-ology’ – the subconscious thoughts, feelings and desires that drive the purchasing decisions we make each day of our lives. Of course, as with any new-born technology, neuromarketing brings with it the potential for abuse, and with **this** comes an ethical responsibility. I take this responsibility extremely seriously, because, at the end of the day, I am a consumer too, and the last thing I would want to do is help companies manipulate us or control our minds. It is not my intention to help companies use neuromarketing to control customers’ minds, or to turn us into robots. Perhaps, eventually, in the distant future, there may be people who use this tool in the wrong way. Nevertheless, my hope is that the vast majority will wield this same instrument for good. (1) *(Adapted from Lindstrom, 2008: 4-5)*

3. Women now bring in half or more of the household income in the majority of households in the United States of America. To achieve this, more and more women use their college and advanced degrees to start or buy their own businesses. In fact, women own 40 percent of all companies in **this country**. From 1987 to 1999, the number of women-owned businesses grew 103 percent, about one and a half times the national average. (1)

*(Adapted from Johnson & Learned, 2004: 8)*

4. Attitude and personal values are key segmenting factors that can also provide new (and often more effective) ways to focus on a market and to position products and services more effectively. For example, moms represent a significant niche for marketers and greatly influence **their** household as consumers. But the definition of ‘mom’ no longer refers only to women in their twenties and thirties with working husbands. The mom segment might include young, single mothers in their late teens or early twenties; fully employed women with fully employed husbands; or moms in their early forties who waited longer to start their families. Research has shown that the parenting style of mothers is often the most effective way to segment that group. (1)

*(Adapted from Johnson & Learned, 2004: 20)*

5. The nature of a conscious response says much about respondents' conscious values and how they would like to perceive themselves but can reveal very little about what really has driven **these subjects'** behaviour in the past or what they will do in the future. For example, there are thousands of people each year who resolve not to overeat; they generate a well-intentioned conscious response to the tightness of their favourite pair of jeans, or their doctor's health warning. However, only a small proportion of these would-be dieters will develop sustained new eating and exercise behaviours. **This** is not because their conscious intention to be healthier was insincere, but because the unconscious drive to eat in response to a particular physical or emotional stimulus will cut in and trigger consumption irrespective of their conscious intent. In the end, the unconscious drives that we might characterise as habit, emotion, or impulse often exert a much stronger influence over behaviour than conscious intent. It is no coincidence that fast-food companies often launch healthy products that customers do not actually buy. In research, McDonald's McLean, KFC's Skinless Fried Chicken, and Pizza Hut's low-cal pizza all appealed to customers, but in restaurants these options failed. (2)

*(Adapted from Graves, 2010: 18-19)*

6. As a marketing specialist and advisor, I have seen too many products inexplicably tripping up, floundering, or barely even making it out of the starting gate. As a branding advisor, **this** nagged me to the point of obsession. I wanted to find out why consumers were drawn to a particular brand of clothing, a certain make of car, or a particular type of shampoo, or chocolate bar. The answer to this question lay, I realised, somewhere in the brain. And I believed that if I could uncover it, it would not only help sculpt the future of advertising, it would also revolutionise the way all of us think and behave as consumers. (1)

*(Adapted from Lindstrom, 2008: 2)*

## SECTION B

(20 marks)

Carefully read the following paragraphs and then answer the questions that follow.

### QUESTION 1

(3 marks)

1 High inflation inverted the old wisdom shared by your parents and grandparents of how compound interest could multiply savings. According to their belief, saving your pennies makes you rich if you wait long enough. In the inverse version, high inflation reduces riches to pennies if you wait too long. Argentina sets the record for the highest and longest inflation, with an annual average inflation of 127 percent per year from 1960 to 1994. Thus, Argentines had the most potential in the world for money meltdown. If an Argentine with the equivalent of \$1 billion in savings had kept all of his money in Argentine currency since 1960, the real value of his financial holdings in 1994 would amount to a thirteenth of a penny. Candy bars that cost 1 Argentine peso each in 1960 cost 1.3 trillion pesos in 1994. To avoid having to use trillions in prices for such items, Argentina had done numerous monetary reforms where it asked the public to exchange 1 zillion 'old pesos' for 1 'new peso'. The prices were thereafter quoted in 'new pesos'.

(Adapted from Easterly, 2001:220)

**1.1 In Paragraph 1, underline the words/phrases/sentences that you think the underlined pronoun or noun refers to, and draw in an arrow to link them, as you did in the previous section. (1)**

**1.2 The first three sentences in Paragraph 1 state:** *High inflation inverted the old wisdom shared by your parents and grandparents of how compound interest could multiply savings. According to their belief, saving your pennies makes you rich if you wait long enough. In the inverse version, high inflation reduces riches to pennies if you wait too long.*

**Which of the following sentences best summarise this section of the paragraph? (1)**

- A) Normally, saving your money causes it to increase due to the effect of compound interest; therefore, during high inflation, the value of any money that is saved decreases.
- B) Normally, saving your money causes it to increase due to the effect of compound interest; for example, during high inflation, the value of any money that is saved decreases.
- C) Normally, saving your money causes it to increase due to the effect of compound interest; similarly, during high inflation, the value of any money that is saved decreases.
- D) Normally, saving your money causes it to increase due to the effect of compound interest; however, during high inflation, the value of any money that is saved decreases.

**1.3 Based on the information provided in Paragraph 1, what do you think the phrase ‘money meltdown’ means?**

**Money meltdown happens when: (1)**

- A) Coins start to melt due to extremely high temperatures.
- B) Banks have to melt existing coins to create new, better coins.
- C) Money rapidly loses its value and buying power over time.
- D) Numerous monetary reforms change the names of currencies.

## QUESTION 2

**(4 marks)**

2 Whenever the main profit opportunity in the economy requires the bypassing of government rules, not much good is going to happen in the real economy; conversely, the black market will likely flourish. For example, the black market premium had a lot to do with the collapse of cocoa in Ghana in the 1980s. During this period, the black market premium had a negative effect on cocoa sales in the country because the farmers had to sell their cocoa to the government marketing board at a price reflecting the official exchange rate. They had to buy their raw materials at black market prices many times higher. By 1982, Ghanaian cocoa farmers were receiving only 6 percent of the world price for their cocoa. The incentives to smuggle it to neighbouring countries and sell it at the world price were overwhelming. People respond to incentives. Trying to fight the incentives, the Ghanaian military decreed the death penalty for ‘economic crimes’ like smuggling.

*(Adapted from Easterly, 2001:222)*

**2.1 In Paragraph 3, underline the words/phrases/sentences that you think the underlined pronoun or noun refers to, and draw in an arrow to link them, as you did in the previous section. (1)**

**2.2 The word ‘Therefore’ has been deleted from the beginning of one of the sentences in Paragraph 3. Read the paragraph again and indicate where the word ‘Therefore’ should be inserted with the following symbol: || (1)**

**2.3 What was the reason why some Ghanaian cocoa farmers smuggled cocoa to neighbouring countries in the 1980s? (1)**

- A) Many Ghanaian ‘economic criminals’ and smugglers pretended to be farmers.
- B) Smuggling products to other countries gave farmers the opportunity to travel.
- C) Ghanaian cocoa could be sold at a higher price in countries outside Ghana.
- D) All of the above statements are correct.

**2.4 The last sentence in Paragraph 3 states:** *Trying to fight the incentives, the Ghanaian military decreed the death penalty for 'economic crimes' like smuggling.*

**From the information provided in this sentence, we can conclude that: (1)**

- A) The Ghanaian military was desperate to reduce the smuggling of products such as cocoa.
- B) Smuggling is a very serious crime in Africa and, therefore, it is often punishable by death.
- C) Ghana was at war with some of its neighbouring countries and so selling cocoa to them was illegal.
- D) Cocoa is very rare and the Ghanaian military did not want to share it with any other countries.

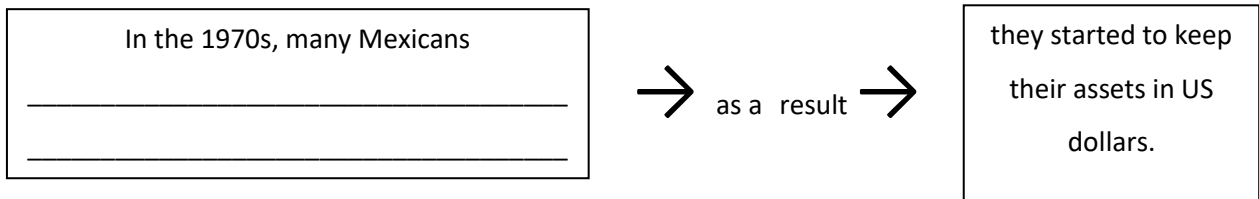
### QUESTION 3

**(2 marks)**

3 In the 1970s, Mexican exporters suffered a profit squeeze, as their peso costs kept increasing but the US dollar prices they received stayed unchanged. Exports fell. Imports seemed relatively cheap compared to the rising prices of Mexican products, and so imports boomed. There was a high external deficit (more imports than exports), which meant external debt accumulation to finance the excess imports. Speculators started to keep their assets in US dollars, becoming wary of an imminent major devaluation.

*(Adapted from Easterly, 2001:224)*

**3.1 Paragraph 3 explains the reason why some Mexicans started to keep their assets in US dollars in the 1970s. Identify this reason and use it to complete the following diagram. (1)**



**3.2 The last sentence in Paragraph 3 states:** *Speculators started to keep their assets in US dollars, becoming wary of an imminent major devaluation.*

**Based on the information provided in Paragraph 3, which of the following characteristics best describe these speculators? The speculators are: (1)**

- A) naive and uninformed
- B) cautious and naive
- C) uninformed and proactive
- D) cautious and proactive

## QUESTION 4

(5 marks)

4 Examples of our capacity for misplaced beliefs are not hard to find. If something seems plausible, impresses us, fits with what we would like to think, or has been sold to us persuasively, we are willing to treat that thing as the truth. To compound the problem, the lines between science and belief are frequently blurred: elements of dependable science are blended with wishful thinking to create an alluring cocktail of reality and desirable fantasy. Astrologers get to lean on the legitimate science of astronomy and overlay bogus futurology to “help” people make decisions about their life (or in the case of Nancy Regan, her presidential husband’s country). But such pseudo-science, despite its masquerade, is no more dependable or repeatable than any other non-scientific belief. (Adapted from Graves, 2010: 1)

**4.1 In Paragraph 4, underline the words/phrases/sentences that you think the underlined pronoun or noun refers to, and draw in an arrow to link them, as you did in the previous section. (1)**

**4.2 Choose the correct word or phrase from the following list and write it in the space provided. (1)**

*Therefore / However / Secondly / In addition*

In general, people like to have their beliefs confirmed; \_\_\_\_\_, they are less likely to be suspicious of a theory if it is aligned with their own way of thinking.

**4.3 Carefully read Paragraph 4 again and select the option below that accurately states some of the information provided in the paragraph. (1)**

- A) Since it is sometimes difficult to distinguish between science and wishful thinking, non-scientific beliefs are unreliable.
- B) Although they can appear scientific and may be promoted by famous people, belief systems like astronomy have no basis in reality.
- C) Although they can appear scientific and be promoted by famous people, belief systems like astrology have no basis in reality.
- D) If something appears to be reasonable, fits in with what we want to believe and is explained to us with heartfelt conviction, it is likely true.

**4.4 How does the author feel about Nancy Regan? (1)**

- A) The author thinks she was a renowned astrologist.
- B) The author thinks she was a bad influence on her husband.
- C) The author thinks she made good decisions about her life.
- D) The author thinks she believed in her husband, the president.



**4.5 Why is the word ‘help’ in quotation marks? (1)**

- A) To directly quote the astrologer’s written or spoken words
- B) To highlight it as it is the paragraph’s main idea
- C) To show how important astrologers’ assistance is
- D) To show that the author does not agree with this term

**QUESTION 5**

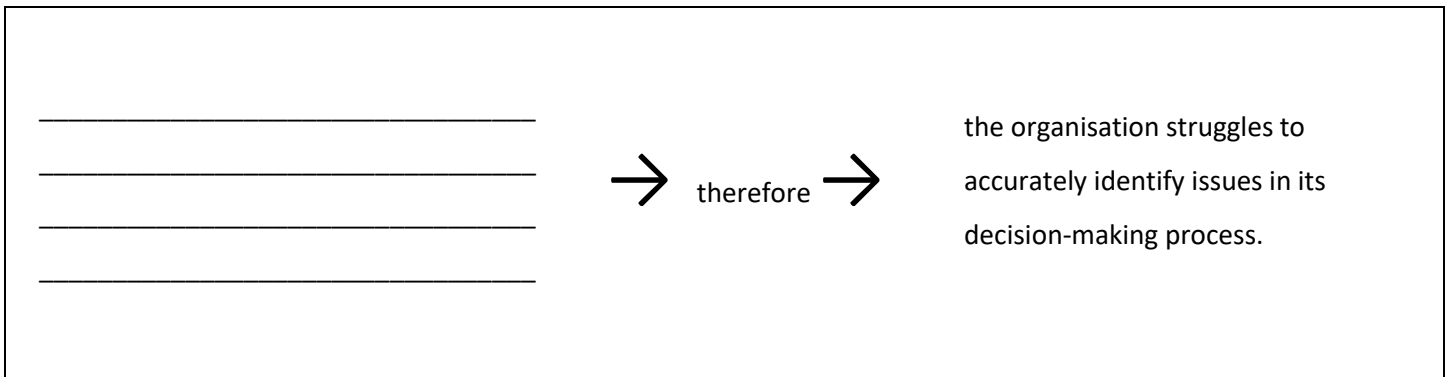
**(3 marks)**

5 When market research is allowed into the decision-making process, and when that research is as flawed as social psychology and neuroscience are proving it to be, we lose the ability to learn from our mistakes. Research corrupts an organisation’s learning process by inserting an erroneous fact – what people think – into the equation. Somewhere between an initial idea and a loss-making scheme, research tells us that we ‘know’ something about what our market thinks. As a result, the inclination is to look elsewhere for the scapegoat. With a complex process feeding into a large organisation, other potential culprits are always close at hand and all too often research escapes proper scrutiny.

*(Adapted from Graves, 2010: 5)*

**5.1 In Paragraph 5, underline the words/phrases/sentences that you think the underlined pronoun or noun refers to, and draw in an arrow to link them, as you did in the previous section. (1)**

**5.2 Paragraph 5 describes the reason why some organisations struggle identify issues in their decision-making process. Identify this reason and use it to complete the following diagram. (1)**



**5.3 Based on the information provided in Paragraph 5, what is one of the disadvantages of a large organisation? (1)**

- A) There is likely to be a complex learning process for management.
- B) It is difficult to identify the real cause of a problem.
- C) There will always be many erroneous facts and inaccuracies.
- D) It makes it difficult to learn from your mistakes.

**QUESTION 6**

**(3 marks)**

6 Businesses frequently spend large sums of money investigating what customers think about them. Ironically, it is arguable that the greatest success a brand can achieve is to be selected without conscious thought. This happens when it has become so synonymous with a person's desires that the unconscious mind has it as the answer before the conscious mind gets involved in considering the question.

