

Investigating the relationship between reading comprehension and semantic skill in children with English as an Additional Language: a focus on idiom comprehension

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Abstract

The current study builds upon previous UK EAL research by i. sampling EAL children who do not struggle with reading comprehension and ii. investigating participants' semantic ability at the word, sentence and discourse levels.

Four groups of 9-10 year old children were recruited: EAL Average Readers; EL1 Average Readers; EAL Above Average Readers; EL1 Above Average Readers. At the word level, EL1 participants significantly outperformed EAL participants on 2 out of 6 vocabulary measures administered (TOWK Expressive Vocabulary and Multiple Contexts). The results of an idiom comprehension measure (ICM) showed that EAL and EL1 participants did not differ in their ability to engage in semantic analysis or in inference from context (semantic ability at the sentence and at the discourse levels respectively). The EL1 Above Average group alone were able to use prior experience with English language idioms to their advantage when answering the ICM. For the EAL participants, relationships between performance on the TOWK Expressive Vocabulary and Multiple Contexts and on the ICM are stronger than for the EL1 participants. The relationships between performance on the ICM and on a measure of reading comprehension are also stronger for EAL than for EL1 participants.

These results suggest the following: i. it is important to develop the vocabulary abilities of EAL children, as the relationships between word-level semantic skills and sentence/discourse level semantic skills are stronger for EAL children than for their EL1 peers; ii. the relationships between the knowledge and skills measured by the ICM (i.e. prior knowledge of English language idioms; semantic analysis; inference from context) and reading comprehension are stronger for EAL than for EL1 children, suggesting the importance of a comprehensive approach to the semantic development of EAL children.

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Abbreviations (in alphabetical order)

ALSPAC: the Avon Longitudinal Study of Parents and Children

BAS: The British Ability Scale

BERA: British Educational Research Association

BICS: Basic Interpersonal Communication Skills

BPS: British Psychological Society

BPVS: British Picture Vocabulary Scale

CALP: Cognitive Academic Language Proficiency

CELF-R: Clinical Evaluation of Language Fundamentals -Revised

C of E: Church of England

CUP: Common Underlying Proficiency

EAL: English as an Additional Language

EID: English Indices of Deprivation

EL1: English as a First Language

ELL: English Language Learners

EROWPVT: Expressive and Receptive One Word Picture Vocabulary Tests

ESL: English as a Second language

EYFS: Early Years Foundation Stage

FSM: Free School Meals

GC: Good Comprehender

GCSE: General Certificate of Secondary Education

GEM: Global Elaboration Model

ICM: Idiom Comprehension Measure

IMD: Index of Multiple Deprivation

L1: First Language

L2: Second Language

LBQ: Language Background Questionnaire

LCTS: Listening Comprehension Test Series

LLD: Language Learning Disorder

LSOA: Lower Super Output Area level

MAT: Matrix Analogies Test

NALDIC: National Association for Language Development in the Curriculum

NARA-R: Neale Analysis of Reading Ability – Revised

NOC: Novel Opaque idiom in Context

NOI: Novel Opaque idiom in Isolation

NTC: Novel Transparent Idiom in Context

NTI: Novel Transparent idiom in Isolation

OFSTED: Office for Standards in Education

PC: Poor Comprehender

PIRLS: Progress in International Reading and Literacy Study

PLASC: The Pupil Level Annual School Census

PLBQ: Parental Language Background Questionnaire

Ravens SPN: The Ravens Standard Progressive Matrices

ROC: Real Opaque idiom in Context

ROI: Real Opaque idiom in Isolation

RTC: Real Transparent idiom in Context

RTI: Real Transparent idiom in Isolation

SDRT: Stanford Diagnostic Reading Test (SDRT, Karlsen and Gardner, 1994)(SDRT, Karlsen and Gardner, 1994)(SDRT, Karlsen and Gardner, 1994)(SDRT, Karlsen and Gardner, 1994)

SEN: Special Educational Need

SWRT: Single Word Reading Test

TLC-Expanded: Test of Language Competence, Expanded edition

TOWK: Test of Word Knowledge

TOWRE PDE: Test of Word Reading Efficiency Phonemic Decoding Efficiency

UK: United Kingdom of Great Britain and Northern Ireland

WAIS-III: Wechsler Adult Intelligence Scale – Third Edition

WASI: Wechsler Abbreviated Scale of Intelligence

WISC-III: Wechsler Intelligence Scale for Children – Third Edition

WRAT3: Wide Range Achievement Test 3

WRMT-R: Woodcock Reading Mastery Tests – Revised

YARC: York Assessment of Reading for Comprehension

Chapter 1: Introduction

1.1 Background and rationale for the research focus

Despite increasing numbers of children who speak English as an Additional Language (EAL) in UK schools (c.f. section 1.3), relatively few studies have specifically investigated these children's English language abilities. Those studies which have been carried out have tended to focus on 2 areas: reading comprehension and vocabulary (e.g. Hutchinson, Whiteley, Smith & Connors, 2003; Burgoyne, Kelley, Whiteley & Spooner, 2009). While these studies have provided valuable information, they have ultimately portrayed a rather simplistic image of the reading comprehension and semantic skills of UK EAL children. Where reading comprehension is concerned, the prevailing view in the UK EAL research is that EAL children are a homogenous, underachieving group in terms of their reading comprehension ability. There is no suggestion that EAL children may vary in their ability to comprehend English text. In terms of semantic ability, only word-level measures of receptive and expressive vocabulary have been considered in previous UK literature. Semantic ability beyond the word level i.e. at the sentence or at the discourse level has not been examined. The rationale for the current study is based on an argument that previous UK EAL literature, while an important first step, fails to acknowledge the complexity of the comprehension and semantic skills of EAL children.

The research central to this thesis acknowledges this complexity. This research is strongly grounded in the UK EAL literature, but builds upon this literature in 2 main ways. Firstly, the current study moves away from the prevailing view in UK research that EAL children are a homogenous, underachieving group in terms of their reading comprehension ability by

sampling groups of 9-10 year old EAL and native English speaking (EL1) children who have Average and Above Average reading skills. Secondly, the current study provides a broader view of the semantic skills of these children than has been provided in previous research by investigating these children's semantic abilities at the word, sentence and discourse levels. EAL children form a significant, growing proportion of the UK's school-age population. The current study contributes to knowledge by enhancing our understanding of their reading comprehension and semantic skills beyond what has been provided by previous research.

1.2 Definition of terms

An EAL learner is the term usually used in the UK to describe children who do not speak English as a native language but who are being educated through the medium of English (e.g. Burgoyne et al., 2009). This term includes children with a wide range of English language skill, from those who are new to English to those who have considerable experience of the language. In North America, the terms English Language Learners (ELLs) and English as a Second Language (ESL) are used to describe these children. Throughout this thesis, a number of North American studies are examined. To avoid confusion, the term EAL will be used throughout this thesis to describe children for whom English is not the language of the home, but who are receiving education through the medium of English, whether in the UK or in North America. The term EL1 is used throughout this thesis to describe children who are monolingual speakers of English.

1.3 Background statistics

NALDIC (The National Association for Language Development in the Curriculum) has compiled data from The Pupil Level Annual School Census (PLASC) which illustrates that

the percentage of EAL-speaking children in English primary schools has risen steadily in recent years, from 14.4% in 2008 to 16% in 2010 to 17.5% in 2012. While the percentage of secondary school children in England who speak EAL is lower (with 12.9% of secondary-age children speaking EAL in 2012) a rising trend is also visible (NALDIC, 2012d). This trend of increasing proportions of children who speak EAL in England's schools shows no sign of abating.

In the January 2012 school census, just under 300 different languages were recorded as being spoken by children attending England's schools, with Panjabi, Urdu, Bengali and Polish being the most commonly spoken (at 1.7%, 1.6%, 1.3% and 0.8% of the entire school population respectively). Eighteen languages were spoken by more than 10,000 speakers (NALDIC, 2012c). In addition to this diversity in terms of EAL L1s, the January 2012 school census showed that the distribution of EAL learners throughout England is extremely uneven. In Inner London, 55.5% of primary school children spoke EAL. The greatest concentration of EAL learners was found in Tower Hamlets, where 77.3% of primary-age children were EAL learners. At the other extreme, 1.8% of pupils in Cornwall and 2.1% of pupils in Dorset were EAL learners (NALDIC, 2012a). These figures show, however, that EAL learners are on school rolls throughout the country, even in very rural areas. NALDIC points out that nearly all teachers will encounter EAL learners at some point during their teaching careers (NALDIC, 2012b). It is crucial, therefore, to gain a more nuanced understanding of the reading comprehension and semantic skills of UK EAL children than has been provided by previous studies.

1.4 Thesis overview

This thesis is split into 7 separate chapters.

Chapter 1: Introduction

This short chapter provides rationale for the study described in this thesis, defines some of the main terms which will be used and provides some background statistics which describe England's EAL children. This chapter also provides an overview of the chapters in the thesis.

Chapter 2: Selected Literature Review

This wide-ranging chapter motivates the study upon which this thesis is based by providing a discussion of the academic achievement of EAL children in the UK, the theoretical framework for the current study and a critical discussion of the research literature which has motivated the study.

Chapter 3: Methodology

Chapter 3 provides the aims and research questions for the study in addition to detailed information regarding every aspect of the preparation and execution of the study's Screening Phase and Main Phase.

Chapter 4: Results (I) Analysing Background Data

This chapter provides analyses of data which is not directly related to the study's research questions but which provides information relating to the linguistic and personal backgrounds

of the participants in the Screening and Main Phases of this study. While the results of these analyses are provided, there is no discussion of these results at this stage (c.f. Chapter 6).

Chapter 5: Results (II) Answering the Research Questions

Chapter 5 describes the analyses which were carried out in order to answer the study's 4 research questions. As is the case in Chapter 4, while the results of these analyses are provided, these results are not discussed until Chapter 6.

Chapter 6: Discussion

In the Discussion chapter, a detailed discussion of the study's findings is provided. The structure of this chapter is based upon the 2 main ways in which the current study builds upon previous UK EAL research: by investigating groups of EAL children who do not struggle with reading comprehension and by administering a broader range of semantic measures than has been used in previous UK EAL studies.

Chapter 7: Conclusion

In this chapter, the study's key findings are described. The study's limitations are discussed and some suggestions for further research are provided. Finally, 4 main arguments made on the basis of the study are provided.

Chapter 2: Selected Literature Review

This chapter presents data, theory and research which supports and motivates the current study. In the interests of brevity, only material which is directly relevant to this study has been included.

2.1 The academic achievement of children learning EAL in England

From the Early Years and Foundation Stage (EYFS) to Key Stage 4, there is a trend for children who speak EAL to underachieve academically in comparison to their EL1 peers, particularly at the earlier stages of education. The Early Years Foundation Stage Profile is a wide-ranging assessment of children's physical, intellectual, emotional and social development. In 2011/12, 56% of children who speak EAL achieved the expected 'good level of development' on the Early Years Foundation Stage Profile in comparison to 65% of their EL1 peers (DFE, 2012b).

Where Key Stages 1 – 4 are concerned, the most recent national data regarding the academic achievement of EAL and EL1 students is from the year 2010/11. Data from 2010/11 shows that at the end of Key Stage 1, the percentage of EL1 children achieving the expected level (Level 2 or above) in each of the 4 main elements tested (reading, writing, mathematics and science) was higher than that for EAL children. The biggest EL1/EAL attainment gap at Key Stage 1 was in Science, with 90% of EL1 children achieving the expected level in this subject compared to 82% of EAL children. An encouraging sign, however, is that for each of the 4 main elements, the EL1/EAL attainment gap has been getting gradually narrower since 2007 (DFE, 2011b).

Where Key Stage 2 results are concerned in 2010/11, a similar overall trend is visible. For each of the 3 main elements tested (reading, writing and mathematics), the percentage of EL1-speaking children who achieved the expected level (Level 4 or above) was higher than that for EAL children. These 3 main elements are collapsed into 2 subjects: English and mathematics. In English, while 82% of EL1 children achieved level 4 or above, 77% of pupils who speak EAL achieved this expected level. In mathematics, the attainment gap is smaller: 81% of EL1 pupils achieved the expected level in comparison with 77% of EAL pupils. Between Key Stages 1 and 2, pupils are expected to make 2 levels of progress in English and mathematics. In English, 83% of EL1 children met this expectation in comparison to 88% of EAL children. In mathematics, 82% of EL1 children made 2 levels of progress in comparison to 86% of EAL children. These figures illustrate a positive trend in EAL children's academic development in primary school. In 2011, while EL1 children were outperforming EAL children in terms of attainment, EAL children were outperforming EL1 children in terms of the proportion who made the expected 2 levels of progress between Key Stages 1 and 2 in both English and mathematics (DFE, 2011c).

At Key Stage 4 (GCSE and Equivalent), 5 A* - C grades including English and maths is a commonly-used benchmark for good performance. In 2010/11, 58.5% of children who speak EL1 in comparison to 55.8% of children who speak EAL achieved this specific benchmark. However, the percentage of EAL-speaking children who achieved 5 A* - C grades overall (i.e. without the mandatory inclusion of English and maths) was 0.4% higher than that for those who speak EL1 (DFE, 2011a). These results suggest that while children with EAL do well in a broad range of subjects, they do not match the achievements of their EL1 peers in more traditional, academic subjects such as English and maths. This trend is reflected in the

English Baccalaureate results of EAL and EL1 groups. In 2010, the Coalition government introduced the English Baccalaureate as a measure which recognises where pupils have achieved a grade C or above in a range of academic subjects: English, mathematics, history or geography, the sciences and a language (DFE, 2012c). While 15.5% of pupils who speak EL1 achieved the English Baccalaureate in 2011/12, the percentage of pupils who speak EAL achieving this measure was lower, at 14.4%.

In terms of expected progress, the pattern seen at Key Stage 2 is mirrored at Key Stage 4, with higher proportions of EAL than EL1 children making expected progress in English and mathematics. 78.1% of children who speak EAL achieved the expected level of progress in English in comparison to 71.1% of children who speak EL1. In mathematics, 75.5% of pupils who speak EAL achieved the expected level of progress in comparison to 63.6% of children who speak EL1 (DFE, 2011a). 'Expected progress' is measured from a child's Key Stage 2 results in English and mathematics and is based on the assumption that a pupil achieving the expected level in English or mathematics at Key Stage 2 (i.e. Level 4) should achieve a minimum of Grade C at GCSE in that subject (DFE, 2010). In other words, if an EAL child has achieved a Level 4 or above in either English or maths at the end of primary school, they are more likely than an EL1 peer at the same Key Stage 2 Level to go on to achieve an A* - C grade in that subject at the end of Key Stage 4. This pattern suggests that EAL children who are doing well academically at the end of primary school are more likely than their EL1 peers to continue to do well until the end of Key Stage 4.

While the same cohort is not represented at each of the Key Stages above, these results are encouraging in terms of the academic development of EAL children during primary and secondary school. More EAL than EL1 children made the expected levels of progress in

English and mathematics between Key Stages 1 and 2, and 2 and 4. The progress made by EAL children during their school career is illustrated by the fact that in the EYFS, the proportion of children making the expected 'good level of development' is 8 percentage points higher for EL1 than for EAL children. By Key Stage 4, the proportion of children achieving the benchmark 5 A* to C grades including English and maths is only 2.7 percentage points higher for EL1 than for EAL learners. In addition, while more EL1 than EAL children achieved the 5 A* - C grades when English and mathematics are included, slightly more EAL than EL1 children achieved 5 A* - C grades in a broad range of subjects at Key Stage 4. Where EAL children continue to lag behind their EL1 peers, therefore, seems to be in traditional, academic subjects such as English and mathematics.

The work of Jim Cummins may elucidate the above trends. Cummins (e.g. 1984; 2008) outlines a theoretical framework for conceptualising L2 proficiency. This framework hinges on the distinction between what Cummins describes as basic interpersonal communication skills (BICS) and cognitive/academic language proficiency (CALP). BICS and CALP are described in terms of 2 intersecting continua. One continuum describes the amount of contextual support available during communication and the other describes the extent to which the communication is cognitively demanding. BICS are required by communication or language tasks which are more context-embedded and cognitively undemanding such as basic, day-to-day conversation. On the other hand, CALP is required by communication or language tasks which are more context-reduced and cognitively demanding.

The level of language proficiency required to engage with national curriculum assessments would certainly be classed as CALP. Cummins argues that while it is common for BICS to reach peer-appropriate levels within around 2 years, 5-7 years are required on average for

language minority pupils to reach peer-appropriate levels of CALP. By this rationale, if an EAL child's first significant exposure to English was when she entered school at age 4, while she may be expected to develop BICS by the age of 6-7, it may therefore take her until the age of 11 to 'catch-up' with her EL1 peers in terms of CALP. The decreasing EAL/EL1 gap in academic achievement from Key Stages 1 – 4 may be due, in part at least, to EAL children's developing CALP. It should be noted, however, that some UK studies suggest that even after an average of 10 years in UK education, some EAL teenagers' English vocabulary is significantly lower than that of their EL1 peers, suggesting that 5-7 years may in some cases be a conservative estimate for CALP development (c.f. Cameron, 2002).

A further issue to consider regarding the academic achievement of UK EAL students in comparison to their EL1 peers is ethnicity. In recent years, for example, there has been a trend across the key stages for pupils of Chinese, Indian, mixed White and Asian and Irish origin to reach the expected level of achievement at higher rates than the national average. Conversely, pupils of Pakistani and Black Caribbean origin have tended to underachieve (DFE 2011a). When considering these trends in light of a discussion of EAL, however, caution must be exerted. In national Department for Education statistics, EAL status and ethnicity are considered separately. It is therefore not clear from this data whether the trend, for example, for pupils of Indian origin to achieve at levels above the national average is equally true of children of Indian background who speak EL1 *and* those who speak EAL.

The academic achievement of children from different ethnic backgrounds is an important issue, and one which is linked to the achievement and progress of EAL children. The focus of the current study, however, is comparisons between children who speak EAL and EL1 on

a range of specific reading-related and semantic skills. Further analysis on the basis of ethnicity is beyond the scope of this small-scale project.

2.2 The theoretical framework for the current study

This governmental data provides broad information regarding EAL and EL1 children's performance in assessments conducted at the end of the national curriculum Key Stages. These sources also provide some information regarding the specific skills which are essential for academic success, such as reading skill. DFE (2011b; 2011c) suggest, for example, that in both Key Stage 1 and Key Stage 2 assessments, there is an overall trend that fewer EAL than EL1 children reach the expected levels of attainment in reading. This trend is corroborated by the PIRLS (Progress in International Reading Literacy Study) national report for England, 2006 (Twist, Schagen & Hodgson, 2007). The PIRLS report found that speaking EAL was negatively associated with all reading outcomes: overall reading achievement; reading for different purposes (for literary experience; to acquire and use information) and different reading processes (the ability to: focus on and retrieve explicitly stated information; make straightforward inferences; interpret and integrate ideas and information; examine and evaluate content, language and textual elements).

Skilled reading is a fundamental requirement for academic success, as it is through reading that children access the curriculum (Parliamentary Office of Science and Technology, 2009). While it is of concern that the DFE (2011b; 2011c) statistical first release documents and Twist et al. (2007) suggest that there is a trend for EAL-speaking children in England to underachieve on reading measures in comparison to their EL1 peers, it is important not to

assume on the basis of these documents that all EAL children struggle with reading. Following from Strand and Demie (2005) and Demie and Strand (2006) who suggest the importance of not viewing EAL learners as a homogenous group in terms of academic attainment, this study will investigate variation in the reading abilities of EAL-speaking children; a detailed examination of the reading skills of 9-10 year old EAL and EL1 children is a key element of this study. It is logical, therefore, that a model which describes the different skills involved in reading should be at the centre of the study design.

Numerous attempts have been made to model the many different aspects of the reading process, from the way in which words are pronounced from print (e.g. Seidenberg & McClelland, 1989; Coltheart, Curtis, Atkins & Haller, 1993; Plaut, McClelland, Seidenberg & Patterson, 1996) to the way in which text is comprehended (e.g. Gernsbacher, 1990; Kintsch, 1998; Garnham, 2001). As the focus of this study is not on the reading process itself, however, an in-depth discussion of these process-related models is beyond the scope of this thesis and will not be provided here. A more appropriate model for discussion in this review is The Simple View of Reading which was initially described by Gough and Tunmer (1986) and which was supported by Hoover and Gough (1990). The Simple View of Reading will form the basis of the theoretical framework for the current study. This model has been central in the way in which children's reading difficulties are currently conceptualized in terms of policy and practice in the UK (e.g. Parliamentary Office of Science and Technology, 2009).

The Simple View of Reading describes how the requirements for skilled reading comprehension are fulfilled. This model does not explain how the complexities of the reading process work, but rather makes 2 central claims: firstly, that these complexities can

be viewed in terms of decoding and linguistic comprehension and secondly, that while both decoding and linguistic comprehension are necessary for skilled reading comprehension, neither is sufficient in and of itself. For the purposes of the Simple View, decoding and linguistic comprehension are defined as follows:

For the simple view, skilled decoding is simply efficient word recognition: the ability to rapidly derive a representation from printed input that allows access to the appropriate entry in the mental lexicon, and thus, the retrieval of semantic information at the word level.

(Hoover and Gough, 1990, p.130)

In the simple view of reading, linguistic comprehension is the ability to take lexical information (i.e. semantic information at the word level) and derive sentence and discourse interpretations. Reading comprehension involves the same ability, but one that relies on graphic-based information arriving through the eye.

(Hoover and Gough, 1990, p.131)

An essential tenet of the Simple View is the idea that reading comprehension difficulties may stem from specific difficulties in either decoding or in linguistic comprehension individually, or from difficulties in both of these areas. Children whose reading difficulties stem primarily from a weakness in decoding are described as having dyslexia. Dyslexia affects an estimated 3-6% of the population. Children whose reading difficulties are specifically rooted in linguistic comprehension are described as having reading comprehension impairment. It is estimated that up to 10% of children may have poor reading comprehension. It is also

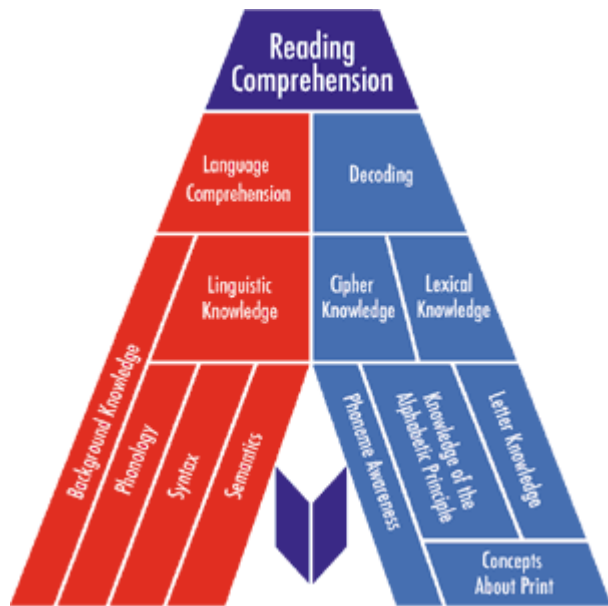
possible for children to have difficulties in both decoding and linguistic comprehension (Parliamentary Office of Science and Technology, 2009).

2.2.1 The Cognitive Foundations for Learning to Read: A Framework

While the Simple View in its original form provides a clear, elegant framework for understanding the main necessary components for skilled reading comprehension, subsequent authors have sought to develop this model in a number of ways. For example, Carver (1998) refined the Simple View formula, Proctor, Carlo, August & Snow (2005) aimed to gain deeper insight into the factors involved in Hoover and Gough's (1990) conceptualization of decoding (by including a real word reading measure) and linguistic comprehension (by including an expressive vocabulary measure, and Joshi and Aaron (2000) and Johnston and Kirby (2006) investigated whether the predictive power of the model would be improved by the addition of a naming-speed component.

The current study focuses on the relationship between semantic skill and reading comprehension in groups of EAL and EL1 children with varying reading skills. As such, it was important that the theoretical framework for this study should support and motivate a detailed investigation of this issue. The Cognitive Foundations for Learning to Read: A Framework (hereafter referred to as the A-frame) (Southwest Educational Development Laboratory [SEDL], 2010) is a development of the Simple View which specifies which particular abilities contribute to the linguistic comprehension and decoding aspects of the model. Figure 1 illustrates how the A-frame builds upon the Simple View by specifying the main skills which contribute to decoding and linguistic comprehension (referred to here as 'language comprehension').

Figure 1 The A-Frame



The main strength of the A-Frame, with regard to its appropriateness as a theoretical framework for the current study, is the way in which the various areas of skill and knowledge which contribute to reading comprehension are specified. Of particular relevance to the current study is the conceptualization of how semantic skill contributes to linguistic knowledge which in turn contributes to language comprehension and finally to reading comprehension. Each of the aspects of the A-Frame is further deconstructed on the SEDL website. Semantics, for example, is described as operating at three distinct levels: the morphology level; the vocabulary level and the sentence/discourse level. The current study will specifically investigate the semantic skill of participants at the vocabulary and at the sentence/discourse levels.

Two main queries may be made regarding the appropriateness of the A-frame as the theoretical basis for this study. Firstly, as the A-Frame has not yet been widely used in the

literature, its validity has not yet been proven. However, the A-frame's usefulness in explaining the factors which contribute to the reading comprehension of EAL children has been highlighted (Geva, 2008). Secondly, the precise relationships between the individual components of the A-Frame (e.g. the exact nature of the contribution of 'semantics' to 'language comprehension) are not specified in this model. However, the A-frame is intended, not as a process model, but rather as an explanatory framework which outlines the various aspects of knowledge which contribute to skilled reading comprehension.

It is important to clarify the relationship between the current study and its theoretical framework. The aim of this study is not to assess the appropriateness of the A-frame for use with UK EAL children. Furthermore, it is not argued that other models of reading are unsuitable for use with EAL children. Rather, the A-frame will be used as a framework which motivates and supports the current study (c.f. section 2.6).

2.3 The UK EAL literature

Burgoyne et al. (2009, p.7) argue that "EAL children experience difficulties with comprehension relative to their monolingual peers, and that these difficulties are not a consequence of poor decoding skills but are more likely to be related to weaker vocabulary." Inherent in this statement is an acceptance of the idea, central to the A-frame, that while good decoding is necessary for successful reading comprehension, it is not sufficient. Despite good decoding, a lack of ability in one or more of the skills contributing to the language comprehension aspect of the A-Frame (e.g. vocabulary) may inhibit reading comprehension. The following discussion will provide a critical examination of the extent to which Burgoyne's statement is supported by the UK EAL literature. This discussion identifies 2

main issues which warrant further investigation (c.f. section 2.3.4). A description of how the current study will address these 2 issues will be provided in sections 2.4.1 and 2.5.2.

2.3.1 The comprehension skills of UK EAL children

A small body of research has investigated the reading comprehension skills of UK EAL children. The 8 articles which have to some extent investigated this area are: Beech and Keys (1997); Frederickson and Frith (1998); Rosowsky (2001); Hutchinson et al. (2003); Stuart (2004); and Burgoyne and colleagues (2009; 2011a; 2011b). Each of these studies compares the reading comprehension skills of EAL children to the reading comprehension skills of a group of EL1 children of the same age.

Burgoyne et al.'s first claim is that, "EAL children experience difficulties with comprehension relative to their monolingual peers" (Burgoyne et al., 2009, p.7). The extent to which each of these 8 UK EAL studies supports this claim deserves close examination.

Rosowsky (2001) reported that a group of 11-12 year old EAL students (all with Mirpuri Panjabi as the L1) scored below a group of EL1 children on the Comprehension aspect of the NARA – R (Neale, Christophers & Whetton, 1989). The format of the NARA-R requires children to read passages of increasing complexity aloud and to answer orally-administered comprehension questions based on these passages. Testing stops when the child has made a certain number of word reading errors in a passage. The EAL group read more NARA-R passages than the EL1 group, making their lower comprehension scores particularly striking. This result should be interpreted with caution, however. Only 6 EAL and 6 EL1 children participated in this study. In addition, while the author states that there is a "significant difference" (Rosowsky, 2001, p. 64) between groups in terms of NARA-R Comprehension

score, he does not actually specify what statistical tests (if any) were used or what the results are. The range of scores in each group is also large. It is difficult, therefore, to accept these findings as reliable. In the same vein, a group of 12 EL1 7 year olds in Stuart (2004) scored significantly above a group of 63 EAL age-matched children (the majority of whom spoke Sylheti) on the comprehension aspect of the second British edition of the NARA-R (Neale, 1997) at the .01 level (no effect sizes are provided). Again, however, this result should be interpreted with caution due to the unequal group sizes.

Both Frederickson and Frith (1998) and Beech and Keys (1997) report patterns similar to those found in Rosowsky (2001) and Stuart (2004) but present more appropriate samples for statistical analysis. Frederickson and Frith (1998) report that on the NARA-R (Neale, 1997), 50 10-11 year old EAL children (all of whom spoke Sylheti as the L1 and who were reported as fluent English speakers) scored significantly below an age-matched group of EL1 speakers at the .01 level (no effect sizes are provided). It is worth noting here, however, that the EAL group was still within the average range (i.e. 1 standard deviation of the standardisation mean) on this measure. Beech and Keys (1997) reported that on the Suffolk Reading Scale (Hagley, 1987), a group of 40 EAL 7-8 year olds (who spoke a range of South Asian languages as L1s) scored significantly below an age-matched group of 29 EL1 children at the .05 level (no effect sizes are provided). This measure requires participants to silently read incomplete sentences and to choose which out of 5 words should be inserted therein. The EAL learners mean scores were greater than 1 standard deviation below what would be expected for their chronological age.

Hutchinson et al. (2003) is pivotal in that it was the first study to examine literacy-related outcomes for UK EAL children longitudinally. These authors tested 43 EAL children (who

spoke a range of south Asian languages as the L1) and 43 age-matched EL1 children on a battery of measures in Years 2 (6-7 years old), 3 (7-8 years old) and 4 (8-9 years old). At each point in time, the EL1 group outperformed the EAL group on reading comprehension which was tested by Form 1 of the NARA-R (Neale, 1997) ($\eta^2 = .165$). While each group made significant progress from Years 2-3 and Years 3-4, there was no significant interaction between school year and language group. This finding suggests that while the EAL children do progress in reading comprehension from year to year, they do not close the gap with their EL1 peers. The EAL group in this study exhibits a 1 year developmental lag in NARA-R reading comprehension. The authors argue that this finding is likely to be conservative, however, due to the EAL children having completed more NARA-R passages than the EL1 group. A feature of the NARA-R is that comprehension is linked to word reading accuracy: more proficient word readers will typically read a greater number of passages than less proficient word readers, and will therefore receive more opportunities to gain marks on comprehension questions.

Hutchinson et al. (2003) argue that because reading comprehension measures such as the NARA-R are confounded by decoding ability, measures of listening comprehension provide a “truer” measure of a child’s linguistic comprehension skill (Hutchinson et al., 2003, p.22).

As such, the participants in this study were also tested on a measure of listening comprehension at each of the 3 time points: an audio-recorded version of the first 4 passages of Form 2 of the NARA-R. Again, the EL1 group outperformed the EAL group at each time point ($\eta^2 = .40$), and again, both groups made significant progress between each school year. However, the EL1 group made significantly more progress than the EAL group between Years 2-3. In addition, a 2 year developmental lag was visible in the performance of the EAL

group on this measure, supporting the authors' argument that the EAL group's presentation of a 1 year developmental lag in NARA-R reading comprehension was a conservative estimation of their reading comprehension skill in comparison to that of their EL1 peers.

In a very similar vein to Hutchinson et al. (2003), Burgoyne et al. (2009) tested a group of 46 7-8 year old EL1 children and an age-matched group of 46 EAL participants (all of whom were speakers of South Asian languages) on the NARA-R (1997). The authors found that the EAL participants completed significantly more texts than the EL1 participants before being discontinued for lack of word-reading accuracy. As such, Burgoyne et al. (2009) entered participants' NARA-R accuracy scores as a covariate when analysing the comprehension scores. The results of these analyses show that the EL1 group scored significantly higher than the EAL group on the comprehension aspect of the NARA-R ($\eta^2 = .15$). The authors do not provide information, however, regarding the extent of the EAL group's comprehension delay. Like in Hutchinson et al. (2003), the first 4 passages of Form 2 of the NARA-R were administered to participants as a listening comprehension measure in addition to levels B and C of the Listening Comprehension Test Series (LCTS, Hagues, Siddiqui & Merwood, 1999). The EL1 group significantly outperformed the EAL group on the former ($\eta^2 = .07$); the extent of the EAL delay is again not specified. However, the groups did not differ significantly on the LCTS.