*(Adapted from Graves, 2010: 13)*

**6.1 In Paragraph 6, underline the words/phrases/sentences that you think the underlined pronoun or noun refers to, and draw in an arrow to link them, as you did in the previous section. (2)**

**6.2 Carefully read Paragraph 6 again and select the option below that accurately states some of the information provided in the paragraph. (1)**

- A) Due to the importance of consumers' conscious thoughts when selecting a particular product, many companies employ market researchers to find out more about consumers' opinions regarding the company's product.
- B) Many companies employ market researchers to find out more about consumers' opinions regarding the company's product, yet these consumers' conscious thoughts are not actually that important since their subconscious mind is predominantly involved in the selection of the product.
- C) Many companies keep on employing market researchers to find out everything they possibly can about consumers' opinions regarding the company's product; for this reason, many consumers have started selecting products without conscious thought.
- D) Many companies employ market researchers to find out more about consumers' opinions regarding the company's product, and these consumers' conscious thoughts are not actually that important, if their subconscious mind continues to select the product.

## SECTION C

(2 marks)

- 1 The following sentence has been omitted (left out) from the paragraph below.

***It is true that profitability is a necessary condition for existence and a means to more important ends, but it is not the end in itself for many visionary companies.***

Indicate in the paragraph, by means of a symbol like this ¶, where in the paragraph you would insert the omitted sentence. (1)

Profit maximisation is often thought to be the biggest driving force or main objective for a successful company. Visionary companies pursue many objectives, of which making money is only one – and not necessarily the primary one. Yes, they seek profits, but they are equally guided by a core set of values and a sense of purpose beyond just making money. Yet, paradoxically, visionary companies make more money than their more purely profit-driven counterparts do. (Adapted from Collins & Porras, 1994: 8)

- 2 The following sentence has been omitted (left out) from the paragraph below.

***On the contrary, they are not afraid to make bold commitments to big, ambitious goals.***

Indicate in the paragraph, by means of a symbol like this ¶, where in the paragraph you would insert the omitted sentence. (1)

Many companies start to play it safe once they have achieved moderate success or reached their first goal, such as breaking even or landing the first big client. Visionary companies often appear cautious and conservative to outsiders. Like climbing a big mountain or landing on the moon, a big, ambitious goal may be daunting and perhaps risky. Yet the excitement and challenge of it grabs people's attention, gets their creative juices flowing and creates immense forward momentum. Visionary companies have wisely used such goals to stimulate progress and blast past their competition at crucial points in history. (Adapted from Collins & Porras, 1994:8)

## Appendix C: Reading Habits questionnaire

**How many languages can you speak?**

- a) 1
- b) 2
- c) 3
- d) 4
- e) 5
- f) 6

**If you can speak more than one language, which language can you speak the best?**

- a) Sepedi/Sesotho sa Leboa
- b) Sesotho
- c) Setswana
- d) siSwati
- e) Tshivenda
- f) Xitsonga
- g) Afrikaans
- h) English
- i) isiNdebele
- j) isiXhosa
- k) isiZulu
- l) French
- m) German
- n) Arabic
- o) Urdu
- p) Tamil

**How many languages can you read?**

- a) 1
- b) 2
- c) 3
- d) 4
- e) 5
- f) 6

**If you can read and write more than one language, which language can you read and write the best?**

- a) Sepedi/Sesotho sa Leboa
- b) Sesotho
- c) Setswana
- d) siSwati
- e) Tshivenda
- f) Xitsonga
- g) Afrikaans
- h) English
- i) isiNdebele
- j) isiXhosa
- k) isiZulu
- l) French
- m) German
- n) Arabic
- o) Urdu
- p) Tamil

**Which language(s) did your parents/grandparents/caretaker speak to you at home between the ages of 1 and 6?**

- a) Sesotho
- b) Setswana
- c) siSwati
- d) Tshivenda
- e) Xitsonga
- f) Afrikaans
- g) English
- h) isiNdebele
- i) isiXhosa
- j) isiZulu
- k) French
- l) German
- m) Arabic
- n) Urdu
- o) Tamil

**What was the main language of instruction at your school in Grades 1 to 3?**

- a) Sesotho
- b) Setswana
- c) siSwati
- d) Tshivenda
- e) Xitsonga
- f) Afrikaans
- g) English
- h) isiNdebele
- i) isiXhosa
- j) isiZulu
- k) French
- l) German
- m) Arabic
- n) Urdu
- o) Tamil

**What was the main language of instruction at your school in Grades 4 to 7?**

- a) Sesotho
- b) Setswana
- c) siSwati
- d) Tshivenda
- e) Xitsonga
- f) Afrikaans
- g) English
- h) isiNdebele
- i) isiXhosa
- j) isiZulu
- k) French
- l) German
- m) Arabic
- n) Urdu
- o) Tamil

**Please rate the following statement in terms of how much you agree or disagree with it:**

- a) Strongly disagree
- b) Disagree
- c) Neutral (neither agree nor disagree)
- d) Agree
- e) Strongly agree

**I enjoy reading.**

- a) Strongly disagree
- b) Disagree
- c) Neutral (neither agree nor disagree)
- d) Agree
- e) Strongly agree

**I am good at reading.**

- a) Strongly disagree
- b) Disagree
- c) Neutral (neither agree nor disagree)
- d) Agree
- e) Strongly agree

**I have strategies to help me understand complex written information; in other words, I know what to do if I do not, at first, understand something I have read.**

- a) Strongly disagree
- b) Disagree
- c) Neutral (neither agree nor disagree)
- d) Agree
- e) Strongly agree

**I read a variety of sources (magazines, newspapers, comics, fictional and non-fictional books, online sources, etc.)**

- a) Strongly disagree
- b) Disagree
- c) Neutral (neither agree nor disagree)
- d) Agree
- e) Strongly agree

**The majority of my reading is done online.**

- a) Strongly disagree
- b) Disagree
- c) Neutral (neither agree nor disagree)
- d) Agree
- e) Strongly agree

**The majority of my reading is done online.**

- a) Strongly disagree
- b) Disagree
- c) Neutral (neither agree nor disagree)
- d) Agree
- e) Strongly agree

**Have you ever been a member of a public library (excluding the library at your school)?**

- a) Definitely not
- b) I don't think so, but I am not completely sure.
- c) Yes, but I never took out any books.
- d) Yes, I sometime took out books.
- e) Yes, I used to take out books and/or currently take out books on a regular basis.

**Approximately how many books (including e-books) do you read in a year?**

I don't really read books.

About 0.5-1 book per year

About 2-3 books

About 4-6 books

I read more than 6 books per year.

**Of the total number of books you read per year, approximately how many are non-fictional books?**

I don't read fictional or non-fictional books.

I only read fictional books.

Fewer than half of the books I read are non-fictional.

About half the books I read are non-fictional.

More than half the books I read are non-fictional.

I only read non-fictional books.

**Approximately how many magazines and/or newspapers do you read in a year?**

I don't read magazines or newspapers.

1-3 newspapers and/or magazines

4-6 newspapers and/or magazines

7-8 newspapers and/or magazines

More than 10 magazines and/or newspapers

**There is a wide variety of reading material to be found online, from Tweets and Instagram posts to full-length books and articles.**

**Approximately how many hours per week do you spend reading material online?**

0 hours per week

5-10 hours per week

10-20 hours per week

20-30 hours per week

More than 30 hours per week

**Approximately what percentage of the time you spend reading material online is spent reading short bits of information, like Tweets and Instagram posts?**

I don't read material online.

0% (I only read longer texts online)

25% of the time

50% of the time

75% of the time

100% (when I read online, it is always short pieces of text)

**What is your favourite book?**

## Appendix D: Intervention schedules

### 2019 Phase 2 intervention schedule

Week	Outcomes (students should be able to)	Methodology	Homework	Assessment	References / materials
1+2	<b>Paragraphs</b> <ul style="list-style-type: none"> <li>Understand and indicate cause and effect</li> <li>Combine sentences to indicate cause and effect</li> <li>Write cause and effect paragraphs</li> </ul>	<ul style="list-style-type: none"> <li>Identify cause and effect in various sections of text and by using appropriate discourse markers. <i>40 minutes</i></li> <li>Write cause and effect paragraphs by following a series of steps (topic sentence, planning, and writing). <i>60 minutes</i></li> </ul>	<ul style="list-style-type: none"> <li>Complete cause and effect paragraphs</li> </ul>	<b>Informal assessment:</b> Demonstrate ability to write appropriate cause and effect paragraphs. Peer assessment. Whole-class feedback.	LST workbook
3+4	<b>Draft session 2: Research Essay Part B</b> <ul style="list-style-type: none"> <li>Peer-assess another student's Research Essay Part B draft</li> </ul>	<ul style="list-style-type: none"> <li>Research essays are exchanged between students, and marked according to a marking rubric, with the assistance and facilitation of the lecturer. <i>100 minutes</i></li> </ul>		<b>Informal assessment:</b> Peer assessment.	

Week	Outcomes (students should be able to)	Methodology	Homework	Assessment	References / materials
1+2	<b>Paragraphs</b> <ul style="list-style-type: none"> <li>Understand comparison and contrast</li> <li>Effectively use vocabulary that indicates comparison and contrast</li> <li>Write paragraphs that use comparison and contrast</li> </ul>	<ul style="list-style-type: none"> <li>Identify comparison and contrast in various sections of text and by using appropriate discourse markers. <i>40 minutes</i></li> <li>Write comparison and contrast paragraphs by following a series of steps (topic sentence, planning, and writing). <i>60 minutes</i></li> </ul>	<ul style="list-style-type: none"> <li>Complete comparison and contrast paragraphs</li> </ul>	<b>Informal assessment:</b> Demonstrate ability to write comparison and contrast paragraphs. Peer assessment. Whole-class feedback. <b>Formal assessment:</b> Research Essay Part B	LST workbook
3+4	<b>Paragraphs</b> <ul style="list-style-type: none"> <li>Complete paragraphs</li> </ul> <b>Research assignments</b> <ul style="list-style-type: none"> <li>Discuss next steps for Group Research Assignments</li> </ul>				<b>Group Research Assignments</b> <ul style="list-style-type: none"> <li>Assignment briefs</li> </ul>
1+2	<b>Group Research Assignment work starts:</b> <ul style="list-style-type: none"> <li>Form project teams and plan for project</li> </ul>	<ul style="list-style-type: none"> <li>Form project teams.</li> <li>Write the Research Assignment Plan.</li> </ul>	<ul style="list-style-type: none"> <li>Collect information</li> <li>Meet with team</li> <li>Finalise plan</li> </ul>		LST workbook
3+4	<b>Giving supporting detail</b> <ul style="list-style-type: none"> <li>Identify and use a range of relevant supporting detail to expand paragraphs</li> </ul>	<ul style="list-style-type: none"> <li>Identify how supporting sentences have been developed in magazines and newspapers.</li> <li>Exercises are completed and discussed with students. <i>100 minutes</i></li> </ul>	<ul style="list-style-type: none"> <li>Write two paragraphs using any two types of supporting details</li> </ul>	<b>Informal assessment:</b> Peer assessment	LST workbook



Week	Outcomes (students should be able to)	Methodology	Homework	Assessment	References/ materials
1+2	<b>Giving supporting detail</b> <ul style="list-style-type: none"> <li>Identify and use a range of relevant supporting detail to expand paragraphs</li> </ul>	<ul style="list-style-type: none"> <li>Use examples, statistics, analogies, anecdotes, reasons and possible consequences or quotes to effectively expand a variety of paragraphs. <i>100 minutes</i></li> </ul>		<b>Informal assessment:</b> Peer assessment  <b>Formal assessment:</b> Vocab 3 – MH	LST workbook Magazines and news- papers
1+2	<b>Synthesising information</b> <ul style="list-style-type: none"> <li>Synthesise texts in an essay, writing coherently and using referencing appropriately</li> </ul>	<ul style="list-style-type: none"> <li>Discuss the meaning of the word ‘synthesise’.</li> <li>Do shorter synthesising exercises. Take time to go to each group to evaluate synthesising.</li> <li>Remind students to reference correctly. <i>100 minutes</i></li> </ul>		<b>Formal assessment:</b> RR 3 (Book report)  <b>Informal assessment:</b> Whole group assessment. Peer assessment: groups assess each other’s work.	LST workbook
3+4	<ul style="list-style-type: none"> <li><b>Semester Test 1 revision</b></li> </ul>	Revise all work covered in Semester Test 1 by doing relevant activities from old papers, and answering questions students bring to class.		<b>Formal assessment:</b> SEM TEST 1	

Week	Outcomes (students should be able to)	Methodology	Homework	Assessment	References / materials
1+ 2	<b>Synthesising information</b> <ul style="list-style-type: none"> <li>Synthesise texts into an essay, write coherently and use referencing appropriately</li> </ul>	<ul style="list-style-type: none"> <li>Synthesise much longer texts.</li> <li>Remind students to reference correctly. Refer To LST 133 Workbook. <i>100 minutes</i></li> </ul>		<b>Informal assessment:</b> Whole group assessment. Peer assessment: groups assess each other's work.	LST workbook
3+4	<b>Synthesising information</b> <ul style="list-style-type: none"> <li>Synthesise texts into an essay, write coherently and use referencing appropriately</li> </ul>	<ul style="list-style-type: none"> <li>Go through syntheses completed in previous class. Groups create a new synthesis from the syntheses completed by individual group members, building on the strong points of each synthesis. <i>100 minutes</i></li> </ul>		<b>Formal assessment:</b> Grammar Ins 6 + 7 – MH <b>Informal assessment:</b> Whole group assessment. Peer assessment.	LST workbook Student drafts
1+2	<b>Good academic writing + Group Research Assignment draft session 1</b> <ul style="list-style-type: none"> <li>Understand and apply a variety of academic writing conventions</li> <li>Understand and apply the process that is followed when writing academic assignments</li> <li>Peer-assess an assignment</li> </ul>	<ul style="list-style-type: none"> <li>Group discussion.</li> <li>Peer assessment in groups with lecturer facilitation.</li> <li>Completion of relevant tasks in class.</li> <li>Mark and give detailed feedback on one other group's assignment. <i>100 minutes</i></li> </ul>		<b>Formal assessment:</b> Research Essay Part C	LST workbook

Week	Outcomes (students should be able to)	Methodology	Homework	Assessment	References / materials
3+4	<b>Visual literacy</b> <ul style="list-style-type: none"> <li>Understand the function of a variety of visual literacy conventions in a variety of texts</li> </ul>	<ul style="list-style-type: none"> <li>Group work: discuss the importance of visual literacy to tertiary students.</li> <li>Complete workbook exercises.</li> <li>Explore ways in which information can be converted into different formats.</li> <li><i>100 minutes</i></li> </ul>	Look for examples of discussed visual literacy conventions in other subjects' textbooks	<b>Informal assessment:</b> Whole-class feedback	LST workbook
1+2	<b>Semester Test 1 Feedback</b>	<ul style="list-style-type: none"> <li>Do semester test feedback</li> </ul>			
3+4	<b>Visual literacy</b> <ul style="list-style-type: none"> <li>Understand and interpret a range of visual elements</li> <li>Create a range of visual elements to support academic texts</li> <li>Rework visual information given in one format into another format</li> </ul>	<ul style="list-style-type: none"> <li>Complete workbook exercises.</li> <li>Explore ways in which information can be converted into different formats.</li> <li><i>100 minutes</i></li> </ul>	<ul style="list-style-type: none"> <li>Complete any tasks not completed in class</li> </ul>	<b>Formal assessment:</b> Vocab 4 – MH  <b>Informal assessment:</b> Whole-class and peer feedback	LST workbook
1+2	<b>Visual literacy</b> <ul style="list-style-type: none"> <li>Understand and interpret a range of visual elements</li> <li>Create a range of visual elements to support academic texts</li> <li>Rework visual information given in one format into another format</li> </ul>	<ul style="list-style-type: none"> <li>Complete workbook exercises.</li> <li>Explore ways in which information can be converted into different formats.</li> <li><i>100 minutes</i></li> </ul>	<ul style="list-style-type: none"> <li>Complete any tasks not completed in class</li> </ul>	<b>Informal assessment:</b> Oral and peer feedback	LST workbook

Week	Outcomes (students should be able to)	Methodology	Homework	Assessment	References / materials
3+4	<b>Draft session 2: Group Research Assignment</b> <ul style="list-style-type: none"> <li>Peer-assess another group's assignment</li> </ul>	<ul style="list-style-type: none"> <li>Group assignments are exchanged between groups, and marked according to a marking rubric, with the assistance and facilitation of the lecturer. <i>100 minutes</i></li> </ul>			
1+2	<b>Draft session 3: Group Research Assignment</b> <ul style="list-style-type: none"> <li>Peer-assess another group's assignment</li> </ul>	<ul style="list-style-type: none"> <li>Group assignments are exchanged between groups, and marked according to a marking rubric, with the assistance and facilitation of the lecturer. <i>100 minutes</i></li> </ul>			
3+4	<b>Revision: Semester test 2</b>	<ul style="list-style-type: none"> <li>Revise all work covered in Semester Test 2 by doing relevant activities from old papers, and answering questions students bring to class.</li> </ul>		<b>Formal assessment: SEMESTER TEST 2</b>	
1+2	Submission of Group Research Assignment			<b>Formal assessment: Group Research Assignment</b>	
3+4	Exam revision				
1+2	Exam revision				
3+4	Exam revision				
1+2	<b>Semester Test 2 Feedback</b>	<ul style="list-style-type: none"> <li>Do semester test feedback</li> </ul>			

Week	Outcomes (students should be able to)	Methodology	Homework	Assessment	References / materials
3+4	Group Research Assignment corrections	With the assistance of the lecturer, students make corrections and learn from the lecturer feedback on their Group Research Assignment. A revised additional version, based on this feedback, is submitted for marks			
1+2	<ul style="list-style-type: none"> <li>• Oral presentations</li> <li>• Peer evaluation</li> </ul>	<ul style="list-style-type: none"> <li>• Two groups at a time do poster presentations in the arena. First, one group (class) assesses the other one, using a rubric. After an hour, “assessors” and “presenters” swop. A group of lecturers goes from group to group and assesses all groups as well.</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Do peer evaluation in class</li> </ul>		<p><b>Formal assessment:</b></p> <p>Group Research Assignment corrections</p> <p>Team members assess each other. Average percentage per team member is used in final Group Research Assignment mark.</p>	
3+4	<ul style="list-style-type: none"> <li>• Oral presentations</li> <li>• Peer evaluation</li> </ul>	<ul style="list-style-type: none"> <li>• Two groups at a time do poster presentations in the arena. First, one group (class) assesses the other one, using a rubric. After an hour, “assessors” and “presenters” swop. A group of lecturers goes from group to group and assesses all groups as well.</li> </ul> <p><b>OR</b></p> <ul style="list-style-type: none"> <li>• Do peer evaluation in class</li> </ul>		<p>Team members assess each other. Average percentage per team member is used in final Group Research Assignment mark.</p>	

## 2021 Phase 3 intervention schedule

Week	Content	Workbook page no	Presentation	Assessments
1	Introduction		PowerPoint lecture	
	Referencing (Bibliography)	1-14	Blackboard Collaborate	
2	Referencing (In-text)	1-14	PowerPoint lecture	
	Summarising and Paraphrasing	15-19	Blackboard Collaborate	
3	Summarising and Paraphrasing	15-19		MH Study Guide Assignment
	Reading Report Revision		Blackboard Collaborate	
4	Discourse Markers	20-24	PowerPoint lecture	Reading Report 1
	Pronouns	40-42	Blackboard Collaborate	MH Homework: PoS +SS
5	Topics, Main Ideas, Topic Sentences	25-34		
	Test Prep		Blackboard Collaborate	MH Test: DM
6	Process Description Paragraphs	49-50	PowerPoint lecture	
	Process Description Paragraphs	49-50	Blackboard Collaborate	MH Test: PoS+S
7	Time Management	57-64	PowerPoint lecture	
	Reading	65-87	Blackboard Collaborate	
8	Test Feedback		PowerPoint lecture	Reading Report 2
	Note-Taking	88-94	Blackboard Collaborate	
9	Note-Taking	88-94	PowerPoint lecture	MH Homework: Punctuation
	Word Building	95-101	Blackboard Collaborate	
10	Dictionary Skills	102-104		MH Test: Punctuation
	Dictionary Skills	102-104		
11	Definitions	105-112	PowerPoint lecture	
	Test feedback		Blackboard Collaborate	
12	Physical Description Paragraphs	13-17	PowerPoint lecture	
	Physical Description Paragraphs	13-17	Blackboard Collaborate	Research Essay (Part A)
13	Test Feedback			
	Revision			
14	Revision			

## 2022 Phase 4 intervention schedule

	Dates	Class	Content	Workbook		Presentation	Assessments
1	21-25 February	1	Referencing (Bibliography)	BSc BCom	pp. 1-11 pp. 1-11	<ul style="list-style-type: none"> <li>● Pre-Recorded Lecture</li> <li>● Blackboard Collaborate</li> </ul>	ClickUP Task: Study Guide
		2	Referencing (In-text)	BSc BCom	pp. 12-14 pp. 12-14	<ul style="list-style-type: none"> <li>● Blackboard Collaborate</li> </ul>	
2	28 February - 4 March	1	Summarising and Paraphrasing	BSc BCom	pp. 15-19 pp. 15-19	<ul style="list-style-type: none"> <li>● Pre-Recorded Lecture</li> <li>● Blackboard Collaborate</li> </ul>	
		2	Summarising and Paraphrasing	BSc BCom	pp. 15-19 pp. 15-19	<ul style="list-style-type: none"> <li>● Blackboard Collaborate</li> </ul>	
3	7-11 March	1	Summarising and Paraphrasing	BSc BCom	pp. 15-19 pp. 15-19	<ul style="list-style-type: none"> <li>● Blackboard Collaborate</li> </ul>	ClickUP Task: Parts of Speech
		2	Discourse Markers	BSc BCom	pp. 20-24 pp. 20-24	<ul style="list-style-type: none"> <li>● Pre-Recorded Lecture</li> <li>● Blackboard Collaborate</li> </ul>	
4	14-18 March	1	Pronouns	BSc BCom	pp. 40-42 pp. 38-40	<ul style="list-style-type: none"> <li>● Pre-Recorded Lecture</li> <li>● Blackboard Collaborate</li> </ul>	ClickUP Task: Sentence Structure
		2	Topics, Main Ideas, Topic Sentences	BSc BCom	pp. 25-34 pp. 25-34	<ul style="list-style-type: none"> <li>● Pre-Recorded Lecture</li> <li>● Blackboard Collaborate</li> </ul>	
5	22-25 March <sup>1</sup>	1	Topics, Main Ideas, Topic Sentences	BSc BCom	pp. 25-34 pp. 25-34	<ul style="list-style-type: none"> <li>● Blackboard Collaborate</li> </ul>	22 March: Reading Report 1 ClickUP Task: Discourse Markers
		2	Test Prep	BSc BCom	Various Various	<ul style="list-style-type: none"> <li>● Blackboard Collaborate</li> </ul>	

6	28 March - 1 April	<b>Test Week</b>				29 March: LST Semester Test	
7	4-8 April	1	<b>Sources</b>	BSc BCom	N/A N/A	<ul style="list-style-type: none"> <li>● Pre-Recorded Lecture</li> <li>● Blackboard Collaborate</li> </ul>	
		2	<b>Reading</b>	BSc BCom	pp. 65-87 pp. 65-88	<ul style="list-style-type: none"> <li>● Pre-Recorded Lecture</li> <li>● Blackboard Collaborate</li> </ul>	
8	11-15 April	1	<b>Process Description Paragraphs</b>	BSc BCom	p. 50 p. 49	<ul style="list-style-type: none"> <li>● Pre-Recorded Lecture</li> <li>● Blackboard Collaborate</li> </ul>	11 April: Reading Report 2
		<b>Recess 12-20 April</b>					
9	18-22 April	2	<b>Process Description Paragraphs</b>	BSc BCom	p. 50 p. 49	<ul style="list-style-type: none"> <li>● Blackboard Collaborate</li> </ul>	ClickUP Task: Punctuation
10	25-29 April <sup>2</sup>	1	<b>Note-Taking</b>	BSc BCom	pp. 88-94 pp. 89-96	<ul style="list-style-type: none"> <li>● Pre-Recorded Lecture</li> <li>● Blackboard Collaborate</li> </ul>	
		2	<b>Note-Taking</b>	BSc BCom	pp. 88-94 pp. 89-96	<ul style="list-style-type: none"> <li>● Blackboard Collaborate</li> </ul>	
11	2-6 May <sup>3</sup>	1	<b>Research Essay (A)</b>	BSc BCom	pp. 95-101 pp. 97-103	<ul style="list-style-type: none"> <li>● Pre-Recorded Lecture</li> <li>● Blackboard Collaborate</li> </ul>	
		2	<b>Word Building</b>	BSc BCom	pp. 102-106 pp. 104-108	<ul style="list-style-type: none"> <li>● Pre-Recorded Lecture</li> <li>● Blackboard Collaborate</li> </ul>	



12	9-13 May	1	Dictionary Skills	BSc BCom	pp. 107-112 pp. 109-114	<ul style="list-style-type: none"> <li>● Pre-Recorded Lecture</li> <li>● Blackboard Collaborate</li> </ul>	9 May: Research Essay (A)	
		2	Definitions	BSc BCom	pp. 107-112 pp. 109-114	<ul style="list-style-type: none"> <li>● Blackboard Collaborate</li> </ul>		
13	16-20 May	1	Definitions	BSc BCom	pp. 113-115 pp. 115-117	<ul style="list-style-type: none"> <li>● Pre-Recorded Lecture</li> <li>● Blackboard Collaborate</li> </ul>		
		2	Test Prep	BSc BCom	Various Various	<ul style="list-style-type: none"> <li>● Blackboard Collaborate</li> </ul>		
14	23-27 May	<b>Test Week</b>						23 May: LST Semester Test
15	30 May - 3 June	1	Physical Description Paragraphs	BSc BCom	pp. 113-115 pp. 115-117	<ul style="list-style-type: none"> <li>● Blackboard Collaborate</li> </ul>		
		2	Physical Description Paragraphs	BSc BCom	Various Various	<ul style="list-style-type: none"> <li>● Blackboard Collaborate</li> </ul>		
16	6-10 June	1	Revision	BSc BCom	Various Various	<ul style="list-style-type: none"> <li>● Blackboard Collaborate</li> </ul>		
		2	Revision	BSc BCom	Various Various	<ul style="list-style-type: none"> <li>● Blackboard Collaborate</li> </ul>		
17	11-30 June	<b>Exam Period</b>						

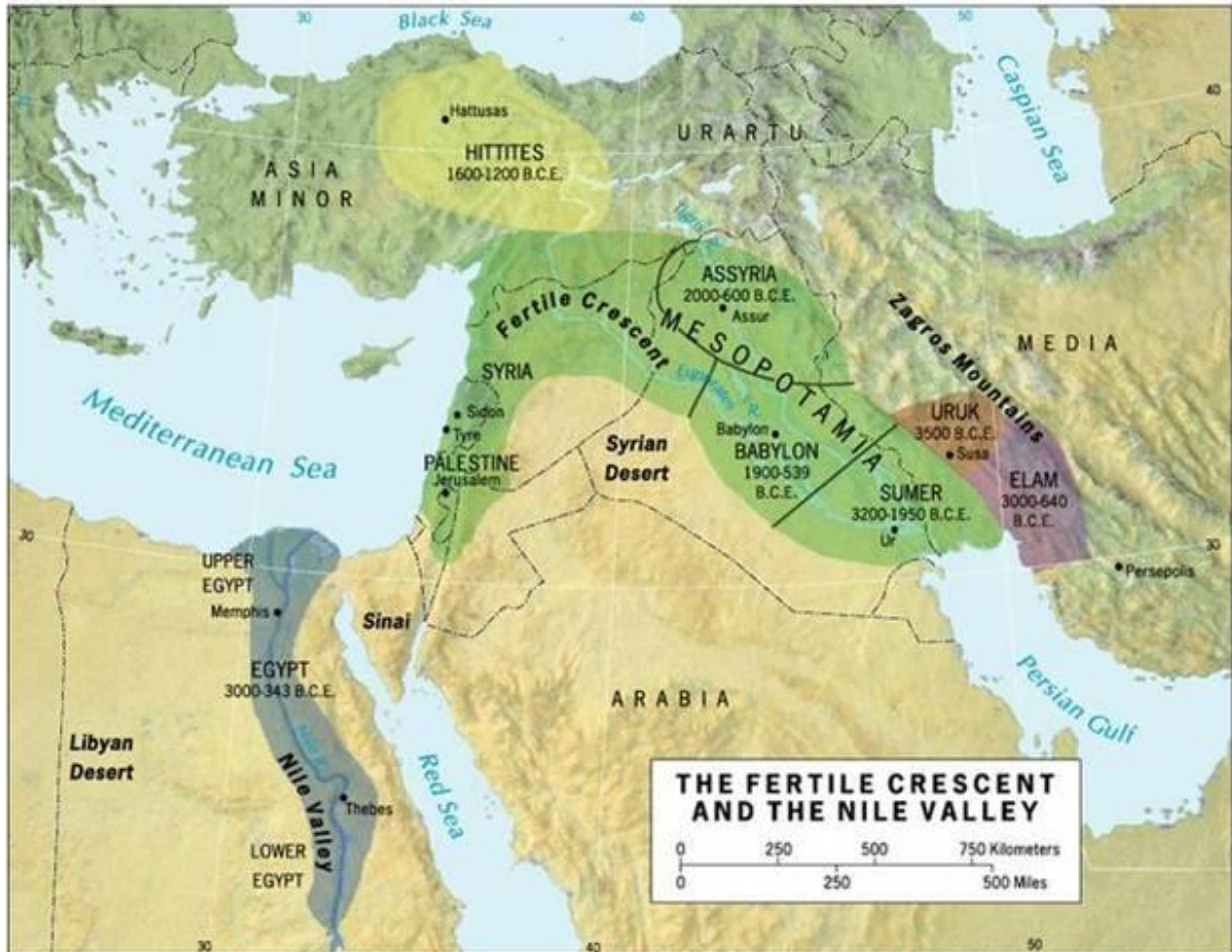
## Appendix E: Worksheets

### Worksheet 1.1: History's Biggest Fraud

Adapted from *Sapiens: A brief history of humankind* by Y.N. Harari (2014)

1. For 2.5 million years humans fed themselves by gathering plants and hunting animals that lived and bred without their intervention. *Homo erectus*, *Homo ergaster* and the Neanderthals plucked wild figs and hunted wild sheep without deciding where fig trees would take root, in which meadow a herd of sheep should graze, or which billy goat would inseminate which nanny goat. *Homo sapiens* spread from East Africa to the Middle East, to Europe and Asia, and finally to Australia and America – but everywhere **they** went, Sapiens too continued to live by gathering wild plants and hunting wild animals. Why do anything else when your lifestyle feeds you amply and supports a rich world of social structures, religious beliefs and political dynamics?
2. All **this** changed about 10,000 years ago, when Sapiens began to devote almost all their time and effort to manipulating the lives of a few animal and plant species. From sunrise to sunset, **humans** sowed seeds, watered plants, plucked weeds from the ground and led sheep to prime pastures. **This work**, they thought, would provide them with more fruit, grain and meat. It was a revolution in the way humans lived – the Agricultural Revolution.
3. The transition to agriculture began around 9500–8500 BC in the hill country of south-eastern Turkey, western Iran, and the Levant. It began slowly and in a restricted geographical area. Wheat and goats were domesticated by approximately 9000 BC; peas and lentils around 8000 BC; olive trees by 5000 BC; horses by 4000 BC; and grapevines in 3500 BC. Some animals and plants, such as camels and cashew nuts, were domesticated even later, but by 3500 BC the main wave of domestication was over. Even today, with all our advanced technologies, more than 90 per cent of the calories that feed humanity come from the handful of plants that our ancestors domesticated between 9500 and 3500 BC – wheat, rice, maize (called 'corn' in the US), potatoes, millet and barley. No noteworthy plant or

animal has been domesticated in the last 2,000 years. If our minds are those of hunter-gatherers, our cuisine is that of ancient farmers.