Burgoyne, Whiteley and Hutchinson (2011a) also carried out a longitudinal study which tested the reading comprehension of 39 EAL participants (all of whom spoke South Asian languages as the L1) and 39 EL1 participants between Year 3 (when they were 7-8 years old) and Year 4 (when they were 8 – 9 years old) using the NARA-R (1997). With reading comprehension as the dependent variable, there was initially no significant main effect of

language group. When the accuracy aspect of the NARA-R was controlled, however, the main effect of language group became highly significant with the EL1 participants outperforming the EAL participants on reading comprehension in Year 3 ($\eta^2 = .13$) and in Year 4 ($\eta^2 = .30$). While both the EAL and EL1 groups made significant progress in reading comprehension between Years 3 and 4, the EL1 participants made significantly greater progress than the EAL participants. Where listening comprehension is concerned, Burgoyne et al. (2011a) administered Form 2 of the NARA-R as a listening comprehension measure, as in the earlier (2009) study. There was a main effect of language group with the EL1 group significantly outperforming the EAL group in both Year 3 and 4 ($\eta^2 = .06$) (again, the extent of this EAL delay was not specified). Both groups made the same, significant amount of progress between Years 3 and 4.

In Burgoyne, Whiteley and Hutchinson (2011b), 16 EAL children (all of whom were speakers of South Asian languages) and 16 EL1 children were matched for word reading accuracy chronological age and gender. The EL1 children significantly outperformed the EAL children on the NARA-R Comprehension ($\eta^2 = .20$). In addition, both groups were tested on the 'Gan' fictional world paradigm (originally developed by Barnes, Dennis & Haefele-Kalvaitis, 1996), a reading comprehension test which controls for background knowledge and investigates both overall text comprehension in addition to performance on four separate question types: literal content; simile comprehension; coherence inferences and elaborative inferences. On overall comprehension, the EL1 children significantly outperformed the EAL children ($\eta^2 = .39$). When separate question-types were analysed, it was found that while the EL1 children significantly outperformed the EAL children on both literal content ($\eta^2 = 0.16$) and simile questions ($\eta^2 = .27$). However, the two groups

performed equally well on both types of inference question. This finding that the EAL learners in Burgoyne et al. (2011b) do not differ from their EL1 peers on measures which test inferencing-skill contrasts the trend found in the PIRLS report. Here, having EAL was negatively associated with all reading outcomes, including inferencing skill (Twist et al., 2007).

Burgoyne's assertion, "EAL children experience difficulties with comprehension relative to their monolingual peers" (Burgoyne et al., 2009, p.7) appears to be broadly supported by these 8 UK EAL studies. However, the above examination suggests that this story may not be quite as simple as it initially appears.

Burgoyne et al. (2011b) suggest that while the EAL participants in their sample experienced difficulty in comparison to their EL1 peers in answering literal questions and questions which required interpretation of a simile, they did not experience such relative difficulties in answering questions which required them to make inferences. This finding suggests that the EAL students in this study do perform equally to their EL1 peers on some comprehension-related skills. However, results published in the PIRLS suggest that EAL learners in England underachieve in comparison to their EL1 peers on all aspects of comprehension, including inferencing (Twis et al., 2007). The ability of EAL learners to engage in inferencing strategies, therefore, requires further investigation (c.f. section 2.5.2).

The issue of test bias is also raised, particularly in Burgoyne et al. (2009). In this study, while the EL1 group scored significantly above the EAL group on a listening comprehension version of the NARA-R, the groups did not significantly differ on the LCTS. This finding suggests that particular measures may be relatively more difficult for EAL than for EL1

learners. The authors discuss some potential reasons for this discrepancy, and argue that test differences in terms of question format and the nature of the stimulus they present may have been contributing factors. The open-ended question format of the NARA-R, they argue, may be more difficult for EAL children than the multiple-choice question format employed by the LCTS (c.f. Spooner, Baddeley & Gathercole, 2004). In addition, Burgoyne et al. (2009) argue that the more academic, decontextualised language used by the NARA-R may have been less accessible to the EAL learners in their study than the more basic, day-to-day language employed in the LCTS (c.f. Cummins, 1984; 2008). These factors should be borne in mind when considering how test-choice may influence EAL learners' outcomes.

A notable finding in Frederickson and Frith (1998) was that while the EAL participants scored significantly below their EL1 peers on the comprehension aspect of the NARA-R, they did score within the average range on this measure. A feature of the EAL sample in this study is that they are described as "fluent English speakers" (Frederickson & Frith, 1998, p.125). In other words, the EAL children in this study are no longer receiving language support services in order to develop their English language abilities. None of the other studies above provide any information as to the English language proficiency of EAL participants. It cannot be argued on the basis of the information provided in Frederickson and Frith (1998) that the relatively developed English language skills of the EAL participants caused their reading comprehension scores to be within the normal range. However, the question of the relationship between English language proficiency and academic outcomes for EAL learners is raised here.

2.3.1.1 The comprehension skills of UK EAL children: summary

On the one hand, the 8 studies above do appear to support Burgoyne's assertion that EAL children experience comprehension difficulties in comparison to their EL1 peers. On the other hand, the suggestions: that these children may not experience difficulties with all aspects of comprehension; that they may find some test-types relatively more difficult than their EL1 peers and that English language proficiency may affect academic outcomes for EAL children, hint that the situation is more complex than it may initially appear. As such, the first main issue raised by the UK EAL literature is the question of whether *all* EAL children in the UK struggle with reading comprehension in comparison to their EL1 peers. This issue will be discussed in further detail in sections 2.4 and 2.4.1 and will form a central theme of the current study.

2.3.2 The decoding skills of UK EAL children

Referring to the trend for children in the UK who speak EAL to experience comprehension difficulties, Burgoyne et al. (2009, p.7) argue "that these difficulties are not a consequence of poor decoding skills". If Hoover and Gough's definition of 'decoding' as "efficient word recognition" is used (Hoover & Gough, 1990, p.130), Burgoyne's statement seems generally supported by these 8 UK EAL studies, all of which employ at least one measure of word reading. In Burgoyne et al. (2011b), for example, the 7-8 year old EAL and EL1 groups who were matched on word reading accuracy as measured by the Reading Decision Test (RDT, Baddeley, Gathercole & Spooner, 2003) differed in terms of reading comprehension as measured by the NARA-R Comprehension.

The measures used to investigate the word reading skills of participants in these studies are of 2 main types. The British Ability Scale single word reading (BAS, Elliott, Murray & Pearson, 1983) and the Wide Range Achievement Test 3 (WRAT3, Wilkinson, 1993) require participants to read single words in the absence of context while the Accuracy component of the NARA-R measures participants' accuracy in reading individual words which are part of extended text.

In Stuart (2004), no significant differences between 7 year old EAL and EL1 groups were found on either the BAS single word reading or on the Accuracy component of the NARA-R. Likewise, the 7-8 year old EAL and EL1 participants in Burgoyne et al. (2009) did not differ on the WRAT3 (Wilkinson, 1993) or on the NARA-R Accuracy. The 7-8 year old EAL and EL1 participants in Beech and Keys (1997) did not differ significantly on the BAS single word reading.

Hutchinson et al. (2003) provides information regarding the developing NARA-R Accuracy scores of groups of EAL and EL1 children as they progress from Years 2 – 4 in school. Both the EAL and EL1 groups made significant progress on this measure between each school year. In addition, there was no significant effect of Group and no significant interactions, showing not only that the EAL and EL1 groups do not differ in terms of NARA-R Accuracy in either Year 2, 3 or 4 in this sample but also that they are progressing on this measure at a similar rate.

Two of these 8 UK EAL studies suggest that EAL learners outperform their EL1 peers on measures of word reading. Rosowsky (2001) reported a “significant difference” in the score of the 11-12 year old EAL and EL1 pupils in his study on the Accuracy component of the

NARA-R, with higher scores being obtained by EAL pupils. The details of any statistical analyses which led to this conclusion are omitted, however, so this conclusion should be treated with caution. In Burgoyne et al. (2011a), the EAL group significantly outperformed the EL1 group on the NARA-R Accuracy ($\eta^2 = .08$) and on that WRAT3 ($\eta^2 = 0.10$) in both Years 3 and 4. In addition, both the EAL and EL1 groups made a similar amount of progress between Year 3 and 4 on both the NARA-R Accuracy and on the WRAT3 suggesting that the EAL group maintain their lead on these measures relative to their EL1 peers during this time period.

A different pattern, however, is found in Frederickson and Frith (1998). In this study, the 10-11 year old EAL group scored significantly below their EL1 peers on the NARA-R Accuracy at the .05 level (no effect sizes are provided), though it should be noted that as with NARA-Comprehension, the EAL still scored within 1 standard deviation of what would be expected according to their chronological age. Distinct from the other UK EAL studies, Frederickson and Frith (1998) compared the EAL group's performance on the NARA-R Accuracy to that on the BAS single word reading, and found that when standard scores were used, these children scored significantly higher on the latter measure at the .01 level.

While Burgoyne et al.'s argument that any comprehension difficulties experienced by EAL children "are not a consequence of poor decoding skills" (2009, p.7) initially seems supported, it is important to examine the validity of this statement in more detail. The definition of 'decoding' requires examination. The difference between measures such as the NARA-R Accuracy and the BAS has already been pointed out. As the NARA-R Accuracy requires participants to read words which are presented in a story context, it is possible that participants may use semantic and/or syntactic cues in addition to graphophonic cues to help

them read these in-text words accurately. As the BAS stimulus words are presented out of context, participants will be unable to use syntactic cues to aid them in reading the stimulus words accurately. However, it is possible that participants may be able to recognise stimulus words from prior exposure and therefore not need to rely solely on graphophonic information in order to read the word correctly. A measure of ‘pure’ decoding, on the other hand, requires participants to read nonwords (c.f. Nation, 2005), a task which requires participants to make accurate mappings between orthography and phonology and which does not provide any semantic or syntactic clues.

2.3.2.1 The decoding skills of UK EAL children: summary

As such, Burgoyne’s assertion that UK EAL children do not experience difficulties in decoding in comparison to their EL1 peers is broadly supported when Hoover and Gough’s definition of ‘decoding’ is used. However, if decoding is defined purely as the ability to make accurate mappings between orthography and phonology, Burgoyne’s argument is too strong; no nonword reading measures were included in any of these studies. The current study will investigate the ‘pure’ decoding skills of 9-10 year old EAL and EL1 children by including a measure of nonword decoding.

2.3.3 The semantic skills of UK EAL children

Burgoyne et al. (2009, p.7) argue that any relative comprehension difficulties experienced by children who speak EAL in comparison to their EL1 peers “are... likely to be related to weaker vocabulary.” Two issues are relevant here: firstly, whether EAL children tend to score significantly below their EL1 peers on measures of vocabulary and secondly, whether

the strength of the relationship between vocabulary and comprehension differs between EAL and EL1 children.

Six of 8 UK EAL studies investigate vocabulary (Frederickson and Frith [1998] and Rosowsky [2001] are the exceptions). In addition, Cameron (2002) and Mahon and Crutchley (2006) compare the receptive vocabulary skills of groups of EAL and EL1 children in the UK. In these studies, vocabulary is conceptualised as either receptive or expressive. In terms of receptive vocabulary, Beech and Keys (1997) found that their 7-8 year old EL1 group significantly outperformed their age-matched EAL group at the .05 level on the British Picture Vocabulary Scale (BPVS, Dunn, Dunn, Whetton & Pintile 1982). Stuart (2004) found that the 7 year old EL1 participants in her study significantly outperformed their 7 year old EAL peers on an updated version of the same measure at the .01 level (BPVS II, Dunn, Dunn, Whetton & Burley, 1997) (no effect sizes are provided in either study). The BPVS is a measure of receptive single word vocabulary where the child must choose, from a choice of 4, the correct picture when a stimulus word is given. In both studies, the EAL participants scored more than 2 standard deviations below what would be expected for their chronological age on this measure.

Cameron (2002) suggests that EAL learners may lag significantly behind their EL1 peers in measures of receptive vocabulary beyond the primary years. In this study, 63 EAL students with a mean age of 14.5 years who spoke a range of (mostly South Asian) home languages were compared with 84 EL1 age-matched students on the vocabulary levels test (Nation, 1990). This test examines participants' ability to match words with definitions. The test consists of five 'levels': 2K; 3K; 5K; 10K and Academic. The 2K, 3K, 5K and 10K levels represent different word frequency bands; words in the 2K level are within the 2000 most

frequent words in the English language, for example. The Academic level contains words which are frequently found in academic texts at secondary and tertiary level. The EAL students in this study scored significantly below their EL1 peers on this measure at both the 3K and 5K levels. A particularly striking aspect of this finding is that the EAL students in this study had been in UK education for an average of 10 years, i.e. beyond the 5-7 years Cummins (e.g. 1984; 2008) suggested was necessary for EAL learners to catch up with their EL1 peers. No measures of expressive vocabulary were administered in any of these 3 studies.

Burgoyne et al. (2009; 2011b) tested the vocabulary skills of their 7-8 year old participants using the Expressive and Receptive One Word Picture Vocabulary Tests (EROWPVT, Brownell, 2000). The receptive component of this measure is similar in format to the BPVS-II. On this receptive component, the EL1 participants outperformed the EAL participants in both the earlier study ($\eta^2 = .15$) and in the later study ($\eta^2 = .27$). On the Expressive component of the EROWPVT, participants are presented with series of pictures and are required to name the object, action or concept depicted. Again, the EL1 participants significantly outperformed the EAL participants in both the earlier ($\eta^2 = .22$) and the later study ($\eta^2 = .45$).

Hutchinson et al. (2003) provides information regarding the progression of their participants' vocabulary skills from the age 6-7 (Year 2) to 7-8 (Year 3) to 8-9 (Year 4) using age-appropriate receptive and expressive composite scores from the Test of Word Knowledge (TOWK, Wiig & Secord, 1992). The receptive composite comprises a receptive vocabulary subtest (which is similar in structure to the BPVS-II and the receptive component of the EROWPVT) and a word opposites subset which requires the participant to choose a word

which means the opposite of a stimulus word. The expressive composite comprises an expressive vocabulary subtest which is similar to the expressive component of the EROWPVT and a word definitions subtest which assesses the participant's ability to provide an oral definition of a stimulus word.

On both the receptive and expressive composites, there was a significant main effect of language group with the EL1 participants outperforming the EAL participants ($\eta^2 = .57$, $\eta^2 = .45$ respectively). There was also a significant main effect of school year, showing significant progression from Years 2 to 3 and Years 3 to 4. There were no significant interactions showing that both the EAL and EL1 group made a similar amount of progress; the EAL children, therefore, were not closing this vocabulary gap between Years 2 and 4. Burgoyne et al. (2011a)'s findings mirrored this pattern with their EAL and EL1 participants between Years 3 and 4, using both the receptive and expressive components of the EROWPVT.

The EAL participants in Mahon and Crutchley (2006), however, did seem to close the vocabulary gap with their EL1 peers. These authors tested the performance of 165 EAL and EL1 children who were split into 6 age-bands from 4 to 9 years of age on the BPVS-II (no measure of expressive vocabulary was administered). The EAL children spoke a wide range of L1s. The results of a 2-way ANOVA with age band and language group as factors showed significant main effects of language group (with the EL1 participants outperforming the EAL participants) and of age band, with BPVS-II scores rising year on year. A significant interaction between these 2 factors shows that the gap between EAL and EL1 participants lessened as the children became older. In other words, it seems as if the EAL participants are catching up on their EL1 peers in terms of receptive vocabulary. Some caution should be

exercised in accepting this conclusion, however, as the numbers of EAL and EL1 participants in each of the age bands varied widely.

Six of these studies examined, to some extent, the relationship between vocabulary and comprehension for EAL and EL1 learners. Where receptive vocabulary is concerned, in Stuart (2004), regression analyses were carried out on the EAL and EL1 participants separately with the NARA-R Comprehension as the dependent variable. In these analyses, the BPVS-II emerged as a significant concurrent predictor of the NARA-R comprehension (over and above the NARA-R Accuracy) for the EAL but not for the EL1 participants. Again, however, the small numbers in the EL1 group mean that this finding should be accepted with caution. In Beech and Keys (1997), conversely, the BPVS did not emerge as a significant unique variance on the Suffolk Reading Scale when a step-wise regression was carried out on the EAL and EL1 participants together. It should be pointed out, however, that 10 predictor variables were entered here, including language group for a sample size of 64. It is possible that the BPVS may have emerged as a significant predictor of reading comprehension had fewer predictor variables been entered or had the sample size been larger.

In Burgoyne et al. (2011a) a series of concurrent and longitudinal multiple regression analyses were carried out separately on the EAL and EL1 groups in order to examine the extent to which reading accuracy, listening comprehension and vocabulary predict reading comprehension (measured by the NARA-R) in Years 3 and 4. It seems as if both receptive and expressive vocabulary were entered as a single vocabulary composite for these analyses, although the authors do not make this clear. A series of hierarchical regression analyses were carried out, with NARA-R Accuracy entered in the first step in each case. Where the EL1 group is concerned, vocabulary was never a significant unique predictor of reading

comprehension. For EAL children, on the other hand, both Year 3 and Year 4 vocabulary were significant unique predictors of Year 4 reading comprehension when entered as the second step before listening comprehension.

Where Burgoyne et al. (2009) is concerned, the extents to which both receptive and expressive vocabulary predict reading and listening comprehension was investigated using standard multiple regression analyses. With NARA-R Comprehension (reading) as the dependent variable, while receptive vocabulary emerged as a significant unique predictor of reading comprehension for the EL1 group, it was expressive vocabulary which emerged as a significant unique predictor of reading comprehension for the EAL group. Where listening comprehension was concerned, expressive vocabulary predicted significant unique variance on both the NARA-R Comprehension (listening) and on the LCTS for both EAL and EL1 participants. The importance of expressive vocabulary for the comprehension skills of EAL children also emerged in Hutchinson et al. (2003). In this study, Year 2 expressive vocabulary (though not receptive vocabulary) emerged as a strong predictor of Year 4 reading and listening comprehension for the EAL participants, a finding which is not present for the EL1 group.

While no regression analyses were carried out in Burgoyne et al. (2011b), correlation analyses were carried out separately for EAL and EL1 participants in order to investigate the relationships between expressive and receptive vocabulary and all other study measures. For both EAL and EL1 participants, NARA-R reading comprehension was highly correlated with both expressive and receptive vocabulary. With reference to the Gan fictional world paradigm, coherence and elaborative inferences were highly correlated with expressive vocabulary for both groups. Where the EAL/EL1 groups differed, however, was in the

finding that for EAL learners only, Literal questions were highly correlated with both expressive and receptive vocabulary.

2.3.3.1 The semantic skills of UK EAL children: summary

Burgoyne et al. (2009, p.7) suggest that any comprehension difficulties experienced by EAL children in the UK in comparison to their EL1 peers are likely “to be related to weaker vocabulary.” This statement is supported in these studies. Overall, these studies suggest that EAL learners score significantly below their EL1 peers on measures of receptive and expressive vocabulary throughout primary school and in 1 case during secondary school. While there are some mixed results regarding the precise nature of the relationship between (receptive and expressive) vocabulary and (reading and listening) comprehension for EAL and EL1 participants, the overall trend emerging from these studies is that the relationships between vocabulary and comprehension are stronger for EAL than for EL1 learners. The relationship between EAL learners’ expressive vocabulary and reading comprehension appears to be particularly strong.

The emphasis of these previous UK EAL studies is on providing information about the number of words the participant is able either to recognise (receptive vocabulary) or produce (expressive vocabulary). Although Hutchinson et al. (2003) administered the TOWK Word Definitions and Word Opposites subtests, performance on these measures was not considered separately in the analyses. It has been argued in the literature that in order to gain a detailed picture of the strengths and weaknesses of participants’ word knowledge, it is important to explicitly consider both how many words are known and also how much is known about words (e.g. Ouellette, 2006).

In addition, semantic knowledge is not limited to vocabulary knowledge. The A-frame posits, for example, that meaning can be conveyed not only at the vocabulary (word) level but also at the discourse level, the sentence level and the morphology level.

The second main issue broached by these previous UK EAL studies is that only a very narrow view of the semantic abilities of the participants in these studies has been provided. The current study will build upon these studies and give a broader investigation of the semantic abilities of UK EAL children than has been previously provided in the literature (c.f. section 2.5.2).

2.3.4 The UK EAL literature: 2 major issues

This detailed examination of the UK EAL literature has revealed 2 major issues: firstly, the fact that the focus has exclusively been on EAL children who struggle with reading comprehension and secondly, the fact that in terms of semantic ability, only word-level receptive and expressive vocabulary measures have been used. As such, the current study will tackle these 2 issues by i. investigating groups of EAL children who do not struggle with reading comprehension and ii. administering a broader range of semantic measures than has been used in previous UK EAL studies.

2.4 UK EAL children who do not struggle with reading comprehension

These 10 studies are important in that they provide a good deal of information concerning the language and literacy abilities of EAL children in the UK. It is important, however, not to unquestioningly assume on the basis of these studies that the reading comprehension of an EAL child will be impaired. It has been suggested, for example, that the aspect of

comprehension being tested, the nature of the test and the English language proficiency of the EAL child may influence reading comprehension outcomes. While a detailed examination of question-type and test-type is beyond the scope of this study, the question of the effect of English language proficiency on EAL children's academic outcomes will be examined. This issue has been investigated in both Strand and Demie (2005) and Demie and Strand (2006).

Strand and Demie (2005) investigated the extent to which a wide range of pupil characteristics influenced the academic attainment of all children in an inner-London LEA at the end of primary school while Demie and Strand (2006) investigated the same issue for children in the same LEA at the end of secondary school. Both studies used Hester's (1990) stages of English learning to move beyond a simple classification of EAL/EL1. Children learning EAL were described as being at one of 4 stages of English proficiency: Stage 1 – New to English; Stage 2 – Becoming Familiar with English; Stage 3 – Becoming a confident user of English or Stage 4 – Fully Fluent in English (c.f. Appendix 2.1 for a full specification). In the 2005 study, data was collected for 1442 EL1 pupils and for 837 EAL pupils. Of the EAL pupils at the end of Key Stage 2, 33 (3.9%) were at Stage 1, 130 (15.5%) were at Stage 2, 327 (14.3%) were at Stage 3 and 347 (41.5%) were at Stage 4. In the 2006 study, data was collected for 842 EL1 pupils and for 540 EAL pupils. Of the EAL pupils at the end of Key Stage 4, 17 (3.15%) were at Stage 1, 48 (8.89%) were at Stage 2, 181 (33.52%) were at Stage 3 and 294 (54.4%) were at Stage 4. No teacher proficiency ratings were collected for EL1 children.

Both studies found that EAL pupils who were classified as being at the early stages of learning English (Stages 1 – 3) achieved significantly lower scores on national examinations (Key Stage 2 tests for the 2005 study and GCSE examinations for the 2006 study) than their

EL1 peers. On the other hand, those EAL pupils who were classified as being fully fluent in English (Stage 4) achieved significantly higher scores than their EL1 peers on these national examinations. The focal point of both studies is the extent to which EAL pupils' stage of proficiency in English predicts academic outcomes when age, gender, stage of special educational need (SEN), free school meal entitlement, mobility and ethnic group have been accounted for. Hierarchical multiple regression analyses show that being at Stage 1-3 of English learning has significant, negative association with academic attainment after the above factors have been controlled. Being fully fluent in English (Stage 4) has a small, positive (albeit non-significant) association with academic attainment when these factors have been controlled, suggesting that the higher attainment of these fully fluent EAL pupils is not due to bilingualism *per se*, but rather to the above characteristics.

The findings presented in Strand and Demie (2005) and Demie and Strand (2006) have bearing on the way in which the government statistics presented above (c.f. section 2.1) should be interpreted. In these statistical first release documents prepared by the Government, it is possible that academic difficulties experienced by those EAL children who are at the lower stages of English proficiency are masked by the achievements of those EAL learners who are fully fluent, for example. On the other hand, it is possible that the achievements of fully fluent EAL learners are obscured. Where the UK EAL studies analysed above are concerned, with the notable exception of Frederickson and Frith (1998), none of these studies provide any indication as to the English language proficiency of their EAL participants. It is therefore possible that the relatively lower comprehension and vocabulary scores of the EAL participants in these studies may be linked, not to EAL status *per se*, but rather to low proficiency in English.

The Strand and Demie studies illustrate the importance of not viewing EAL children as a homogenous group, but rather as a heterogeneous population who vary widely in terms of the characteristics which influence academic achievement, and in academic achievement itself. In each of the UK EAL studies discussed above, the EAL and EL1 groups are treated as homogenous in terms of their reading comprehension ability. While this design-type provides an initial indication as to overall trends in reading comprehension achievement between EAL and EL1 groups, it fails to take account of variation in reading comprehension ability within EAL and EL1 groups. As such, there is a risk of viewing EAL children in terms of having a reading comprehension deficit.

A key innovation of the current study is that it will move away from the view, prevalent in the literature, of UK EAL children as a homogenous group of children, all of whom experience reading comprehension difficulties. Rather, this study will investigate variations in reading comprehension skill within samples of Year 5 EAL children. In order to move towards a fuller understanding of EAL children's reading comprehension strengths and difficulties, it is important to consider not only those children who are struggling but also those with good reading comprehension.

Although the UK EAL studies already discussed suggest that EAL children tend to lag behind their monolingual peers on measures of reading comprehension, some recent studies carried out in Canada suggest a different trend. These studies provide rationale for considering that not all EAL children will struggle with reading comprehension in comparison to their EL1 peers. In Lipka and Siegel (2007), for example, groups of Grade 3 EAL and EL1 children did not differ in their achievement on the Stanford Diagnostic Reading Test: Reading Comprehension (SDRT, Karlsen & Gardner, 1994) which requires participants to read short

passages and answer multiple-choice questions within a specified time limit. Similarly, in Lesaux, Rupp and Siegel (2007) groups of Grade 4 EAL and EL1 children did not differ on the SDRT. It is not clear precisely why the results obtained in these Canadian studies are in contrast to the trends visible in the UK EAL literature, where EAL learners tend to perform at a lower level than their EL1 peers on measures of reading comprehension. One possibility is test-type. While the NARA-R requires children to provide oral answers to open-ended questions, the SDRT uses a written, multiple-choice format. It has been suggested both in this chapter (c.f. section 2.3.1) and in the literature (e.g. Spooner et al., 2004) that certain groups of learners may find an open-ended test format relatively more difficult than a format which does not test participants' articulation ability, such as multiple-choice.

One study in particular provides a precedent for examining variation in the reading comprehension ability of EAL samples and for comparing comprehension-matched groups of EAL and EL1 students on a range of comprehension-related measures. Also in Canada, Lesaux, Lipka and Siegel (2006) identified groups of Good Comprehenders (GCs) and Poor Comprehenders (PCs) within their large sample which comprised both EAL and EL1 children. The GC and PC groups in this study were matched on word reading and chronological age and differed on reading comprehension (measured by the SDRT). Of the EL1 children in the study, 80% were designated as GCs and 17% were designated as PCs. Of the EAL children, 75% were designated as GCs and 21% were designated as PCs. The difference in the percentage of EAL and EL1 children in the GC group and the percentage of EAL and NS children in the PC group was not significant. However, the EAL GCs scored significantly below the EL1 GCs on measures of verbal working memory and syntactic awareness. The EAL PCs also scored significantly below the EL1 PCs on these measures.

This result suggests that even when EAL and EL1 children are matched on reading comprehension ability, there may still be differences between EAL and EL1 groups on certain comprehension-related skills. Lesaux et al. (2006) speculate that the EAL children's difficulties in verbal working memory and syntactic awareness in comparison to their comprehension-matched EL1 peers may have a negative impact upon their future reading comprehension development

2.4.1 The current study: investigating UK EAL children who do not struggle with reading comprehension

These Canadian studies differ from those carried out in the UK in terms of both measures employed and cultural context. However, they provide support and impetus for looking for variations in reading comprehension ability within EAL samples in the UK and specifically for moving away from any assumption that EAL children will inevitably score below their EL1 peers in measures of reading comprehension. In order to address the first major issue which emerged from the UK EAL literature, the current study will sample groups of EAL and EL1 children who have Average or Above Average reading comprehension skill. In order to achieve a more detailed understanding of the linguistic abilities of the EAL participants, teacher estimations of these children's position on Hester's (1990) stages of English learning will be collected. Further to Lesaux et al., (2006) which suggested that EAL and EL1 groups may differ on certain comprehension-related skills even when they are matched on reading comprehension, the current study will test participants' performance on a range of semantic skills.

2.5 A more comprehensive view of the semantic abilities of UK EAL children

The second main issue identified in the UK EAL literature was that this body of work has taken a rather narrow view of the semantic abilities of UK EAL children. In order to tackle this issue, the current study will, first of all, administer a wider range of vocabulary measures than has been administered in previous studies. This study will build upon Hutchinson et al. (2003) in particular by administering all the 4 TOWK Level 2 core subtests for 8-17 year old participants in addition to 2 supplementary subtests (c.f. section 3.7.1.2). Administering such a range of word-level tests will provide a more detailed picture of participants' strengths and weaknesses in different aspects of word knowledge than has been provided in previous UK EAL studies. The major innovation of this study, however, is the way in which it will investigate the semantic knowledge of EAL children beyond the word level.

The UK EL1 literature is more developed than the UK EAL literature in terms of research which has been carried out in the area of semantics. Therefore, the former was consulted in order to gain insight into how UK EL1 researchers have investigated the semantic abilities of children beyond the word level. One strand of research which particularly stood out was recent work which has been carried out by Kate Cain and colleagues. This research uses an idiom comprehension measure to investigate the semantic abilities of groups of children with differing comprehension skills at the sentence and at the discourse levels (Cain, Oakhill & Lemmon, 2005; Cain & Towse, 2008). The idiom comprehension measure used in Cain and Towse (2008) will be the focus of the proposed study (c.f. section 2.5.1.3).

2.5.1 An Introduction to idioms

Cain and Towse (2008, p.1538) define idioms as “figurative expressions that can often take both a literal and a figurative meaning.” Idioms are diverse and correspond to a wide range of grammatical patterns including, but by no means limited to: article + adjective + noun (e.g. a loose cannon; a close shave); article + present participle + noun (e.g. a spitting image; a sitting duck); article + past participle + noun (e.g. a foregone conclusion). While a detailed linguistic examination of idioms is beyond the scope of this discussion, 2 of the main ways in which idioms have been understood will be presented: the traditional or noncompositional view, and the compositional view.

The traditional, or noncompositional view describes idioms thus: ‘idioms consist of two or more words...the overall meaning of these words cannot be predicted from the meanings of the constituent words (Kovecses, 2010, p. 231; Gairns and Redman, 1986; McArthur, 1992). In this view, the figurative meanings of idioms are unconnected to the meanings of the idiom’s individual parts. These figurative meanings are seen as being “directly stipulated in the mental lexicon in the same way the meanings of individual words are listed in a dictionary” (Gibbs, 1994, p.270).

A significant number of theorists and researchers, many of whom are working from the perspective of cognitive linguistics, have rejected the assumptions of the traditional view of idioms, however. Gibbs and colleagues have carried out a good deal of work which suggests that for many idioms, the meanings of their individual parts contribute independently to their overall figurative meanings; these idioms are described as ‘decomposable’. For example, idioms such as ‘spill the beans’ or ‘lay down the law’ are described as decomposable on the

basis that each individual component of the idiom contributes to its overall figurative meaning. On the other hand, idioms such as ‘kick the bucket’ or ‘shoot the breeze’ are described as ‘nondecomposable’ (e.g. Gibbs, Nayak, Bolton & Keppel, 1989; Gibbs & Nayak, 1989). Gibbs and Nayak (1989) have also shown that people’s judgments of the semantic analyzability of idioms (i.e. how decomposable they are) tend to be fairly consistent.

The view that idioms vary in their decomposability (referred to herein as ‘transparency’) is central to the current study. Indeed, it was for this precise reason that idioms, rather than other types of formulaic language, were selected for use in this study’s dependent measure. Presenting nondecomposable (referred to in this study as ‘opaque’) idioms to children may provide a great deal of information regarding their ability to infer the holistic, metaphorical meaning of the phrase using context cues alone. It would not have been possible to gain this information using other kinds of formulaic phrase such as collocations (e.g. take back, take off, take flight) which allow participants to use the internal semantics of the phrase in interpreting its meaning.

Idioms, according to the compositional view, include phrases which are both semantically opaque (e.g. to be wet behind the ears; to take the biscuit) and semantically transparent (e.g. to get away with murder; to skate on thin ice). This variation allows for the measurement of participants’ ability to interpret idiomatic phrases using inference from context (where opaque idioms are concerned) and/or analysis of the internal semantics of the phrase (where transparent idioms are concerned). An idiom comprehension measure may therefore be used to provide a more detailed insight into EAL/EL1 participants’ semantic abilities at the

discourse and phrase levels than would have been possible using semantically transparent formulaic phrases alone.