- Scholars once believed that agriculture spread from a single Middle Eastern point of origin to the four corners of the world. Today, scholars agree that agriculture sprang up in other parts of the world not by the action of Middle Eastern farmers exporting their revolution but entirely independently. People in Central America domesticated maize and beans without knowing anything about wheat and pea cultivation in the Middle East. South Americans learned how to raise potatoes and llamas, unaware of what was going on in either Mexico or the Levant. China's first revolutionaries domesticated rice, millet and pigs. North America's first gardeners were those who got tired of combing the undergrowth for edible gourds and decided to cultivate pumpkins. New Guineans tamed sugar cane and bananas, while the first West African farmers made African millet, African rice, sorghum and wheat conform to

their needs. From these initial focal points, agriculture spread far and wide. By the first century AD the vast majority of people throughout most of the world were agriculturists.

5. Why did agricultural revolutions erupt in the Middle East, China and Central America but not in Australia, Alaska or South Africa? The reason is simple: most species of plants and animals can't be domesticated. Sapiens could dig up delicious truffles and hunt down woolly mammoths, but domesticating either species was out of the question. **The fungi** were far too elusive, **the giant beasts** too ferocious. Of the thousands of species that our ancestors hunted and gathered, only a few were suitable candidates for farming and herding. Those few species lived in particular places, and those are the places where agricultural revolutions occurred.
6. Scholars once proclaimed that the agricultural revolution was a great leap forward for humanity. They told a tale of progress fuelled by human brain power. Evolution gradually produced ever more intelligent people. Eventually, people were so smart that they were able to decipher nature's secrets, enabling them to tame sheep and cultivate wheat. As soon as this happened, they cheerfully abandoned the gruelling, dangerous, and often miserable life of hunter-gatherers, settling down to enjoy the pleasant, satiated life of farmers. [1128]

### **Anaphor questions**

What does each of the highlighted words/phrases in the text refer to? Underline your answer and connect it to the highlighted word/phrase using an arrow.

### **General inference questions**

1. What is 'agriculture'? What is a 'revolution'? What was the 'Agricultural Revolution'? How did you figure out this answer? Did you use background knowledge or textual evidence?
2. Based on the information found in Paragraph 3, what is 'the Levant'? What textual evidence and/or background knowledge did you use?
3. Why does the author say that 'our cuisine is that of ancient farmers' in Paragraph 3? If you did not know what the word 'cuisine' meant, how would you figure it out?
4. What word could be used to replace the word 'tamed' as it is used in Paragraph 4?

5. What does it mean to 'comb the undergrowth' in Paragraph 4? If you had never come across this term before, what information in Paragraph 4 and/or background knowledge could you use to figure it out?
6. What do 'these initial focal points' in Paragraph 4 refer to?
7. In your next worksheet you will continue with this text, starting with Paragraph 7. Can you predict what Paragraph 7 will discuss? Refer to Paragraph 6; focus on the tone of this paragraph and the author's point of view. Do you think the author believes these scholars? Why do you think the scholars came up with this theory?
8. What is the main idea of Paragraph 6?

### Cause and effect and contrast questions

9. What is the reason why Sapiens continued to be hunter-gatherers? Refer to Paragraph 1.
10. Re-read Paragraph 2, and complete the following contrast sentence:  
*Humans used to be hunter-gatherers, but then they \_\_\_\_\_*
11. Re-read Paragraph 2, and complete the following cause and effect sentence:  
*Humans worked hard to cultivate crops and animals because \_\_\_\_\_*
12. What is the relationship between the following two sentences from Paragraph 4?  
*Scholars once believed that agriculture spread from a single Middle Eastern point of origin to the four corners of the world.*  
*Today, scholars agree that agriculture sprang up in other parts of the world not by the action of Middle Eastern farmers exporting their revolution but entirely independently.*
13. What is the relationship between the following two sentences from Paragraph 5?  
*Why did agricultural revolutions erupt in the Middle East, China and Central America but not in Australia, Alaska or South Africa?*  
*The reason is simple: most species of plants and animals can't be domesticated.*
14. Re-read Paragraph 5 and complete the following contrast sentence:  
*Our ancestors hunted and gathered thousands of species; however, \_\_\_\_\_*
15. Based on the information provided in Paragraph 6, what is believed to be one of the most significant results of increasing intelligence in humans?

## Worksheet 1.2: History's Biggest Fraud

Adapted from *Sapiens: A brief history of humankind* by Y.N. Harari (2014) (continues from Paragraph 6)

- 7.** **That tale** is a fantasy. There is no evidence that people became more intelligent with time. Foragers knew the secrets of nature long before the Agricultural Revolution, since their survival depended on an intimate knowledge of the animals they hunted and the plants they gathered. Rather than heralding a new era of easy living, the Agricultural Revolution left farmers with lives generally more difficult and less satisfying than those of foragers. Hunter-gatherers spent their time in more stimulating and varied ways, and were less in danger of starvation and disease. The Agricultural Revolution certainly enlarged the sum total of food at the disposal of humankind, but the extra food did not translate into a better diet or more leisure. Rather, it translated into population explosions and pampered elites. The average farmer worked harder than the average forager, and got a worse diet in return. The Agricultural Revolution was history's biggest fraud.
- 8.** Who was responsible? Neither kings, nor priests, nor merchants. The culprits were a handful of plant species, including wheat, rice and potatoes. These plants domesticated *Homo sapiens*, rather than vice versa.
- 9.** Think for a moment about the Agricultural Revolution from the viewpoint of wheat. Ten thousand years ago wheat was just a wild grass, one of many, confined to a small range in the Middle East. Suddenly, within just a few short millennia, **it** was growing all over the world. According to the basic evolutionary criteria of survival and reproduction, wheat has become one of the most successful plants in the history of the earth. In areas such as the Great Plains of North America, where not a single wheat stalk grew 10,000 years ago, you can today walk for hundreds upon hundreds of kilometres without encountering any other plant. Worldwide, wheat covers about 2.25 million square kilometres of the globe's surface, almost ten times the size of Britain. How did this grass turn from insignificant to abundant?
- 10.** Wheat did it by manipulating *Homo sapiens* to its advantage. **This ape** had been living a fairly comfortable life hunting and gathering until about 10,000 years ago, but then began to invest more and more effort in cultivating **this plant**. Within a couple of millennia, humans in many parts of the world were doing little from dawn to dusk other than taking care of wheat plants. **It** wasn't easy. Wheat demanded a lot of **them**. Wheat didn't like rocks and pebbles, so Sapiens broke their backs clearing fields. Wheat didn't like sharing its space, water and nutrients with other plants, so men and women laboured long days



The agricultural revolution resulted in hard work for people and animals.

weeding under the scorching sun. Wheat got sick, so Sapiens had to keep a watch out for worms and blight. Wheat was defenceless against other organisms that liked to eat it, from rabbits to locust swarms, so the farmers had to guard and protect it. Wheat was thirsty, so humans lugged water from springs and streams to water **it**. Its hunger even impelled Sapiens to collect animal faeces to nourish the ground in which wheat grew.

11. The body of *Homo sapiens* had not evolved for such tasks. **It** was adapted to climbing apple trees and running after gazelles, not to clearing rocks and carrying water buckets. Human spines, knees, necks and arches paid the price. Studies of ancient skeletons indicate that the transition to agriculture brought about a plethora of ailments, such as slipped discs, arthritis and hernias. Moreover, the new agricultural tasks demanded so much time that people were forced to settle permanently next to their wheat fields. **This** completely changed their way of life. We did not domesticate wheat. **It** domesticated us.
12. How did wheat convince *Homo sapiens* to exchange a rather good life for a more miserable existence? What did it offer in return? It did not offer a better diet. Remember, humans are omnivorous, and so we thrive on a wide variety of foods. Grains made up only a small fraction of the human diet before the Agricultural Revolution. A diet based on **cereals** is poor in minerals and vitamins, hard to digest, and really bad for your teeth and gums.
13. Wheat did not give people economic security. The lives of peasants are less secure than that of hunter-gatherers. **Foragers** relied on dozens of species to survive, and could therefore weather difficult years even without stocks of preserved food. If the availability of one species was reduced, they could gather and hunt more of other species. Farming societies have, until very recently, relied for the great bulk of their calorie intake on a small variety of domesticated plants. In many areas, they relied on just a single staple, such as wheat, potatoes or rice. If the rains failed or clouds of locusts arrived or if a fungus learned how to infect that staple species, peasants died by the thousands and millions.



Being nomadic gives hunter gatherers certain advantages.

14. Nor could wheat offer security against human violence. The early farmers were at least as violent as their forager ancestors, if not more so. Farmers had more possessions and needed land for planting. The loss of pasture land to raiding neighbours could mean the difference between subsistence and starvation, so there was much less room for compromise. When a foraging band was hard-pressed by a stronger rival, **it** could usually move on. It was difficult and dangerous, but it was feasible. When a strong enemy threatened an agricultural village, retreat meant giving up fields, houses and granaries. In many cases, **this** doomed the refugees to starvation. Farmers, therefore, tended to stay put and fight to the bitter end.

15. Many anthropological and archaeological studies indicate that in simple agricultural societies with no political frameworks beyond village and tribe, human violence was responsible for about 15 per cent of deaths, including 25 per cent of male deaths. In time, human violence was brought under control through the development of **larger social frameworks** – cities and states. But it took thousands of years to build such huge and effective political structures.
16. Village life certainly brought the first farmers some immediate benefits, such as better protection against wild animals, rain and cold. Yet for the average person, the disadvantages probably outweighed the advantages. **This** is hard for people in today's prosperous societies to appreciate. Since we enjoy affluence and security, and since our affluence and security are built on foundations laid by the Agricultural Revolution, we assume that the Agricultural Revolution was a wonderful improvement. Yet it is wrong to judge thousands of years of history from the perspective of today. A much more representative viewpoint is that of a three-year-old girl dying from malnutrition in first-century China because her father's crops have failed. Would she say 'I am dying from malnutrition, but in 2,000 years, people will have plenty to eat and live in big air-conditioned houses, so my suffering is a worthwhile sacrifice'?
17. What then did wheat offer agriculturists, including that malnourished Chinese girl? It offered nothing for people as individuals. Cultivating wheat provided much more food per unit of territory, and thus enabled *Homo sapiens* to multiply exponentially. Around 13,000 BC, when people fed themselves by gathering wild plants and hunting wild animals, the area around the oasis of Jericho, in Palestine, could support at most one roaming band of about a hundred relatively healthy and well-nourished people. Around 8500 BC, when wild plants gave way to wheat fields, the oasis supported a large but cramped village of 1,000 people, who suffered far more from disease and malnourishment.

### Anaphor questions

What does each of the highlighted words/phrases in the text refer to? Underline your answer and connect it to the highlighted word/phrase using an arrow.

### General inference questions

15. What does 'domestication' mean? If you did not know the meaning of this word, what background knowledge and textual evidence would you use to figure out the meaning of the word?
16. Why does the author say that wheat domesticated Sapiens? Refer to Paragraph 11.
17. What is 'blight'? If someone is not sure of the meaning of this word, what sentence in Paragraph 10 would help this person to figure out the meaning? Quote the correct sentence.

Now, use the information from that sentence to complete the following sentence: Blight is something that \_\_\_\_\_.

18. Fill in the diagram below indicating the advantages and disadvantages that the Agricultural Revolution brought about:

Advantages	Disadvantages
19.1	19.4
19.2	19.5
19.3	19.6



### Cause and effect questions and contrast questions

19. What is the main idea of Paragraph 7?
20. What is the relationship between the main idea of Paragraph 6 and the main idea of Paragraph 7?
21. Which of the following discourse markers can be used to join the following two sentences? Refer to Paragraph 7.

and but because for example therefore in summary

*Many people believe that the Agricultural Revolution introduced an era of easy living.*

*After the Agricultural Revolution, most people had lives that were less satisfying than those of their ancestors.*

22. What is the reason why the author states that the Agricultural Revolution was history's biggest fraud? Refer to Paragraph 7.
23. What relationship can you identify in all of the following sentences from Paragraph 10?

*Wheat didn't like rocks and pebbles, so Sapiens broke their backs clearing fields. Wheat didn't like sharing its space, water and nutrients with other plants, so men and women laboured long days weeding under the scorching sun. Wheat got sick, so Sapiens had to keep a watch out for worms and blight. Wheat was defenceless against other organisms that liked to eat it, from rabbits to locust swarms, so the farmers had to guard and protect it.*

24. What was the result of people regularly doing tasks for which the human body was not designed? Refer to Paragraph 10 and write your answer as a cause and effect sentence.
25. Which of the following discourse markers can be used to complete the following sentence? Refer to Paragraph 11.

therefore thus consequently since although

*People were forced to settle permanently next to their wheat field \_\_\_\_\_ the new agricultural tasks required a lot of their time.*

26. According to Paragraph 13, what would hunter-gatherers do if one edible species of plant was no longer available to them? Is your answer a cause or an effect?
27. Underline the cause in the following sentence from Paragraph 13:

*If the rains failed or clouds of locusts arrived or if a fungus learned how to infect that staple species, peasants died by the thousands and millions.*

28. Refer to Paragraph 14, and identify two reasons why farmers were more violent than hunter-gatherers. Use these reasons to complete the following sentences:

33.1 *Farmers were more violent than hunter-gatherers, because \_\_\_\_\_*

33.2 \_\_\_\_\_; *therefore, farmers were more violent than hunter-gatherers.*

29. What is the relationship between the following two sentences from Paragraph 14?

- *When a foraging band was hard-pressed by a stronger rival, it could usually move on.*
- *When a strong enemy threatened an agricultural village, retreat meant giving up fields, houses and granaries.*

30. What is the reason for the gradual reduction of human violence in agricultural societies? Refer to Paragraph 15.

## Worksheet 2.1: Always Connected

Adapted from *Irresistible: The Rise of Addictive Technology and the Business of Keeping Us Hooked*, by Adam Alter

1) Human beings are social creatures – not occasionally or by accident but always. Sociability is one of our core capabilities, and **it** shows up in almost every aspect of **our** lives as both cause and effect. You can see an echo of our talent for sociability in the language we have for groups; we use incredibly rich language in describing human association. We can make refined distinctions between a corporation and a congregation, a clique and a club, a crowd and a cabal. Our social nature even shows up in negation. One of the most severe punishments that can be handed out to a prisoner is solitary confinement; even in a social environment as harsh as prison, complete removal from human contact is harsher still.

2) Due to our combination of personal smarts and social intuition, humans are the undisputed champions of the animal kingdom in flexibility of collective membership. We act in concert everywhere, from simple tasks like organizing a birthday party (itself a surprisingly complicated task) to running an organization with thousands of members or even fighting in a war. **This skill** allows groups to tackle tasks that are bigger, more complex, more dispersed, and of longer duration than any person could tackle alone. The centrality of group effort to human life means that anything that changes the way groups function will have profound implications for everything from commerce and government to media and religion.

3) In the digital age, forming groups has gotten a lot easier. To put it in economic terms, the costs incurred by creating a new group or joining an existing one have fallen in recent years, and not just by a little bit. **They** have collapsed. ("Cost" here is used in the economist's sense of anything expended: money, but also time, effort, or attention.) And as we would expect, when desire is high and costs have collapsed, the number of **such groups** is skyrocketing, and the kinds of effects **they** are having on the world are spreading. The current change, in one sentence, is this: most of the barriers to group action have collapsed, and without **those barriers**, we are free to explore new ways of gathering together and getting things done.

4) While we are all familiar with social media platforms like Facebook, Twitter and Instagram, **these house-hold names** are by no means alone. The reach and influence of social media is growing at an alarming rate, and each year hundreds of new platforms for communicating and sharing information are introduced. Consider the photo-sharing social media platform, Flickr. For most of its users, Flickr is mainly a way to share photos of pets, family reunions, and the effects of that third margarita, but it also hosts photos of broad public interest.

5) Flickr provided some of the first photos of the London Transport bombings in 2005, including **some** taken with camera-phones by evacuees in the Underground's tunnels. Flickr beat many traditional news outlets by providing these photos, because there were few photojournalists in the affected parts of the transport network (three separate trains on the Underground, and a bus), but many people near those parts of the transport system had camera-phones that could e-mail the pictures in. Having cameras in the hands of amateurs on the scene was better than having cameras in the hands of professionals who had to travel.

6) Flickr also helped provide the world with photographic documentation of the 2006 military coup in Thailand. Immediately after **the coup**, the military placed restrictions on reporting by the media, but **it** didn't (and probably couldn't) place **similar restrictions** on the whole populace. As a result, many of the earliest photos of tanks in front of Government House, the parliament building, came from individuals posting images from ordinary digital cameras, and **they** were discoverable by their tags ("Bangkok", "Thailand", "Military", "Coupe").



Londoners stand together after the bombings.

7) Despite all the potential benefits of digital age technological developments that allow for instant global communication and socialisation, as with anything in life, too much of a good thing is not without its risks. **This** is something that social media and tech developers are well aware of.

8) For instance, at the launch of the Apple iPad in 2010, Steve Jobs claimed that he believed that everyone should own an iPad. Yet he refused to let his kids use the device. **He** is not the only tech giant that imposes these limitations. It seemed as if the people producing tech products were following the cardinal rule of drug dealing: never get high on your own supply.

9) Greg Hochmuth, one of Instagram’s founding engineers, realized he was building an engine for addiction. “There’s always another hashtag to click on,” Hochmuth said. “Then **it** takes on its own life, like an organism, and people can become obsessive.” Instagram, like so many other social media platforms, is bottomless. Facebook has an endless feed; Netflix automatically moves on to the next episode in a series; Tinder encourages users to keep swiping in search of a better option. Many users do benefit from these apps and websites, but most also struggle to use them in moderation.

10) Jobs, Hochmuth and other tech experts have good reason to be concerned. During the social media boom of the last decade, they discovered two things. First, that our understanding of addiction is too narrow. We tend to think of addiction as something inherent in certain people—**those** we label as addicts. Heroin *addicts* in vacant, dirty houses. Chain-smoking nicotine *addicts*. Pill-popping prescription-drug *addicts*. **The label** implies that they’re different from the rest of humanity. They may rise above their addictions one day, but for now they belong to their own category. In truth, addiction is produced largely by environment and circumstance. Steve Jobs knew **this**. He kept the iPad from his kids because, for all the socio-economic advantages that made them unlikely substance addicts, he knew they were susceptible to the iPad’s charms.

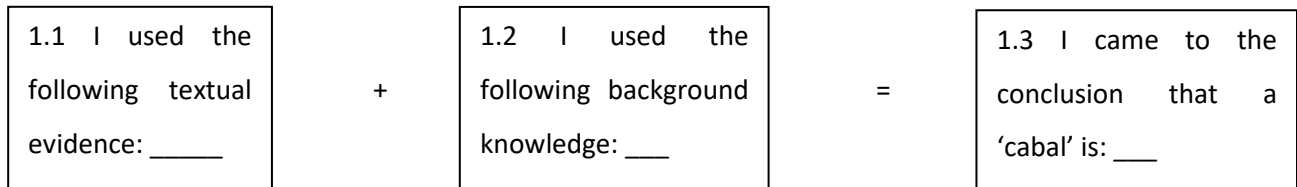
11) Tech experts also discovered that the environment and circumstance of the digital age are far more conducive to addiction than anything humans have experienced in our history. In the 1960s, we swam through waters with only a few hooks: cigarettes, alcohol, and drugs that were expensive and generally inaccessible. In the 2010s, those same waters are littered with hooks. There’s the Facebook hook, the Instagram hook, the porn hook, the email hook, the online shopping hook, and so on. The list is long—far longer than it’s ever been in human history, and we’re only just learning the power of these hooks.

### Anaphor questions

What does each of the highlighted words/phrases in the text refer to? Underline your answer and connect it to the highlighted word/phrase using an arrow.

### General inference questions

1. What is a ‘cabal’? (\*I do not expect you to know the exact meaning of this word, but you should be able to use the textual evidence provided in Paragraph 1 to make an educated guess.)



2. What does it mean to 'act in concert'? What background knowledge and textual evidence did you use to answer this question?

2.1 I used the following textual evidence: _____	+	2.2 I used the following background knowledge: ____	=	2.3 I came to the conclusion that 'acting in concert' is: ____
--	---	---	---	--

3. What are 'the effects of that third margarita'? What background knowledge and textual evidence did you use to answer this question?

3.1 I used the following textual evidence: _____	+	3.2 I used the following background knowledge: ____	=	2.3 I came to the conclusion that 'the effects of that third margarita' is: _
--	---	---	---	---

4. What other word or phrase could be used instead of 'hooks' in Paragraph 11?

4.1 I used the following textual evidence: _____	+	4.2 I used the following background knowledge: ____	=	4.3 I came to the conclusion that another word/phrase for 'hooks' in Par 11 is: _
--	---	---	---	---

5. Why does the author speak about us 'swimming' through water in Paragraph 11? What is he comparing us to? Explain how you figured out your answer.

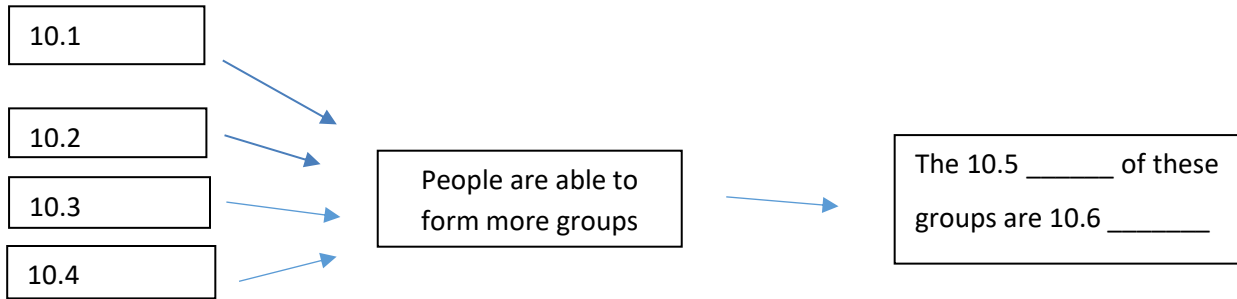
5.1 I used the following textual evidence: _____	+	5.2 I used the following background knowledge: ____	=	5.3 I came to the conclusion that the author is comparing us to: _
--	---	---	---	--

### Cause and effect questions and contrast questions

6. Read Paragraph 1 and complete the following sentence:  
*One of the worst forms of punishment is solitary confinement, since \_\_\_\_\_.*
7. Read Paragraph 2 and add an appropriate discourse marker to complete the following sentence: *Humans are able to tackle large, complex tasks \_\_\_\_\_ we can form groups and work together.*
8. Read Paragraph 2 and complete the following diagram:

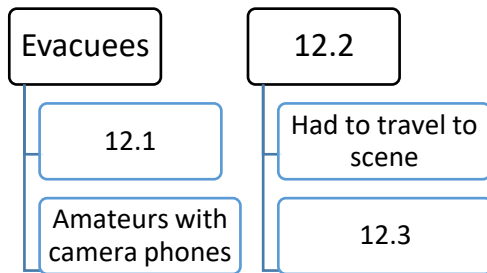
Changing the way groups function effects many aspects of our lives → because →

9. Read Paragraph 3 and complete the following diagram:



10. What relationship does the diagram above illustrate?

11. Read Paragraph 5 and compare the evacuees and photojournalists in London during the 2005 Transport Bombings:



12. What relationship does the diagram above illustrate?

13. Read Paragraph 6 and answer the following questions:

- a. What is the relationship between the following two sentences?
  - *The Thai military were unable to silence the entire population.*
  - *The Thai military prevented the media from reporting on the coup.*
- b. What is the relationship between the following two sentences?
  - *Most of the photos of the first days of the coup were taken by the general population.*
  - *The Thai military were unable to silence the entire population.*

14. Read Paragraph 10 and complete the following sentence:

Steve Jobs's children were unlikely to 15.1 \_\_\_\_\_, yet 15.2 \_\_\_\_\_.

15. Read Paragraph 11 and write a contrast sentence that compares the 1960s with the 2010s.

## Worksheet 2.2: Always Connected

In 2004, Facebook was fun; in 2016, it's addictive. Many scientists and psychologists are interested to know why certain social media platforms are so good at keeping us hooked. Their findings can tell us a lot about human nature, how we view ourselves and how we interact socially.

Instagram is addictive, for example, because some photos attract many likes, while others fall short. Thus, users chase the next big hit of likes by posting one photo after another, and return to the site regularly to support their friends. People are endlessly driven to compare themselves to others. We take photos to capture memories that we'll revisit privately, but primarily to share those memories with others. The main thing that makes using Facebook and Instagram so addictive is that every activity you post either does—or doesn't—attract likes, regrams, and comments. If one photo turns out to be a dud, there's always next time. **It's** endlessly renewable because it's as unpredictable as people's lives are themselves. There are so many photos on Instagram that you might expect users to shrug off negative feedback. In truth, though, the spotlight seems to find us even when we're in a crowd. In 2000, psychologists asked a small group of college students to take part in an experiment and walk into a room filled with other students while wearing a T-shirt featuring a photo of Barry Manilow. (An unnecessary test confirmed that college students prefer not to wear a Barry Manilow shirt in public.) After a few minutes, one of the experimenters escorted **the unlucky subjects** from the room, and asked **them** to guess how many of their fellow students noticed the Barry Manilow shirt. Of course **they** had been preoccupied by **the shirt** the entire time, so they guessed that half the students in the room would recall the shirt; in truth, only one in five remembered seeing the Barry Manilow shirt. A dud photo that attracts only three likes on Instagram is a bit like a Barry Manilow shirt. **It's** embarrassing to its owner, who assumes that other users are staring and laughing, when in fact **they're** far more concerned with their own photos.

The sting of negative feedback is so potent that many users take hundreds of shots before posting. Apps like Facetune allow tech novices to airbrush away their flaws for “perfect skin; a perfect smile,” the ability to reshape their faces and bodies, remove blemishes, and recolour grey hair. Essena O'Neill, a young Australian model, had half a million followers when she decided to reveal the truth behind her glamorous Instagram posts. O'Neill changed her account name to Social Media Is Not Real Life, deleted thousands of old photos, and edited the captions under others. One photo featured O'Neill on the beach in a bikini:

'NOT REAL LIFE—took over 100 in similar poses trying to make my stomach look good. Would have hardly eaten that day. Would have yelled at my sister to keep taking them until I was somewhat proud of this. Yep so totally #goals.'

A caption under another shot of O'Neill in a formal dress by a lake read:

'NOT REAL LIFE—I didn't pay for the dress, took countless photos trying to look hot for Instagram, the formal made me feel incredibly alone.'



Essena O'Neill poses for Instagram.

O'Neill attracted some backlash. Former friends accused her of "100 percent self-promotion," and others called her new campaign "a hoax." But tens of thousands of others praised her publicly. "Read her captions—this girl is a boss," said one. "Aah, so good, love what she's doing," said another. O'Neill was voicing publicly what thousands of Instagram users felt across the globe: that the pressure to present perfection with every shot is relentless and, for many people, unbearable.

As part of my research for this book, I visited reSTART, a rehabilitation programme for adolescents who struggle with Internet addiction. Many young people I met **there** obviously derived a lot of pleasure from their online friendships, so it wasn't clear to me why experts frowned on online interactions. Hilarie Cash, a clinical psychologist and cofounder of reSTART, explained that "there's nothing wrong with making friends online, as long as you also make friends in the real world." The addictive online interactions are dangerous, not for what they provide, but for what they can't provide: a chance to learn what it means to sit, face-to-face, as you maintain a conversation with another person. The staccato taps of a keyboard—and even remote webcam interactions—obey a very different rhythm, and convey information along a much narrower bandwidth than face-to-face interactions. "Even the smell of another person, the consistent eye contact that comes from being in the same room, is important," Cash said. "Interacting over social media is a lot like feeding sugar to a hungry person," Cash told me. "It's pleasurable in the short-term, but eventually, they'll starve."

The age of behavioural addiction is still young, but early signs point to a crisis. Addictions are damaging because they crowd out other essential pursuits, from work and play to basic hygiene and social interaction. The good news is that our relationships with behavioural addiction aren't fixed. There's much we can do to restore the balance that existed before the age of smartphones, emails, wearable tech, social media networking, and on-demand viewing. The key is to understand why digital age tech is so addictive, how it has changed our social landscape, and learn how to use it safely and productively.

### Anaphor questions

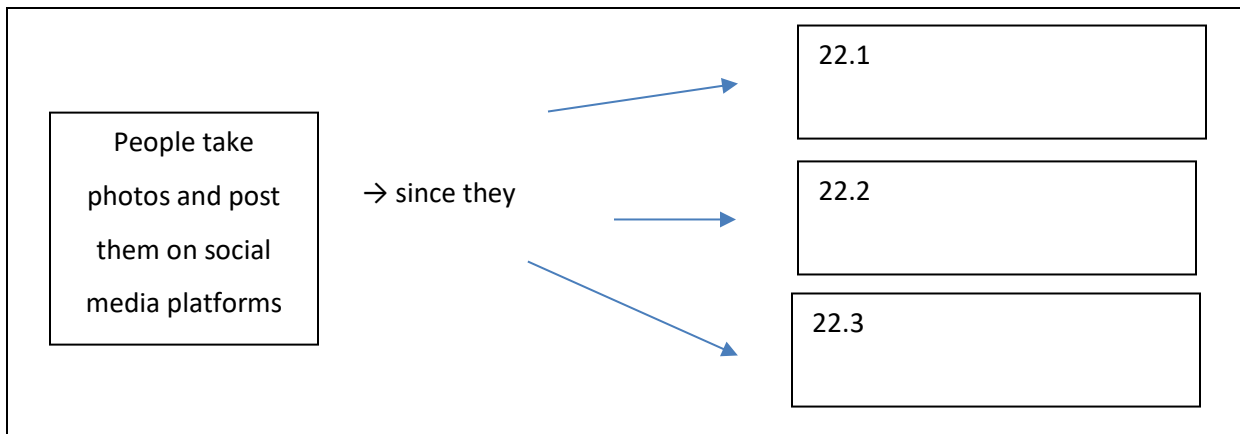
What does each of the highlighted words/phrases in the text refer to? Underline your answer and connect it to the highlighted word/phrase using an arrow.