Idioms are prevalent in both spoken and written language and are regularly encountered by children. Six to ten percent of sentences in American reading books designed for children between 8 and 12 years of age contain idiomatic expressions (Nippold, 1991). Thus, if children experience difficulties in understanding idioms, these difficulties may impact upon their ability to understand the meaning of what they read and hear.

Idioms have been shown in research to pose particular problems for children with language difficulties, particularly those of a semantic or pragmatic nature (Kerbel & Grunwell, 1998) and for children with reading comprehension difficulties (Cain et al., 2005; Cain & Towse, 2008; Levorato, Roch & Nesi, 2007). However, there is a gap in the literature in that no published research has specifically investigated whether children who speak EAL experience difficulties with idiom comprehension. It is important to address this gap as idiom comprehension measures may provide a great deal of information not only about whether children understand different kinds of idioms per se, but also about their wider semantic abilities (c.f. Cain et al., 2005; Cain & Towse, 2008). The proposed study will provide a detailed examination of the idiom comprehension abilities of both EAL and EAL children.

2.5.1.1 Focal points of the idiom comprehension literature

A great deal of the first language (L1) idiom comprehension literature has focused on the influence of 3 key factors in children's developing idiom comprehension abilities: familiarity, transparency (described in section 2.5.1 as 'decomposability') and context. Below is a brief overview of studies which suggest firstly, that these 3 factors play a role in the ease with

which children and adolescents comprehend idioms and secondly, that the precise effects of these 3 factors have been difficult to disentangle. More pertinent to the proposed study, however, is why idiom transparency and the presence of context in particular have been found to influence idiom interpretation and how well-designed idiom comprehension measures may provide insight into participants' semantic skills beyond the word level. These issues will be discussed in sections 2.5.1.2 and 2.5.1.3.

Familiarity

Familiarity refers to "how frequently the idiom occurs in the language" (Nippold & Taylor, 1995, p.427). Nippold and colleagues have carried out a number of studies which suggest that familiarity has a facilitative effect on idiom comprehension for American children and adolescents (e.g. Nippold & Taylor, 1995; Dean Qualls & Harris, 1999; Dean Qualls, O'Brien, Blood & Hammer, 2003) and Australian children and adolescents (e.g. Nippold, Taylor & Baker, 1996; Nippold & Taylor, 2002). However, in these studies, familiarity effects are difficult to disentangle from the effects of idiom transparency (Dean Qualls & Harris, 1999; Dean Qualls et al., 2003) and the presence of context (Nippold & Taylor, 1995; Dean Qualls & Harris, 1999; Nippold & Taylor, 2002; Spector, 1996).

Transparency

Transparency is described by Cain et al. (2005, p.67) as "the degree of agreement between the literal and figurative meanings of an idiom." Nippold and colleagues have investigated whether idiom transparency facilitates comprehension for children and adolescents in terms of the metasemantic hypothesis. This hypothesis states that "beyond exposure, the learner must actively analyse the expressions to fully understand their meanings" (Nippold & Taylor,

2002, p.385). Research evidence suggests that transparency facilitates idiom comprehension for American children and adolescents (Nippold & Taylor, 1995) and Australian children and adolescents (Nippold & Taylor, 2002). In addition, studies carried out in France suggest that while children as young as 5 can understand transparent idioms in context (Caillies & Le Sourn-Bissaoui, 2006; 2008) they need to be between 6 years old (Caillies & Le Sourn-Bissaoui, 2008) and 8 years old (Caillies & Le Sourn-Bissaoui, 2006) to begin to understand opaque idioms in context. The results of the Caillies & Le Sourn-Bissaoui studies, therefore, do not fully support the metasemantic hypothesis because they suggest that while idiom transparency does facilitate comprehension, even opaque idioms, i.e. those which have a low degree of agreement between the literal and figurative meanings of the idiom, may be understood when presented in a supportive context. While transparency is an important factor in the ease with which children and adolescents can understand idioms, its effects have often been confounded in the research with familiarity (Caillies & Le Sourn-Bissaoui, 2006; 2008) and context (Nippold & Taylor, 1995; 2002).

Context

The facilitative effect of a supportive context on idiom comprehension has been shown in a number of studies which have compared idiom comprehension in differing context conditions for Italian 7 and 9 year olds (e.g. Cacciari & Levorato, 1989; Levorato & Cacciari, 1992; Levorato & Cacciari, 1999) and American 5, 6, 8 and 9 year olds (Gibbs, 1987). 'Supportive context' in this instance refers to the target idiom's being embedded in a short story which supports a figurative, idiomatic interpretation of this idiom. These results, however, are variously confounded by idiom transparency (Levorato & Cacciari, 1992) or familiarity (Cacciari & Levorato, 1989; Levorato & Cacciari, 1999; Gibbs, 1987).

2.5.1.2 Inference from context and semantic analysis: semantic abilities beyond the word level

The above studies suggest that familiarity, transparency and context may all play some role in the extent to which children and adolescents comprehend idioms. Beyond ascertaining that these factors do influence the ease with which children and adolescents correctly interpret idioms, a more pertinent question for the current study is why this might be the case. The current study will focus on context and transparency. It is argued in the literature that the presence of a supportive context and idiom transparency are closely linked to two strategies which may be used in order to interpret an unknown idiom: inference from context (when context is available) and semantic analysis (when the idiom is transparent) (Levorato & Cacciari, 1999; Levorato & Cacciari, 1995). Inference from context is the ability to infer the meaning of an unknown word or phrase (in this case an idiom) from available contextual information. As such, this skill can be argued to be linked to semantic ability at the discourse level. Semantic analysis is described by Cain and Towse (2008, p.1539) as the ability to “derive alternate meanings of phrases” and can be argued to be linked to semantic ability at the sentence level. Therefore, an idiom comprehension measure which controls for familiarity and manipulates presence of context and idiom transparency may provide information about participants’ semantic skills beyond the word level. The importance of discourse-level and sentence-level semantic skills is supported by the A-Frame (c.f. section 2.2.1).

The strategies of inference from context and semantic analysis have been argued to be important not only for the interpretation of idioms. Levorato, Cacciari and colleagues use a theoretical framework referred to as the Global Elaboration Model (GEM, Levorato & Cacciari, 1995) to describe idiom comprehension development. According to the GEM,

figurative language develops in the same manner as language in general, whether literal, metaphorical, ambiguous etc. In other words, no special mechanism for the development of figurative language is proposed. It is argued, therefore, that semantic analysis and inference from context play important roles in understanding not only new idiomatic phrases but in understanding all types of language.

According to Levorato and Cacciari (1995, p.263), “comprehension and production of figurative meanings derive from the ability to go beyond a local, piece-by-piece elaboration of a text (or a portion of discourse) to search for a global and coherent meaning.” Inference from context, therefore, is considered central to the GEM as it allows the child to use surrounding text to infer the meaning of an unfamiliar idiom. Where possible, (i.e. with transparent idioms) semantic analysis may be used either on its own (when, for example, the idiom is presented in isolation) or together with inference from context to aid in the interpretation of unfamiliar idioms. ‘Context’ in this instance, refers to a story scenario which supports the figurative (idiomatic) rather than the literal meaning of the phrase. The proposed study will build upon Cain and colleagues’ work (2005; 2008) to investigate whether there are any group differences between EAL and EL1 Average and Above Average readers in terms of semantic analysis and/or inference from context, skills which are argued to be important not only for idiom comprehension but for language comprehension in general.

2.5.1.3 Cain and colleagues’ investigation of idiom comprehension

The aim of Cain et al. (2005) is “to investigate how individual differences in text comprehension (are) related to children’s understanding of idioms in relation to... familiarity, transparency, and context” (Cain et al., 2005, p.71). Uniquely, this study uses a novel idiom

condition to isolate participants' ability to use semantic analysis and inference from context whilst controlling for the potential confound of prior knowledge. The novel idioms in this study were translations of idioms in European languages (Italian, Spanish and Danish) for which there is no equivalent in English.

The participants in this study are 9-10 year olds, 14 of whom are designated as Good Comprehenders (GCs) and 14 of whom are designated as Poor Comprehenders (PCs). These groups were rigorously selected. First of all, the Gates-MacGintie Primary Two Vocabulary Test (level 4, Form K) (McGintie & MacGintie, 1989) was used to screen exceptionally good or exceptionally poor readers. Of the remaining children, 14 PCs were selected who achieved age-appropriate accuracy on the NARA-R but whose reading comprehension was at least 12 months below their chronological age. 14 GCs were recruited who had age appropriate reading accuracy but whose reading comprehension was age-appropriate or above. The 2 groups were matched on age, NARA-R accuracy, the number of NARA-R stories read; Gates McGintie vocabulary, the BPVS and on a measure of semantic fluency.

Cain et al. (2005) uses an explanation task and analyses response-types. In the isolation condition, real transparent, real opaque, novel transparent and novel opaque idioms are presented in the absence of context. In the context condition, the same four types of idiom are presented as the final sentence of a story which supports the idiomatic meaning of the phrase. In each case, the isolation condition was presented before the context condition. In the isolation condition, the child was presented with the idioms orally and was asked to say what they thought each idiom meant. In the context condition, the story context was read to the child, after which the child was asked to say what they thought the idiom in each story meant. The response types were coded as follows: idiomatic; related figurative; unrelated

figurative; literal; repetition; don't know. Idiomatic answers were awarded 2 points whereas related figurative answers (which show a partial understanding of the figurative meaning) were awarded 1 point. Where the novel idioms are concerned, the 'idiomatic' meaning is considered as the English equivalent of the idiomatic meaning in the idiom's original language.

The main findings for this study are as follows. Overall, real idioms were easier to interpret than novel idioms. In isolation, both GCs and PCs were able to derive the meanings for some novel transparent idioms, suggesting that both groups were able to use semantic analysis when no context was present. For both groups, context had a facilitative effect. The GCs and PCs did not differ in their ability to interpret either real or novel transparent idioms in context but the PC group was significantly less able to interpret both real and novel opaque idioms in the context condition. In other words, PCs seem to be able to use semantic analysis to support their interpretation of transparent idioms, but have difficulty in using context to support their comprehension of opaque idioms. In terms of the A-frame, these results suggest that PCs experience semantic difficulties at the discourse level but not at the sentence level.

These findings are supported by Cain and Towse (2008). In this study, 9-10 year old participants were selected in a similar manner to Cain et al. (2005) although in this later study, the GC and PC groups were not matched on the BPVS. This study used the same idioms and stories as were used in the earlier study. Cain and Towse (2008) differs in two main ways from Cain et al. (2005). Firstly, a multiple choice measure is used instead of the explanation measure used in the earlier study. It has been argued in the literature that tasks which require explanation may not provide a measure of comprehension alone, but may be confounded by articulation ability (Spooner et al., 2004). Secondly, the Ambiguous

Sentences subtest from the Test of Language Competence, Expanded edition (TLC-Expanded, Wiig & Secord, 1989) is included as an independent measure of semantic analysis. This measure assessed participants' ability to understand that certain sentences containing ambiguous words may have multiple meanings. The results of this study show that in a similar manner to Cain et al. (2005), both groups of children were able to use semantic analysis to interpret the meanings of transparent idioms in isolation. In addition, the groups did not differ in their achievement on the independent measure of semantic analysis. Together, these results suggest that PCs do not experience difficulties in semantic analysis. However, as in Cain et al. (2005), the PCs in Cain and Towse (2008) were less able to take advantage of the supportive story context to interpret the meaning of opaque idioms. Similarly, Cain, Oakhill and Lemmon (2004) found that children with Poor Comprehension were impaired in their ability to infer the meaning of novel vocabulary items from context. Together, these studies broadly support the GEM in showing that PCs also experience idiom comprehension difficulties. However, it is important to note that these idiom comprehension difficulties do not seem to stem from difficulties in semantic analysis but rather from difficulties in using supportive context to infer the meaning of unfamiliar phrases. In terms of the A-frame, these results suggest that while EL1 PCs do not experience difficulties in semantic skills at the sentence level, they do experience difficulties at the discourse level.

2.5.2 The current study: providing a more comprehensive view of the semantic abilities of UK EAL children

In order to address the second main issue raised by the UK EAL literature, the current study will first of all include a wider range of vocabulary measures than has been administered in

previous UK EAL studies in order to derive a more comprehensive view of participants' semantic abilities at the word level. In addition, this study will use the measure employed by Cain and Towse (2008) to investigate whether groups of 9-10 year old EAL and EL1 Average and Above Average readers differ in their abilities to use semantic analysis and inference from context to interpret both real and novel idioms using a multiple-choice format.¹ In doing so, this study will provide a deeper examination of the semantic abilities of EAL children than has previously been offered in UK EAL research by going beyond an examination of semantic ability at the word level. In addition, this investigation of the inferencing skills of UK EAL children will inform the issue of whether these children experience difficulties in inferencing in comparison to their EL1 peers (Twist et al., 2007; c.f. Burgoyne et al., 2011b). Information on participants' judgement of idiom familiarity and transparency will be collected and detailed error analysis will be carried out to provide further information as to the strategies employed on encountering unfamiliar idioms.

2.6 Working Memory

The term 'working memory' refers to "a system that is required to maintain information in an accessible state in the face of concurrent processing, distraction, and/or attention shifts" (Engel de Abreu, 2011)(Engel de Abreu, 2011). Working memory is therefore particularly important for reading comprehension, which requires readers to form a meaning-based representation of the text, referred to variously as a mental model or a situation model (e.g. Gernsbacher, 1990;Johnson-Laird, 1983;Kintsch, 1998). The construction of a coherent

¹ The original intention of this study was to sample groups EAL and EL1 Good and Poor Comprehenders. However, Section 3.4.2 (main phase step 4 in Methodology) describes how no EAL or EL1 PCs were available in the Screening Phase sample, and how the decision to investigate EAL and EL1 Average and Above Average readers was made.

mental model of text requires the reader to engage in a range of complex processes, such as integrating information across clauses and making inferences about aspects of the text which are not explicitly stated (such as the meaning of an unknown idiom, for example). Working memory is the system which holds both recently read parts of the text, and information which has been retrieved from long term memory, and enables the integration of these different types of information into a coherent mental model of the text (c.f. Cain, Oakhill and Bryant, 2004).

A substantial body of research supports the central role of working memory in the reading comprehension of EL1 children (e.g. Cain, Oakhill and Bryant, 2004; Cain and Oakhill, 2006; Seigneuric and Ehrlich, 2005). While the relationship between working memory and reading comprehension in bilingual children has received less attention in the literature, the studies which have been carried out in this area suggest the importance of working memory for L2 reading comprehension (e.g. Geva and Ryan, 1993). With particular relevance to the current study, the potential role of working memory in the interpretation of opaque idioms in context has been investigated in a recent study by Caillies and Le Sourn-Bissaoui (2013). These authors point out that in interpreting opaque idioms in context, participants “have to maintain simultaneously both conflicting literal and figurative interpretations as being different from the expression itself, in addition to context”, a task which would presumably place heavy demands on working memory (Caillies and Le Sourn-Bissaoui, 2013, p.2).

Caillies and Le Sourn-Bissaoui investigated the relationships between working memory (measured by the three working memory subtests from the WISC-IV: Digit Span Forward; Digit Span Backward; Letter-Number Sequencing) (Wechsler, 2004) and the comprehension of opaque idioms in context. Participants in this study were 6, 7 and 8 year old monolingual

French-speaking children living in France. These authors found that “surprisingly”, there was no significant relationship between working memory factorial scores and the comprehension of opaque (described in this study as nondecomposable) idioms in context (Caillies and Le Sourn-Bissaoui, 2013). Caillies and Le Sourn-Bissaoui suggest that this result may be attributable to the specific working memory measures employed, hypothesising that complex span tasks may have produced different results.

This issue of working memory measure choice is also relevant to the question of whether EAL and EL1 children differ with respect to working memory. Mixed results have emerged from the literature. Lesaux et al. (2006) found that groups of Grade 4 EAL and EL1 children who were matched on reading comprehension differed with respect to working memory scores, with the EL1 children scoring significantly higher than their comprehension-matched EAL peers. Engel de Abreu (2011), however, found no significant differences in the working memory scores of monolingual (with Luxembourgish as the L1) and bilingual (with a range of L1s) children who were followed longitudinally between the ages of 6 – 8 years old. By contrast, Morales, Calvo and Bialystok (2013) found that 5 and 7 year old Canadian EAL children (speaking a range of L1s) scored significantly higher than their age-matched EL1 peers on working memory tasks, with larger effects in experimental conditions which had more demanding executive function requirements.

These authors suggest that the inconsistencies across these studies, regarding the relative working memory strengths or weaknesses of EAL children in comparison to their EL1 peers, may be linked to the working memory measures employed. While Morales et al. (2013) employed working memory measures which were exclusively visuo-spatial, both Lesaux et al. (Lesaux, Lipka and Siegel, 2006) and Engel de Abreu (Engel de Abreu, 2011) employed a

range of working memory tasks, all of which involved either words or digits and therefore involved verbal skills. While the EAL and EL1 participants in Lesaux et al. (2006) did not differ in terms of reading comprehension, the EAL participants scored significantly below their comprehension-matched EL1 peers on a measure of syntactic awareness which required participants to provide a missing word for each of 11 sentences. In Engel de Abreu (2011), EAL participants scored significantly below their EL1 peers on measures of both receptive and expressive vocabulary. In both studies, therefore, the EAL participants displayed relatively weaker English verbal skills than their EL1 peers. Morales et al. (2013) suggest that working memory tasks which rely on verbal skills may underestimate the working memory abilities of EAL participants.

While working memory is not a focal point of the current study, it is taken into account in two main ways. Given Morales et al.'s (2013) suggestion that verbal tasks may place relatively high demands on the working memory resources of EAL children relative to their EL1 peers, care will be taken to reduce the working memory demands of the study's dependent measure, the ICM, in an attempt to avoid a potential confound of working memory in the results of this task (c.f. section 3.6.1.1). In addition, a working memory task will be administered to all Main Phase participants in order to check for EAL/EL1 group differences (c.f. section 3.6.1.3). If such differences are found, this working memory task will be used as a covariate in order to examine whether working memory is an important factor in the EAL and EL1 children's response choice on the study's dependent measure, the ICM.

2.7 How the A-frame supports the current study

The main way in which the A-Frame supports the current study is in its endorsement of the idea that semantic ability involves more than vocabulary breadth. The A-Frame's specification of semantic ability at the morphology, vocabulary, sentence and discourse levels provides a theoretical motivation for the current study's investigation of EAL and EL1 learners' semantic abilities at 3 of these levels (an investigation of morphology is beyond the scope of this study). The current study's investigation of a wider range of word-level measures than has been administered in previous UK EAL studies in addition to its use of an idiom comprehension measure to investigate participants' semantic abilities at the sentence and discourse levels receives strong support from the A-Frame.

A secondary way in which the A-Frame supports the current study is in its insistence on the contribution of decoding to successful reading comprehension. Herein lies the motivation for the EAL and EL1 Average and Above Average groups in this study to be matched not only on reading comprehension, but also on the Accuracy component of the York Assessment of Reading for Comprehension (YARC, Snowling et al., 2009) (in-text word reading accuracy) and on the phonemic decoding efficiency subtest of the Test of Word Reading Efficiency (TOWRE, Torgesen, Wagner and Rashotte, 1999) ('pure' nonword decoding). This strategy of matching EAL and EL1 groups on a range of reading-related and background variables allows for fine-grained comparisons of the EAL and EL1 groups' performance on the semantic variables administered.

2.8 Research Questions

The current study will address the following Research Questions:

1a. Is the idiom comprehension of EAL and EL1 Average and Above Average Readers differentially affected by:

- i) Idiom Realness
- ii) Idiom Transparency
- iii) Presence of Supportive Context?

1b. Is the idiom comprehension of EAL and EL1 Average and Above Average Readers differentially affected by:

- i) Idiom Realness
- ii) Idiom Transparency
- iii) Presence of Supportive Context?

When a) TOWK Expressive Vocabulary; b) TOWK Multiple Contexts; c) WMTB-C Backwards Digit Recall are used as covariates?

2a. Do the EAL and EL1 Average and Above Average Readers differ in the extent to which they choose:

- i) Congruent response options in context
- ii) Incongruent response options in context
- iii) Literal response options in isolation

2b. Do the EAL and EL1 Average and Above Average Readers differ in the extent to which they choose:

- i) Congruent response options in context
- ii) Incongruent response options in context
- iii) Literal response options in isolation

When a) TOWK Expressive Vocabulary; b) TOWK Multiple Contexts; c) WMTB-C Backwards Digit Recall are used as covariates?

3. What is the relationship between idiom comprehension and a) participant familiarity ratings and b) participant transparency ratings for EAL and EL1 Average and Above Average Readers?

4. Does Idiom Comprehension predict variance on YARC Comprehension over and above that predicted by vocabulary for EAL and EL1 Average and Above Average Readers?

2.9 Chapter 2: summary

This chapter has provided the following: a discussion of the academic achievement of EAL children in the UK; an introduction to the study's theoretical framework; a critical overview of relevant research which has described the comprehension and semantic skills of UK EAL children; a discussion of the issues in this body of research which the current study will address; a clarification of the relationship between the current study and its theoretical framework and finally, the study's four research questions. This chapter has provided a foundation for Chapter 3 which will present this study's methodology.

Chapter 3: Methodology

3.1 Aims

The first main aim of this study was to use an idiom comprehension measure (ICM) (c.f. Cain & Towse, 2008) to investigate the semantic abilities of UK EAL children, in comparison to those of EL1 children who are matched for reading ability. This ICM investigates participants' abilities to engage in i. inference from context (by testing their ability to infer the meaning of opaque idioms from context) and ii. semantic analysis (by testing their ability to infer the meaning of transparent idioms when presented in isolation).

The second main aim of this study was to identify whether EAL and EL1 children with Average reading abilities perform differently to EAL and EL1 children with Above Average reading abilities on this idiom comprehension task.

3.2 Research Design

This quasi-experimental study has a 2-factor independent samples design with between-participant factors of Language Group (EAL or EL1) and Reading Group (Average or Above Average Reader) and within-participant factors of Realness (Real or Novel idiom), Transparency (Transparent or Opaque idiom) and Context (the idiom is presented in Isolation or with supportive Context).

3.2.1 Project overview

Data-collection for the study took place during the 2010/11 academic year and consisted of a Screening Phase followed by a Main Phase. During the Screening Phase which was carried

out between September and December 2010, 224 children, each attending one of 10 primary schools, participated in a single 1-to-1 session with the researcher and completed measures of reading accuracy, rate and comprehension, non-word decoding and nonverbal ability (c.f. section 3.6.1). All children also answered a short questionnaire designed to ascertain which languages were spoken in their home. On the basis of the results of the Screening Phase, 93 children were selected to participate in the Main Phase of the study which took place between January and July 2011 (c.f. section 3.7.1). These children were split into 4 groups: EAL Average readers; EAL Above Average readers; EL1 Average readers and EL1 Above Average readers (c.f. section 3.4.2 Step 4 below). Each of these children participated in 4 further 1-to-1 sessions with the researcher during which they completed measures of idiom comprehension, vocabulary and working memory. The EAL children also completed a language background questionnaire. The organisation of this study is illustrated in Appendix 3.1.

3.2.2 Rationale for using a quasi-experimental research design

Campbell and Stanley (1966, p.34) acknowledge that it is not always possible in social settings to fulfil all requirements of a true experiment. This is the case in the present study. The participants naturally vary in terms of the independent variables (L1 and reading comprehension skill); pure random assignment to groups is therefore impossible. In such cases, Campbell and Stanley (1966) advocate the use of quasi-experimental designs. The quasi-experimental design of this study has some features of experimental design such as the manipulation of independent variables (i.e. L1 and reading comprehension skill), but does not include all of the “internal validity requirements” of experimental design such as random assignment to groups (Bryman, 2008, p.41).

Steps were taken to strengthen the internal validity of this design by selecting groups which were matched on demographic and academic factors which may influence their idiom comprehension. All 4 groups were matched on chronological age, gender, non-verbal ability and free school meal uptake. In addition, the EAL and EL1 Average groups and the EAL and EL1 Above Average groups were matched for reading accuracy, rate and comprehension and for non-word decoding. Any finding of EAL/EL1 differences in idiom comprehension, therefore, would not be confounded by the influence of these variables. A quasi-experimental design is appropriate for this study as it allows a systematic examination of groups' performance in idiom comprehension to be carried out.

3.3 Sampling

3.3.1 Screening Phase

In May 2010, the headteachers of 80 primary schools in Oxford, Banbury, Leamington Spa, Aylesbury, High Wycombe and Reading were sent a covering letter (c.f. Appendix 3.2) and information sheet (c.f. Appendix 3.3). The schools were chosen because all had average or above-average percentages of EAL children on their registers (Office for Standards in Education, 2010), all were within commuting distance from Oxford (where the researcher lives) by bicycle, train or car and none were currently hosting research projects from the researcher's university department. These schools were contacted 1-2 weeks later by telephone to ask whether they might be interested in participating in the study. Ten schools (1 in Oxford; 1 in Banbury; 2 in Leamington Spa; 3 in High Wycombe and 3 in Reading) agreed to participate. Table 1 illustrates some general characteristics of participating schools. This information was taken from 2011 Department for Education statistics (DfE, 2012a).

Table 1 School Information

Code	Religious Character	Age Range	Number of Pupils on Roll	% EAL on Roll	% Eligible for FSM
1	C of E	3 - 11	405	31.4	13.7
2	Catholic	3 - 11	233	38.2	15.5
3	Community	4 - 11	119	41.2	21.0
4	Community	3 - 11	424	60.1	22.9
5	Community	3 - 11	233	74.9	26.3
6	Community	3 - 11	236	48.7	16
7	Community	4 - 11	417	69.8	8.6
8	Community	3 - 11	453	51.3	13.1
9	Catholic	4 - 11	413	26.3	1.2
10	C of E	3 - 11	199	31.2	14.7
National Average				16.8 (DfE, 2011d)	19.2 (DfE, 2011d)

Participating schools were asked to send information sheets for parents (c.f. Appendix 3.4) and opt-in parental consent forms (c.f. Appendix 3.5) to the parents/guardians of all children who were due to begin Year 5 in September 2010 excluding those who: i. Joined the UK educational system after Year 3; ii. Had a statement of Special Educational Need; iii. Were not planning to return to the school for Year 5 (to the school’s knowledge). These exclusion criteria were minimised in order to allow the researcher to screen a large number of children and to reduce the administrative burden on the school. The initial aim was to recruit 200 children into the Screening Phase of the study. This number was thought to be large enough to allow 4 groups of c.25 children to be recruited into the Main Phase yet manageable for a single tester during the time available. The 224 children whose parents provided written consent participated in the Screening Phase of the project. Participating schools were asked to indicate whether each of these 224 children spoke EAL and whether they were in receipt of

Free School Meals (FSM). The schools attended by Screening Phase Participants are illustrated in Table 2.

Table 2 Number of EAL and EL1 Screening Phase Participants Attending Each School

	EAL	EL1	School Total
School 1	8	15	23
School 2	9	9	18
School 3	4	5	9
School 4	11	11	22
School 5	21	3	24
School 6	4	15	19
School 7	39	13	52
School 8	14	12	26
School 9	4	20	24
School 10	0	6	6
Total	120	104	224

The general characteristics of these Screening Phase participants are illustrated in Table 3.

Table 3 Screening Phase Participant Characteristics: Chronological Age, Gender, Free School Meal Uptake

	EAL	EL1
Number	115	109
Number of Males	55	50
Number of Females	60	59
Mean Age on date of Screening session (Months)	115.65	115.90
Number in receipt of Free School Meals	14	11
Percentage in receipt of Free School Meals	12.17	10.09

The participants in the Screening Phase represent a range of ethnicities and, where the EAL group is concerned, a range of L1s. These are illustrated in Appendix 3.6.

3.4.1.1 Representativeness of the Screening sample

As non-probability sampling was used, it is important to discuss the extent to which the Screening sample has external validity. The population in question is Year 5 children in

England who do not meet the above exclusion criteria. Of the thousands of primary schools in England, only 80 were contacted and invited to participate in this study. Furthermore, these 80 primary schools were all situated within commuting distance of Oxford city centre. Thus, the participants in this study cannot be argued to be representative of the population and the results of the study will not be generalisable to the population.

The next question is whether these results will be generalisable to all eligible children who attend urban Oxford, Banbury, Leamington Spa, High Wycombe and Reading primary schools with higher-than-average percentages of children with EAL. Although all 80 schools which met these criteria were contacted, only 10 granted access. It cannot be argued that the children participating in the Screening Phase of this study will be statistically representative of the population; this study does not have strong external validity.

While the Screening sample is not statistically representative of the population, the diversity of ethnicities represented in the EAL and EL1 groups and the range of L1s represented in the EAL group bear strong resemblance to national patterns (NALDIC, 2008; 2011). In addition, Table 1 shows that the participating schools are diverse in terms of religious character and size. It should be noted in Table 3 however, that while participating schools serve pupils from a range of socio-economic backgrounds, the percentages of children in the screening sample who receive free school meals are lower than the national average of 19.2% (DfE, 2011d).

3.3.2 Main Phase

In order to address this study's research questions, the results of the Screening Phase were used to select groups of children for the 4 comparison groups. The following steps were taken:

Step 1. From the initial sample of 224, those 9 EAL children who reported on the short language screening questionnaire that both parents/caregivers spoke 'Always/Mostly English' were removed. This step was taken to ensure that all children recruited into the EAL groups were exposed to the L1 on a regular basis.

Step 2. Those 25 EAL children whose L1 was not an Indo-Aryan language were removed. The Indo-Aryan language group constitutes a branch of the Indo-Iranian language group which itself is a branch of the Indo-European language family. Indo-Aryan languages are spoken mainly in the South Asian countries of India, Pakistan, Bangladesh, Nepal and Bhutan, and also on the islands of Sri Lanka and the Maldives. These languages are linked by 'a complex net of phonological and grammatical features' (Cardona & Jain, 2003, p.9) and are distinct from the languages spoken in the areas which surround these countries geographically: Iranian languages to the west, Dravidian languages in the South and Tibeto-Burman languages in the north and in the east (Cardona & Jain, 2003, pp.6-7). It was considered important to limit the range of EAL L1s in order to limit the amount of variation in the sample.

Step 3. Those children (either EAL or EL1) who had a standard score of less than 85 on the Phonemic Decoding Efficiency Subtest of the Test of Word Reading Efficiency (TOWRE PDE, Torgesen et al., 1999) (0 EAL, 2 EL1), a standard score of less than 40 on the Matrix

Reasoning subtest of the Wechsler Abbreviated Scale of Intelligence (WASI Matrices, Wechsler, 1999) (15 EAL, 12 EL1), or both (0 EAL, 1 EL1) were removed. This step was taken to ensure that the results of those children whose nonword decoding and/or non-verbal ability was below the normal range would not unduly influence the results of the main analyses.

Step 4. The remaining 160 children were ranked according to their Comprehension scores on The York Assessment of Reading for Comprehension (YARC, Snowling et al., 2009).

The intended design for this study was to compare groups of EAL and EL1 Good and Poor Comprehenders. Poor Comprehenders (PCs) are children who exhibit specific reading comprehension difficulties in the absence of decoding difficulties. Monolingual, English-speaking PCs have been the focus of investigation for a number of groups of researchers in the UK during recent years, notably Cain and colleagues (e.g. Cain et al., 2005; Cain & Towse, 2008) and Nation and colleagues (Nation & Snowling, 1999; 2000). The current study intended to build upon this body of research by investigating the idiom comprehension abilities of Good and Poor Comprehenders who speak EAL. However, at Step 4 above, even those children with the lowest YARC Comprehension scores were within the normal range on this measure. Neither EAL nor EL1 PCs were available within the sample. Due to time constraints, it was not possible to re-run the Screening Phase. It was therefore necessary to modify the design of the study to accommodate the profile of the children who came through the Screening Phase. A notable feature of the 160 children at Step 4 above was the high proportion that had scores on the YARC which were well above what would be expected for their chronological age. Given the emphasis of UK EAL research on children who struggle with reading comprehension, the researcher decided to take this opportunity to investigate the

idiom comprehension and vocabulary skills of UK EAL children for whom reading comprehension does not present a challenge. As an important focus of the research is to acknowledge heterogeneity in the reading comprehension skills of UK EAL children, the 4-group design was retained. Step 5 describes how the 4 groups – of EAL Average; EAL Above Average; EL1 Average and EL1 Above Average readers – were selected.

Step 5. These 160 children were split into 5 groups, Group 1 having the highest YARC Comprehension scores and group 5 having the lowest YARC Comprehension scores. Group 3 was removed in order to facilitate the selection of Average and Above Average Readers who differed on YARC Comprehension. From Groups 1 and 2, 22 EAL children and 23 EL1 children were selected. The EAL and EL1 group means (rather than individual participants in each group) were matched on the following variables: Chronological Age, gender, YARC Accuracy, Rate, Comprehension, TOWRE PDE and WASI Matrices. These groups constituted the EAL and EL1 Above Average Readers. From Groups 4 and 5, 24 EAL children and 24 EL1 children who are matched in the same manner on the above variables were selected. These groups constituted the EAL and EL1 Average Readers. The groups' ethnicity information and L1 information are found in Appendix 3.7. Table 4 illustrates the Main Phase participants' performance on the Screening Phase measures.

Table 4 Main Phase Participant Characteristics: Chronological Age, Gender, Reading and Non-Verbal Ability Scores

	EAL Average Readers (n=24)	EAL Above- Average Readers (n=22)	EL1 Average Readers (n=24)	EL1 Above- Average Readers (n=23)
Number of Males	9	10	13	11
Number of Females	15	12	11	12
Number taking Free School Meals	1	1	4	3
Mean Chronological Age (year, mth)	9;6	9;9	9;7	9;7
Mean YARC Comprehension Ability	57.03	70.68	58.46	71.63
Mean Comprehension Age Equivalent	9;04	11;11	9;06	12;02
Mean YARC Accuracy Ability	60.40	68.59	58.77	67.37
Mean Accuracy Age Equivalent	10;09	>12;07	10;06	12;04
Mean YARC Rate Ability	72.96	81.25	70.10	81.85
Mean Rate Age Equivalent	10;01	11;05	9;08	11;07
Mean TOWRE Phonemic Decoding Efficiency	38.00	45.750	34.146	42.913
Mean TOWRE PDE Age Equivalent	11;3	13;9	10;3	12;9
Mean WASI Matrices Raw	21.04	22.55	20.62	23.00
Mean WASI Matrices Age Equivalent	10;02	11;10	10;02	11;10

Chi –square tests were carried out to ascertain whether the 4 groups differed in terms of gender. No significant group differences were found, $X^2(3) = 1.37, p > .05$. This result shows that there are no significant differences in the distributions of boys and girls in any of the 4 groups participating in the Main Phase of this study. Gender is therefore not considered as an important variable in this study and will not feature in the analyses carried out in Chapters 4 of 5 of this thesis. The number of participants in receipt of FSM was less than 5 for each group. While it was therefore not possible to run chi-square tests, looking at the data descriptively suggests that it is unlikely that there are group differences in the number of participants taking FSM (c.f. section 4.3.3 for further information regarding participants' socio-economic status).

Kolmogorov-Smirnov tests show that for all groups on all measures, the data approaches a normal distribution (c.f. Appendix 3.8). However, Levene's test is significant for YARC Rate and YARC Comprehension (both $p < .05$). Field (2009, p.360) argues that ANOVA is quite robust to violations of the assumption of homogeneity of variance when sample sizes are equal. The sample sizes in each of the 4 groups in this study's design are only very slightly different. Non-parametric checks will nonetheless be carried out to verify the results from the 2-way ANOVAs for these variables. A series of 2-way ANOVAs with between-participants factors of Language Group and Comprehension Group was carried out to ascertain patterns of group difference on the following variables: Chronological Age in Months; WASI Matrices; YARC Accuracy; YARC Rate; YARC Comprehension; TOWRE PDE. The results of these ANOVAS are presented in Table 5.

Table 5 Comparing Language Groups and Reading Groups on Background Measures:
Chronological Age, Reading and Non-Verbal Ability

	Language Group	Reading Group
Chronological Age	$F(1, 89) = .36, p > .05,$ partial $\eta^2 = .00$	$F(1, 89) = 3.53, p > .05,$ partial $\eta^2 = .04$
WASI Matrices	$F(1, 89) = .00, p > .05,$ partial $\eta^2 = .00$	$F(1, 89) = 6.31, p < .05,$ partial $\eta^2 = .07$
YARC Accuracy	$F(1, 89) = .98, p > .05,$ partial $\eta^2 = .01$	$F(1, 89) = 34.00, p < .001,$ partial $\eta^2 = .23$
YARC Rate	$F(1, 89) = .49, p > .05,$ partial $\eta^2 = .01$	$F(1, 89) = 38.32, p < .001,$ partial $\eta^2 = .30$
YARC Comprehension	$F(1, 89) = 1.56, p > .05,$ partial $\eta^2 = .02$	$F(1, 89) = 19.58, p < .001,$ partial $\eta^2 = .69$
TOWRE PDE	$F(1, 89) = 5.12, p < .05,$ partial $\eta^2 = .05$	$F(1, 89) = 31.24, p < .001,$ partial $\eta^2 = .26$

Table 5 shows first of all that there are no significant Language Group or Reading Group differences when it comes to Chronological Age ($p > .05$). Where Reading Group is concerned, Table 5 in conjunction with Table 4 shows that as expected, Above Average readers perform significantly better than the Average readers on all measures (all $ps < .05$). For Language Group, Table 5 in conjunction with Table 4 shows that for all measures with the exception of TOWRE PDE, there are no significant differences between EAL and EL1 readers (all $ps > .05$). These results are confirmed for YARC Rate and YARC Comprehension using Mann-Whitney U tests.

This TOWRE PDE finding requires further investigation. The key requirement of the matching strategy employed in this design is that on all of the above measures, there are no significant differences between the EAL Average and EL1 Average groups and that there are no significant differences between the EAL Above Average and EL1 Above Average groups. A pair of independent samples t -tests was carried out to confirm that this is the case for the TOWRE PDE. These t -tests show that there are indeed no significant differences in

performance on the TOWRE PDE between EAL Average and EL1 Average groups, $t(46) = 1.68, p > .05, r = .24$, or between EAL Above Average and EL1 Above Average groups, $t(43) = 1.56, p > .05, r = .23$.

It is important that i. the EAL and EL1 Average groups and ii. the EAL and EL1 Above Average groups are matched on the above variables. This matching ensures that the results of the Idiom Comprehension Measure (ICM) between the Average readers and between the Above Average readers will not be confounded by either demographic (e.g. gender, chronological age, free school meals), reading-related (e.g. reading comprehension, accuracy, rate, nonword decoding) or general intelligence (e.g. non-verbal ability) variables. It is also important that the EAL Above Average readers score significantly higher than the EAL Average readers and that the EL1 Above Average readers score significantly higher than the EL1 Average readers on reading-related measures. As such, it is possible to observe whether the ICM discriminates between the Average and Above Average groups.

Although the range of L1s spoken by children in the EAL groups was tightly constrained, there is variation in the number of L1s spoken by the EAL participants in this study (7 different languages represented). No analyses will be carried out, however, comparing the performance of speakers of different EAL L1s. Due to the small numbers of speakers of each language/language combination within the EAL Average and Above Average groups, it would not be possible to gain reliable results from statistical analyses. Similarly, any attempt to provide a qualitative interpretation of patterns of performance between different L1 groups would be inappropriate given the small numbers involved. The aim of this study is not to analyse the reading comprehension and semantic skills of speakers of individual L1s. Rather,

it is to provide comparisons between EAL and EL1 on a broader range of semantic skills than has been provided in the past.

3.4 Minimising bias

Throughout the fieldwork period, the researcher was concerned with minimising error variance due to variation in participants' experiences of the research. Care was taken to maximise consistency in participants' experiences of the test setting, the researcher's attitude and the structure of the sessions.

3.4.1 Setting

During the Pilot, Screening and Main Phases of the project all measures were administered individually to each child outside the classroom. In each school, care was taken in selecting a testing environment which would ensure the child's comfort and security and in which the testing sessions would not be disrupted by noise. The researcher requested that in each school, a desk and 2 chairs be provided in an area which was within view of members of the school staff whilst being quiet enough for the testing sessions to proceed smoothly. In each school, the researcher was allocated a space which fulfilled these requirements in a school library area, a shared workspace or in a space connected to the child's classroom.

3.4.2 Researcher effects

The extent to which participants' performance was affected by the fact that they were administered on a 1-to-1 basis by an unfamiliar adult is unclear. However, conversation with participants' teachers confirmed that all children were used to being separated from their classes for group and individual work with teaching assistants and volunteers. Visitors were a

regular presence in all schools. None of the participants appeared anxious at the prospect of participating in the study and no participant at any point asked to withdraw from the study.

The researcher took care throughout to maintain an encouraging, yet neutral attitude to participants' responses. During the Main Phase, the researcher was aware that for the ICM in particular, it was essential to avoid indicating whether the child had selected the target idiomatic response. If a participant knew that they had chosen the target idiomatic response for an item in the Isolation condition, for example, there would be a possibility that they could use this prior knowledge to choose the correct response for this idiom in the Context condition. When participants asked whether they had chosen the correct answer on any condition of this measure, the researcher responded that she was unable to tell them whether they had chosen correctly.

3.4.3 Content and structure of the sessions

The content and structure of all sessions in the Screening Phase and in the Main Phase was identical across participants, as was the presentation of all instructions and explanations. During the Main Phase, at least a week was left between sessions to minimise participant fatigue. As the researcher carried out all sessions, a high level of consistency was achieved across participants.

3.5 Research Procedures I

3.5.1 Screening Phase

The structure of the Screening session is illustrated in Table 6.

Table 6 Structure of the Screening Session

Screening Session	Introduction and Explanation of the Session	c.4 minutes
	YARC	c.5-15 minutes
	WASI Matrices	c.10 minutes
	TOWRE Phonemic Decoding Efficiency	c.3 minutes
	Screening Questionnaire	c.3 minutes

At the Screening Session, the researcher aimed to make participants feel at ease. After introducing herself, the researcher explained that she would like the participant to do some tasks. The researcher assured participants that they would not be asked to do anything too difficult and that they could stop at any point if they wished. The tasks were introduced in the following manner, “*Would you like to do some reading with me?*”, “*Would you like to look at some patterns?*” At the end of the session, the researcher thanked all participants. If the child asked whether they would be participating in future sessions, the researcher explained that she planned to return to the child’s school in a few months but that she wasn’t sure which children she would be working with.

3.5.1.1 Reading comprehension: The York Assessment of Reading for Comprehension (YARC, Snowling et al., 2009)

The Passage Reading assessment of the YARC assesses the oral reading accuracy, rate and comprehension skills of primary school children aged 5-11. This measure was recently standardised on 200 pupils in each primary year group throughout England, Northern Ireland, Scotland and Wales. The YARC is used in the present study as it is considered to have a number of advantages over existing measures of reading comprehension such as the NARA-R. For example, the YARC’s 2008 UK standardisation suggests that its norms may be used for the current study with confidence. In particular, 14.2% of the standardisation sample

spoke EAL, a figure close to the 14.3% of primary school children in England who spoke EAL in 2008 (DCSF, 2008). The YARC is also quicker to administer than the NARA-R as test entry point is determined by word reading. The possibility of participants experiencing fatigue or frustration during testing is therefore lessened. Pilot work for the current study confirmed that Year 5 EAL children had no difficulty in understanding the instructions for the YARC or in completing the test.

Reliability and Validity of the YARC

The results of reliability assessments for the Accuracy, Rate and Comprehension aspects of the YARC are printed in the test manual (Snowling et al., 2009, pp. 58 - 60) and show that reliability for the different levels lies between .75 and .93 for Accuracy, between .90 and .95 for Rate and between .48 and .77 for comprehension. In considering the relatively lower reliability scores for Comprehension, the test developers explain that accuracy and rate are “relatively easy to measure” while “comprehension is a multi-faceted construct and our estimates of it are based on quite a small number of comprehension questions for each passage” (Snowling et al., 2009, p.58). The developers advise, therefore, that an estimate of a participant’s reading comprehension ability should be based on 2 passages of suitable difficulty. This advice was heeded in this study.

The YARC’s developers also consider the content and concurrent validity of the test. The YARC’s Accuracy component is argued to have content validity because the test requires participants to read passages aloud, a task which requires accurate pronunciation of words. For Comprehension, the test developers administered the age-appropriate comprehension questions from both Forms A and B to 14 pupils from each year group (Reception – Year 6)

without the accompanying comprehension passage. In general, these pupils were unable to provide correct answers to the comprehension questions (Snowling et al., 2009, p.61); YARC Comprehension is therefore considered as having acceptable content validity. For concurrent validity, a subset of the standardisation sample completed the NARA-II and standardised scores achieved by these pupils on this measure and on the YARC were compared. Similar scores were achieved by these pupils on both measures; the YARC is therefore considered to have adequate concurrent validity with the NARA-R.

Administering the YARC

Form A of the YARC was administered to each participant according to the instructions provided in the manual (Snowling et al., 2009, pp.11-19). Firstly, the Single Word Reading Test (SWRT, Foster, 2007) was administered to each child. The SWRT requires participants to read aloud a series of words of increasing difficulty. The number of words correctly read indicates an appropriate starting passage level for the YARC. Each participant then read this passage aloud and answered the accompanying comprehension questions. Depending on the participant's performance on the Accuracy and Comprehension aspects of this initial passage, s/he then completed a harder or easier second passage as appropriate. Throughout, the researcher carefully followed all relevant administration guidelines in the manual.

Scoring the YARC

The YARC was scored according to instructions given in the manual. The test yields raw scores for Accuracy, Rate and Comprehension for each passage administered. For Accuracy, the raw score was the number of errors the child made in reading the passage aloud. A raw score for Rate equalled the number of seconds taken to read the passage. For

Comprehension, the raw score equalled the number of Comprehension questions answered correctly. These raw scores were converted to ability scores which take the level of the passages completed into account. As 2 passages were administered to each participant, a mean ability score was calculated for each of the 3 aspects of the test. Mean ability scores were then used to obtain standard scores for Accuracy, Rate and Comprehension for each participant. The researcher scrupulously followed the scoring procedures outlined in the manual throughout.

3.5.1.2 Decoding: The Phonemic Decoding Efficiency Subtest of the Test of Word Reading Efficiency (TOWRE PDE, Torgesen et al., 1999)

The Phonemic Decoding Efficiency (PDE) subtest is one of 2 subtests of the TOWRE and measures the number of pronounceable nonwords which can be correctly decoded in 45 seconds. The original intention of this study was to sample groups of EAL and EL1 Good Comprehenders (GCs) and Poor Comprehenders (PCs). GCs and PCs would have been matched for nonword decoding (as measured by the TOWRE PDE) but GCs would have had significantly higher scores on the YARC Comprehension than the PCs. The rationale for using a nonword decoding measure in order to select GCs and PCs is provided by Nation (2005) who advocates using a measure of ‘pure’ nonword decoding which is independent of the Comprehension measure used. Although the actual participants in the Main Phase of this study are not EAL and EL1 GCs and PCs, rather EAL and EL1 Average and Above Average readers, it remains important to match the EAL and EL1 Average readers and the EAL and EL1 Above Average readers on a measure of ‘pure’ decoding in order to be certain that performance on the dependent variables for EAL and EL1 groups is not differentially influenced by this variable.

The primary reason that the TOWRE PDE was selected for use in the current study is its speed and ease of administration. In addition, it is norm-referenced from the ages of 6 - 24 (albeit on a US, not a UK population) and it has been successfully used in previous research with UK EL1 samples (e.g. Ricketts, Nation & Bishop, 2007; Ricketts, Bishop & Nation, 2008). Pilot work carried out for the current study confirmed that Year 5 EAL children found this test accessible and enjoyable.

Reliability and Validity of the TOWRE PDE

The TOWRE PDE's developers investigate its reliability by carrying out a number of different procedures: an alternate-form reliability procedure; the test-retest method; an inter-rater reliability procedure; correlations between Form A and B. In each instance, reliability coefficients were .90 and above (Torgesen et al., 1999, pp. 59 - 64).

The test developers describe in detail the steps taken to demonstrate the content, criterion-related and construct validity of the TOWRE PDE. Quantitative evidence for the content validity of the TOWRE PDE is provided through use of item discrimination analysis, item difficulty analysis and item functioning analysis (Torgesen et al., 1999, pp. 65 - 71). In terms of criterion-related validity, the concurrent validity of the TOWRE PDE is suggested by strong correlations (.87 - .91) between results on this measure and results on the Word Attack subtest of the Woodcock Reading Mastery Tests – Revised (WRMT-R, Woodcock, 1987) (Torgesen et al., 1999, pp. 71 - 76). Detailed information included in the manual suggests that the TOWRE PDE has adequate construct validity (Torgesen et al., 1999, pp. 76 - 84). The above information provides convincing evidence that the TOWRE PDE is a reliable and valid measure of nonword reading efficiency.

Administering the TOWRE PDE

Participants completed first Form A and then Form B of the Phonemic Decoding Efficiency section of the TOWRE. The Practice list was administered first to familiarise participants with the nature of the test. For each Form, the participant is presented with a list of nonwords of increasing complexity. The participant's task is to read aloud as many nonwords as possible within 45 seconds. There is no stopping rule for the test; if the participant completes the list before 45 seconds has elapsed, s/he stops. The administration procedures outlined in the Manual (Torgesen et al., 1999, p.21 - 25) were followed carefully.

Scoring the TOWRE PDE

The participants' raw score on each form of the TOWRE PDE is the total number of nonwords correctly pronounced within 45 seconds. For the purposes of this study, each participant's raw score was the mean of the raw score achieved on forms A and B of the test. The manual was then used to obtain standard scores.

3.5.1.3 Non-Verbal Ability – the Matrix Reasoning subtest of the Wechsler Abbreviated Scale of Intelligence (Wechsler, 1999)

The WASI is individually administered and was developed to provide a quick, reliable measure of intelligence in individuals aged from 6 to 89 in a range of settings. It is linked to both the Wechsler Intelligence Scale for Children – Third Edition (WISC-III, Wechsler, 1991) and the Wechsler Adult Intelligence Scale – Third Edition (WAIS-III, Wechsler, 1997). The WASI Matrix Reasoning (WASI Matrices) is one of 4 subtests of the WASI and measures nonverbal fluid reasoning and general intellectual ability. The test consists of a series of 35 incomplete patterns that the participant must complete by selecting one of 5

possible choices. The measure was standardised for a US population. It was important to match Language groups on a measure of non-verbal ability in this study in order to be sure that any Language group differences on the dependent variables which may arise would not be due to differences in non-verbal ability. The WASI Matrices were used in this study solely for matching, rather than diagnostic purposes.

The WASI Matrices were chosen for use in this study for practical reasons. From previous experience in carrying out research in UK primary schools, the researcher was aware that teachers tend to prefer that children are not absent from the classroom for sessions of longer than around 30 minutes. Due to the large number of participants in the Screening Phase, it was imperative that all Screening measures were carried out in a single session. It was therefore important that the measure of non-verbal ability selected for this study could be administered in no more than around 10 minutes. Other widely-used measures of non-verbal ability which are appropriate for 9-10 year old participants such as The Ravens Standard Progressive Matrices (Ravens SPM, Raven, 2008) take over 20 minutes to administer. The WASI Matrices has been successfully used in a number of UK studies with 9-10 year old native English speaking children (e.g. Ricketts et al., 2007; Ricketts et al., 2008). When this measure was administered to the pilot sample for the current study, none of the children with EAL in this sample had any difficulty in understanding the instructions for this measure or in completing the test.

Reliability and Validity of the WASI Matrices

The test developers use a number of techniques to estimate the reliability of the WASI Matrices. Internal consistency reliability coefficients with Fisher's z transformation range

from between .86 and .96 for children aged between 6 and 16 (c.f. Wechsler, 1999, p.125). Using the test-retest method, the stability coefficient for children was .77 (Wechsler, 1999, p.130). Where interscorer agreement is concerned, the correlation coefficients for WASI Matrices tend to be above .90 (Wechsler, 1999, p.129). On the basis of these analyses, the WASI Matrices can be said to be reliable.

The test developers investigate the content validity and the construct validity of the WASI Matrices. The content validity of the WASI Matrices was examined by running correlations between performance on this measure and its equivalent in the WAIS-III (Wechsler, 1997). The mean correlation coefficient across age groups is .66 (Wechsler, 1999, p.136). The construct validity of the WASI Matrices was investigated by examining the intercorrelations between the WASI subtests and IQ scales and the outcomes of factor analyses. The WASI Matrices correlates significantly with each of the 3 other subtests at a moderate level (from .48 - .54) with the highest correlation being with the Block Design, the other non-verbal subtest (Wechsler, 1999, p.140). Factor analyses were carried out to ascertain whether the WASI subtests measure separate constructs of verbal and nonverbal cognitive abilities. The results of these factor analyses suggest that the separation of verbal from nonverbal subtests is indeed viable (Wechsler, 1999, p.141).

Administering the WASI Matrices

The WASI Matrices subtest was administered according to the Manual's instructions. Sample items A and B were administered to all participants in the first instance. The test was then started at item 5 for all participants. If items 5 and 6 were completed correctly, full marks were awarded for items 1-4 and the participant progressed to item 7. If either item 5 or

6 was not completed correctly, the reverse rule was implemented where items 1-4 were administered in reverse sequence until 2 consecutive items were answered correctly. Credit was given for any remaining items in the reverse sequence and testing resumed in the forwards direction from item 5 or 6 as appropriate. The test was discontinued either when 4 consecutive incorrect answers were given, when 4 incorrect answers were given with a consecutive sequence of 5 items or when the participant reached item 32.

Scoring the WASI Matrices

Each correct answer was awarded 1 point and 1 point was also given for reversal items as appropriate. The maximum raw score for the participants in this study was 32. The raw scores were converted to standard scores using the norms included in the manual.

3.5.1.4 Screening Questionnaire

This short questionnaire (c.f. Appendix 3.9) was developed for the current study. The questions on this instrument ask specifically about the different language(s) the child speaks with their parent(s) or caregiver(s). This questionnaire served 2 purposes: to ensure that the school had correctly identified participants as either EAL or EL1; to exclude EAL children who reported that both parents/caregivers spoke Always/Mostly English from the Main Phase of the study. In the case of a household with only 1 parent/caregiver, EAL children were excluded from the Main Phase if they reported that their parent/caregiver spoke Always/Mostly English at home. This Screening Questionnaire was piloted on both EAL and EL1 children and was found to be an efficient way to gain basic information about home language use.

3.6. Research Procedures II

3.6.1 Main Phase

The structure of the Main Phase of this study is illustrated in Table 7.

Table 7 Structure of the Main Phase

Main Phase: EAL Average Readers (n = 24); EAL Above Average Readers (n = 22); EL1 Average Readers (n = 24); EL1 Above Average Readers (n = 23)		
Session 1	Idiom Comprehension (Isolation Condition) TOWK Word Definitions subtest	c.20 mins c.10 mins
Session 2	TOWK Expressive subtest TOWK Receptive subtest TOWK Synonyms subtest TOWK Figurative Usage subtest	c.7 mins c.7 mins c.7 mins c.9 mins
Session 3	Idiom Comprehension (Context Condition)	c.25 mins
Session 4	WMTB-C Backwards Digit Recall subtest TOWK Multiple Contexts subtest Language Background Questionnaire (for EAL children only)	c.5 mins c.7 mins c.10 mins
Session 5	Idiom Comprehension Transparency Rating (for subset of the children only)	c.15 mins

At the beginning of the first Main Phase session the researcher re-introduced herself to the children and explained that if they agreed, she would like them to do some tasks. The researcher explained that she and the child would do 3 more sessions together during the coming weeks (or 4 more if the child was in the Transparency subset). All children were in agreement. The tasks were introduced as follows, “*Would you like to look at some phrases with me?*”; “*would you like to do a task involving words?*” At the end of each session, the researcher told the child when the next session would take place.

3.6.1.1 The Idiom Comprehension Measure (ICM)

An expanded version of the ICM used in Cain and Towse (2008) was employed in this study. The original Cain and Towse (2008) measure is described in this section while amendments made to this measure for the current study are described in section 3.7.1.1. Four different idiom-types are used in Cain and Towse (2008): Real-Transparent; Real-Opaque; Novel-Transparent and Novel-Opaque (c.f. Appendix 3.10 for a list). Six idioms of each type are included. Real idioms are those which occur commonly in English; the interpretations for these idioms were taken from *The Collins Cobuild Dictionary of Idioms* (Sinclair, 2002). Novel idioms do not occur in English but are translations of idioms which occur in other European languages (Italian, Spanish and Danish). Transparent idioms have a high degree of agreement between the literal and figurative meanings of the idiom while opaque idioms have a low degree of agreement between the literal and figurative meanings of the idiom.

The categorisation of idioms as being either Real or Novel was confirmed through pilot work with 12 undergraduate students. All Real idioms were 'recognised' by at least 10 participants while all Novel idioms were 'recognised' by no more than 2 participants. Information regarding the extent to which these participants were able to provide correct definitions of the idioms is provided in Cain et al. (2005, p.73). The categorisation of idioms as being either Transparent or Opaque was confirmed by a separate group of 12 undergraduate students who completed a component rating task. A description of this task and its results is provided in Cain et al. (2005, pp. 73 - 4). Finally, a group of 12 undergraduate students who had not participated in any previous pilot work for this study completed an in-context explanation task to confirm that each idiom could be interpreted when supportive context was provided (c.f. Cain et al., 2005, pp. 74 - 75).

For each idiom, 4 multiple-choice response options were provided: “a) a target idiomatic interpretation of the phrase; b) a figurative interpretation, which (is) plausible within the story context; c) a figurative interpretation, which (is) not plausible within the story context; and d) an interpretation that (provides) a literal interpretation of the phrase” (Cain & Towse, 2008, p.1542). These response-options are referred to in the current study as Idiomatic, Congruent, Incongruent and Literal respectively. Each idiom was presented twice, on separate occasions, once in isolation and once with supportive context.

The Cain and Towse (2008) measure has numerous strengths. It has already been successfully used in the UK with native English speaking Year 3 and Year 5 children (c.f. Cain & Towse, 2008; Cain, Towse & Knight, 2009), its multiple-choice format eliminates any potential confound of articulation ability (c.f. Spooner et al., 2004) and it provides the opportunity for detailed error analysis. In addition, the use of different idiom-types and presentation conditions addresses the influence of 3 factors which have been shown in the literature to be important for idiom comprehension: familiarity (which will be referred to in this study as ‘Realness’); context and transparency. On the basis of a pilot study for the current project, the measure used in Cain and Towse (2008) was modified very slightly for use in the Main Phase of the current study (c.f. section 3.8). Appendix 3.11 provides the Isolation Condition of the measure used in the current study while Appendix 3.12 provides the Context Condition of the measure. Appendix 3.13 provides an illustration of how the 4 response-types relate to the story context for a sample Novel Opaque idiom. Descriptive statistics from the pilot study (c.f. Appendix 3.14) suggest that children who speak EAL are able to engage with this measure and that their general patterns of achievement on this

measure are in line with what would be expected on the basis of previous research (i.e. a facilitatory effect of supportive context and of idiom transparency).

Reliability and Validity of the ICM

As this idiom comprehension measure is non-standardised, the reliability and validity of the measure have not been tested in a rigorous manner. However, the measure has been successfully used in 2 previous UK studies with typically-developing Year 3 and Year 5 children (Cain et al., 2009) and with Year 5 GCs and PCs (Cain & Towse, 2008). While no statistical information related to the reliability of the measure is provided, some comments about the content validity in particular of the measure may be made. A central aim of the ICM employed in this study is to test participants' ability to engage in i. semantic analysis and ii. inference from context. The use of Novel idioms in this measure strengthens its content validity. If Real idioms alone were used, prior exposure to these idioms in everyday life could influence the ability of participants to engage in semantic analysis and inference from context. Secondly, the finding in Cain and Towse (2008) that Poor Comprehenders (PCs) experience difficulties in using context to infer the meanings of opaque idioms is in line with other research by Cain and colleagues which has suggested that PCs have difficulties in using context to generate inferences (Cain et al., 2004; e.g. Cain & Oakhill, 1999; Cain, Oakhill, Barnes & Bryant, 2001). A third comment in support of the content validity of this ICM is the finding in Cain et al. (2009) that there are developmental differences in the comprehension of Real idioms (Nippold & Taylor, 1995; a finding which is supported in Nippold & Martin, 1989; Nippold & Rudzinski, 1993) and that there are also developmental differences between childhood and adulthood in the use of semantic analysis and inference from context.

Administering the ICM

For each participant, the Isolation condition was administered before the Context condition. An interval of at least 1 week was left between the administration of the Isolation and Context conditions. In each condition, the order of administration of items was the same for each participant. The order of items was different for Isolation and Context conditions. The items were arranged so that idioms of the same type (e.g. novel opaque etc) did not appear consecutively.

On each occasion the idioms, multiple-choice options and story contexts (in the context condition) were presented in a booklet. The researcher worked through these booklets with the child by reading out their contents, allowing the child to follow the printed words. The researcher started the Isolation condition by reading out the instructions printed on the first page of the booklet before moving on to the first practice item. When the child had given a response the researcher said, *'(Yes/That's not quite right...It's raining cats and dogs' means 'it's raining very hard.' This saying does not mean that animals are falling from the sky. The saying as a whole may have a meaning which is quite different from the meaning of the words in the saying.'* The researcher then moved on to the second practice item. When the child had given a response (either correct or incorrect), the researcher said, *'Yes/That's not quite right...Around the clock' means '24 hours a day.' This saying does not mean to draw around a clock. Remember, the saying as a whole may have a meaning which is not quite the same as the meaning of the words in the saying.'* Where the context condition was concerned, the researcher again read the instructions printed on the first page of the booklet and then administered the first practice item. When the child responded, the researcher said, *'Yes/That's not quite right... 'To go by the book' means 'to follow the rules.' This saying does*

not mean 'to do what a book tells you.' The saying as a whole may have a meaning which is quite different from the meaning of the words in the saying.' The researcher then moved on to the second practice item. When the child responded, the researcher answered, *'Yes/That's not quite right... To eat your hat' means 'to be very shocked.'* *This saying does not mean that someone will have their hat for dinner. Remember, the saying as a whole may have a meaning which is not quite the same as the meaning of the words in the saying. Use the stories to help you understand the meaning of the saying.'* The researcher then moved on to the first item.

The EAL and EL1 participants in the current study were not matched on a measure of working memory during the Screening Phase due to time constraints. Steps were therefore taken to minimise the working memory burden of the ICM, the study's dependent measure, in order to reduce the possibility that potential working memory differences between the EAL/EL1 groups may influence performance on this measure (c.f. section 2.6). For example, the children were encouraged to read silently along as the researcher read the ICM text aloud. In addition, the ICM text was made available for participants to refer back to if required before they provided their answers. These procedures were particularly important in reducing the working memory burden in the Context condition of the measure, as they meant that participants did not need to hold the entire story context in their memory whilst working out which response to provide, as would have been the case had they not had access to the written text.

When administering the context condition, a time limit of 2 minutes was imposed for the child to answer each item. No child went beyond this time limit. In addition, standard explanations for 'lounge' and 'frisbee,' 2 words in the context stories, were devised after

some children in the Pilot questioned their meanings. If a participant questioned the meaning of 'lounge' the researcher said, "A lounge may also be called a sitting room or a living room. It's a room in a house where people sit together." If a participant questioned the meaning of 'Frisbee' the researcher said, "A Frisbee is a toy shaped like a disc which flies through the air." No vocabulary explanations for any word in a) the idioms themselves or b) the multiple choice options were given. Data obtained from this ICM is used to address RQs 1, 2, 3 and 4.

Expanding the measure used in Cain and Towse (2008)

The measure used in Cain and Towse (2008) was expanded for the present study to explore the notion that children's perceptions of the familiarity and transparency of idioms may not match those of adults (c.f. Nippold & Taylor, 2002). During the first idiom comprehension session, before asking the children to complete the multiple-choice task for idioms in isolation, all children were asked whether they have heard the idiom: 1 = many times; 2 = a few times; 3 = once; 4 = never. After the idioms-in-context session, a further session was scheduled for a subset of participants only due to time constraints. These children were presented with both the idiomatic and literal meanings of each idiom and were asked to rate the relatedness of the idiomatic and literal meanings of the idiom on a 4-point scale: 1 = very related; 2 = quite related; 3 = a little bit related; 4 = not related at all. A similar procedure was used with 11 and 16 year olds in Nippold and Taylor (2002). The information obtained from these ratings is used to address RQ 3.

Scoring the ICM

A simple scoring procedure was adopted. For familiarity ratings and transparency ratings, participants' answers were coded from 1-4 as explained above. These codes were defined in

SPSS. For the Isolation and Context Conditions, participants' answers were coded as follows: 1 = target Idiomatic response; 2 = Congruent figurative interpretation; 3 = Incongruent figurative interpretation; 4 = Literal response. For each participant, the number of times each response (i.e. Idiomatic, Congruent, Incongruent, Literal) was provided for each idiom-type (e.g. Real Transparent Isolation) was calculated. For example, for RTI idioms, one participant may have provided 3 Idiomatic responses, 2 Congruent responses, 1 Incongruent responses and 0 Literal responses. As 6 examples of each idiom-type were included in the measure, the maximum value for any one response for any idiom-type was 6. For each of the 4 groups, a mean value was calculated for the number of times each response was provided for each idiom type. For idiomatic responses, these mean values were used to answer RQ1. For Congruent, Incongruent and Literal responses, the mean values were used to answer RQ2.