## General inference questions

17. Consider the author's choice of words in the following clause from Paragraph 13: 'users chase the next big hit of likes by posting one photo after another'. Which words are interesting and noticeable? Why do you think those words were used? What effect is the author trying to create?
18. If you did not know what the word 'dud' in Paragraph 13 meant, what textual evidence could you have used to try and figure it out?
19. What does it mean to 'shrug something off'? If you did not know what this phrase meant, what textual evidence from Paragraph 14 could you use to figure it out?
20. Who is Barry Manilow? (\*I do not expect you to know exactly, but you should be able to use your own background knowledge and the textual evidence provided in Paragraph 14 to make an educated guess.)
21. In what way is interacting over social media a lot like feeding sugar to a hungry person? Refer to Paragraph 17 and answer in your own words.

## Cause and effect questions and contrast questions

22. Read Paragraph 13 and complete the following diagram:



23. What is the effect of some posts attracting a lot of attention while other posts attract very little attention? Refer to Paragraph 13.
24. What is the relationship between the following two sentences? Refer to Paragraph 14.
  - The college students were preoccupied by the Barry Manilow shirt the entire time.
  - They assumed a lot of people would notice the shirt.
25. Read paragraph 14 and complete the following sentence:

Although very few people noticed the Barry Manilow shirt, \_\_\_\_\_.



26. Circle the cause and underline the effect in the following sentence from Paragraph 15:

The sting of negative feedback is so potent that many users take hundreds of shots before posting.

27. Read Paragraph 15 and complete the following sentence by adding the correct type of discourse marker:

Most people on Instagram look happy and glamorous \_\_\_\_\_ O'Neill revealed that most of the photos are not representative of real life.

28. Read Paragraph 16 and complete the following sentence:

\_\_\_\_\_; therefore, she was praised by her followers.

29. What is the relationship between the following two sentences? Refer to Paragraph 17.

- There is nothing wrong with online friendships.
- It is important that also make friends in the real world.

## Worksheet 3.1: McDonald's Didn't Create a Better Hamburger

Adapted from *Naked economics: Undressing the dismal science*, by Charles Wheelan (2002)

1. When Bill Clinton ran for president in 1992, he suggested the idea of Hope Scholarships. **The Clinton plan** (based on an earlier experiment at Yale) seemed like an excellent idea: Students could borrow money for college and then repay the loans after graduation with a percentage of their annual income rather than the usual fixed payments of principal plus interest. Graduates who went on to become investment bankers would owe more in student loans than graduates who counselled disadvantaged teens in poor neighbourhoods, which was exactly the point. The plan was designed to address the concern that students graduating with large debts are forced to do well rather than do good. After all, it is hard to become a teacher or a social worker after graduating with \$75,000 in student loans.
2. In theory, the program would finance itself. Administrators could determine the average postgraduation salary for eligible students and then calculate the percentage of income they would have to pay in order for the program to recoup its costs—say 1.5 percent of annual income for fifteen years. Students who became brain surgeons would pay back more than average; students who fought tropical diseases in Togo would pay less. On average, the high and low earners would cancel each other out and the program would break even.
3. There was just one problem: The Hope Scholarships had no hope of working, at least not without a large, ongoing government subsidy. The problem was a crucial asymmetry of information: Students know more about their future career plans than loan administrators do. College students never know their future plans with certainty, but most have a good idea whether their postgraduation income will be more or less than average—which is enough to determine if a Hope Scholarship would be more or less expensive than a conventional loan. Aspiring Wall Street barons would avoid the program because it's a bad deal for them. Who wants to pay back 1.5 percent of \$5 million every year for fifteen years when a conventional loan would be much cheaper? Meanwhile, the world's future pre-school teachers and Peace Corps volunteers would opt in.
4. The result is called adverse selection; future graduates sort themselves in or out of the program based on private information about their career plans. In the end, the program attracts predominantly low earners. The repayment calculations, based on the average postgraduation salary, no longer apply and the program cannot recover its costs. One may assume that Mr. Clinton ignored what his advisers almost certainly told him about the Yale experiment: It was quietly cancelled after five years, both because repayments fell short of projections and because the administrative costs were unaffordable.

5. What we don't know *can* hurt us. Economists study how we acquire information, what we do with **it**, and how we make decisions when all we get to see is a book's cover. Indeed, the Swedish Academy of Sciences recognized **this point** in 2001 by awarding the Nobel Prize in Economics to George Akerlof, Michael Spence, and Joseph Stiglitz for their seminal work on the economics of information. Their work explores the problems that arise when rational people are forced to make decisions based on incomplete information, or when one party to a transaction knows more than another. **Their** insights are relevant to some of our most pressing social issues, from genetic screening to discrimination in the workplace.
  
6. Consider a small law firm interviewing two job candidates, one male and one female. Both candidates are recent Harvard Law School graduates and are eminently qualified for the position. If the "best" candidate for the job is the one who will earn the most money for the firm, which seems a reasonable assumption, then I will argue that the rational choice is to hire the man. The interviewer has no specific information on the family plans of the candidates at hand (and is forbidden by law from asking about **them**), but can make a reasonable inference based on what everyone knows about America in the twenty-first century: Women still bear the bulk of child-rearing responsibilities. Demographics suggest that both candidates are likely to start families in the near future. Yet only the female candidate will take paid maternity leave. More important, she may not return to work after having the child, which leaves the firm with the cost of finding, hiring, and training another lawyer.
  
7. Is any of this certain? No. The male candidate may have dreams of staying home with his five children; the female candidate may have decided years ago that she has no interest in having children. But **these** are not the most likely scenarios. The female candidate is punished because the firm has no information on her specific circumstances but good data on broad social trends. Is **this** fair? No. (And it's not legal either.) *Yet the firm's logic makes sense.* In other words, it is rational to discriminate in this case, which turns the whole idea of discrimination on its head. Discrimination is usually irrational.
  
8. When we approach **this situation** as an information problem, there are several crucial insights. First, firms are not the only villains. When professional women choose to have a child, take paid maternity leave, and then quit their companies, **they** impose a cost, arguably unfair, on their firms. *More important, they impose a cost on other women.* Firms that feel they have been "burned" by employees who take maternity leave and then quit are more likely to discriminate against young women in the hiring process (particularly those who are already pregnant) and less likely to offer generous maternity benefits. The good news is that there is a quick and easy solution: a generous but refundable maternity package. Keep it if you come back to work, return it if you don't. **That simple policy change** gives us nearly everything we want. Firms no longer have to be concerned about paying

benefits to women who will not return to work. Indeed, it becomes possible to offer more generous benefits without providing an incentive for workers to take the money and run. Women, in turn, do not face the same level of discrimination in the hiring process. Obviously, the best long-term solution is for men to take on more child-rearing responsibilities. As that happens, employers will have less reason to assume that young female workers are more likely to quit or cut back when they have children than young men are. [1079]

### **Anaphor questions**

What does each of the highlighted words/phrases in the text refer to? Underline your answer and connect it to the highlighted word/phrase using an arrow.

### **General inference questions**

1. From the perspective of which country is the author writing? What textual evidence can you find in the first two sentences of Paragraph 1 to support your answer?
2. What is meant by 'do well rather than good' in Paragraph 1?
3. What is 'Togo'? If you had not come across this word before, what information in Paragraph 2 could you have used to figure it out?
4. What can we infer about the salaries of American pre-school teachers based on the information in Paragraph 3?
5. What does the phrase 'repayments fell short of projections' mean? If you had not come across this phrase before, what background knowledge and/or information from Paragraph 4 would you have used to figure it out?
6. What are the 'broad social trends' referred to in Paragraph 7?

### **Cause and effect questions and contrasting questions**

7. Why did Bill Clinton think that the Hope Scholarships mentioned in the first paragraph would work? Provide your answer as a cause and effect sentence, using the discourse marker 'for this reason'.
8. One of the sentences in Paragraph 2 is a contrasting sentence. Write that sentence down, and insert a contrasting discourse marker along with the necessary punctuation.
9. Identify the error in the following sentence based on the information in Paragraph 3:  
*Since the Hope Scholarships would never work, future high-earners would choose conventional student loans.*
10. Refer to Paragraph 3, and write a contrasting sentence which compares aspiring Wall Street barons and future pre-school teachers. Use the discourse marker 'conversely'.
11. Identify the error in the following sentence:  
*Women are more likely than men to quit their jobs in order to raise a family; however, it makes more sense for the law firm to hire the male candidate.*

12. Insert a suitable discourse marker in this sentence from Paragraph 7:

*The male candidate may have dreams of staying home with his five children; \_\_\_\_\_, the female candidate may have decided years ago that she has no interest in having children.*

13. Rewrite the following sentence from Paragraph 8 as a cause and effect sentence using the discourse marker 'thus':

*When professional women choose to have a child, take paid maternity leave, and then quit their companies, they impose a cost, arguably unfair, on their firms.*

14. Underline the cause in the following sentence from Paragraph 8:

*Firms that feel they have been "burned" by employees who take maternity leave and then quit are more likely to discriminate against young women in the hiring process (particularly those who are already pregnant) and less likely to offer generous maternity benefits.*

## Worksheet 3.2: McDonald's Didn't Create a Better Hamburger

Adapted from *Naked economics: Undressing the dismal science*, by Charles Wheelan (2002)

Continues from Paragraph 8

9. This chapter started with two examples of information-related problems—cases in which missing information causes individuals and organisations to behave in ways that have serious social implications. Economists are also intrigued by more commonplace examples of how markets react to missing information. We spend our lives shopping for products and services whose quality we cannot easily determine. (You had to pay for this book before you were able to read it.) In the vast majority of cases, consumers and firms create their own mechanisms to solve information problems. Indeed, therein lies the genius of McDonald's that inspired the title of this chapter. The "golden arches" have as much to do with information as **they** do with hamburgers. Every McDonald's hamburger tastes the same, whether it is sold in Moscow, Mexico City, or Cincinnati. **That** is not a mere curiosity; it is at the heart of the company's success. Suppose you are driving along Interstate 80 outside of Omaha, having never been in the state of Nebraska, when you see a McDonald's. Immediately you know all kinds of things about the restaurant. You know that it will be clean, safe, and inexpensive. You know that it will have a working bathroom. You know that it will be open seven days a week. You may even know how many pickles are on the double cheeseburger. *You know all of these things before you get out of your car in a state you've never been in.*



While the core menu stays the same, McDonald's also cater for local tastes as can be seen in these menus from Singapore and India.

10. Compare **that** to the billboard advertising Chuck's Big Burger. Chuck's may offer one of the best burgers west of the Mississippi. Or it might be a likely spot for the nation's next large *E. coli* outbreak. How would you know? If you lived in Omaha, then you might be familiar with Chuck's reputation. But you don't; you are driving through Nebraska at nine o'clock at night. (What time does Chuck's close, anyway?) If you are like millions of other people, even those who find fast food relatively unappealing, you will seek out the golden arches because you know what lies beneath them. McDonald's sells hamburgers, fries, and, most important, predictability.
11. **This idea** underlies the concept of "branding," whereby companies spend enormous sums of money to build an identity for their products. Branding solves a problem for consumers: How do you select products whose quality or safety you can determine only after you use them (and sometimes not even **then**)? Hamburgers are just one example. The same rule applies in everything from vacations to fashion. Will you have fun on your cruise? Yes, because it is Royal Caribbean—or Celebrity or Viking or Cunard. I have a poor sense of fashion, so I am reassured that when I buy a Tommy Hilfiger shirt I will look reasonably presentable when I leave the house.
12. Branding has come under assault as a tool by which greedy multinational corporations persuade us to pay extortionate premiums for goods that we don't need. Economics tells a different story: Branding helps to provide an element of trust that is necessary for a complex economy to function. Modern business requires that we conduct major transactions with people whom we've never met before. I regularly mail off checks to Fidelity even though I do not know a single person at **the company**. Government regulators can only protect me from the most egregious kinds of fraud. They do not protect me from shoddy business practices, many of which are perfectly legal. Businesses routinely advertise their longevity. That sign outside the butcher proclaiming "Since 1927" is a politic way of saying, "We wouldn't still be here if we ripped off our customers."
13. Branding can be a very profitable strategy. In competitive markets, prices are driven relentlessly toward the cost of production. If it costs 10 cents to make a can of soda and I sell it for \$1, someone is going to come along and sell it for 50 cents. Soon enough, someone else will be peddling it for a quarter, then 15 cents. Eventually, some ruthlessly efficient corporation will be peddling soda for 11 cents a can. From the consumer's standpoint, this is the beauty of capitalism. From the producer's standpoint, it is "commodity hell."
14. How does a firm save its profits from the death spiral of competition? By convincing the world (rightfully or not) that its mixture of corn syrup and water is different from everyone else's mixture of corn syrup and water. Coca-Cola is not soda; it's Coke. Producers of branded goods create a monopoly for themselves—and price their products accordingly—by persuading consumers that their products are like no other. Nike clothes are not pieces of fabric

sewn together by workers in Vietnam; they are Tiger Woods's clothes. Even farmers have taken this message to heart. At the market, one finds (and pays a premium for) Sunkist oranges, Angus beef, Tyson chickens.

### General inference questions

15. What is an 'interstate'? What textual evidence can you find in Paragraph 9 to support your answer?
16. What is 'Omaha' and where is it? What textual evidence can you find in Paragraph 9 to support your answer?
17. If you did not know what 'E. coli' was, what could you infer from the following two sentences from Par. 10?  
*Chuck's Big Burgers may offer one of the best burgers west of the Mississippi. Or it might be a likely spot for the nation's next large E. coli outbreak.*
18. What do 'the golden arches' refer to?
19. What is meant by the statement in Paragraph 10 that McDonald's 'sells' predictability?
20. What are Royal Caribbean and Cunard? What evidence can you find in Paragraph 11 to support your answer?
21. In the scenario described in Paragraph 13, why would a corporation have to be incredibly efficient to sell the can of soda in question for 11 cents?
22. What do the words 'egregious' and 'shoddy' mean? If you had not come across these terms before, what information in Paragraph 12 could you have used to figure it out?
23. What does 'peddling' mean? If you had never come across this word before, what information in Paragraph 13 could you have used to figure it out?
24. What does 'mixture of corn syrup and water' in Paragraph 14 refer to?

### Cause and effect and contrasting questions

25. Refer to Paragraph 12 and write a cause and effect sentence about the reason for McDonald's success.
26. What is the relationship between the following two sentences?  
*You have never been to a McDonald's in Russia.*  
*You know how many pickles are on the double cheeseburger.*
27. Why do businesses often include a phrase like 'Since 1927' as part of their branding? Refer to Paragraph 12 and write your answer as a cause and effect sentence.
28. There is a contrasting relationship between the following two sentences from Paragraph 13.  
*From **the consumer's standpoint**, this is the beauty of capitalism. From the producer's standpoint, it is "commodity hell." Highlight the phrase in the second sentence that contrasts with 'the consumer's standpoint' and underline the phrase that contrasts with 'the beauty of capitalism'.*



## Worksheet 3.3: McDonald's Didn't Create a Better Hamburger

Adapted from *Naked economics: Undressing the dismal science*, by Charles Wheelan (2002)

(Continues from Paragraph 14)

15. Firms will do whatever they can to “signal” their own quality to the market. **This** was the insight of 2001 Nobel laureate Michael Spence, an economist at Stanford University. Suppose that you are choosing an investment adviser. The first firm you visit has striking wood panelling, a marble lobby, original Impressionist paintings, and executives wearing handmade Italian suits. Do you think: (1) My fees will pay for all this very nice stuff—what a rip-off!; or (2) wow, this firm must be extremely successful and I hope they will take me on as a client. Most people would choose 2. (If you’re not convinced, think about it the other way: How would you feel if your investment adviser worked in a dim office with flickering light bulbs, plastic chairs and old, bulky computers?)
16. The trappings of success—the panelling, the marble, the art collection—have no inherent relation to the professional conduct of the firm. Rather, we interpret **them** as “signals” that reassure us that the firm is top-notch. They are to markets what a peacock’s bright feathers are to a prospective mate: a good sign in a world of imperfect information.
17. Here is a related question that economists like to ponder: Harvard graduates do very well in life, but is that because they learned things at Harvard that made them successful, or is it because Harvard finds and admits talented students who would have done extraordinarily well in life anyway? In other words, does Harvard add great value to its students, or does it simply provide an elaborate “signalling” mechanism that allows bright students to advertise their talents to the world by being admitted to Harvard? Alan Krueger, a Princeton economist, and Stacy Dale, an economist at the Mellon Foundation, have done an interesting study to get at **this question**. **They** note that graduates of highly selective colleges earn higher salaries later in life than graduates of less selective colleges. For example, the average student who entered Yale, Swarthmore, or the University of Pennsylvania in 1976 earned \$92,000 in 1995; the average student who entered a college such as Penn State, Denison, or Tulane, earned \$22,000 less. That is not a particularly surprising finding, nor does it get at the question of whether the students at schools like Yale and Princeton would earn more than their peers at less competitive schools even if they played beer pong and watched television for four years.
18. So Mr. Krueger and Ms. Dale took their analysis one step further. They examined the outcomes of students who were admitted to both a highly selective school and a moderately selective school. Some of those students headed to places like the Harvard or Yale; others chose their less selective option. Mr. Krueger and Ms. Dale’s

chief finding is best summarized by the title of the paper: “Children Smart Enough to Get into Elite Schools May Not Need to Bother.” The average earnings of students admitted to both a highly selective school and a moderately selective school were roughly the same regardless of which type of college they attended. (The one exception was students from lower-income families for whom attending a more selective school increased earnings significantly.) Overall, the quality of student appears to matter more later in life than the quality of the university he or she attended.

19. Is it irrational to spend \$200,000 or more to attend an Ivy League university? Not necessarily. At a minimum, a Princeton or Yale diploma is the CV equivalent of a “thumbs up” from a professional critic. It pronounces you highly qualified so that others in life—employers, spouses, in-laws—will have fewer doubts. And there is always the possibility that you may learn something while huddling for four years with the world’s great minds.
20. This chapter started with a serious social issue, and so it will end. Profiling based on gender is an information problem, and so is profiling based on race. There are two simple questions at the heart of the issue. First, does gender or race —alone or in conjunction with some other circumstance — convey meaningful information related to behaviour? If so, what do we do about it? The answer to the first question gets most of the attention. For example, American police officers have long argued that race can be a tip-off; well-dressed white kids in poor Latino neighbourhoods are often looking to buy drugs. It is undeniable that some criminal organizations, like the Mafia, do have racial or ethnic affiliations.
21. Indeed, we all profile in our own way. We are taught from a young age that one should never judge a book by its cover. *But we must; it is often all we get to see.* Imagine you are walking in a parking garage at night when you hear footsteps behind you. Ideally, you would ask this person for a CV; you and he would sit down for coffee and discuss his goals, his job, his family, his political philosophy, and, most important, the reason he is walking behind you in a dark parking garage. You would do a criminal background check. Then, with all this information in hand, you would decide whether or not to hit the panic button on your key ring. The reality, of course, is different. You get one quick glance over your shoulder. What information matters? Gender? Race? Age? Briefcase? Clothing?
22. I’ll never forget my own experience as a victim of racial profiling. I boarded a westbound bus from downtown Chicago just as it started to get dark. Chicago is a very segregated city; most of the neighbourhoods west of downtown are predominantly African-American. I was wearing a suit, and after a few blocks I was the only white guy on the bus. Around that time, an older black woman asked kindly, “Oh, are the Bulls playing tonight?” The Chicago Bulls play at the Chicago Stadium, which is also directly west of the city centre. This woman had inferred, innocently enough, that the only reason a white guy in a suit would be on this bus around 7:00 p.m. would be

to go to a Bulls game. Obviously it was unfair and potentially hurtful for her to draw any conclusion about my destination based only on my skin colour and style of dress. The really weird thing is that I *was* on my way to the Bulls game.

- 23.** Race, age, ethnicity, and/or country of origin can convey information in some circumstances, particularly when other better information is lacking. From a social policy standpoint, however, the fact that **these attributes** may convey meaningful information is not the point we should focus on. The question that matters is: Are we willing to systematically harass individuals who fit a broad racial or ethnic profile that may, on average, have some statistical support but will still be wrong far more often than it is right? Most people would answer no in most circumstances. We've built a society that values civil liberties even at the expense of social order. Opponents of racial profiling always seem to get dragged into the argument of whether or not it is good police work or an effective counterterrorism tool. **That's** not the only relevant point—and it may be completely irrelevant in some cases. If economics teaches us anything, it's that we ought to weigh costs and benefits. The costs of harassing ten or twenty or one hundred law-abiding people to catch one more drug dealer are not worth it. Terrorism is trickier because the potential costs of letting just one person slip through the cracks are so devastatingly high. So what exactly should we do about it? That is one of the tough trade-offs in the post–September 11 world.

### **Anaphor questions**

What does each of the highlighted words/phrases in the text refer to? Underline your answer and connect it to the highlighted word/phrase using an arrow.

### **General inference questions**

29. Use two of your own adjectives to describe the offices of the first investment firm described in Paragraph 15.
30. Use two of your own adjectives to describe the offices of the second investment firm in Paragraph 15.
31. What does 'trappings of success' mean? If you had never come across this term before, what information from Paragraphs 15-16 could you have used to figure it out?
32. What does it mean to 'ponder' something? If you had never come across this terms before, what evidence from Paragraph 18 could you have used to figure it out?
33. What is Harvard? If you had never heard of Harvard before, what textual evidence from Paragraph would you have used to figure it out?
34. Which of the following two groups of colleges is the most selective? Refer to Paragraph 17.

#### **Group A:**

Penn State, Denison, and Tulane

#### **Group B:**

Yale, Swarthmore, and the University of Pennsylvania

35. Why would the type of college make more of a difference for students from lower-income families?
36. What is 'beer pong'? If you had never come across this term before, what information from Paragraph 17 and/or background knowledge could you have used to figure it out?
37. What does it mean to 'profile' someone?
38. What are 'opponents of racial profiling'? If you had never come across this phrase before, what information from Paragraph 23 and/or background knowledge could you have used to figure it out?
39. The title of this text is 'McDonald's didn't create a better hamburger'. If McDonald's hamburgers are not 'better', then what, according to the author, did McDonald's in fact do that made it successful?
40. Give an alternative title to this text that captures its main idea.

### Cause and effect and contrasting questions

41. Write a contrasting sentence based on the information in Paragraph 16. Use the discourse marker 'yet'.
42. Based on the information in Paragraph 17-19, which of the following two graphic organisers is the most accurate?

A) Being successful → Go to Harvard
B) Go to Harvard → Being successful

43. What is the relationship between the first half and the second half of the following sentence?  
*For example, the average student who entered Yale, Swarthmore, or the University of Pennsylvania in 1976 earned \$92,000 in 1995; the average student who entered a moderately selective college, such as Penn State, Denison, or Tulane, earned \$22,000 less.*
44. Why would you want all the information listed in Paragraph 21 about the person in the parking garage before deciding whether or not to hit the panic button? Write your answer as a cause and effect sentence.

## Worksheet 4.1: Coming Full Circle: How Legalisation Threatens Drug Lords

Adapted from *Narconomics: How to run a drug cartel*, by Tom Wainwright (2016)

1. There is no sign on the door of the large grey warehouse that I have driven out to on the edge of Denver, Colorado. But I check my phone's map and **this** seems to be the place: an unmarked lot in a nondescript business park in one of the city's less glamorous neighbourhoods. No one much is around, though I imagine someone watching me through the CCTV cameras that are trained on the warehouse's entrance as I walk up the ramp to the door. I buzz the unlabelled entry phone, and after a short wait the door is opened by a cheerful young man with a broad grin and a mop of blond hair, wearing Bermuda shorts and flip-flops. In a reception area inside, he carefully makes a copy of my driver's license, as more CCTV cameras look on. Opening another door, we are met with warm air and the faint hum of high-wattage lights and air conditioners. Most noticeable of all is an overpowering smell of marijuana.
2. **This** is the cannabis-growing facility of Denver Relief, which runs Denver's oldest legal marijuana dispensary. **The firm** was started in 2009 by Ean Seeb, a young Coloradan who became a devotee of medical marijuana after a skiing accident left him with an injury that only cannabis seemed to soothe. As if fate were giving him a hint, he later lopped off the tip of one of his fingers in another painful accident, which further persuaded him of the power of pot. Starting off with savings of just \$4,000 and a stash of half a pound of marijuana, Denver Relief began as a delivery service, ferrying cannabis to the city's registered medical-marijuana patients, who have been allowed to use the drug with a doctor's permission since 2000. On January 1, 2014, Denver Relief broadened its market to include recreational users, after Colorado became the first place in the world to legalize the sale of marijuana for nonmedical purposes.
3. For the cartels that have until now had total control over the cannabis market, Denver Relief's drug farm and the dozens more like it that have popped up in Colorado represent serious competition. For many years, the illegality of America's favourite drug meant criminal organizations held the exclusive rights to the market. And what a market: despite its illegality, about four out of ten Americans admit to having tried marijuana. Across the country, cannabis is thought to be worth roughly \$40 billion a year—about the same as the recorded music industry. Until recently, every cent of **that** went to criminal organizations. But in 2014, Colorado, and then Washington State, became the first places in the United States, and the world, to allow law-abiding, tax-paying folk such as Seeb and Hice to enter the market. Later **that year**, Alaska and Oregon voted to follow suit. Many other states have vowed to **do the same**. In these few places, licensed businesses can now grow, process, and sell marijuana to anyone over the age of twenty-one, including those from other states or other countries. By the end of the first year of

trading, Colorado's dispensaries alone had reached about \$700 million in cannabis sales—money that the cartels saw as rightfully theirs.

4. Colorado's legal businesses enjoy several important advantages over those that inhabit the black-market economy. Take the cultivation side of the industry first. Cannabis cultivation, like any other form of agriculture, benefits enormously from economies of scale. A small number of big warehouses can grow crops more efficiently than lots of small **ones**. In the illegal economy, the danger of being discovered puts a natural ceiling on the scale of operations. In Mexico, some drug producers have managed to work around **this limitation**, but usually only in remote, outdoor locations, where growing is nothing like as sophisticated as what goes on in Denver Relief's facility. Some Colorado growing rooms are larger than 100,000 square feet—about the size of a big supermarket. Each plant can produce about 75 grams of usable marijuana, with a retail value of a little over \$1,000. **This** means that even a fairly modest grow-site, housing 1,000 plants, would have hundreds of thousands of dollars of cannabis under cultivation at any time. **This** is presumably why Denver Relief doesn't advertise its name on the side of its warehouse. But operating a large facility is far riskier for illegal operations, which don't have the option of taking out insurance—and, of course, **they** can hardly call the police if they are burgled.
  
5. Illegal cannabis plantations are also kept small by another constraint: electricity. Growing cannabis indoors—the best way to achieve a potent, valuable crop—requires the plants to be kept under bright, energy-intensive lights for many hours each day. **That** means a suspiciously large electricity bill. Online forums for cannabis enthusiasts buzz with messages from people wondering how much power they can use before their electricity provider reports **them** to the police. “Guides for growers used to say that as a rule of thumb a big TV uses about 1,000 watts. So if someone was growing in a five-bedroomed house, they could use maybe 5,000 watts without it looking too suspicious,” says Hice. **That** is a puny amount: Denver Relief's facility uses about 150,000 watts of light, plus around another 100,000 watts in air-conditioning and other gadgetry. The bill comes to \$800 per day.
  
6. For illicit growers, all the lights create another problem: round-the-clock lighting generates a lot of heat. The police have caught on to **this**, and many departments now use infrared cameras to scan neighbourhoods for suspiciously hot homes. Seen through the heat-sensitive camera of a police helicopter, a cannabis-growing house glows a giveaway bright-white in an otherwise dark street. The cops aren't the only ones who hunt for cannabis farms in this way: criminals in Birmingham, England, have been caught using drones equipped with infrared cameras to spot hidden grow-sites, to rob or extort the owners. “They are fair game,” a drone-using extortionist told the local *Halesowen News*. “It is not like I'm using my drone to see if people have nice televisions. I am just after drugs to steal and sell. If you break the law then you enter me and my drone's world.” The obstacles to growing cannabis

illegally on any serious scale mean that unlicensed growers are at a big disadvantage when it comes to competing with the warehouses of Colorado in terms of quantity.

### **Anaphor questions**

What does each of the highlighted words/phrases in the text refer to? Underline your answer and connect it to the highlighted word/phrase using an arrow.

### **General inference questions**

1. The first paragraph describes the cannabis-growing facility of Denver Relief, but until the last sentence of that paragraph, it is not clear what the facility is used for. What clues in the first paragraph hint at the fact that the warehouse is used to grow marijuana?
2. What is 'America's favourite drug' (Paragraph 3)? How do you know?
3. Identify four different words in this text that are used to refer to this drug.
4. What is the real reason why Denver Relief does not advertise their name on the warehouse?
5. What unit is used to measure electricity?
6. What does it mean to extort someone? What textual evidence could help you to figure out this answer?

### **Cause and effect and contrasting questions**

7. Write two cause and effect sentences and one contrasting sentence using information from the first three paragraphs. Write the sentences in your own words and use a suitable discourse marker for each sentence.
8. Write two cause and effect sentences and two contrasting sentences using information from Paragraphs 4 to 6. Write the sentences in your own words and use a suitable discourse marker for each sentence.
9. Why are the electricity bills of illegal cannabis plantations 'suspiciously' high? Refer to Paragraph 5 and provide your answer as a cause and effect sentence.

## Worksheet 4.2: Coming Full Circle: How Legalisation Threatens Drug Lords

Adapted from *Narconomics: How to run a drug cartel*, by Tom Wainwright (2016)

(Continues from Paragraph 6)

- As I wander around Denver, seeing businesspeople go in and out of hotels and the convention centre, I try to imagine **their** husbands and wives nervously lighting up a joint. **It** seems a bit improbable at first. But then legal firms are finding all sorts of ways of packaging cannabis in formats that appeal to different sorts of consumers. Walk into a marijuana dispensary and in addition to the shelves displaying glass jars of cannabis buds, and the cabinets of prerolled joints for novices, you will often see a refrigerator stocked with brightly coloured drinks bottles, and shelves piled high with plastic packs of chocolates. Cannabis enthusiasts have long experimented with different ways of ingesting the drug, from hash brownies to the Indian *bhong lassi*, a yogurty, ganja-infused drink. Now, legalization has allowed players with real expertise to enter the market. So far, Colorado has licensed more than 250 “infused product manufacturers,” or companies that take cannabis and turn it into tempting products that are impossible to find in the illegal market.
- The biggest in Colorado is a company called Dixie Elixirs, which makes a range of cannabis drinks, chocolates, and pills. The inside of the Dixie factory looks rather like the crystal-meth laboratory in *Breaking Bad*. But it owes as much to Willy Wonka as it does to Walter White. While some of the white-coated technicians are working with concentrated narcotics, others are stirring vats of molten chocolate or plucking aluminium bottles off an assembly line. Chuck Smith, the company’s chief financial officer, walks me around the factory, pausing to admire something called an Apeks Supercritical CO<sub>2</sub> Extraction Machine, a \$100,000 spaghetti of dials, wires, and metal cylinders that extracts the active ingredients from cannabis plants. Different parts of the factory put together cannabis-infused drinks, in flavours such as Watermelon Cream and Sparkling Pomegranate, and even such products as massage oils.