3.6.1.2 The Test of Word Knowledge Level 2 (TOWK, Wiig and Secord, 1992)

Level 2 of the TOWK comprises 8 subtests: 4 core and 4 supplementary (c.f. Table 8) which are intended for use with children between the ages of 8 and 17. Each subtest is defined as testing either expressive semantic ability (E) or receptive semantic ability (R). Due to time constraints, the entire battery was not administered to participants in the present study. Rather, the 4 core subtests for this age group plus 2 supplementary subtests (Receptive Vocabulary and Expressive Vocabulary) were administered to all children who participated in the Main Phase of the project.

Table 8 Level 2 TOWK Subtests

Level 2: Ages 8 – 17
Relational and Metalinguistic Aspects
Core Subtests
Word Definitions (E)
Synonyms (R)
Multiple Contexts (E)
Figurative Usage (R)
Supplementary Subtests
Expressive Vocabulary (E)
Receptive Vocabulary (R)
Word Opposites (R)
Conjunctions and Transition Words (R)

(from Wiig & Secord, 1992, p. 4).

Administering these 6 TOWK subtests did not provide an exhaustive account of a child's vocabulary knowledge. However, doing so provides a detailed picture of the particular word-level semantic strengths and weaknesses of each individual child and of group patterns of performance. Of particular pertinence to the current study is the extent to which vocabulary mediates the relationship between idiom comprehension and reading comprehension. The TOWK is therefore used to address RQ4. A second area of interest is the question of whether the EAL/EL1 groups in the current study are matched on all 6 TOWK subtests. If not, the relevant subtests will be used as covariates for RQ1 and RQ2 in order to examine whether vocabulary explains the extent to which participants select each of the 4 potential response-types on the ICM. Data obtained from the TOWK will therefore address RQs 1, 2 and 4.

The TOWK has a number of features which make it appropriate for use in the current project. For example, it is quick to administer and it includes a discontinuation rule which ensures

that participants do not become discouraged from being forced to tackle items which are too difficult for them. As the TOWK was standardised in the US rather than the UK, caution should be exercised in using standard scores. There is a precedent, however, for using the TOWK with UK EAL and EL1 samples: Hutchinson et al. (2003) used the Word Definitions, Word Opposites, Receptive Vocabulary and Expressive Vocabulary subtests in a longitudinal study of EAL and EL1 participants in Years 2, 3 and 4.

Reliability and Validity of the TOWK

The reliability of the TOWK is examined using the following methods: tests of internal consistency; test-retest reliability and interscorer reliability. In each case, the reliability coefficient was above .75 and was deemed adequate (Wiig & Secord, 1992, pp. 56 - 59).

Evaluations of the TOWK's content, construct and concurrent validity are included in the Manual. The test developers address the content validity of the TOWK by answering 4 questions posed by Kretschmer and Kretschmer (1978) which were designed to allow users to evaluate the content validity of a test (Wiig & Secord, 1992, p.49). The construct validity of the TOWK was examined as follows: the extent to which the test correctly discriminates between participants who have been diagnosed as having Language Learning Disorder (LLD) and those who are non-LLD was assessed (c.f. Wiig & Secord, 1992, p. 52); intercorrelations between the Level 2 subtests were examined and were found to range from .61 to .74; a factor analysis confirmed the hypothesis that the test measures receptive and expressive language performance (Wiig & Secord, 1992, pp. 45 - 54). The concurrent validity of the test was examined by correlating performance on the TOWK Receptive Composite, Expressive Composite and Total Score with the Clinical Evaluation of Language Fundamentals -Revised

(CELF-R, Semel, Wiig & Secord, 1987), the WISC-III (Wechsler, 1991) and the Matrix Analogies Test-Short Form (MAT, Naglieri, 1985). These correlations are all significant with coefficients of between .59 and .76 (Wiig & Secord, 1992, pp. 54 - 55). The above discussion, in addition to further information provided in the manual, suggests that the TOWK has adequate reliability and validity for use in the current study.

Overview of the TOWK subtests and administration procedures

Each TOWK subtest has a range of age-related starting points and has basal and discontinuation rules. The basal rule for all TOWK subtests is that the student must achieve 5 consecutive correct answers before continuing with the test. If a basal is not achieved with the first 5 items administered, the examiner works backwards until 5 consecutive answers are provided. Some participants may not achieve a basal. The discontinuation point for all TOWK subtests is 5 consecutive incorrect answers, or completion of the subtest.

Core subtests

The Word Definitions and Synonyms subtests investigate the child's knowledge of "the semantic features shared by words" (Wiig & Secord, 1992, p. 6).

Word Definitions: The participants in the current study began at item 1 (starting point for 5-11 year olds). The child is given a word and is asked to talk about both the "kind of thing" the word is and to say "some things about it" (Wiig & Secord, 1992, p. 28). Points are awarded for responses which elaborate on the word's category membership and its semantic features.

Synonyms: The starting point for all participants in this study was item 9 (starting point for 9 year olds). The stimulus word is presented to the child along with 3 or 4 word choices. The correct word choice is a synonym of the stimulus word while the other words may be antonyms of the stimulus, members of the same semantic class or associated with the stimulus.

The Multiple Contexts and Figurative Usage subtests address the child's understanding of the fact that a substantial proportion of English vocabulary consists of words which have more than one meaning.

Multiple Contexts: All participants began this subtest at item 1 (starting point for 8-11 year olds). In this subtest, the child is asked to provide 2 distinct meanings for a stimulus word. Each of the stimulus words has a minimum of 2 and a maximum of 5 possible meanings.

Figurative Usage: The starting point for participants in this study was item 1 (starting point for 8 – 11 year olds). In this subtest the participant is either presented with a figurative expression and must choose the appropriate literal meaning from 4 choices or is presented with the literal meaning and must choose the appropriate figurative expression from 4 choices. There are a number of types of figurative expression in this subtest including opaque idioms (e.g. “shake a leg”); transparent idioms (e.g. “give a pat on the back”); and collocations (e.g. “hold off”).

Supplementary subtests

The Expressive and Receptive Vocabulary subtests address the ability to “identify and label referents” and to “use these referents in speaker-listener interactions” (Wiig & Secord, 1992, p. 6).

Receptive vocabulary: Item 10 (starting point for 8 – 13 years) was the starting point for all participants in this study. The child is asked to point to a picture which represents a word said by the researcher.

Expressive vocabulary: All participants in this study began this subtest at item 5 (starting point for 6-9 years). In this subtest, the researcher shows the child a picture and says a phrase (e.g. “what is the toy doing?”) in order to elicit a response.

Scoring the TOWK subtests

For the Word Definitions subtest, a score of 2 was awarded for a 3-component response, a score of 1 for a 2-component response and a score of 0 for a 1-component response or for an incorrect response. If no response was given for a particular item, this was noted on the response sheet (NR). To score this subtest, the scores of 1 and 2 points were added together to yield a raw score.

For all other subtests, in order to calculate a raw score the number of 0 and NR responses was subtracted from the number of the final item administered. These raw scores were used to calculate standard scores using the tables provided in the Manual.

3.6.1.3 Working Memory: Backwards Digit Recall Subtest from the Working Memory Test Battery for Children (WMTB-C, Pickering & Gathercole, 2001)

The theoretical background for the WMTB-C is Baddeley's influential model of working memory (c.f. Baddeley & Hitch, 1974; Baddeley, 1986). This model conceptualises working memory as consisting of 3 components: the central executive which 'is responsible for important high-level cognitive activities that include planning, coordinating the flow of information through working memory and retrieving knowledge from long-term memory' (Pickering & Gathercole, 2001, p. 1); the phonological loop which stores the sound structure of information and the visuo-spatial sketchpad which stores visual or spatial information (Pickering & Gathercole, 2001, p. 2).

The Backwards Digit Recall subtest is one of 9 subtests of the WMTB-C and is one of 3 subtests which measures central executive function. Ideally, a full battery of working memory measures would have been administered to Main Phase participants in order to gain a detailed understanding of participants' working memory profiles. Due to time constraints, however, it was only possible to administer a single measure. The Backwards Digit Recall subtest was chosen in order to gain insight into participants' ability to both retain and manipulate information, skills which are required when completing the ICM.

This subtest requires participants to listen to digit sequences and to repeat these digit sequences in reverse order. Previous studies have yielded mixed results regarding the relative performance of EAL and EL1 participants on measures of working memory (Engel de Abreu, 2011; e.g. Lesaux, Lipka and Siegel, 2006; Morales, Calvo and Bialystok, 2013). This measure was included in the current study to investigate any potential working memory differences in the EAL and EL1 groups. In addition, if any Language Group differences are

found for working memory, this Backwards Digit Recall test will be used as a covariate for RQ1 and RQ2 in order to examine whether working memory is an important factor in the EAL and EL1 children's response choice on the ICM. This measure is also standardised on a UK population and is quick and easy to administer.

Reliability and Validity of the WMTB-C

Test-retest reliability was assessed for each of the subtests of the WMTB-C by administering the subtest on 2 separate occasions, each 2 weeks apart. For Year 5 and 6 children, the correlation between the 2 scores on the Backward Digit Recall subtest was .71 (Pickering & Gathercole, 2001, p. 19).

The criterion-related and construct validity of the WMTB-C as a whole are examined. The criterion-related validity of the central executive aspect of the WMTB-C was assessed in 2 different ways. Firstly, the relationships between composite scores for the central executive aspect of the WMTB-C and a number of standardised measures of vocabulary, literacy and arithmetic were examined. Central executive performance was significantly associated with vocabulary, literacy and arithmetic. These patterns are also found in the literature (c.f. Pickering & Gathercole, 2001, p. 24 - 25). Secondly, performance on the WMTB-C was examined with reference to children's performance in England's National Curriculum Key Stage 1 and 3 standardised assessments of English and maths. These analyses suggest that performance on the WMTB-C, particularly on central executive measures, is closely related to performance in National Curriculum assessments of English and maths at these levels. Exploratory and confirmatory factor analysis showed that the factor structure of the WMTB-C is closely related to the structure of the model which motivated the construction of the test

battery, suggesting that the WMTB-C has strong construct validity (Pickering & Gathercole, 2001, p. 20 - 24). Overall, the WMTB-C appears to have satisfactory reliability and validity.

Administration of the Backwards Digit Recall subtest of the WMTB-C

Practice trials P1 and P2 followed by the first block of test trials were administered to all children in the first instance (these require participants to recall 2 numbers in backwards order). All participants responded correctly to at least 4 trials in block 1 so Practice trials P3 and P4 followed by the second block of test trials were then administered to all children (these require participants to recall 3 numbers in backwards order). The test then proceeded through the blocks of test trials. If a participant succeeded in providing 4 correct answers in any block, full marks were given for the remaining items in that block and the first item in the next block was administered. If 3 or more errors were made in any block the test was discontinued. The test was administered following the procedures outlined in the manual (Pickering & Gathercole, 2001, p. 68 - 73).

Scoring the Backwards Digit Recall subtest of the WMTB-C

Correct responses to each trial are given a score of 1. Each child's score was summed to give a raw score which was then converted to a standard score by consulting the Manual.

3.6.1.4 Questionnaire for Parents/Guardians of EL1 children

This questionnaire was sent to the Parents/Guardians of all EL1 children who participated in the Main Phase of the project (c.f. Appendix 3.15). Its purpose was to gather information about factors which a) may influence the child's academic performance such as mother's level of education and b) the child's linguistic background such as whether the child is

attending any extra-curricular language classes. This questionnaire was developed for use in this study.

3.6.1.5 Questionnaire for Parents/Guardians of EAL children

This questionnaire was sent to the Parents/Guardians of all EAL children who participate in the Main Phase of the project (c.f. Appendix 3.16). In addition to the questions included in the questionnaire for Parents/Guardians of EL1 children, this questionnaire included additional questions which may be pertinent to the child's English comprehension development such as when the child first received sustained exposure to English, the language environment in the home and whether the child is becoming literate in her L1 or in another language. This questionnaire was developed for the current study and is designed to complement the Language Background Questionnaire (LBQ).

3.6.1.6 The Language Background Questionnaire (LBQ)

The LBQ (c.f. Appendix 3.17) is a modified, expanded form of the Language Preference Questionnaire (Beech & Keys, 1997) (c.f. Appendix 3.18). The purpose of this oral questionnaire for the proposed study is to ensure that even if the child's parent/guardian does not return a Parental Questionnaire, a detailed description of the EAL group's language experience in their own words is obtained. The LBQ is not exhaustive. However, it provides a basic level of insight into the child's language and literacy background.

The modifications of the original Beech and Keys (1997) questionnaire were made on the basis of pilot work with Year 2, 3 and 4 children which was carried out as part of an MSc project during the summer of 2009 (McKendry, 2009). This pilot work indicated that the Beech and Keys (1997) questionnaire may be expanded to provide more specific information

about the different languages which are spoken by various members of the child’s family in different situations and to include information about whether the child is becoming literate in their first language or in any other language apart from English. The 2009 pilot work indicated that Year 4 EAL children were generally able to provide detailed information about their language experiences. It is assumed for the purposes of the current study that Year 5 children would be able to do the same.

The manner in which each of the measures employed in the Main Phase of this study address the study’s Research Questions is illustrated in Table 9.

Table 9 How the Measures Employed Address the Research Questions

Research Question	Measure(s)
1	Idiom Comprehension Measure, TOWK Level 2 Subtests, WMTB-C subtest
2	Idiom Comprehension Measure, TOWK Level 2 subtests, WBTB-C subtest
3	Idiom Familiarity and Transparency Ratings
4	Idiom Comprehension Measure, TOWK Level 2 subtests

3.7 Pilot

During June – July 2010, 10 EAL children and 5 EL1 children participated in a Pilot. All children were members of a single Year 5 class in School 5. During 5 separate sessions, participants in the Pilot completed all Screening and Main Phase tasks in addition to an ‘Idiom Comprehension Vocabulary Measure’ (ICVM) which was developed with this Pilot in mind. In order for participants to be able to employ semantic analysis it is important that they are familiar with the literal meanings of the words in the Transparent idioms. It is of additional concern that if there are any words in the Opaque idioms that participants have not

previously encountered, they may focus their attention on attempting to interpret the meaning of this single word as opposed to the meaning of the idiom as a whole. The ICVM required participants to choose, from 3 possibilities, the most appropriate usage of each of the content words contained in the idioms used in Cain and Towse (2008) (c.f. Appendix 3.19).

The main purposes of the Pilot were: i. to use the ICVM to check that participants were familiar with all of the vocabulary items included in the idiom comprehension measure; ii. to check that the instructions for the idiom comprehension measure were appropriate; iii. to check that the testing schedule was suitable; iv. to check that the EAL children were happy to complete the language background questionnaire and that this questionnaire yielded a sufficiently detailed picture of the EAL children's language use; v. to check that participants' parents were willing to fill in the parental questionnaire and that the questions asked on this questionnaire were appropriate.

This pilot revealed the need for some small changes: i. Some participants were unsure of the meanings of 2 words in the idioms: 'cloaked' and 'scalded.' These participants were told that 'cloaked' meant 'covered' and 'scalded' meant 'burned'. All participants understood these explanations. 'Covered' and 'burned' were therefore substituted for 'cloaked' and 'scalded' in the idiom comprehension measure which was used in the Main Phase of the study. No other vocabulary changes were made. Standard explanations were created for 2 words in the context stories, 'lounge' and 'Frisbee', which were queried by some participants; ii. The instructions for the Context condition were modified slightly so that participants were explicitly told that they should use the story to help them understand the meanings of the sayings. In addition, a second practice item was added to each condition to ensure that all

participants understood exactly what they were being asked to do; iii During the Pilot, the researcher noted that all of the names included in the Context stories in the Idiom Comprehension Measure are commonly used in the White British community e.g. Billy, Jamie, Ann, Debbie. Given that half of the participants in the current study were not from a White British background, some of the names used in the Context stories were modified to reflect the diversity of ethnic backgrounds represented in the study's participants; iii. The testing schedule was modified so that in the Main Phase, each child completed 4 longer sessions rather than 5 shorter sessions; iv. In the language background questionnaire, the wording of 3 items was modified to enhance clarity; v. A question asking whether participants were eligible for FSM was removed from the parental questionnaire as teachers at the pilot school felt that some parents would be hesitant to provide this information. The pilot offered the opportunity for the researcher to practice administering and scoring all tests, allowing the actual study to run smoothly. None of the pilot participants took part in the actual study.

3.8 Thanking participating children and schools

Care was taken in showing appreciation to participating children, teachers, and schools after the Screening Phase and at the end of the project. Within a week of finishing the Screening Phase in each school, a thank you card was sent to all teachers and staff who had helped with the project. A Christmas card was also sent to these individuals in December 2010. At the end of the Main Phase, each child who participated in the Screening Phase was presented with a certificate. All Year 5 children in the school were also presented with a booklet which explained the meanings of the Real idioms encountered in the study. All class teachers and any teaching assistants who had helped with the project were given a thank-you card and

some chocolate. A box of biscuits or chocolates was also given to the staffroom of each participating school. The researcher explained that feedback from the project would be provided before Summer 2012.

3.9 Ethical considerations

This study, including all additional materials has been approved by the Social Sciences and Humanities Inter-Divisional Research Ethics Committee (University of Oxford). The study conforms to Protocol MSD/IDREC/2005/P2.1 for studies using non-invasive methods with typically-developing children in schools. The researcher took care to ensure that each aspect of the study conformed to guidelines set down by both the British Psychological Society (BPS, 2009) and the British Educational Research Association (BERA, 2011). Particular attention was paid throughout to issues of confidentiality and anonymity. The consent of parents and assent of children were also of importance. In addition to an opt-in procedure being used for gaining consent from parents, the researcher also took participants' wishes into consideration. There was no pressure on any participant to continue with testing if they were unwilling to do so. However, no participants indicated that they were unwilling to partake in the study at any point.

There are certain other aspects of this research which the researcher considered carefully in carrying out the project in order to minimise potential ethical concerns. Before the beginning of the testing period in each school, the researcher arranged a meeting with the teacher who had been given the role of overseeing the research. Where possible, class teachers who would be involved with the study were present at this meeting. During this meeting, the researcher broached a number of issues which important to the ethical running of the project.

3.9.1 Disruption to the school day

In each participating school, care was taken to ensure that the researcher's presence caused minimal disruption. During the initial meeting, the researcher spoke to teachers about the specifics of how the project would be carried out in each particular school in terms of where the researcher would work, whether there were any specific times that the school would prefer the researcher not to take the children out of class and whether the school wanted the researcher to walk to and from the classroom with the children. Each school's preferences were noted and carefully adhered to.

3.9.2 Inclusion

During this initial meeting, the researcher spoke to teachers about how best to ensure that no child felt either singled out in being asked to participate in the project, or excluded by not being asked to participate in the project. In terms of guarding against children feeling singled out, in each school, over half the members of the Year 5 cohort were eligible to participate in the study. Most Year 5 children in each school received a letter home. In terms of guarding against any child feeling excluded at not being asked to participate in the project, all schools indicated that it was not uncommon for letters to be sent home with some children but not with others. Indeed, during the entire testing period, no child asked the researcher why s/he hadn't been asked to take part.

3.9.3 Language considerations

The fact that one or both of the EAL children's parents/guardians may have limited English proficiency was of concern with relation to informed consent. During the initial meeting, the

researcher asked the headteacher of each participating school for advice regarding the school's policy for sending information sheets and consent forms to parents who may have limited English. One school offered to translate the letter and information sheet into Polish, the most common community language represented in the school. All other schools suggested that the information sheets and consent forms be sent home in English and if any parents had difficulty in understanding these documents, they would be encouraged to telephone or visit the school where a bilingual member of staff (if available) would explain the study to them.

3.10 Chapter 3: summary

This methodology chapter has presented the main aims and research questions pertinent to the research. It has also described the design of the study, the pilot phase, sampling procedures and research procedures including a detailed description of the materials used. Emphasis has been placed on issues of test reliability and validity. The following chapter presents the results of analyses which are not directly related to the study's research questions, but which provide information relating to the linguistic and personal backgrounds of the participants in the Screening and Main Phases of this study.

Chapter 4: Results (I) Analysing Background Data

Two main areas are covered in this chapter. While neither of these areas is directly related to this study's research questions, both are important for a more comprehensive understanding of the samples recruited in the Screening and Main Phases of this study. Firstly, reading comprehension and English language proficiency data obtained from the full Screening sample is analysed. The extent to which major trends found in previous EAL UK literature are visible in this sample is examined and the reasons for the existence of these trends are questioned. Secondly, data derived from the Language Background Questionnaire (LBQ) and from the Parental Language Background Questionnaire (PLBQ), both of which were administered to Main Phase participants only, is analysed. This data provides detailed background information about EAL participants' linguistic experiences outside school and limited personal background information about all Main Phase participants. The relationship between this background information and a) reading comprehension and b) idiom comprehension is examined. While not directly relevant to this study's research questions, the data presented in this chapter provides detailed information about the study's participants. This data therefore contextualises Chapter 5 which presents the results of analyses which directly respond to the study's research questions.

4.1 Analysing the Screening Phase data

A key aspect of this study is that the groups of EAL and EL1 Average readers and EAL and EL1 Above Average readers who participate in the Main Phase are matched on a number of reading-related variables. However, it is of interest to examine whether the general trends

observed in the EAL literature (that EAL children tend to have poor reading comprehension but good decoding skills in comparison to their EL1 peers) are mirrored for this sample.

Table 10 illustrates the Screening Phase participants' characteristics, and their performance on the Screening Phase measures.

Table 10 Screening Phase Participants' Background Characteristics and Performance on All Measures Administered

	EAL	EL1	Chi-Square Test
Number of Males	55	50	$\chi^2(1) = 0.86, p > .05$
Number of Females	60	59	
Number in receipt of Free School Meals	14	11	$\chi^2(1) = .245, p > .05$
	EAL	EL1	Independent samples <i>t</i>-test
Mean Age in Months on date of Screening Session (SD)	115.65 (3.74)	115.90 (3.78)	$t(222) = -.496, p > .05$
Mean YARC Accuracy Ability Score (SD)	61.67 (8.67)	60.67 (10.11)	$t(222) = .792, p > .05$
Mean YARC Rate Ability Scores (SD)	74.38 (10.02)	73.90 (11.96)	$t(222) = .325, p > .05$
Mean YARC Comprehension Ability Score (SD)	61.72 (8.22)	65.88 (8.98)	$t(222) = -3.617, p < .001$
Mean TOWRE PDE Score (SD)	39.96 (9.52)	34.94 (11.72)	$t(222) = 3.524, p < .01$
Mean WASI Matrices Score (SD)	19.89 (6.14)	20.64 (5.46)	$t(222) = -.959, p > .05$

Of particular interest in Table 10 are the findings that EL1 children significantly outperform EAL children on the YARC Comprehension and that the EAL significantly outperform EL1 children on the TOWRE PDE; these results remain significant when the α -level is set at 0.008 to account for multiple comparisons (0.05/6). These comprehension-related findings are

directly in line with what would be expected from the UK EAL literature (e.g. Beech and Keys, 1997; Hutchinson et al., 2003; Burgoyne et al., 2009, 2011a). The decoding-related findings are in line with suggestions made by the UK EAL literature (e.g. Rosowsky, 2001; Burgoyne et al., 2011) though it should be borne in mind that measures of word reading rather than of 'pure' decoding were administered in these studies. Appendix 4.1 suggests that the only occasion on which both the assumption of both normal distribution and homogeneity of variance is violated is in the case of the TOWRE PDE. The significant between-group difference found for the TOWRE PDE was therefore verified using a Mann-Whitney test.

This study seeks to counter a simplistic assumption that all EAL children underachieve in reading comprehension, however. In order to achieve this aim, it is important to provide a thorough examination of the tendency for EAL participants in the Screening Phase to achieve relatively high or low scores on the YARC Comprehension in comparison to the EL1 group. To this end, all Screening Phase participants were ranked according to their performance on the YARC Comprehension. On the basis of this ranking, the top third formed the Higher Comprehension group, the middle third formed the Middle Comprehension group and the bottom third formed the Lower Comprehension group. Table 11 shows the numbers and percentages of EAL and EL1 participants in the Higher, Middle and Lower Comprehension groups.

Table 11 Number and Percentage of EAL and EL1 participants in the Higher, Middle and Lower Comprehension Groups

	EAL	EL1
Higher Comprehension Group	25 (33.3)	50 (66.7)
Middle Comprehension Group	43 (58.1)	31 (41.9)
Lower Comprehension Group	47 (62.7)	28 (37.3)
Total	115 (100)	109 (100)

Loglinear analysis was carried out to ascertain whether the proportions of EAL and EL1 participants in each of the 3 comprehension groups are equal. The 2-way loglinear analysis produced a final model that retained all effects. The likelihood ratio of this model was $\chi^2(0) = 0, p = 1$. This indicated that the highest-order interaction (the language group x comprehension group) interaction is significant, $\chi^2(2) = 15.16, p < .01$. To break down this effect, separate chi-square tests on the language group variable were carried out for each level of the comprehension group variable. There is a significant association between membership of the Lower Comprehension Group and whether the child is EAL or EL1, $\chi^2(1) = 5.79, p < .05$. Odds ratios indicate that if the child is EAL, the odds of being in the Lower Comprehension Group are 1.97 times higher than if s/he is EL1. For the Higher Comprehension Group, there is a significant association between membership of this Group and whether the child is EAL or EL1, $\chi^2(1) = 14.63, p < .001$. Odds ratios suggest that if the child is EL1, the odds of their being in this Higher Comprehension Group are 3.06 times higher than if they are EAL. Conversely, there is no significant association between membership of the Middle Comprehension Group and whether the child is EAL or EL1, $\chi^2(1) = 2.03, p > .05$. Therefore, both EAL and EL1 children are equally likely to be in the Middle Comprehension Group. By illustrating the distribution of EAL children along a continuum of

reading comprehension ability, these analyses provide a more nuanced picture of EAL children's reading comprehension than has been previously provided in the UK literature.

A further question that should be addressed here is *why* more EAL than EL1 children are located in the Lower Comprehension Group and why fewer EAL than EL1 children are located in the Higher Comprehension Group. While a detailed examination of this issue is beyond the remit of this study, the findings of Strand and Demie (2005) are worth consideration. Strand and Demie (2005) found that it is not EAL status per se, but rather a child's level of English language proficiency (as specified by the child's teacher) which most strongly predicts academic achievement as measured by the Key stage 2 national tests. These authors found that if an EAL child was rated by her teacher as being either: 1 = 'New to English'; 2 = 'Becoming Familiar with English'; or 3 = 'Becoming Confident as a User of English', they achieved significantly lower scores in the Key Stage 2 standardised tests than their monolingual peers. However, if an EAL child was rated by their teacher as being: 4 = 'Fully Fluent in English', they achieved significantly higher scores in all Key Stage 2 standardised tests than their EL1 peers. In order to investigate the relationship between teacher proficiency ratings and reading comprehension for the EAL members of the Screening Sample, participants' teachers were asked to assess the English language proficiency of all EAL children who participated in the Screening Phase using this 4-point scale. Teacher proficiency ratings were not collected for the EL1 participants. Data was available for 109 of the 115 EAL children who participated in the Screening Phase. Table 12 illustrates the number of EAL participants with each of the 4 proficiency ratings in each of the 3 Comprehension groups.

Table 12 The Relationship between English Language Proficiency (as Rated by the Participant’s Teacher) and Reading Comprehension for EAL Participants

	1; New to English	2; Becoming Familiar with English’	3; Becoming Confident as a User of English’	4; Fully Fluent in English	Total
Higher Comprehension Group	0	0	5	20	25
Middle Comprehension Group	0	1	7	32	40
Lower Comprehension Group	0	9	12	23	44
Total	0	10	24	75	109

No child was rated as being ‘New to English’ and the number of children designated as ‘becoming familiar with English’ was low. In order to produce a matrix which was appropriate for loglinear analysis, (i.e. with no cell having an expected count of less than 5), those children who were given ratings of 2 and 3 were included in a ‘Not Fully Proficient’ group (34 participants), and those children who were given a rating of 4 were included in a ‘Fully Proficient’ group (75 participants).

Loglinear analysis was carried out to ascertain whether the proportions of Fully Proficient (i.e. with a teacher proficiency rating of 4) and Not Fully Proficient (i.e. with a teacher proficiency rating of 1, 2 or 3) EAL children in each of the 3 comprehension groups were equal. The 2-way loglinear analysis produced a final model that retained all effects. The likelihood ratio of this model was $\chi^2(0) = 0, p = 1$. This indicated that the highest-order interaction (proficiency x comprehension group) interaction is significant, $\chi^2(2) = 9.34, p < .01$. To break down this effect, separate chi-square tests on the proficiency variable were

carried out for each level of the comprehension group variable. There is a significant association between membership of the Lower Comprehension Group and whether the child is Not Fully Proficient or Fully Proficient, $\chi^2(1) = 59.40, p < .01$. Odds ratios indicate that if the child is Not Fully Proficient, the odds of being in the Lower Comprehension Group are 3.68 times higher than if s/he is Fully Proficient. For the Middle Comprehension Group, $\chi^2(1) = 3.69, p = .055$ and for the Higher Comprehension Group, $\chi^2(1) = 1.89, p > .05$, the chi-square analyses yield non-significant results. Therefore, there is no significant relationship between teacher proficiency ratings and membership of either the Middle Comprehension Group or the Higher Comprehension Group (NB these Comprehension Groups include both EAL and EL1 children).

4.2 Analysing the Screening Phase data: summary

The above analyses have shown that overall, the EAL participants in the Screening Sample score significantly lower than their EL1 peers on YARC Comprehension. There is, however, variation in the reading comprehension skills of EAL children; some EAL participants do achieve sufficiently high results to place them in the Higher Comprehension Group. An examination of the relationship between EAL participants' English language proficiency (as rated by their teachers) and Comprehension Group membership has shown that lower English proficiency is significantly related to membership of the Lower Comprehension Group. There is no significant relationship, however, between teacher proficiency ratings and membership of the Middle or Higher Comprehension groups. These analyses have moved beyond the simple EAL/EL1 comparisons included in previous UK studies and have provided some indication as to the link between low English language proficiency and lower reading comprehension skills in EAL children.

4.3 Analysing the Language Background Questionnaire and the Parental Language Background Questionnaire

The Language Background Questionnaire (LBQ) (c.f. Appendix 3.17) was administered orally to all EAL participants in the Main Phase of the study while the Parental Language Background Questionnaire (PLBQ) was administered to all participants in the Main Phase of the study, both EAL and EL1 (c.f. Appendices 3.15 and 3.16). The purpose of the LBQ is to gain a detailed overview of the EAL participants' language experiences when they are not in school. For both EAL and EL1 participants, the PLBQ provides relevant information about the child's background which a 9-10 year old child may not know, such as the child's and the parents' place of birth and the mother's level of education. For both groups, the PLBQ asks parents to specify which languages are spoken in the home (in order to corroborate the child's EAL/EL1 status) and for EAL participants, parents are asked to provide further information about the child's language experiences outside school. Together, the LBQ and the PLBQ provide a rich source of information about the Main Phase participants' personal and linguistic backgrounds.

The information provided by these questionnaires does not play a part in answering this study's research questions. However, this information serves 3 important functions. It allows: for a detailed description of the sample in terms of personal and linguistic background factors; for between-group comparisons on a range of these background factors; for an analysis of the relationship between these factors and both reading comprehension and idiom comprehension, the focal points of this study. As non-probability sampling was used when selecting participants for this study, it is crucial to understand the nature of the study sample in terms of factors which may affect performance on both these variables.

4.3.1 Analysing the Language Background Questionnaire (LBQ)

The LBQ is split into 6 sections, each of which is designed to provide insight into an aspect of the EAL participants' day-to-day language use. All EAL children who participated in the Main Phase of this study completed the LBQ. For each section, a Total Score with a maximum value of 1 was derived. Sections A and B provide information about L1 use for interpersonal interaction and exposure to L1 audio/visual media respectively. Section C provides separate scores for L1 and English computer use (in addition to an overall computer use score). Section D provides separate scores for L1 and English exposure to print in the home (in addition to an overall score for exposure to print in the home). Section E provides information about non-English literacy and Section F provides information about whether the child is learning to read a language for religious purposes. In each case, a higher score indicates greater exposure to/use of the language in question.

Sections C and D provide direct comparisons between use of the L1 and of English. Of initial interest, therefore, is whether the results for Section C and D indicate significant within-group differences in L1 and English computer use, and exposure to print. Paired samples *t*-tests show that for the EAL Average group, the score for English computer use is significantly higher than that for L1 computer use, $t(23) = 6.11, p < .001$, while the score for English exposure to print in the home is significantly higher than the score for L1 exposure to print in the home, $t(23) = 3.20, p < .01$. Where the EAL Above Average group is concerned, paired samples *t*-tests show the same patterns emerging for computer use, $t(21) = 7.99, p < .001$ and for exposure to print in the home, $t(22) = 5.94, p < .001$. All values are significant even when the α -level is set at 0.025 to account for multiple comparisons. These results

suggest that for both EAL Average and Above Average readers, English is the dominant language of computer use and of printed materials in the home.