Is the warning label clear enough? Dixie Elixirs’ colourful products appeal to customers who would not normally buy marijuana.



9. Like the rest of the industry, the marijuana edibles market has become far more sophisticated since the recreational market was legalized. “Every year sees a quantum leap in technology. Five years ago we were in a small kitchen doing everything by hand,” says Smith. In 2014, the company moved into a 30,000-square-foot factory, where visitors can peer into the glass-walled mixing rooms. The rapid development of new methods of consuming cannabis—from drinks to chocolate bars to Dixie’s “dew drops,” a highly concentrated liquid form of the drug that can be absorbed under the tongue—shows the nimbleness of entrepreneurs in the legitimate business world in coming up with new ways to reach new customers. Just as lager was invented to persuade more women to drink beer and “light” cigarettes were developed to target health-conscious smokers, edible or quaffable cannabis products may well open up a new market of potential potheads who don’t like the idea of smoking a joint.
  
10. Dixie has made the most of the booming market, with revenues growing fivefold within the first six months of recreational weed being legalized. But as the firm’s profile has risen, it has had to counter accusations that its products are more dangerous than its customers realize. Although marijuana is an unusually safe drug—it seems to be as good as impossible to overdose, with no fatalities ever recorded—taking too much of it can be a nasty experience, causing attacks of paranoia that can last for hours. Edibles firms have been singled out for criticism because it is far easier to overindulge with **these products** than through smoking. Whereas the effects of a joint come on quickly, a chocolate bar or drink can take forty-five minutes to get the user high. A common mistake among first-timers is to have a nibble, feel no effect, and wolf down the rest—locking them into a prolonged, frightening experience from which they have no way out.
  
11. Maureen Dowd, a *New York Times* columnist, made **this mistake** on a reporting trip to Denver when she tucked into a chocolate bar that she later learned should have been shared among sixteen people. As she later wrote in the *Times*: “For an hour, I felt nothing. But then I felt a scary shudder go through my body and brain. I barely made it from the desk to the bed, where I lay curled up in a hallucinatory state for the next eight hours. . . . I was panting and paranoid, sure that when the room-service waiter knocked and I didn’t answer, he’d call the police and have me arrested for being unable to handle my candy. . . . As my paranoia deepened, I became convinced that I had died and no one was telling me.”
  
12. A handful of people have come off much worse. Levi Thamba Pongi, a nineteen-year-old exchange student from Congo who was studying in Wyoming, leaped to his death from the balcony of the Denver Holiday Inn after eating a marijuana cookie that was supposed to be divided among six people. According to his friends, an hour after

eating the cookie, he began speaking in French, throwing things around the hotel room, and trying to talk to a lamp. He then bolted from the room and threw himself off a balcony before they could stop him. Another man, Richard Kirk, was accused of shooting dead his wife after eating a marijuana cookie. Kirk pleaded guilty by reason of insanity.

13. Since **those tragedies**, Colorado has tightened up its rules on edibles, demanding clearer labelling and child-safe bottle tops. People in the edibles business point out that other products, notably alcohol, are far more dangerous and yet more loosely regulated. But pot companies have also realized that it is in their own interest to tread cautiously. “The thing that’s going to kill the industry is if [companies] do it wrong, and give the industry a bad name,” says Chuck Smith. Dixie’s original range of drinks, which come in cute little bottles smaller than a can of Coke, say in small letters on the side that they contain up to 7.5 servings. That strikes me as a very high dose for a bottle that contains barely seven gulps. Many customers seem to agree; Dixie has responded to demand with a new range of lower-dose drinks called Dixie One, which contain only 5 milligrams of tetrahydrocannabinol, or THC, the chemical in cannabis that gets you high, rather than the 75 milligrams that its strongest drinks contain.
14. I leave Dixie’s strange chocolate-drug factory feeling a bit more sceptical about the supposed harmlessness of cannabis. If a single chocolate bar or a few gulps of pomegranate drink can make you go temporarily crazy, it seems that the drug has evolved into something stronger than is commonly thought. Still, it is encouraging that market forces seem to be pulling firms such as Dixie in the direction of making milder ranges of their product, rather than pushing them toward developing ever-stronger versions. One thing is clear, though: however terrifying a cannabis cookie is to Maureen Dowd or to other potential consumers, it is a far scarier prospect for the cartels that currently deal marijuana in America. No organized crime group, so far as I know, is in the business of smuggling chocolate hash brownies. Legal cannabis firms, by contrast, are popularizing a new way of consuming drugs that could in time bring in millions of new customers who don’t like the idea of puffing on a bong but might be persuaded to try a THC-loaded drink. How will the cartels fare against these new, legal competitors, who outdo them in quantity, quality, and innovation?
- 15.

### **Anaphor questions**

What does each of the highlighted words/phrases in the text refer to? Underline your answer and connect it to the highlighted word/phrase using an arrow.

### General inference questions

10. What are 'edibles'?
11. What does 'quaffable' mean? What textual evidence could help you to figure out this answer?
12. What does it mean to 'wolf down' something? If you had never come across this phrase before, what information in Paragraph 10 could you have used to figure it out?
13. What does the word 'sceptical' mean? If you had never come across this word before, what information in Paragraphs 13-14 could you have used to figure it out?

### Cause and effect and contrasting questions

14. Write one cause and effect sentence and one contrasting sentence using information from Paragraphs 7 to 9. Write the sentences in your own words and use a suitable discourse marker for each sentence.
15. Write one cause and effect sentence and one contrasting sentence using information from Paragraph 10. Write the sentences in your own words and use a suitable discourse marker for each sentence.
16. Write one cause and effect sentence and one contrasting sentence using information from Paragraph 13. Write the sentences in your own words and use a suitable discourse marker for each sentence.
17. Write one contrasting sentence using information from Paragraph 11 and Paragraph 14. Write the sentence in your own words and use a suitable discourse marker.
18. Write one cause and effect sentence and one contrasting sentence using information from Paragraph 13. Write the sentences in your own words and use a suitable discourse marker for each sentence.

## Worksheet 4.3: Coming Full Circle: How Legalisation Threatens Drug Lords

Adapted from *Narconomics: How to run a drug cartel*, by Tom Wainwright (2016)

(Continues from Paragraph 14)

15. The vast American cannabis market remains the cartels' to lose. Americans burn their way through more than 3,000 tons of marijuana a year. Some is homegrown, and a little is imported from countries such as Canada and Jamaica. But for many years, the lion's share of that pot has come from Mexico. In 2011, the US National Drug Intelligence Centre estimated that the Mexicans supplied somewhere between 40 percent and 67 percent of all the pot consumed in the country.
  
16. Amid all the excitement in Denver, it is easy to forget that, as of 2015, only four of America's fifty states—Colorado, Washington, Oregon, and Alaska—have fully legalized cannabis. They are all smallish ones, too: their combined population is only about 5 percent of the national population. Cartels might struggle to compete with the legal cannabis industry in those four states, but for the time being the remaining 95 percent of Americans have to buy their weed on the black market. However, to the irritation of drug cartels and American police officers alike, legal marijuana has a habit of finding its way into neighbouring states. In places where the drug is still outlawed, consumers now have a choice between buying cannabis that is imported from Mexico or that which is smuggled in from American states where it is legal. How much illicit interstate trade goes on?
  
17. The legal market has become the black market for the rest of the United States. All you need is an ID proving you are over twenty-one years old to walk into a Colorado dispensary and buy up to a quarter of an ounce of marijuana. There is then little to stop you from driving over the border to states where cannabis is illegal. Police on the highways can do their best to intercept such traffic. "I'd guess we're seizing 10 percent or less," says Gorman, a highway patrol cop.
  
18. It is hardly surprising that legal weed is seeping out. Colorado marijuana is premium stuff. It doesn't have pesticides. Buy a pound of **it here** and you could double your money in Missouri or Iowa.
  
19. Illegal dealers are doing their best to cling on by serving niches that the legal market cannot reach. In Colorado, for instance, dispensaries have to close for the day at 7:00 p.m. So the evening shift still belongs to the black

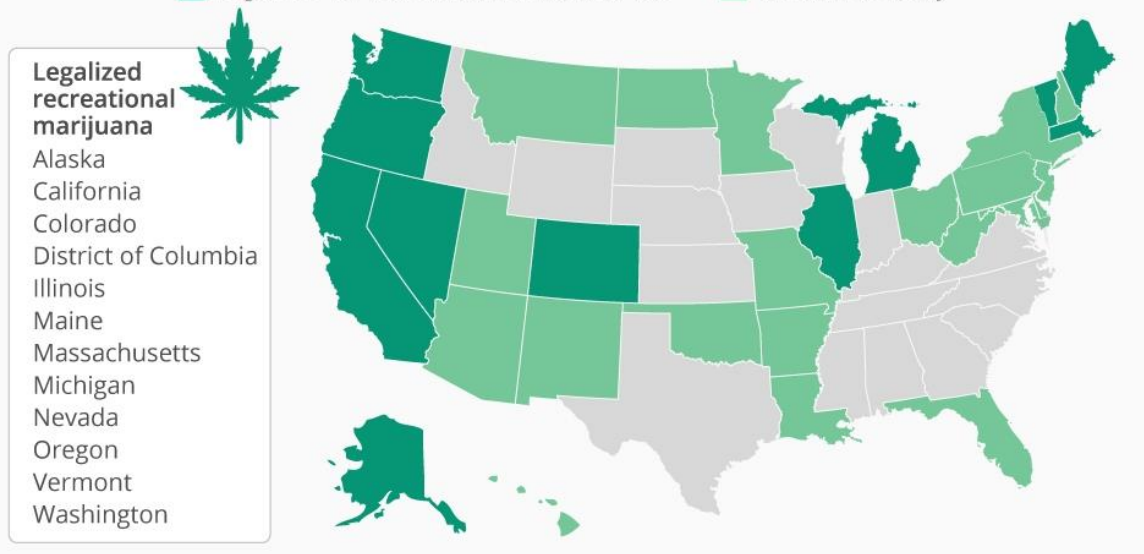
market. In any case, many existing drug-users will stick with their current supplier, if only out of habit, Gorman thinks. “There’s a myth about drug dealers that’s totally wrong. They’re very regular people. I might call you for marijuana because you’re a buddy of mine. If you’re a dealer, and I’m already buying dope from you, what changes?”

20. The thing that might change is the wholesale end of the market. It may be that Gorman is right, and that some chronic users will keep getting cannabis from their current dealer, out of habit or loyalty. But the big question for the drug cartels is where dealers like that get their own supply. In other words, will America’s black market in cannabis remain one in which Mexican weed can compete? Or will it turn into a “grey market,” in which illegal dealers buy weed through legal channels and make their money by selling it illegally—in states where it isn’t allowed, at times when it is banned, or to people under age twenty-one? The latter model is how the black markets in alcohol and tobacco have turned out, for instance. Visit any college campus on a Saturday night, and it is obvious that there is a thriving market in illicit alcohol. But underage drinkers don’t buy illegally brewed beer that has been smuggled in from Mexico. Instead, they buy booze that was made legally, and sold in an ordinary shop, but acquired illegally via a “dealer,” who in practice is probably an older brother or friend. Likewise, most illegal cigarettes are ones that were produced legitimately for one market, and diverted illegally to another market where cigarettes are subject to higher taxes. (By one estimate, more than half the cigarettes smoked in New York are smuggled in from other states for **this reason**.)

## Which States Have Legalized Marijuana?

Laws on recreational and medical marijuana use in the U.S.\*

■ Legalized for recreational & medical use    ■ Medical use only



Since the publication of Wainwright’s book, even more US states have legalised marijuana.

21. The only way that the cartels will be able to compete in this grey market is if they can beat the legal growers on price. How do they measure up? Back in the offices of Denver Relief, Ean Seeb, the boss, says that **the firm's** nursery can produce a gram of smokable marijuana for about \$2. That puts the company roughly in line with other established players in Colorado: most of Denver's **big producers** aim to produce a pound of cannabis for \$1,000, or about \$2.20 per gram. After tax, it retails for about \$11 to \$15 per gram in medical dispensaries, and more like \$16 to \$20 in recreational outlets, where taxes are higher.
22. On **that basis**, illegal Mexican pot looks pretty competitive. According to the White House annual drugs report, the average price of illegal cannabis in the United States is about \$15 per gram, or a little cheaper if bought in large quantities. Cannabis dispensaries in Denver say that illegal suppliers have been cutting their prices since the legal market was born, in order to retain clients. One retailer estimates that illegal marijuana is 20–30 percent cheaper than the store-bought variety. But that does not take the strength of the pot into account. According to the White House, the THC content of illegal cannabis averages only about 7 percent. **That** is pretty feeble compared with the stuff on sale in Colorado's legal marijuana emporiums, where plenty of strains advertise THC content of more than 20 percent. In other words, you would have to smoke almost three times as much Mexican marijuana to get the same effect that you would from a single dose of the Colorado variety. If they want to stay competitive, then cartels will have to offer their inferior product for less than one-third of the price of the legal stuff.
23. **Their** ability to do that varies from state to state. A basic law of drug smuggling is that the further the product has to travel, the more expensive it becomes. Every step of the contraband's perilous journey involves someone taking a risk, for which they expect to be compensated. So just as heroin becomes gradually more expensive as it makes its way from Afghanistan to Europe, illegal cannabis becomes pricier the further it has travelled from the Mexican border.
24. Adjusting for purity, smuggled cannabis from Colorado or Washington came out cheaper than Mexican weed in forty-seven of the forty-eight mainland states. Only in Texas, right on Mexico's doorstep, is **the cartels' product** a better value.
25. The potential loss of most of the US cannabis market would represent a serious blow to Mexico's criminal gangs. IMCO reckons that the cartels earn about \$2 billion a year from selling marijuana in the United States. According to IMCO's calculations, the spread of legal cannabis from Colorado and Washington to other states could mean that Mexico's cartels lose nearly three-quarters of their current business, cutting their cannabis revenues to \$600

million. And **those calculations** were done before other states started to legalize. For every new place in the United States that starts growing legal cannabis on a large scale, the illegal market will shrink, and the smuggled cannabis that feeds **it** will increasingly come from American states, not from Mexico.

### **Anaphor questions**

What does each of the highlighted words/phrases in the text refer to? Underline your answer and connect it to the highlighted word/phrase using an arrow.

### **General inference questions**

19. What is the myth about drug dealers to which the author refers?
20. What can we infer about the cost of cigarettes in New York? What textual evidence could help you to figure out this answer?
21. Based on the information in Paragraph 21, what is one of the biggest challenges faced by legal marijuana dispensaries in the US?
22. Where is most of the heroin used in Europe manufactured?

### **Cause and effect and contrasting questions**

23. Write one cause and effect sentence and one contrasting sentence using information from Paragraph 18. Write the sentences in your own words and use a suitable discourse marker for each sentence.
24. Write one cause and effect sentence and one contrasting sentence using information from Paragraph 21. Write the sentences in your own words and use a suitable discourse marker for each sentence.
25. What difference can we expect in terms of the source of cannabis when comparing cannabis users in Washington and those in Texas? Give your answer as a contrasting sentence.
26. Write one cause and effect sentence using information from Paragraph 22 and one cause and effect sentence using the information from Paragraph 24. Write the sentences in your own words and use a suitable discourse marker for each sentence.