A second area of interest is whether the EAL Average and Above Average participants differ with respect to any of these aspects. The groups' mean scores are illustrated in Table 13.

Table 13 Means (and standard deviations) for EAL Average and Above Average Groups' Responses on the LBQ

	EAL Average	EAL Above Average
Section A Total	0.65 (0.14)	0.61 (0.15)
Section B Total	0.38 (0.24)	0.42 (0.43)
Section C English	0.51 (0.25)	0.64 (0.23)
Section C L1	0.19 (0.21)	0.15 (0.15)
Section C Total	0.35 (0.20)	0.40 (0.14)
Section D English	0.68 (0.20)	0.88 (0.19)
Section D L1	0.43 (0.35)	0.47 (0.35)
Section D Total	0.55 (0.21)	0.67 (0.23)
Section E	0.45 (0.47)	0.27 (0.40)
Section F	0.67 (0.87)	0.35 (0.49)

A series of independent samples *t*-tests were carried out in order to compare the groups' Section Total scores and, where relevant, English and L1 scores. The results of these *t*-tests are illustrated in Table 14. Section E Total was the sole occasion on which the assumptions of both normal distribution and homogeneity of variance were violated (c.f. Appendix 4.2) and the *t*-test result was confirmed using a Mann-Whitney test in this instance.

Table 14 EAL Average and Above Average Groups' Responses on the LBQ

		Levene's test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	t	df	Sig. (2-tailed)
Section A Total	Equal variances assumed	.152	.699	.800	44	.428
	Equal variances not assumed			.798	42.812	.430
Section B Total	Equal variances assumed	1.532	.222	-.400	44	.691
	Equal variances not assumed			-.390	31.984	.699
Section C English	Equal variances assumed	.145	.705	-1.743	44	.088
	Equal variances not assumed			-1.749	43.988	.087
Section C L1	Equal variances assumed	1.705	.198	.616	44	.541
	Equal variances not assumed			.624	41.930	.536
Section C Total	Equal variances assumed	4.136	.048	-.948	44	.348
	Equal variances not assumed			-.963	41.144	.341
Section D English	Equal variances assumed	.105	.747	-3.459	44	.001
	Equal variances not assumed			-3.472	44.000	.001
Section D L1	Equal variances assumed	.002	.967	-.381	44	.705
	Equal variances not assumed			-.381	43.701	.705
Section D Total	Equal variances assumed	.207	.651	-1.845	44	.072
	Equal variances not assumed			-1.840	43.010	.073
Section E total	Equal variances assumed	5.702	.021	1.362	44	.180
	Equal variances not assumed			1.371	43.825	.177
Section F Total	Equal variances assumed	1.272	.266	1.449	42	.155
	Equal variances not assumed			1.520	37.317	.137

The α -level was set at .005 (.05 divided by 10) to account for multiple comparisons.

Table 14 shows that the only significant group difference at the $p < .005$ level is found for Section D English. This section of the LBQ assesses the extent to which English language print materials (e.g. magazines, newspapers, books) are available in the EAL children's homes. The EAL Above Average participants score significantly higher on this aspect of the LBQ than the EAL Average participants, suggesting that these Above Average readers have more access to English language print outside school than their Average peers. This result

suggests the importance of exposure to English language print materials outside school for the development of EAL children's reading skills.

The EAL Average and Above Average readers do not significantly differ on any of the other sections of the LBQ. In considering this outcome, it should be noted that those EAL participants in the Screening Phase who reported that both parents/caregivers spoke 'Always or Mostly English' were not put forward to participate in the Main Phase. As such, all EAL participants in the Main Phase of this study were regularly exposed to the L1 in their day to day lives, a fact which may explain the lack of variation in the groups' LBQ scores. It is important to note, however, that regular exposure to the L1 does not inhibit the EAL Above Average readers in achieving excellent scores on the reading-related measures administered in this study.

A second area of interest is the extent to which the EAL participants' scores on the LBQ are related to reading comprehension and idiom comprehension, the focal aspects of this study. In order to investigate this issue, a series of bivariate correlations was carried out between LBQ Section Total Scores and i) YARC Comprehension and ii) the overall number of idiomatic responses provided on the ICM (max = 48) for EAL Average and Above Average groups separately. Table 15 illustrates the outcomes of these correlations for the EAL Average group.

Table 15 Correlating Scores on the LBQ with scores on the YARC Comprehension and the ICM for EAL Average Readers

		YARC Comp Ability	ICM Overall Score
YARC Comp Ability	Pearson Correlation	1	.622
	Sig. (2-tailed)		.001
LBQ: Section A Total	Pearson Correlation	.183	.256
	Sig. (2-tailed)	.392	.227
LBQ: Section B Total	Pearson Correlation	-.240	-.044
	Sig. (2-tailed)	.259	.839
LBQ: Section C English	Pearson Correlation	.029	.243
	Sig. (2-tailed)	.894	.252
LBQ: Section C L1	Pearson Correlation	-.093	.075
	Sig. (2-tailed)	.665	.726
LBQ: Section C Total	Pearson Correlation	-.046	.218
	Sig. (2-tailed)	.830	.307
LBQ: Section D English	Pearson Correlation	.015	-.040
	Sig. (2-tailed)	.945	.852
LBQ Section D L1	Pearson Correlation	.310	.407
	Sig. (2-tailed)	.140	.048
LBQ: Section D Total	Pearson Correlation	.262	.316
	Sig. (2-tailed)	.216	.133
LBQ: Section E Total	Pearson Correlation	.280	.303
	Sig. (2-tailed)	.184	.150
LBQ: Section F Total	Pearson Correlation	.023	-.255
	Sig. (2-tailed)	.916	.229

Table 15 illustrates that while there is a strong, positive correlation between the EAL Average group's scores on the YARC Comprehension and on the ICM, there are no significant correlations between any aspect of the LBQ and YARC Comprehension for this group. There is, however, a marginally significant positive correlation with a medium effect size between the EAL Average group's overall scores on the ICM and their score for Section D L1 on the LBQ. This aspect of the LBQ refers to the extent to

which L1 print materials (e.g. newspapers, magazines, books) are available in children’s homes.

Where EAL Above Average readers are concerned, Table 16 illustrates a slightly different pattern.

Table 16 Correlating Scores on the LBQ with scores on the YARC Comprehension and on the ICM for EAL Above Average Readers

		YARC Comprehension Ability Score	ICM Overall Score
YARC Comp Ability	Pearson Correlation	1	.691
	Sig. (2-tailed)		.000
LBQ: Section A Total	Pearson Correlation	.426	.233
	Sig. (2-tailed)	.048	.297
LBQ: Section B Total	Pearson Correlation	.477	.389
	Sig. (2-tailed)	.025	.074
LBQ: Section C English	Pearson Correlation	-.124	-.051
	Sig. (2-tailed)	.581	.822
LBQ: Section C L1	Pearson Correlation	.106	.141
	Sig. (2-tailed)	.638	.532
LBQ: Section C Total	Pearson Correlation	-.037	.043
	Sig. (2-tailed)	.869	.851
LBQ: Section D English	Pearson Correlation	.231	.037
	Sig. (2-tailed)	.300	.870
LBQ: Section D L1	Pearson Correlation	.275	.169
	Sig. (2-tailed)	.215	.452
LBQ: Section D Total	Pearson Correlation	.311	.148
	Sig. (2-tailed)	.159	.512
LBQ: Section E Total	Pearson Correlation	.026	.389
	Sig. (2-tailed)	.909	.073
LBQ: Section F Total	Pearson Correlation	-.390	-.407
	Sig. (2-tailed)	.090	.075

Table 16 shows that there is a significant, strong, positive correlation between YARC Comprehension and overall score on the ICM for the EAL Above Average readers, as there was also for the EAL Average readers. Unlike the EAL Average readers, however, the EAL Above Average readers' YARC Comprehension Ability Scores are significantly positively correlated with the LBQ Section A Total and Section B Total. Section A provides information about which language(s) the child uses during interpersonal interaction with family and friends; higher scores in this section indicate a linguistic environment which is more L1-rich. Section B provides information about the language(s) in which the child is exposed to media (e.g. tv and films, radio, music). Again, higher scores for this section suggest that the child is exposed to L1-rich media. While the correlation between Section A Total and YARC Comprehension is only marginally significant, medium effect sizes are seen for both correlations. There are no significant correlations between the overall score on the ICM and any aspect of the LBQ, however.

While correlation does not imply causation, these results do imply that greater exposure to the L1 in terms of exposure to printed material in the home is linked to higher scores on the ICM overall for the EAL Average group. Greater exposure to the L1 in terms of interpersonal interaction and audio/visual media is related to higher YARC Comprehension Ability scores for the EAL Above Average group. These results are important in that they suggest that providing EAL children with a rich range of experiences in the L1 outside school does not detract from comprehension-related skills in the L2 in school. Indeed, these L1 experiences may be beneficial to the child's academic achievement in English.

4.3.2 Analysing the Parental Language Background Questionnaire (PLBQ)

The function of the PLBQ is to complement the LBQ in providing additional information about participants' linguistic experiences in the case of the EAL children, and about relevant family background information (such as the child's mother's level of education) for all participants. The response rate for the PLBQ was relatively high with 88% of parents responding overall. PLBQs were received from parents of 21/24 EAL Average Readers, 20/22 EAL Above Average Readers, 22/24 EL1 Average Readers, 19/23 EL1 Above Average Readers. These questionnaires confirmed that only English was spoken in the homes of the EL1 participants, and that languages other than English were spoken in the homes of the EAL participants. Each question on the PLBQ will be considered separately.

4.3.2.1 Family information

The first 4 questions on the PLBQ ask about the child's, and their parents' birthplace and the number of years the child's mother spent in full-time education. The purpose of questions 1-3 is not to provide data which will be used in statistical analyses, but rather to provide a descriptive overview of the participants' family background. Statistical analyses are carried out for question 4 in order to ascertain whether there are group differences in participants' mothers' educational background.

PLBQ Question 1 (All Participants): Was the child born in the UK?

Table 17 shows descriptively that the majority of participants in each of the 4 groups were indeed born in the UK.

Table 17 PLBQ Participants' Birthplace

Group	Non-UK	UK	Total
EAL Average	4	17	21
EAL Above Average	5	15	20
EL1 Average	1	21	22
EL1 Above Average	0	19	19
Total	10	72	82

PLBQ Question 2 (All Participants) Was the child's mother born in the UK?

However, Table 18 shows that while the majority of EL1 participants' mothers were born in the UK, the majority of EAL participants' mothers were not.

Table 18 PLBQ Participants' Mothers' Birthplace

Group	Non-UK	UK	Total
EAL Average	15	6	21
EAL Above Average	16	4	20
EL1 Average	2	20	22
EL1 Above Average	2	17	19
Total	35	47	82

PLBQ Question 3 (All Participants) Was the child's father born in the UK?

Following the general pattern observed in Table 18, Table 19 shows that while most of the EAL participants' fathers were not born in the UK, the majority of the EL1 participants' fathers were. The data illustrated in Table 17 - Table 19 suggest that the majority of EAL participants in this study are second generation immigrants.

Table 19 PLBQ Participants' Fathers' Birthplace

Group	Non-UK	UK	Total
EAL Average	16	5	21
EAL Above Average	17	3	20
EL1 Average	0	22	22
EL1 Above Average	1	18	19
Total	34	48	82

PLBQ Question 4 (All Participants) How many years did the child's mother spend in full-time education?

Increased maternal education has been linked to positive educational outcomes for children (c.f. Bornstein, Hahn, Suwalsky & Haynes, 2003). It was considered important in this study, therefore, to collect data regarding the number of years each participant's mother spent in full-time education. Table 20 illustrates the mean number of years spent in full-time education by participants' mothers. NB 4 respondents did not answer this question.

Table 20 PLBQ Participants' Mothers' Years in Full-Time Education

	N	Mean	Std. Deviation
EAL Average	20	11.35	5.092
EAL Above Average	20	12.45	3.913
EL1 Average	21	13.14	2.455
EL1 Above Average	17	14.41	2.785
Total	78	12.78	3.813

While Table 20 illustrates that descriptively, there is variation between the 4 groups in terms of the numbers of years participants' mothers spent in full-time education, a one-way ANOVA suggests that there are no significant between-group differences, $F(3, 74) = 2.19, p > .05$. As both the assumption of normal distribution and homogeneity of variance

are violated (c.f. Appendix 4.2), this result was confirmed using a Kruskal-Wallis test.

Statistically speaking, there are no group differences on this measure.

Table 21 - Table 24 illustrate how the relationship between the number of years participants' mothers spent in education and their performance on the YARC Comprehension and the ICM Overall was investigated by means of bivariate correlations for each of the 4 groups separately.

Table 21 Correlating Participants' Mothers' Years in Full-Time Education with YARC Comprehension and ICM Overall – EAL Average Readers

		YARC Comp Ability	ICM Overall Score
Mother's Years in Full-Time Education	Pearson Correlation	.550	.408
	Sig. (2-tailed)	.012	.074

Table 22 Correlating Participants' Mothers' Years in Full-Time Education with YARC Comprehension and ICM Overall – EAL Above Average Readers

		YARC Comp Ability	ICM Overall Score
Mother's Years in Full-Time Education	Pearson Correlation	.414	-.009
	Sig. (2-tailed)	.070	.968

Table 23 Correlating Participants' Mothers' Years in Full-Time Education with YARC Comprehension and ICM Overall – EL1 Average Readers

		YARC Comp Ability	ICM Overall Score
Mother's Years in Full-Time Education	Pearson Correlation	-.163	-.007
	Sig. (2-tailed)	.482	.975

Table 24 Correlating Participants' Mothers' Years in Full-Time Education with YARC Comprehension and ICM Overall – EL1 Above Average Readers

		YARC Comp Ability	ICM Overall Score
Mother's Years in Full-Time Education	Pearson Correlation	.394	-.265
	Sig. (2-tailed)	.118	.305

The results of these correlation analyses show that for the EAL Average group alone, there is a significant, positive correlation between how long participants' mothers spent in full-time education and the YARC Comprehension. This correlation has a large effect. No significant correlations are found for any other group.

4.3.2.2 Linguistic information

PLBQ Question 5 (EAL Participants Only) Child's English abilities before starting school

Although Table 17 illustrated that the majority of EAL participants were born in the UK, Table 18 and Table 19 show that the majority of their parents were not. It is of interest,

therefore, to examine whether the EAL Average and Above Average participants in this study differ in the extent to which they were familiar with English before beginning school in the UK. On the PLBQ, the parents of EAL children were asked to report whether their child spoke ‘No English’, ‘A Little English’ or ‘A Lot of English’ before starting school. When these 3 responses were considered separately, the expected counts in 2 out of the 6 cells in the crosstabulation produced were less than 5. In order to conduct chi-square analysis, the ‘No English’ and ‘A Little English’ categories were collapsed as illustrated in Table 25.

Table 25 EAL Children's English Language Abilities before Starting School

		‘No English’ or ‘A Little English’	‘A Lot of English’	Total
EAL Average	Count	15	6	21
	Expected Count	13.3	7.7	21.0
EAL Above Average	Count	11	9	20
	Expected Count	12.7	7.3	20.0

Chi-square analysis shows that the amount of English spoken by EAL Average and Above Average participants before school did not differ significantly, $\chi^2(1) = 1.19, p > .05$.

A further question is whether EAL children who are reported by their parents to have spoken differing amounts of English before starting school also differ in terms of YARC Comprehension or ICM Overall. In order to investigate this issue, the ‘no English’, ‘a Little English’ and ‘a Lot of English’ categories were re-coded into dummy variables and entered into regression models with a) YARC Comprehension and b) ICM Overall as the dependent variables. All EAL participants were included in these analyses. Table 26 and

Table 27 show that there are no significant differences in either YARC Comprehension or in ICM Overall scores between children who are reported to have spoken ‘no English’ before starting school and children who are reported to have spoken either a) ‘a little English’ or b) ‘a lot of English’ before starting school. These results suggest that EAL children who arrive at school with limited English are still capable of achieving average, or even above average scores in English reading comprehension by Year 5 (NB all participants in this study had been in the UK educational system at least since the beginning of Key Stage 2).

Table 26 Regressing EAL Children's English Language Abilities before School onto the YARC Comprehension

	B	SE B	β	Sig
(Constant)	62.150	2.626		.000
no English vs a little English	-.121	3.191	-.007	.970
no English vs a lot of English	4.483	3.391	.253	.193

Table 27 Regressing EAL Children's English Language Abilities before School onto the ICM Overall

	B	SE B	β	Sig
(Constant)	22.700	2.402		.000
no English vs a little English	.824	2.918	.055	.779
no English vs a lot of English	3.833	3.101	.239	.223

PLBQ Question 6 (EAL participants only) Parents' estimation of child's ability to speak strongest home language

Given that this study was conducted exclusively through the medium of English, and that a 9-10 year old child's self-assessment of their L1 ability may not be reliable, a question regarding the parents' estimation of the EAL participants' L1 ability was included in the PLBQ. Parents were asked to rate whether their child spoke his/her L1 'Not Very Well', 'A Little Less Well than Peers', 'The Same as Peers', or 'Very Well'. It is of initial interest to compare whether participants in the EAL Average and Above Average groups differ in their reported L1 ability. As was the case for PLBQ Question 5, when a crosstabulation was produced, the expected counts in a number of the cells were less than 5. In order to conduct chi-square analyses, the 'Not Very Well' and 'A Little Less Well...' categories were collapsed and the 'The Same...' and 'Very Well' categories were collapsed, as illustrated in Table 28.

Table 28 Parents Estimation of EAL Child's Ability to Speak Strongest Home Language

		'Not Very Well' or 'A Little Less Well...'	'The Same...' or 'Very Well'	Total
EAL Average	Count	6	15	21
	Expected Count	7.7	13.3	21.0
EAL Above Average	Count	9	11	20
	Expected Count	7.3	12.7	20.0

Chi-square analyses show that there are no significant differences in parental estimation of the EAL child's ability to speak his/her strongest home language between Average and Above Average groups, $\chi^2 = 1.19, p > .05$.

The extent to which children who differ in parental estimations of L1 proficiency may also differ on the YARC Comprehension or on the ICM Overall was investigated. The 'Not Very Well', 'A Little Less Well...', 'The Same...' and 'Very Well' categories were re-coded into dummy variables and entered into 2 regression analyses with a) YARC Comprehension and b) ICM Overall as the dependent variables. Table 29 and Table 30 show that EAL children whose parents estimate that they speak English 'A Little Less Well than Peers', 'The Same as Peers' or 'Very Well' do not differ from EAL children who are reported to speak English 'Not Very Well' on either the YARC Comprehension or on the ICM Overall. These results suggest that EAL children both who do and who do not possess strong L1 skills may achieve average or above average English reading comprehension measures for their chronological age.

Table 29 Regressing Parents' Estimations of EAL Children's English Language Ability onto the YARC Comprehension

	B	SE B	β	Sig
(Constant)	63.833	2.491		.000
'Not Very Well' vs 'A Little Less Well...'	1.229	3.939	.056	.757
'Not Very Well' vs 'The Same...'	-1.825	3.523	-.096	.607
'Not Very Well' vs 'Very Well'	-.048	3.395	-.003	.989

Table 30 Regressing Parents' Estimations of EAL Children's English Language onto the ICM Overall

	B	SE B	β	Sig
(Constant)	23.417	2.237		.000
'Not Very Well' vs 'A Little Less Well...'	1.333	3.537	.067	.708
'Not Very Well' vs 'The Same...'	-.417	3.164	-.024	.896
'Not Very Well' vs 'Very Well'	2.583	3.049	.158	.402

PLBQ Question 7 (EAL Participants Only) Is the child learning to read in any language other than English

It has been suggested in the literature that for minority language children, becoming literate in the L1 may be beneficial when learning to read in the L2 (in this case English) (e.g. Collier, 1987; Reese, Garnier, Gallimore & Goldenburg, 2000; Royer & Carlo, 1991). On the PLBQ, parents were asked to note whether their child was learning to read in any language other than English. In Table 31, all expected counts are above 5. It is possible, therefore, to run chi-square analyses to investigate whether the probability that a child is learning to read in a language other than English differs significantly according to reading group. The chi-square was non-significant, $\chi^2(1) = .007, p > .05$, suggesting that this is not the case.

Table 31 Is the child learning to read in a language other than English?

		Child learning to read in language other than English	Child not learning to read in language other than English	Total
Average	Count	8	13	21
	Expected Count	7.9	13.1	21.0
Above Average	Count	7	12	19
	Expected Count	7.1	11.9	19.0
Total	Count	15	25	40

In order to investigate whether a child's becoming literate in a language other than English may be linked to their scores on either the YARC Comprehension or on the ICM Overall, parental responses to this question were coded as 1 (the child is learning to read in a language other than English) or 0 (the child is not learning to read in a language other than English) and entered as predictors in 2 regression models with a) YARC Comprehension and b) ICM Overall as dependent variables. Table 32 and Table 33 show that EAL children whose parents report that they either are or are not learning to read in a language other than English do not significantly differ in their scores on either the YARC Comprehension or on the ICM Overall.

Table 32 Regressing Parents' Report of Child's Non-English Reading onto the YARC Comprehension

	B	SE B	β	Sig
(Constant)	64.071	1.851		.000
Non-English Reading vs No Non-English Reading	-.947	2.511	-.057	.708

Table 33 Regressing Parents' Report of Child's Non-English Reading onto the ICM Overall

	B	SE B	β	Sig
(Constant)	24.190	1.675		.000
Non-English Reading vs No Non-English Reading	.250	2.273	.017	.913

4.3.3 Using postcodes to gain information about participants' Socio-Economic Status

While FSM eligibility is commonly used as a proxy for low SES, there exist numerous factors which may influence whether a child who is eligible for FSM actually takes FSM. Social stigma, or fear of making a child stand out from their peers, are two examples. It is difficult to say whether the reported low uptake of free school meals for the EAL and EL1 participants in the Main Phase of this study may have been affected by these, or similar factors. In order to attempt to gain a more detailed overview of the socio-

economic circumstances of the EAL and EL1 participants in the Main Phase of this study that was provided by FSM data, post code data was collected using the PLBQ.

In England, each individual post code may be linked to a Lower Super Output Area level (LSOA), of which there are 32,482 in total. For each LSOA, a wide range of data is available from sources such as the English Indices of Deprivation (EID) of which the 2010 version is the most recent available (Department for Communities and Local Government, 2010). For this study not all parents who returned PLBQs provided postcode data; 30 post codes were provided by parents of EAL participants, while 22 post codes were provided by parents of EL1 participants. The EID was used to gain information about the LSOA deciles in which these post codes are located (1 being the most deprived and 10 being the least deprived). It should be noted that it cannot be certain that a household in a particular postcode will accurately reflect the nature of the LSOA in general. It is possible that wealthy households may be located in areas which are otherwise deprived and vice versa. In addition, this post code data is available only for about half of the Main Phase sample. For these reasons, this data is intended as descriptive only, and will not be used in any statistical analyses.

While the EID contains a host of separate measures, 4 were considered most relevant for the purposes of providing an indication of the SES of the participants in the Main Phase of this study: Index of Multiple Deprivation Score (an overall measure of deprivation); a measure of income deprivation; a measure of the extent of deprivation in education, training and skills; a measure of the percentage of children in low income families).

Table 34 – Table 37 illustrate the number and percentage of EAL and EL1 participants' households which are located in each decile for each of these four measures.

Table 34 Number and Percentage of Participants' Households Located in Each Decile
from Most Deprived to Least Deprived: Index of Multiple Deprivation Score

Decile	Number of EAL households located in this Decile	% of EAL households located in this Decile	Number of EL1 households located in this Decile	% of EL1 households located in this Decile
1	0	0	0	0
2	0	0	0	0
3	5	16.67	1	4.55
4	10	33.33	0	0
5	4	13.33	6	27.27
6	4	13.33	6	27.27
7	1	3.33	1	4.55
8	4	13.33	2	9.09
9	0	0	5	22.73
10	2	6.67	1	4.55
Total	30	100	22	100

Table 35 Number and Percentage of Participants' Households Located in Each Decile
from Most Deprived to Least Deprived: Income Deprivation Score

Decile	Number of EAL households located in this Decile	% of EAL households located in this Decile	Number of EL1 households located in this Decile	% of EL1 households located in this Decile
1	0	0	0	0
2	3	10	0	0
3	6	20	3	13.64
4	6	20	3	13.64
5	5	16.67	3	13.64
6	2	6.67	2	9.09
7	4	13.33	4	10.18
8	2	6.67	3	13.64
9	0	0	3	13.64
10	2	6.67	1	4.55
Total	30	100	22	100

Table 36 Number and Percentage of Participants' Households Located in Each Decile from Most Deprived to Least Deprived: Deprivation in Education, Training and Skills Score

Decile	Number of EAL households located in this Decile	% of EAL households located in this Decile	Number of EL1 households located in this Decile	% of EL1 households located in this Decile
1	3	10	0	0
2	0	0	0	0
3	3	10	0	0
4	4	13.33	4	18.18
5	9	30	5	16.67
6	0	0	2	9.09
7	1	3.33	4	18.18
8	0	0	0	0
9	7	23.33	5	16.67
10	3	10	2	9.09
Total	30	100	22	100

Table 37 Number and Percentage of Participants' Households Located in Each Decile from Most Deprived to Least Deprived: Percentage of Children in Low-Income Houses

Decile	Number of EAL households located in this Decile	% of EAL households located in this Decile	Number of EL1 households located in this Decile	% of EL1 households located in this Decile
1	1	3.33	0	0
2	0	0	1	4.55
3	8	26.67	3	13.64
4	8	26.67	3	13.64
5	5	16.67	4	18.18
6	0	0	3	13.64
7	4	13.33	2	9.09
8	0	0	5	22.73
9	2	6.67	0	0
10	2	6.67	1	4.55
Total	30	100	22	100

Table 34 – Table 37 suggest that those EAL and EL1 participants whose parents returned postcode data live in households which represent a range of levels of deprivation but which tend not to represent the most deprived end of the scale. There is a very slight descriptive tendency for the EL1 participants to live in households which are located in less deprived LSOAs than their EAL peers. Overall, however, this available data suggests that the participants in this study are varied in terms of SES, from the lower end of the scale to the highest.

4.4. Analysing the Language Background Questionnaire and the Parental Language Background Questionnaire: summary

The main functions of the LBQ and of the PLBQ were to provide: a detailed description of the sample in terms of personal and linguistic background factors; between-group comparisons on a range of these background factors and an analysis of the relationship between these factors and both reading comprehension and idiom comprehension.

In terms of personal background factors, these questionnaires show that while the majority of participants in each of the 4 groups and the majority of EL1 participants' parents were born in the UK, the majority of EAL participants' parents were not. Most of the EAL participants in this study, therefore, may be described as 2nd generation immigrants. In terms of parental education, participants' mothers had spent, on average, more than 10 years in full-time education. The post code data collected suggests that the EAL and EL1 participants in the Main Phase of this study live in households which vary in terms of deprivation, but that children from the most deprived households seem not to be strongly represented in the sample.

In terms of linguistic background factors, the PLBQs confirmed participants' status as EAL or EL1 in all cases and showed that the EAL participants had mixed experiences in terms of the amount of English they spoke before starting school, their perceived ability in their strongest L1 and whether or not they were learning to read in a language other than English. The LBQ provided additional information regarding the EAL participants' language experiences outside school and suggested that for both EAL Average and Above Average groups, English, rather than the L1, is dominant where both computer use and exposure to print in the home are concerned.

There were very few group differences on factors measured by the LBQ and PLBQ. The LBQ showed that the EAL Above Average group scored significantly higher than the EAL Average group on a measure of exposure to English language print in the home. No other significant group differences were found.

In terms of the relationship between the personal and linguistic factors measured by the LBQ and PLBQ and a) YARC Comprehension and b) ICM overall, some significant findings emerged. For the EAL Average group alone, mother's education showed a significant, positive correlation with YARC Comprehension while exposure to L1 print materials in the home showed a significant, positive correlation with the ICM Overall. Where the EAL Above Average group is concerned, there was a significant, positive correlation between YARC Comprehension and both greater use of the L1 for interpersonal communication and greater exposure to audio/visual media in the L1. These results suggest that regular, varied exposure to the L1 is positively related to English language comprehension-related outcomes for EAL children.

4.5 Chapter 4: summary

This chapter has provided information which provides important insight into both the nature of the Screening sample and the Main Phase sample. The major finding in terms of the Screening sample was that EAL children who were rated by their teachers as being not yet fully proficient in English were significantly more likely than their fully proficient EAL peers to have low performance on the YARC Comprehension. The key finding in terms of the Main Phase sample was that for the EAL Average group, increased exposure to L1 print materials is positively correlated with performance on the ICM overall whereas for the EAL Above Average group, increased L1 use in interpersonal interaction and increased exposure to the L1 in audio/visual media is positively correlated with the YARC Comprehension.

Chapter 5: Results (II) Answering the Research Questions

The main function of this chapter is to address the study's 4 Research Questions. As such, this Chapter provides: i. a detailed description of the analyses which have been carried out in order to address these Research Questions; ii. the results of these analyses. The interpretation of these analyses and the conclusions drawn may be found in Chapters 6 and 7 of this thesis.

5.1 Research Question 1, Research Question 2 and the assumptions of ANOVA

The main methods of analysis employed in Research Questions 1 and 2 are mixed ANOVA models. ANOVA models require 2 main assumptions to be met: normally distributed data and homogeneity of variance. In carrying out the analyses reported for Research Questions 1 and 2 below, these assumptions were violated in some cases. Appendices 5.1-5.2 and 5.4 – 5.9 illustrate 2 main concerns: a number of significant Kolmogorov-Smirnov values and a number of significant Levene's tests ($ps < .05$). It is important to examine the extent to which these violations of the assumptions of ANOVA may affect the results of Research Questions 1 and 2 in this study.

Regarding the first concern, the dependent variable in each case is the mean number of, for example, Idiomatic responses (of a maximum of 6) which are chosen by each group for each idiom-type. As such, the dependent variable is calculated by aggregating

dichotomous responses (1 = Idiomatic responses, 0 = non-Idiomatic responses). While it is possible for an aggregation of dichotomous responses to produce a normal distribution, a potential maximum score of only 6 for each idiom-type is not sufficiently large to generate normally distributed data according to the Kolmogorov-Smirnov test, which is extremely sensitive. This is a limitation of the Idiom Comprehension Measure (ICM). However, on the basis of the z -scores of skewness and kurtosis and indeed of the histograms also illustrated in Appendices 5.1, 5.4, 5.6 and 5.8, it was decided that the distribution of the data is adequate for ANOVA methods to be carried out.

Regarding the second concern, the significant Levene's tests arise because the proportion of Idiomatic responses provided varies as a function of the within-participant factors. For example, if, for a particular idiom, the proportion of Idiomatic responses is either very low or very high, the variation in the number of Idiomatic responses provided is much smaller than if there is greater variance in the extent to which Idiomatic responses are chosen. In general, the effect of a violation of the assumption of homogeneity of variance is that p values produced by F tests are too low i.e. there is a greater possibility of a Type 1 error. With respect to the assumption of homogeneity of variance in ANOVA, Cohen (2000a, p.343) states, "It is assumed that all of the populations involved have the same variance. However, when the sample sizes are equal, this assumption is routinely ignored." In an update to *Explaining Psychological Statistics* made available on his web page, Cohen elaborates on this point by explaining that when sample sizes are equal, "even large differences in population variances have little effect on the Type I error rate of the ordinary ANOVA, so heterogeneity of variance is almost always ignored in this case" (Cohen, 2000b, p.1). As the sample sizes in each of the 4 groups in this study's

design are almost exactly equal, these violations of the assumption of homogeneity of variance are not considered to be of grave concern.

However, given the violations of the assumptions described above, in order to confirm the results of each of the ANOVAs in Research Questions 1 and 2, non-parametric checks were carried out. No single non-parametric equivalent to mixed ANOVA exists.

Therefore, all significant effects have been examined using appropriate non-parametric checks: significant main effects have been checked using Wilcoxon Signed-Rank tests; significant interaction effects have been checked using either Mann-Witney U tests (for independent samples) or Wilcoxon Signed-Rank tests (for paired samples) as appropriate; significant between-participants effects have been verified using Mann-Witney U tests. In each instance, the non-parametric checks confirm the results of the parametric tests, supporting the use of mixed ANOVA to address these research questions.

5.2 Research Question 1

1a

Is the idiom comprehension of EAL and EL1 Average and Above Average Readers differentially affected by:

i) Idiom Realness

ii) Idiom Transparency

iii) Presence of Supportive Context?

1b

Is the idiom comprehension of EAL and EL1 Average and Above Average Readers differentially affected by:

i) Idiom Realness

ii) Idiom Transparency

iii) Presence of Supportive Context?

When a) TOWK Expressive Vocabulary; b) TOWK Multiple Contexts; c) WMTB-C Backwards Digit Recall are used as covariates?

5.2.1 Research Question 1 structural overview

Research Question 1a will be examined first of all by running an initial, omnibus F -test. In the interests of brevity, the findings from this omnibus F -test will not be described in detail. Mixed ANOVAs will then be carried out on EAL and EL1 groups separately. Given the emphasis on EAL/EL1 group differences in this study, an in depth description of the results of these mixed ANOVAs will be provided. Research Question 1b will then be examined: the separate mixed EAL/EL1 ANOVAs will be re-run, covarying out TOWK Expressive Vocabulary, TOWK Multiple Contexts and WMTB-C Backwards Digit Recall separately. The results of these ANCOVAs will be compared with those from the relevant mixed ANOVAs. An overview of the ICM effects relevant to Research Question 1 is found in Appendix 5.10.

5.2.2 Research Question 1 mean scores

The mean sum scores for the number of Idiomatic responses given in each of the conditions of the Idiom Comprehension Measure (ICM) are shown in Table 38. The maximum potential score for each condition is 6. A description of the ICM is provided in section 3.7.1.1 of this thesis and an overview of the individual idioms used in this study is provided in Appendix 3.10.

Table 38 Research Question 1a: Mean Sum Scores (and Standard Deviations) for Idiomatic Responses by Group and Condition

	real				novel			
	transparent		opaque		transparent		opaque	
	isolation	context	isolation	context	isolation	context	isolation	context
EAL Average	2.33 (1.69)	3.92 (1.59)	1.33 (1.34)	3.29 (1.68)	2.29 (1.57)	3.67 (1.52)	1.46 (1.06)	3.29 (1.16)
EAL Above Average	3.64 (1.26)	4.50 (1.19)	1.68 (1.43)	4.41 (1.01)	3.05 (1.59)	4.50 (1.37)	1.64 (.85)	3.91 (.92)
EL1 Average	3.00 (1.32)	3.83 (1.40)	.79 (.88)	3.50 (1.79)	2.42 (1.41)	3.46 (1.44)	1.42 (.83)	3.46 (1.53)
EL1 Above Average	3.74 (1.21)	4.91 (.95)	2.22 (1.09)	4.87 (1.06)	2.96 (1.33)	4.48 (.85)	1.65 (.88)	4.13 (.97)

5.2.3 Research Question 1a initial omnibus *F*-test

An omnibus *F*-test was carried out in the first instance. This *F*-test provides an initial overview of between-participants, within-participant and interaction effects in the data.

5.2.3.1 Between-participants effects

There is a significant between-participants effect of Reading Group, with Above Average readers (mean = 3.52) giving significantly more Idiomatic responses than Average

readers (mean = 2.72) overall, $F(1, 89) = 22.42, p < .001$, partial $\eta^2 = .20$. No significant between-participant effects involving Language Group and no significant interaction effects involving Language Group were found (all $ps > .05$).

5.2.3.2 Within-participant effects

This omnibus F -test revealed that there are significant main effects of Realness, Transparency and Context, with significantly more idiomatic responses being provided for Real (mean = 3.25) than for Novel idioms (mean = 2.99), for Transparent (mean = 3.54) than Opaque idioms (mean = 2.69) and in the Context (mean = 4.01) than in the Isolation condition (mean = 2.23).

5.2.3.3 Interaction effects

There are significant 2-way interactions between Realness*Reading Group, $F(1, 89) = 5.67, p < .05$, partial $\eta^2 = .06$, and Transparency*Context, $F(1, 89) = 44.39, p < .001$, partial $\eta^2 = .33$, and a significant 3-way interaction between Realness*Transparency*Context, $F(1, 89) = 4.74, p < .05$, partial $\eta^2 = .05$.

5.2.4 Rationale for carrying out separate EAL/EL1 Mixed ANOVAs

The focus of Research Question 1a is whether Realness, Transparency or Context differentially affect the extent to which the 4 groups in this study choose Idiomatic interpretations of figurative phrases. This initial omnibus F -test has shown that while Transparency and Context do not significantly interact with either Language Group or Reading Group, there is a significant Realness*Reading group interaction.

No significant interaction between Realness*Language Group was found in this initial omnibus *F*-test. However, it is possible that the effect of idiom Realness on Average and Above Average readers may have nuanced differences across Language Groups which are not sufficiently strong to reach significance in the omnibus *F*-test. In order to investigate this possibility, separate mixed ANOVAS with 1 between-participants factor of Reading Group and 3 within-participant factors of Realness, Transparency and Context were carried out on the EAL and EL1 participants separately. As EAL/EL1 group differences are the focus of this study, it is important to run these further analyses to be certain that no such differences are missed.

5.2.5 Research Question 1a EAL Group Mixed ANOVA

For the EAL participants, a mixed ANOVA was carried out with a between-participant factor of Reading Group and within-participant factors of Realness (Real or Novel idiom), Transparency (Transparent or Opaque idiom) and Context (Isolation or Context condition).

5.2.5.1 Between-participant effects

There is a significant between-participant effect of Reading Group with the EAL Above Average readers (mean = 3.42) giving significantly more Idiomatic responses than the EAL Average readers (mean = 2.70), $F(1, 44) = 7.49, p < .01$, partial $\eta^2 = .15$. This pattern is the same as that found in the initial omnibus *F*-test.

5.2.5.2 Within-participant effects

This ANOVA revealed that similar to the omnibus *F*-test on Idiomatic responses, there are significant within-participant effects of Transparency and of Context, with more

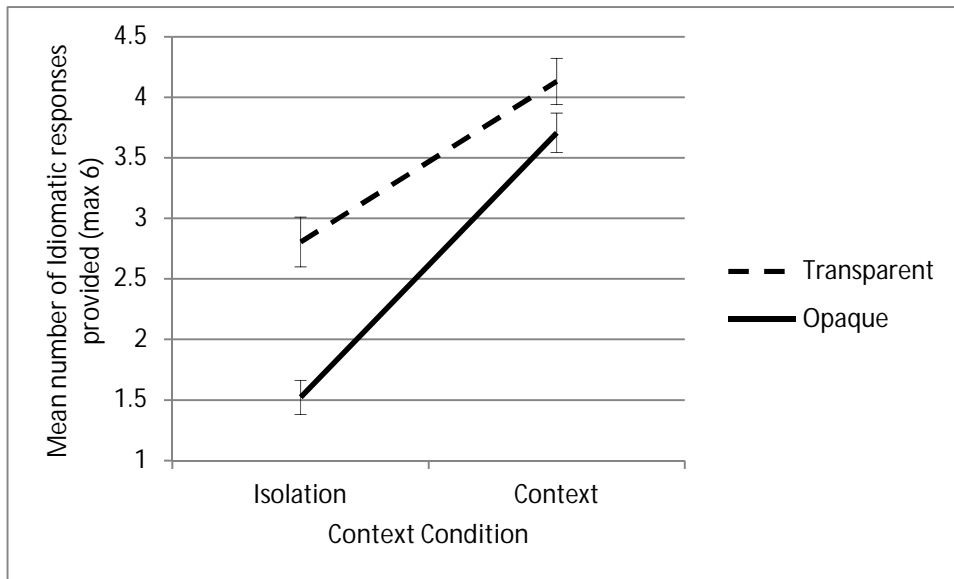
idiomatic responses being provided for Transparent (mean = 3.49) than for Opaque (mean = 2.63) idioms and in the Context condition (mean = 3.94) than in the Isolation condition (mean = 2.18). Distinct from this omnibus *F*-test, however, there is no significant effect of Realness ($p > .05$).

5.2.5.3 Interaction effects

There is a significant interaction between Transparency*Context, $F(1, 44) = 14.31$, $p < .001$, partial $\eta^2 = .25$. The pattern observed in this interaction mirrors that found in the initial omnibus *F*-test above. In contrast to this omnibus *F*-test, the 3-way interaction between Transparency*Context*Reading group approaches significance, $F(1, 44) = 3.96$, $p = .053$, partial $\eta^2 = .083$. In further contrast to the initial omnibus *F*-test, there are no significant interactions between Realness*Reading Group or between Realness*Transparency*Context for the EAL group in this EAL mixed ANOVA (all $ps > .05$).

The significant Transparency*Context interaction is illustrated in Figure 2.

Figure 2 EAL Mixed ANOVA Idiomatic responses: Interaction between Transparency*Context



Two paired-samples *t*-tests were carried out to interpret this interaction. The α -level was set at .025 (0.05 divided by 2) to account for these 2 comparisons. In the Isolation condition, significantly more Idiomatic responses were given for Transparent idioms (mean = 2.80) than for Opaque idioms (mean = 1.52), $t(45) = 6.17, p < .001, r = 0.68$. This pattern was matched in the Context condition; significantly more Idiomatic responses were given for Transparent idioms (mean = 4.13) than for Opaque idioms (mean = 3.70), $t(45) = 2.91, p < .01, r = 0.40$. The significant interaction arises from the differences in effect sizes: the difference in the number of Idiomatic responses given for Transparent and Opaque idioms in the Isolation condition has a large effect ($r = 0.68$) while the difference in the number of Idiomatic responses given for Transparent and Opaque idioms in the Context condition as a medium effect ($r = 0.40$).

The 3-way interaction between Transparency*Context*Reading Group is illustrated in Figure 3 and Figure 4.

Figure 3 EAL Mixed ANOVA Idiomatic Responses: Interaction between Transparency*Context for the EAL Average Group

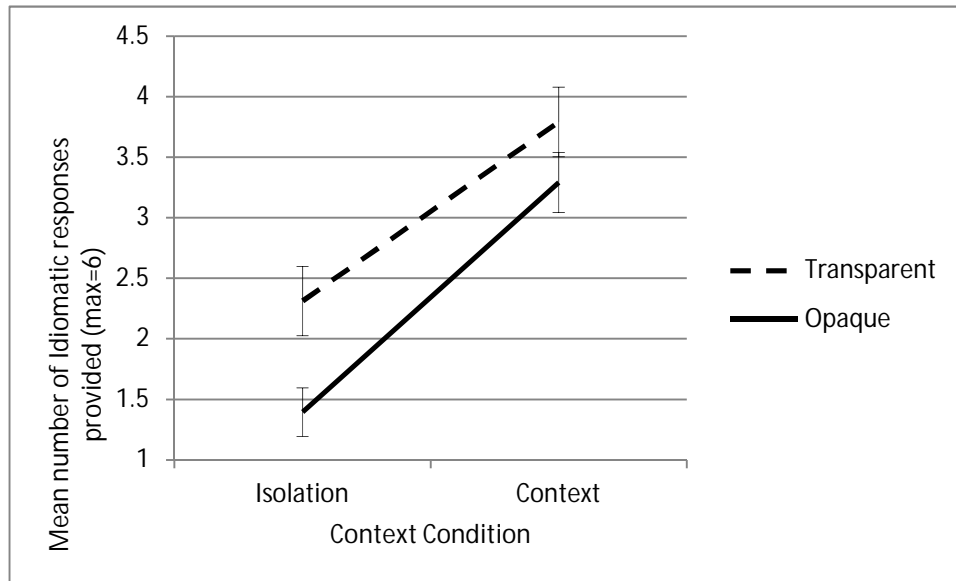
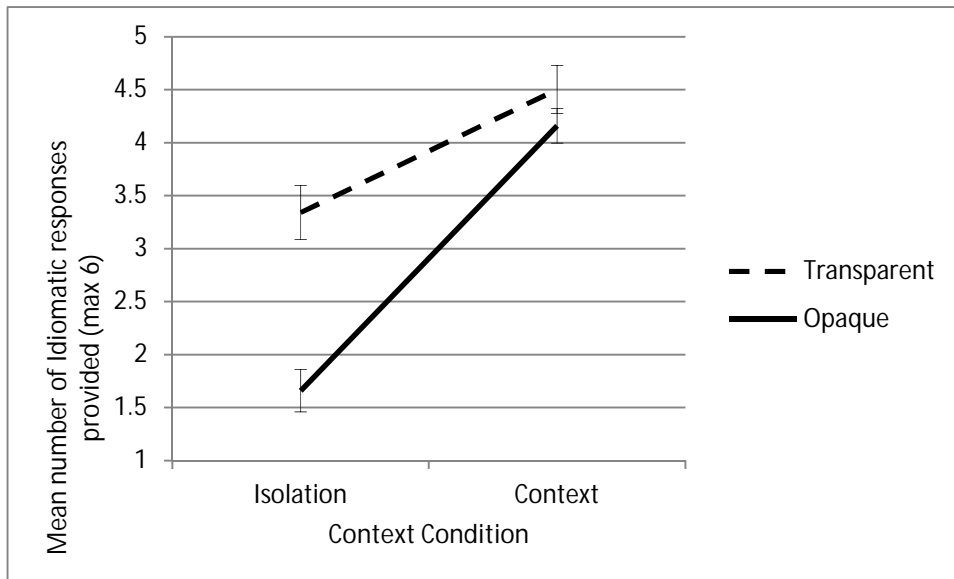


Figure 4 EAL Mixed ANOVA Idiomatic Responses: Interaction between Transparency*Context for the EAL Above Average Group



Four paired-samples *t*-tests were carried out to investigate whether the number of Idiomatic responses provided differed due to different combinations of Reading Group, Transparency or Context. The α -value was set at .0125 (0.05 divided by 4) to account for the 4 comparisons. For the EAL Average group, significantly more Idiomatic responses were given in the Transparent Isolation condition (mean = 2.31) than in the Opaque Isolation condition (mean = 1.40), $t(23) = 3.20, p < .01, r = 0.56$. With the α -level set at .0125, there are no significant differences between the number of Idiomatic responses given in the Transparent Context condition (mean = 3.79) than in the Opaque Context condition (mean = 3.29), $t(23) = 2.22, p < .05, r = 0.42$. Where the EAL Above Average group are concerned, significantly more Idiomatic responses were given in the Transparent Isolation condition (mean = 3.34) than in the Opaque Isolation condition (mean = 1.66), $t(21) = 5.92, p < .001, r = 0.79$ while there are no significant differences between the number of Idiomatic responses given in the Transparent Context condition

(mean = 4.50) and in the Opaque Context condition (mean = 4.16), $t(21) = 1.85$, $p > .05$, $r = 0.37$. This 3-way interaction does not quite reach statistical significance.

5.2.6 Research Question 1a EL1 Group Mixed ANOVA

The same mixed ANOVA model was carried out on the EL1 participant data with a between-participant factor of Reading Group (Above Average vs. Average) and within-participant factors of Realness (Real or Novel idiom), Transparency (Transparent or Opaque idiom) and Context (Isolation or Context condition).

5.2.6.1 Between-participants effects

For the EL1 group there is a significant between-participants effect of Reading Group with more Idiomatic responses being given by the EL1 Above Average group (mean = 3.62) than the EL1 Average group (mean = 2.73), $F(1, 45) = 16.91$, $p < .001$, partial $\eta^2 = .27$. This is the same pattern as that found in both the initial omnibus F -test and the EAL Mixed ANOVA.

5.2.6.2 Within-participant effects

For the EL1 group, there are significant within-participant effects of Realness, Transparency and Context, with more idiomatic responses being provided for Real (mean = 3.36) than for Novel (mean = 3.00) idioms, for Transparent (mean = 3.60) than Opaque (mean = 2.76) idioms, and in the Context (mean = 4.08) than in the Isolation (mean = 2.27) condition. This pattern mirrors that of the initial omnibus ANOVA. The within-participants effect of Realness is not found in the EAL ANOVA on Idiomatic responses.

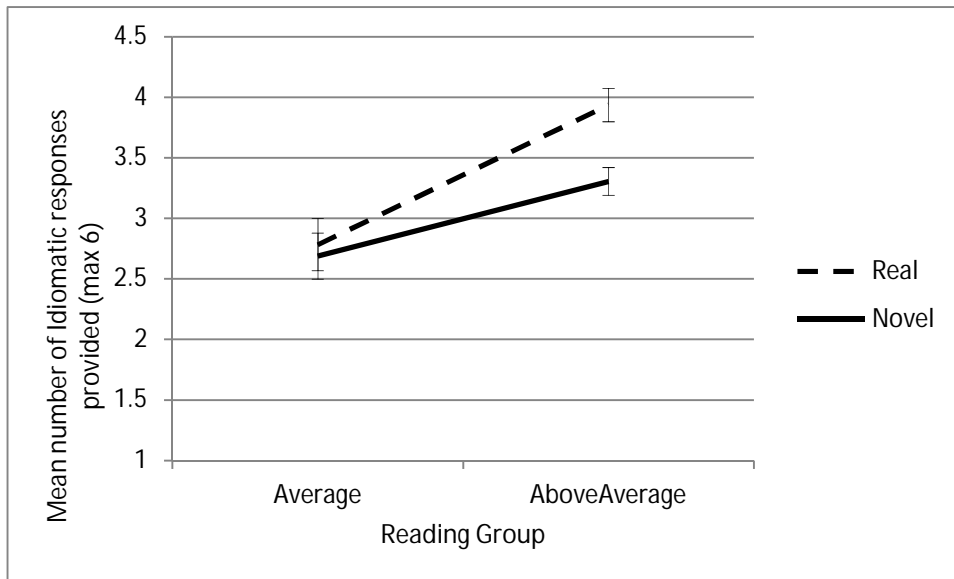
5.2.6.3 Interaction effects

The 3 significant interactions found for this EL1 mixed ANOVA follow the same patterns as those found in the initial omnibus ANOVA. Like the EAL Mixed ANOVA above, there is a significant interaction between Transparency*Context, $F(1, 45) = 31.69, p < .001$, partial $\eta^2 = .41$. Distinct from the EAL Mixed ANOVA, there is a significant interaction effect of Realness*Reading Group, $F(1, 45) = 5.75, p < .05$, partial $\eta^2 = .11$, and the 3-way interaction between Realness*Transparency*Context approaches significance, $F(1, 45) = 3.90, p = .054$, partial $\eta^2 = .08$. The Transparency*Context*Reading Group interaction which approached significance in the EAL Mixed ANOVA is non-significant in the EL1 mixed ANOVA ($p > .05$).

The pattern of the 2-way interaction between Transparency*Context is identical to that illustrated in Figure 2 above and will not be graphed again in the interests of brevity.

The 2-way interaction between Realness*Reading Group is illustrated in Figure 5 below.

Figure 5 EL1 Mixed ANOVA Idiomatic Responses: Interaction between Realness*Reading Group



This interaction was further investigated using 2 pair-wise *t*-tests. The α -level was set at .025 to account for the 2 comparisons (0.05 divided by 2). These *t*-tests show that for the EL1 Average group, there is no significant difference between the number of Idiomatic responses given for Real idioms (mean = 2.78) and for Novel idioms (mean = 2.68), $t(23) = .54, p > .05, r = 0.11$. For the EL1 Above Average group, however, significantly more Idiomatic responses were given for Real idioms (mean = 3.93) than for Novel idioms (mean = 3.30), $t(22) = 4.61, p < .001, r = 0.70$. The pattern of this interaction mirrors that found in the initial omnibus *F*-test above.

The 3-way interaction between Realness*Transparency*Context is illustrated in Figure 6 and Figure 7.

Figure 6 EL1 Mixed ANOVA Idiomatic Responses: Interaction between Realness*Context for Transparent Idioms

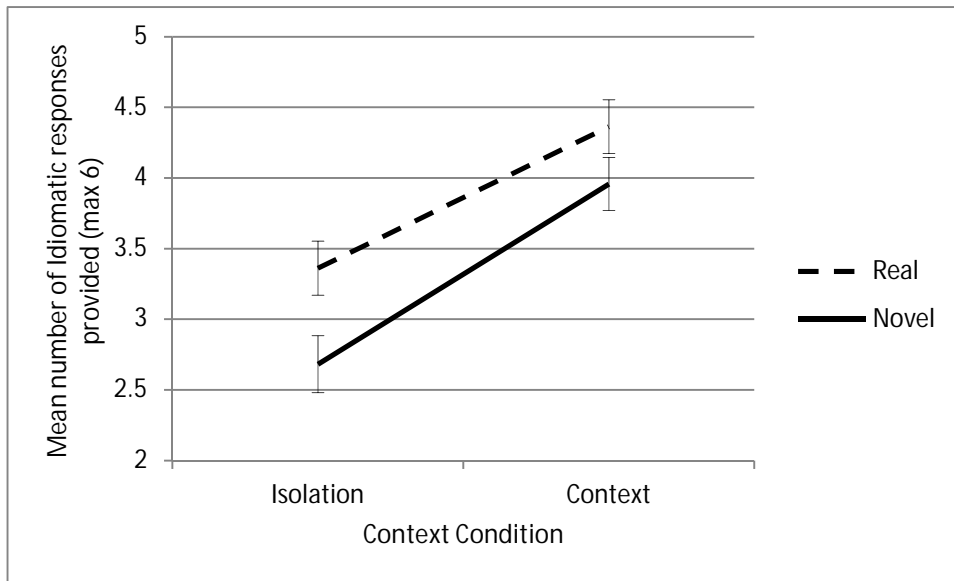
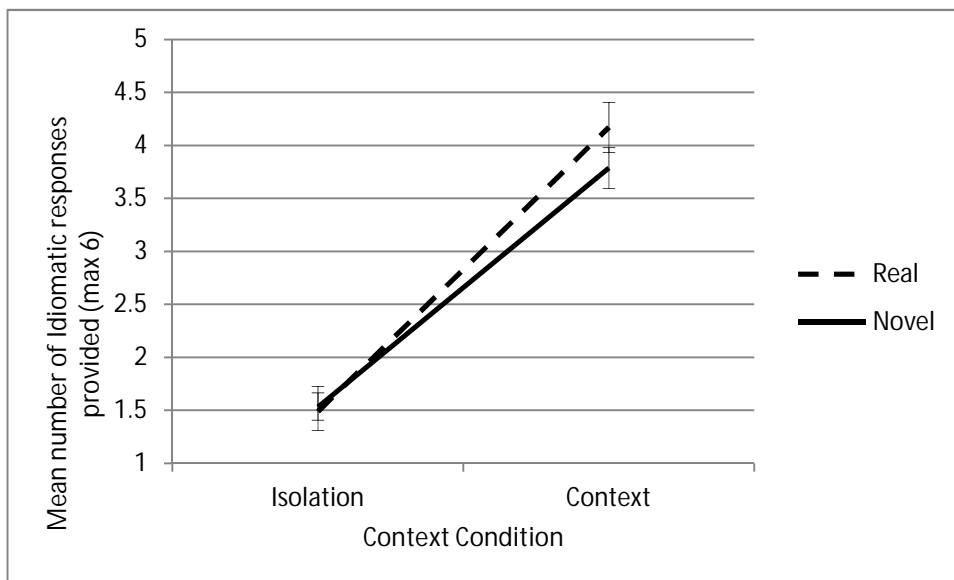


Figure 7 EL1 Mixed ANOVA Idiomatic Responses: Interaction between Realness*Context for Opaque Idioms



A series of 4 pair-wise *t*-tests was carried out to further investigate the nature of these interactions. The α -level was set at .0125 (0.05 divided by 4) to account for the 4 comparisons. These *t*-tests show that for the EL1 participants, significantly more Idiomatic responses are given in the Real Transparent Isolation (mean = 3.36) condition than in the Novel Transparent Isolation condition (mean = 2.68), $t(46) = 3.41$, $p < .01$, $r = 0.45$. No other significant differences were found. This pattern is the same as that found in the initial omnibus *F*-test above.

A summary of the effects found in the above analyses is given in Table 39 below.

Table 39 Research Question 1a: ICM Effects found in the Omnibus *F*-test and in the EAL and EL1 Mixed ANOVAs on Idiomatic Responses

	Omnibus <i>F</i>-test	EAL Mixed ANOVA	EL1 Mixed ANOVA
Between-Groups Effects			
Reading Group	$p < .001$, partial $\eta^2 = .20$.	$p < .01$, partial $\eta^2 = .15$	$p < .001$, partial $\eta^2 = .27$
Language Group	n.s.		
Main Effects			
Realness	$p < .01$, partial $\eta^2 = .10$	n.s.	$p < .01$, partial $\eta^2 = .19$
Transparency	$p < .001$, partial $\eta^2 = .53$	$p < .001$, partial $\eta^2 = .49$	$p < .001$, partial $\eta^2 = .58$
Context	$p < .001$, partial $\eta^2 = .83$	$p < .001$, partial $\eta^2 = .82$	$p < .001$, partial $\eta^2 = .85$
Interaction Effects			
Realness*Reading Group	$p < .05$, partial $\eta^2 = .06$	n.s.	$p < .05$, partial $\eta^2 = .11$
Transparency*Context	$p < .001$, partial $\eta^2 = .33$	$p < .001$, partial $\eta^2 = .25$	$p < .001$, partial $\eta^2 = .41$
Realness*Transparency*Context	$p < .05$, partial $\eta^2 = .05$	n.s.	$p = .054$, partial $\eta^2 = .08$
Transparency*Context*Reading Group	n.s.	$p = .053$, partial $\eta^2 = .083$	n.s.

5.2.7 Research Question 1a: summary

In summary, the main finding in Research Question 1a is that the EAL and EL1 participants are differentially affected by idiom Realness. For EAL participants, there are no within-participant effects of Realness and no interaction effects involving Realness. For the EL1 participants, however, the Realness*Reading Group interaction illustrates that more idiomatic responses are provided by the EL1 Above Average readers for Real than for Novel idioms. The Realness*Transparency*Context interaction shows that EL1 participants provide more idiomatic responses in the Real Transparent Isolation condition than in the Novel Transparent Isolation condition.

5.2.8 Introducing Research Question 1b: EAL/EL1 group differences in vocabulary and working memory

Independent samples *t*-tests were used to compare EAL and EL1 participants on a range of vocabulary measures and on a measure of working memory (c.f. Appendix 5.3). These *t*-tests show that on the TOWK Expressive Vocabulary subtest, the EL1 group (mean = 18.55) scores significantly higher than the EAL group (mean = 16.61), $t(91) = -3.03$, $p < .01$, $r = 0.30$. On the TOWK Multiple Contexts subtest, again, the EL1 group (mean = 12.74) scores significantly higher than the EAL group (mean = 10.17), $t(91) = -2.22$, $p < .05$, $r = 0.24$. On the Backwards Digit Recall subtest of the WMTB-C, the EAL group (mean = 18.52) scores significantly higher than the EL1 group (mean = 15.81), $t(78.21) = 2.97$, $p < .01$, $r = 0.32$ (equal variances not assumed).

As the EAL and EL1 groups differ on these vocabulary and working memory variables, the Mixed ANOVAS carried out for RQ1a were re-run using these variables as

covariates. Non-parametric checks have already confirmed the findings from these ANOVAs and so will not be re-run for the ANCOVAs below. The ANCOVA analyses were carried out in order to assess whether these vocabulary and working memory variables differentially affect performance on the ICM for the EAL and EL1 participants in this study. The 4 groups' mean scores on each of these variables are illustrated in Table 40.

Table 40 Mean scores on TOWK Expressive Vocabulary, TOWK Multiple Contexts and WMTB-C Backwards Digit Recall by Group (standard deviations)

	TOWK Expressive Vocabulary	TOWK Multiple Contexts	WMTB-C Backwards Digit Recall
EAL Average	15.12 (.58)	7.83 (.88)	17.25 (.92)
EAL Above Average	18.23 (.53)	12.73 (1.01)	19.91 (1.19)
EL1 Average	17.17 (.57)	9.92 (1.18)	14.83 (.65)
EL1 Above Average	20.00 (.59)	15.70 (.99)	16.83 (.72)

5.2.9 EAL Group Mixed ANCOVA – TOWK Expressive Vocabulary as a covariate

For the EAL group, a mixed ANCOVA was carried out with within-participant factors of Realness, Transparency and Context, a between-participants variable of Reading Group and a covariate of Expressive Vocabulary.

5.2.9.1 Between-participants effects

There is no significant effect of Reading Group ($p > .05$). It seems that the significant between-participants effect observed in the EAL Mixed ANOVA above may be explained by Expressive Vocabulary.

5.2.9.2 Within-participant effects and interaction effects

There are no significant within-participant effects and no significant interaction effects (all p s > .05), suggesting that all significant effects observed in the EAL Mixed ANOVA on Idiomatic responses may be explained by Expressive Vocabulary.

5.2.10 EL1 Group Mixed ANCOVA - TOWK Expressive Vocabulary as a covariate

For the EL1 group, a mixed ANCOVA was carried out with within-participant factors of Realness, Transparency and Context, a between-participants variable of Reading Group and a covariate of Expressive Vocabulary.

5.2.10.1 Between-participants effects

There is a significant between-participants effect of Reading Group (p < .05) which mirrors the pattern observed in the EL1 Mixed ANOVA. Unlike the EAL group, Reading Group differences on the ICM for the EL1 group are not entirely explained by Expressive Vocabulary.

5.2.10.2 Within-participant effects and interaction effects

In contrast to the EL1 mixed ANOVA, there are no significant within-participant effects (all p s > .05). There is, however, a significant interaction effect of Realness*Reading Group (p < .05), the pattern of which is identical to that found in the EL1 Mixed ANOVA (c.f. Figure 5).

The 3-way interaction between Realness*Transparency*Reading Group approaches significance, $F(1, 44) = 3.89$, $p = .055$, partial $\eta^2 = .08$ and is illustrated in Figure 8 and

Figure 9. This interaction is non-significant ($p > .05$) in the EL1 mixed ANOVA illustrated for Research Question 1a.

Figure 8 EL1 ANCOVA Idiomatic Responses: Interaction between Realness*Reading Group for Transparent Idioms (Expressive Vocabulary as a Covariate)

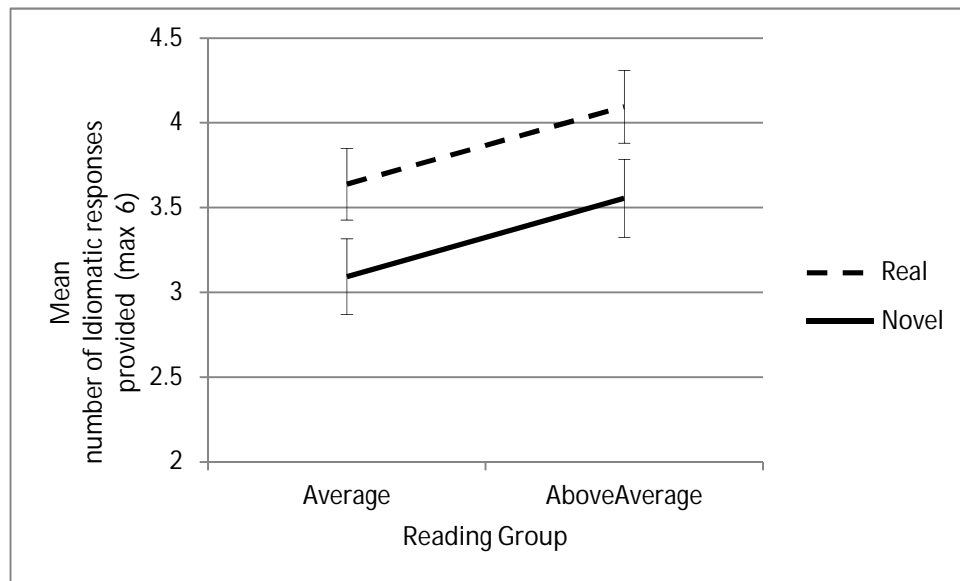


Figure 9 EL1 ANCOVA Idiomatic Responses: Interaction between Realness*Reading Group for Opaque Idioms (Expressive Vocabulary as a Covariate)

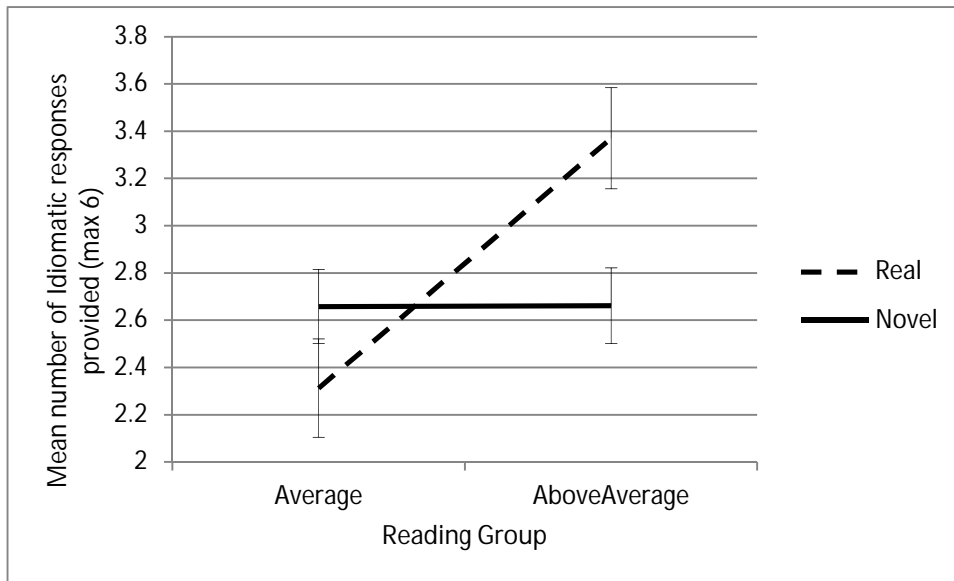


Figure 9 suggests that this Realness*Transparency*Reading Group interaction arises because EL1 Average Readers do not differ in the number of Idiomatic responses given for Real Opaque and for Novel Opaque idioms. In all other conditions illustrated in Figure 8 and Figure 9, more Idiomatic responses are given for Real than for Novel idioms. It seems that the inability of EL1 Average readers to distinguish between Real and Novel idioms in the EL1 mixed ANOVA is linked, in the case of Transparent idioms, to Expressive Vocabulary.

This pair of ANCOVAs has shown that while Expressive Vocabulary accounts for all effects found in the EAL ANOVAs above, the EL1 group retains a between-participants effect for Reading Group and a significant interaction effect of Realness*Reading Group when Expressive Vocabulary has been controlled for. The EAL and EL1 groups therefore draw upon different skills when completing the ICM.

5.2.11 EAL Group Mixed ANCOVA – TOWK Multiple Contexts as a covariate

For the EAL group, a mixed ANCOVA was carried out with within-participant factors of Realness, Transparency and Context, a between-participants variable of Reading Group and a covariate of Multiple Contexts.

5.2.11.1 Between-participants effects

There is no significant between-participants effect of Reading Group ($p > .05$). The between-participants effect of Reading Group found in the EAL Mixed ANOVA on Idiomatic responses may be explained by performance on the TOWK Multiple Contexts.

5.2.11.2 Within-participant effects and interaction effects

Following the pattern found in the relevant EAL mixed ANOVA, there is a significant within-participant effect of Context ($p < .001$). There are no significant within-participant effects of Realness or of Transparency (both $ps > .05$) and no significant interaction effects. These findings show that the within-participant effect of Transparency, and the significant interaction between Transparency*Context (Figure 2) and Transparency*Context*Reading Group (Figure 3 and Figure 4) observed in the EAL Mixed ANOVA above are no longer present when variability due to the TOWK Multiple Contexts subtest is held constant.

5.2.12 EL1 Group Mixed ANCOVA – TOWK Multiple Contexts as a covariate

For the EL1 group, a mixed ANCOVA was carried out with within-participant factors of Realness, Transparency and Context, a between-participants variable of Reading Group and a covariate of Multiple Contexts.

5.2.12.1 Between-participants effects

Mirroring the pattern found in the EL1 Mixed ANOVA above, there is a significant between-participants effect of Reading Group ($p < .05$). Again, this finding differs from that for the EAL group.

5.2.12.2 Within-participant effects and interaction effects

As is the case in the EL1 Mixed ANOVA, there are significant main effects of Transparency and of Context. Unlike the EL1 mixed ANOVA, there is no significant main effect of Realness ($p > .05$) and no significant interactions involving Realness (all $ps > .05$). The interaction between Transparency*Context is marginally significant ($p < .05$) and follows the same pattern as was observed in the EL1 Mixed ANOVA on Idiomatic responses (the pattern of which follows that illustrated in Figure 2).

This pair of ANCOVAs shows that TOWK Multiple Contexts differentially accounts for performance on the ICM for EAL and EL1 groups. When Multiple Contexts is controlled for, a between-participants difference for Reading Group is no longer observed for the EAL group; this is not the case for the EL1 group. An important finding is that for the EL1 group, performance on Multiple Contexts seems to account for all effects involving Realness which were found in the EL1 mixed ANOVA.

5.2.13 EAL Group Mixed ANCOVA – WMTB-C Backwards Digit Recall as a covariate

For the EAL group, a mixed ANCOVA was carried out with within-participant factors of Realness, Transparency and Context, a between-participants variable of Reading Group and a covariate of Backwards Digit Recall.

5.2.13.1 Between-participants effects

Following the pattern observed in the EAL mixed ANOVA above, there is a significant effect of Reading Group ($p < .05$).

5.2.13.2 Within-participant effects and interaction effects

Like the EAL mixed ANOVA above, there is a significant within-participant effect of Context ($p < .01$). However, there are no significant within-participant effects of Realness or of Transparency (both $ps > .05$), suggesting that the significant within-participant effect of Transparency observed in the EAL mixed ANOVA may be explained by Backwards Digit Recall. Distinct from the EAL Mixed ANOVA above, there is no significant interaction between Transparency*Context. However, the interaction between Transparency*Context*Reading Group approaches significance ($p = .057$). This 3-way interaction follows the same pattern as that found in the EAL Mixed ANOVA above (c.f. Figure 3 and Figure 4).

5.2.14 EL1 Group Mixed ANCOVA – WMTB-C Backwards Digit Recall as a covariate

For the EL1 group, a mixed ANCOVA was carried out with within-participant factors of Realness, Transparency and Context, a between-participants variable of Reading Group and a covariate of Backwards Digit Recall.

5.2.14.1 Between-participants effects

As is the case in the EL1 Mixed ANOVA, there is a significant between-groups effect of Reading Group ($p < .01$). This pattern of results is the same as that for the EAL group.

5.2.14.2 Within-participant effects and interaction effects

Following the pattern of the EL1 mixed ANOVA, there are significant within-participant effects of Transparency ($p < .01$) and of Context ($p < .01$). However, there is no significant main effect of Realness ($p > .05$), suggesting that performance on Backwards Digit Recall can explain the within-participant effect of Realness observed in the EL1 Mixed ANOVA above. In contrast to this EL1 mixed ANOVA, no significant interactions between Transparency*Context or between Realness*Transparency*Context emerge from this analysis. However, the interaction between Realness*Reading Group approaches significance ($p = .057$). The pattern found in this Realness*Reading Group interaction is identical to that found in the EL1 mixed ANOVA above (c.f. Figure 5).

Overall, the patterns found in the EAL and EL1 Backwards Digit Recall ANCOVAs are similar to those found in the respective mixed ANOVAs above. The main discrepancies are the lack of interaction effects involving Transparency or Context in the EL1

ANCOVA. The significant effects found in the above ANCOVAs are summarised in Table 41 below.

Table 41 Research Question 1b: ICM Effects found in EAL and EL1 ANCOVAs on Idiomatic responses

	EAL (Expressive Vocabulary as a Covariate)	EL1 (Expressive Vocabulary as a Covariate)	EAL (Multiple Context as a Covariate)	EL1 (Multiple Contexts as a Covariate)	EAL (Backwards Digit Recall as a Covariate)	EL1 (Backwards Digit Recall as a Covariate)
Between-Groups Effects						
Reading Group	n.s.	$p < .05$, partial $\eta^2 = .11$	n.s.	$p < .05$, partial $\eta^2 = .11$	$p < .05$, partial $\eta^2 = .09$	$p < .01$, partial $\eta^2 = .22$
Main Effects						
Realness	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Transparency	n.s.	n.s.	n.s.	$p < .05$, partial $\eta^2 = .09$	n.s.	$p < .01$, partial $\eta^2 = .19$
Context	n.s.	n.s.	$p < .001$, partial $\eta^2 = .42$	$p < .001$, partial $\eta^2 = .45$	$p < .01$, partial $\eta^2 = .23$	$p < .01$, partial $\eta^2 = .18$
Interaction Effects						
Realness*Reading Group	n.s.	$p < .05$, partial $\eta^2 = .09$	n.s.	n.s.	n.s.	$p = .057$, partial $\eta^2 = .08$
Transparency*Context	n.s.	n.s.	n.s.	$p < .05$, partial $\eta^2 = .085$	n.s.	n.s.
Realness*Transparency*Context	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Transparency*Context*Reading Group	n.s.	n.s.	n.s.	n.s.	$p = .057$, partial $\eta^2 = .08$	n.s.
Realness*Transparency*Reading Group	n.s.	$p = .055$, partial $\eta^2 = .08$	n.s.	n.s.	n.s.	n.s.

5.2.15 Research Question 1b: summary

5.2.15.1 TOWK Expressive Vocabulary as a covariate

When Expressive Vocabulary was used as a covariate, none of the significant effects observed in the EAL Mixed ANOVA remained, suggesting that the EAL participants draw heavily upon their skills in Expressive Vocabulary when completing the ICM. For the EL1 group, however, a significant between-groups effect of Reading Group and a significant interaction effect of Realness*Reading Group remained when Expressive Vocabulary was partialled out, suggesting that the EL1 participants draw upon other skills in addition to Expressive Vocabulary when completing the ICM.

5.2.15.2 TOWK Multiple Contexts as a covariate

When Multiple Contexts was used as a covariate, the only significant effect which remained from the EAL Mixed ANOVA was a within-participant effect of Context, suggesting that while Multiple Contexts is very important for EAL performance on the ICM, it does not have quite as great an influence as Expressive Vocabulary. Where EL1 participants were concerned, the between-participants effect of Reading Group and the within-participant effects of Transparency and Context were retained from the EL1 Mixed ANOVA. However, Multiple Context explains the significant within-participants effect of Realness found in the EAL Mixed ANOVA in addition to all interaction effects involving Realness, suggesting that Multiple Contexts is an important factor in explaining ICM differences between EAL and EL1 groups.

5.2.15.3 WMTB-C Backwards Digit Recall as a covariate

Overall, it seems that participants drew less strongly upon their working memory skills when completing the ICM than on the vocabulary skills essential for Expressive Vocabulary and Multiple Contexts. Some differences do exist, however, between the results of the EAL and EL1 ANCOVAs with Backwards Digit Recall as a covariate, and the EAL and EL1 Mixed ANOVAs. Where the EAL participants are concerned, the effect of Transparency is lessened in this ANCOVA: there no significant within-participant effect of Transparency and no significant interaction between Transparency*Context. However, the interaction between Transparency*Context*Reading Group approaches significance. Where EL1 participants are concerned, while the significant within-participants effect of Transparency found in the EL1 Mixed ANOVA is retained, no interaction effects involving Transparency or Context remain after Backwards Digit Recall has been partialled out for the EL1 group.

5.3 Research Question 2

2a

Do the EAL and EL1 Average and Above Average Readers differ in the extent to which they choose:

- i) Congruent response options in context
- ii) Incongruent response options in context
- iii) Literal response options in isolation

2b

Do the EAL and EL1 Average and Above Average Readers differ in the extent to which they choose:

- iv) Congruent response options in context
- v) Incongruent response options in context
- vi) Literal response options in isolation

When a) TOWK Expressive Vocabulary; b) TOWK Multiple Contexts; c) WMTB-C Backwards Digit Recall are used as covariates?

5.3.1 Research Question 2 structural overview

Research Question 2a will be addressed initially by means of a series of omnibus *F*-tests for Congruent, Incongruent and Literal responses respectively. As was the case for Research Question 1, the results of these initial ANOVAs will not be described in detail in the interests of succinctness. Separate Mixed ANOVAs will then be carried out on the Congruent, Incongruent and Literal responses provided by EAL and EL1 participants separately. As a main focus of this study is to investigate differences between the performance of EAL and EL1 participants on the ICM, the results of these separate Mixed ANOVAs will be discussed in detail. In order to address Research Question 2b, these separate Mixed ANOVAs will be re-run as ANCOVAs, covarying out TOWK Expressive Vocabulary, TOWK Multiple Contexts, and WMTB-C Backwards Digit Recall separately. The results of these ANCOVAs will be compared with those of the Mixed ANOVAs. An overview of the ICM effects relevant to Research Question 2 is found in Appendix 5.11.

5.3.2 Research Question 2 mean scores

The mean sum scores for the number of Congruent, Incongruent and Literal responses given in each of the conditions of the Idiom Comprehension Measure are shown in Table 42. The maximum potential mean score for each condition is 6.

Table 42 Research Question 2a: ICM Mean Sum Scores (and standard deviations) for Congruent, Incongruent and Literal Responses by Group and Condition

Real					Novel			
transparent			opaque		transparent		opaque	
	isolation	context	isolation	context	isolation	context	isolation	context
Congruent								
EAL Average	0.79 (0.83)	1.00 (1.02)	0.92 (0.93)	1.75 (1.11)	0.96 (0.95)	1.50 (1.35)	1.54 (1.10)	1.42 (0.88)
EAL Above Average	0.68 (0.72)	1.09 (1.06)	1.27 (0.83)	1.18 (0.91)	1.14 (0.99)	1.00 (1.20)	2.00 (1.11)	1.50 (0.91)
EL1 Average	0.67 (0.70)	1.25 (0.94)	1.17 (0.87)	1.67 (1.40)	.79 (.72)	1.25 (0.90)	1.38 (1.10)	1.46 (1.06)
EL1 Above Average	0.52 (0.79)	0.74 (0.92)	1.26 (0.86)	0.91 (0.90)	0.96 (0.77)	0.97 (0.76)	1.65 (1.11)	1.13 (0.76)
Incongruent								
EAL Average	1.33 (1.27)	0.92 (1.35)	1.17 (1.34)	0.75 (0.79)	1.42 (1.10)	0.50 (0.78)	1.04 (0.91)	0.83 (0.76)
EAL Above Average	1.32 (1.09)	0.18 (0.39)	1.27 (1.08)	0.32 (0.48)	0.77 (0.87)	0.32 (0.48)	1.00 (0.76)	0.45 (0.60)
EL1 Average	1.42 (0.97)	0.54 (0.59)	1.71 (1.04)	0.92 (1.14)	1.46 (1.06)	0.71 (0.75)	0.83 (0.82)	0.58 (0.72)
EL1 Above Average	1.04 (0.56)	0.17 (0.39)	0.91 (0.85)	0.09 (0.29)	1.26 (0.86)	0.26 (0.45)	0.91 (0.66)	0.57 (0.73)
Literal								
EAL Average	1.54 (1.25)	1.67 (0.48)	2.58 (1.50)	0.21 (0.51)	1.33 (0.96)	0.33 (0.64)	1.96 (1.43)	0.46 (0.72)
EAL Above Average	0.36 (0.66)	0.23 (0.53)	1.77 (1.11)	0.09 (0.29)	1.05 (1.09)	0.18 (0.39)	1.36 (0.58)	0.14 (0.35)
EL1 Average	0.92 (0.93)	0.38 (0.88)	2.33 (1.17)	0.42 (0.65)	1.33 (1.24)	0.58 (0.83)	2.38 (1.76)	0.50 (1.14)
EL1 Above Average	0.70 (0.97)	0.09 (0.29)	1.61 (1.08)	0.04 (0.21)	0.83 (0.83)	0.30 (0.47)	1.78 (1.20)	0.09 (0.29)

5.3.3 Congruent response options in context: initial omnibus *F*-test

Where Congruent responses are concerned, the main area of interest is the extent to which they are chosen where supportive context is present. Selecting a Congruent response in a Context condition shows that the participant is able to make use of supportive context to infer the meaning of an Idiomatic phrase. All tests carried out on Congruent responses will involve responses given for idioms presented in the Context condition only. An *F*-test with 2 between-participant factors of Reading Group (Average or Above Average reader) and Language Group (EAL or EL1) and with 2 within-participant factors of Realness (Real or Novel idiom) and Transparency (Transparent or Opaque idiom) was carried out in the first instance.

5.3.3.1 Between-participant effects

There is a significant between-participants effect of Reading Group, with Average Readers (mean = 1.35) giving significantly more Congruent Responses when Context is present than Above Average Readers (mean = 1.05), $F(1, 89) = 4.93, p < .05$, partial $\eta^2 = .05$. No significant between-participant effects involving Language Group were found (all $ps > .05$).

5.3.3.2 Within-participant effects

This omnibus *F*-test revealed that there is a significant within-participant effect of Transparency with significantly more Congruent responses being provided for Opaque (mean = 1.32) than Transparent (mean = 1.09) idioms ($p < .05$). However, there is no significant within-participant effect of Realness ($p > .05$).

5.3.3.3 Interaction effects

While no interaction effects achieve statistical significance, the 4-way Interaction between Realness*Transparency*Reading Group*Language Group approaches significance, $F(1, 89) = 3.74, p = .056$, partial $\eta^2 = .04$.

5.3.4 Incongruent response options in context: initial omnibus *F*-test

As with Congruent responses, the extent to which participants select Incongruent responses in the Context condition is of primary interest. In selecting an Incongruent response, the participant shows that s/he does not recognise that this response is at odds with the story context. All *F*-tests carried out on Incongruent responses involve idioms presented in the Context condition only. An initial omnibus *F*-test with 2 between-participant factors of Reading Group (Average or Above Average reader) and Language Group (EAL or EL1) and 2 within-participant factors of Realness (Real or Novel idiom) and Transparency (Transparent or Opaque idiom) was carried out.

5.3.4.1 Between-participant effects

A significant between-participants effect of Reading Group was found with Average readers (mean = 0.72) giving significantly more Incongruent responses than Above Average readers (mean = 0.30), $F(1, 89) = 24.88, p < .001$, partial $\eta^2 = .22$. No significant between-participant effects involving Language Group were found ($p > .05$).

5.3.4.2 Within-participant effects

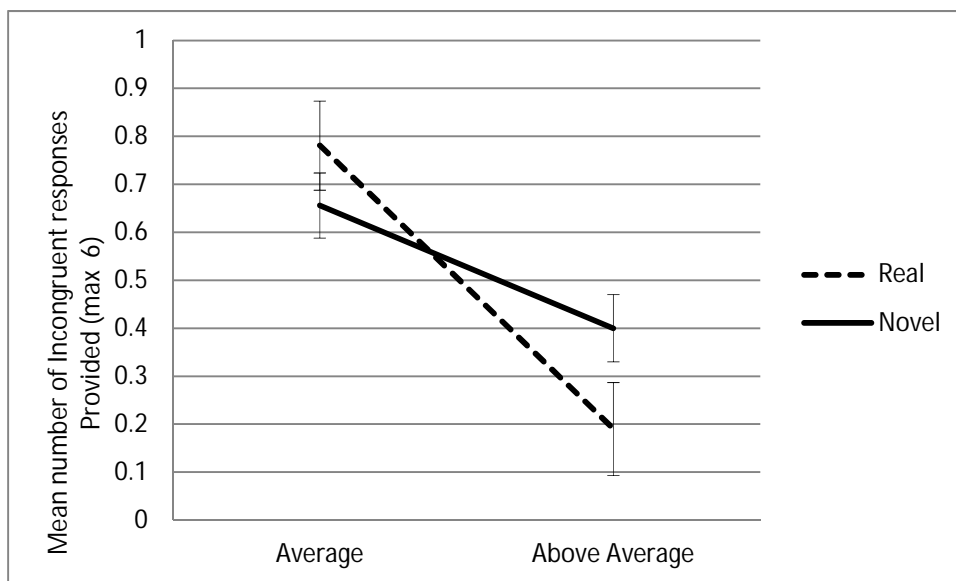
Where Incongruent responses are concerned, no significant within-participant effects were found (all $ps > .05$).

5.3.4.3 Interaction effects

There is a significant 2-way interaction between Realness*Reading Group, $F(1, 89) = 4.23, p < .05$, partial $\eta^2 = .05$ and a significant 4-way interaction between Realness*Transparency*Reading Group*Language Group, $F(1, 89) = 7.85, p < .01$, partial $\eta^2 = .08$.

The Realness*Reading Group interaction is not found in either the EAL or EL1 Mixed ANOVA on Incongruent responses and so is illustrated in Figure 10.

Figure 10 Omnibus F -test Incongruent Responses in Context: Interaction between Realness*Reading Group



This 2-way interaction was further examined through use of 2 pairwise t -tests. The α -level was set at 0.025 to account for the 2 comparisons (0.05 divided by 2). These t -tests show that while for Average readers there are no significant differences between the number of Incongruent responses provided for Real (mean = 0.78) and Novel (mean = 0.66) idioms in Context ($p > .05$), Above Average readers provide significantly more

Incongruent responses for Novel (mean = 0.40) than for Real (mean = 0.19) idioms in Context, $t(44) = -3.09$, $p < .01$, $r = 0.34$.

5.3.5 Literal response options in isolation: initial Omnibus *F*-test

It is of interest to look at the number of Literal responses given by participants both in Isolation and in Context. If a Literal response is given in an Isolation condition, the implication is that the child is approaching the idiom as a literal rather than a figurative phrase. If a Literal response is given in a Context condition, the implication is not only that the child does not consider the idiom as a figurative phrase but also that the child does not recognise that the literal interpretation of the phrase is at odds with the story context.

In the Context conditions in particular, however, very few Literal responses are provided; there are also extremely severe violations of the assumptions of both normal distribution and homogeneity of variance (c.f. Appendix 5.8). It was therefore considered inappropriate to run inferential statistics on the number of Literal responses provided in Context conditions. Descriptively, however, it appears that the EAL Average group may have a literal processing tendency in the Real Transparent Context condition (c.f. Table 42).

All *F*-tests carried out on Literal responses involve responses provided for idioms in the Isolation condition only. An initial omnibus *F*-test was carried out with 2 between-participant factors of Reading Group (Average or Above Average reader) and Language Group (EAL or EL1) and with 2 within-participant factors of Realness (Real or Novel idiom) and Transparency (Transparent or Opaque idiom).

5.3.5.1 Between-participant effects

There is a significant between-participants effect of Reading Group with more Literal responses being given for idioms in Isolation by Average readers (mean = 1.80) than by Above Average readers (mean = 1.18), $F(1, 89) = 13.78, p < .001$, partial $\eta^2 = .13$. There is no significant between-participants effect of Language Group ($p > .05$).

5.3.5.2 Within-participant effects

There is a significant main effect of Transparency ($p < .001$) with more Literal responses being given for Opaque idioms (mean = 1.97) than for Transparent idioms (mean = 1.01). There is no significant main effect of Realness ($p > .05$).

5.3.5.3 Interaction effects

The 2-way interaction between Realness*Transparency is the only significant interaction found for Literal responses in Isolation, $F(1, 89) = 5.02, p < .05$, partial $\eta^2 = .05$.

5.3.6 Rationale for carrying out separate EAL/EL1 Mixed ANOVAs

As in Research Question 1, any potential Language Group differences in response patterns deserve further attention. The Realness*Transparency*Reading Group*Language Group interaction is significant for Incongruent responses and nears significance for Congruent responses. In order to investigate whether further, more nuanced differences exist in the non-Idiomatic response patterns given by EAL/EL1 groups, separate mixed ANOVAs were carried out for EAL and EL1 participants. These mixed ANOVAs had 1 between-participants factor of Reading Group and 2 within-participants factors of Realness and Transparency and were carried out on i. Congruent

responses provided in Context, ii. Incongruent responses provided in Context, iii. Literal responses provided in Isolation.

5.3.7 Congruent response options in Context: EAL Mixed ANOVA

5.3.7.1 Between participant effects

In contrast to the omnibus F -test on Congruent responses, there is no significant between-participants effect of Reading Group ($p > .05$).

5.3.7.2 Within-participant effects

There is a significant within-participant effect of Transparency with more Congruent responses being given for Opaque idioms (mean = 1.46) than for Transparent idioms (mean = 1.15). There is no significant main effect of Realness ($p > .05$). This pattern is the same as that found in the initial omnibus F -test for Congruent responses.

5.3.7.2 Interaction effects

In clarification of the 4-way interaction found in the initial omnibus ANOVA on Congruent responses, there is a significant 3-way interaction of Realness*Transparency*Reading Group, $F(1, 44) = 4.68$, $p < .05$, partial $\eta^2 = .10$.

This 3-way interaction is illustrated in Figure 11 and Figure 12.

Figure 11 EAL Mixed ANOVA Congruent Responses in Context: Interaction between Realness*Transparency for the EAL Average Group

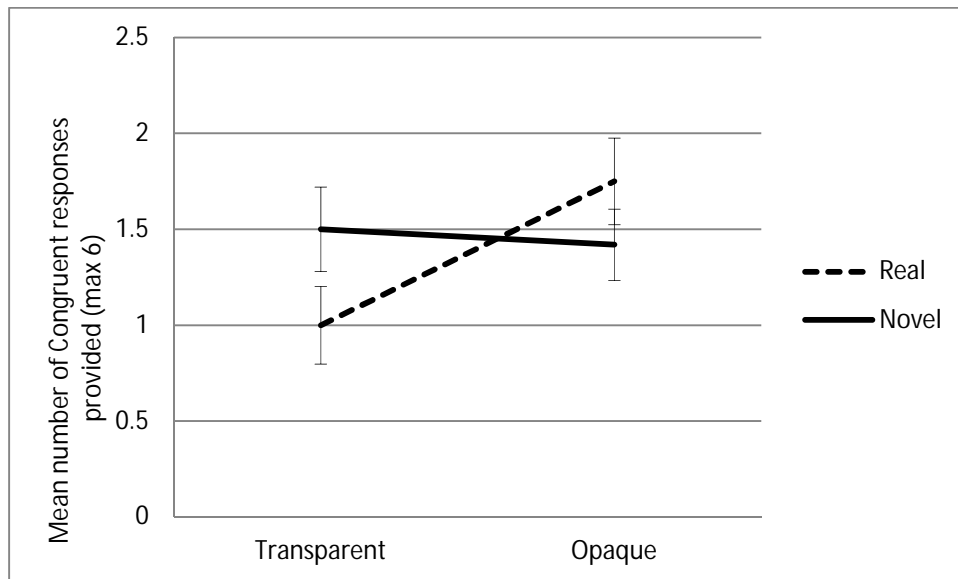
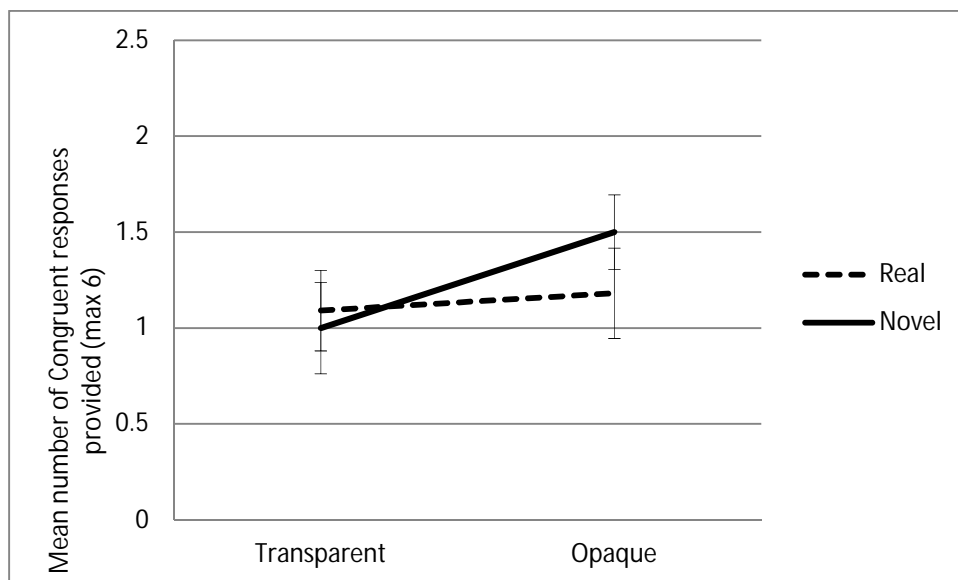


Figure 12 EAL Mixed ANOVA Congruent Responses in Context: Interaction between Realness*Transparency for the EAL Above Average Group



This interaction was further examined by using 4 pairwise *t*-tests. The α -level was set at 0.0125 to account for the 4 comparisons (0.05 divided by 4). Figure 11 shows that significantly more Congruent responses were given by the EAL Average group in the Real Opaque Context condition (mean = 1.75) than in the Real Transparent Context condition (mean = 1.00), $t(23) = -3.00, p = .006, r = 0.53$. No other significant pairwise differences were found.

5.3.8 Congruent response options in Context: EL1 Mixed ANOVA

5.3.8.1 Between-participants effects

In line with the omnibus *F*-test and in contrast to the EAL mixed ANOVA (both on Congruent responses), a significant between-participants effect of Reading Group was found with significantly more Congruent responses being given in Context by EL1 Average (mean = 1.28) than by EL1 Above Average participants (mean = 0.91), $F(1, 45) = 4.78, p < .05, \text{partial } \eta^2 = .10$.

5.3.8.2 Within-participant effects

Distinct from the initial omnibus *F*-test on Congruent responses, and from the EAL mixed ANOVA on Congruent responses, no significant main effects are found for either Realness or for Transparency (both $ps > .05$).

5.3.8.3 Interaction effects

In contrast to both the initial omnibus *F*-test on Congruent responses and to the EAL mixed ANOVA on Congruent responses, no significant interaction effects were found (all $ps > .05$).

5.3.9 Incongruent response options in Context: EAL Mixed ANOVA

5.3.9.1 Between-participant effects

In line with the initial omnibus ANOVA on Incongruent responses, there is a significant between-participants effect of Reading Group, $F(1, 44) = 10.16, p < .01$, partial $\eta^2 = .19$, with significantly more Incongruent responses being given by EAL Average (mean = 0.75) than by EAL Above Average (mean = 0.32) readers in Context.

5.3.9.2 Within-participant effects

There are no significant within-participant effects of either Realness or Transparency (both $ps > .05$). The finding mirrors that found in the relevant omnibus F -test above.

5.3.9.3 Interaction effects

Distinct from the omnibus ANOVA above, there are no significant interaction effects (all $ps > .05$).

5.3.10 Incongruent response options in Context: EL1 Mixed ANOVA

5.3.10.1 Between-participants effects

Like the initial omnibus ANOVA on Incongruent responses and the EAL Mixed ANOVA on Incongruent responses, there is a significant between-participants effect of Reading Group, $F(1, 45) = 8.12, p < .001$, partial $\eta^2 = .26$, with significantly more Incongruent responses being given by EL1 Average (mean = 0.69) than by EL1 Above Average (mean = 0.27) readers in Context.

5.3.10.2 Within-participant effects

In line with both the initial omnibus ANOVA on Incongruent responses and also with the EAL mixed ANOVA on Incongruent responses, there are no significant within-participant effects of either Realness or of Transparency where the EL1 group are concerned (both $ps > .05$).

5.3.10.3 Interaction effects

Following the pattern of the initial omnibus F -test on Incongruent responses and distinct from the EAL Mixed ANOVA on Incongruent responses, there is a significant interaction effect of Realness*Transparency*Reading Group, $F(1, 45) = 6.41, p < .05$, partial $\eta^2 = .13$

The significant Realness*Transparency*Reading Group interaction is illustrated in Figure 13 and Figure 14.

Figure 13 EL1 Mixed ANOVA Incongruent Responses in Context: Interaction between Realness*Transparency for the EL1 Average Group

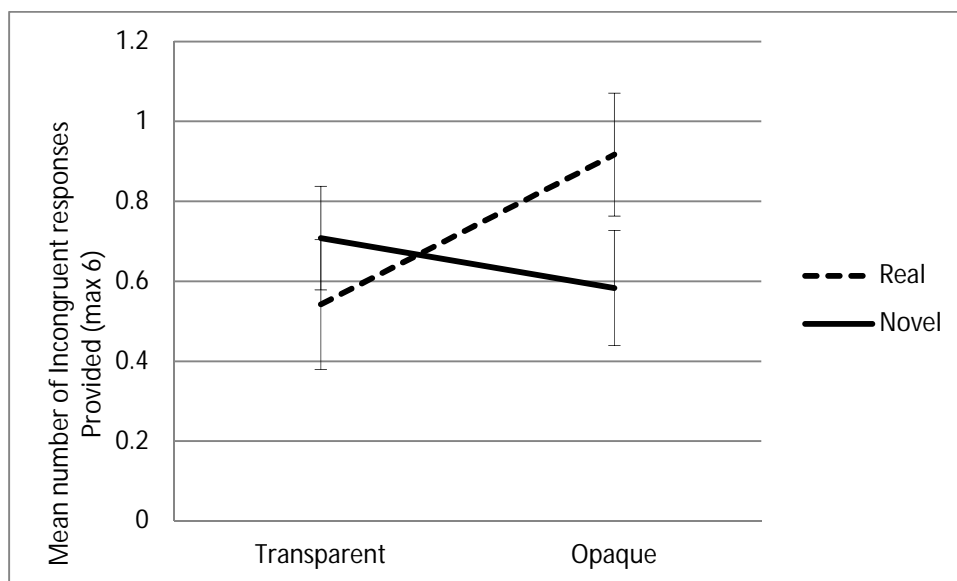
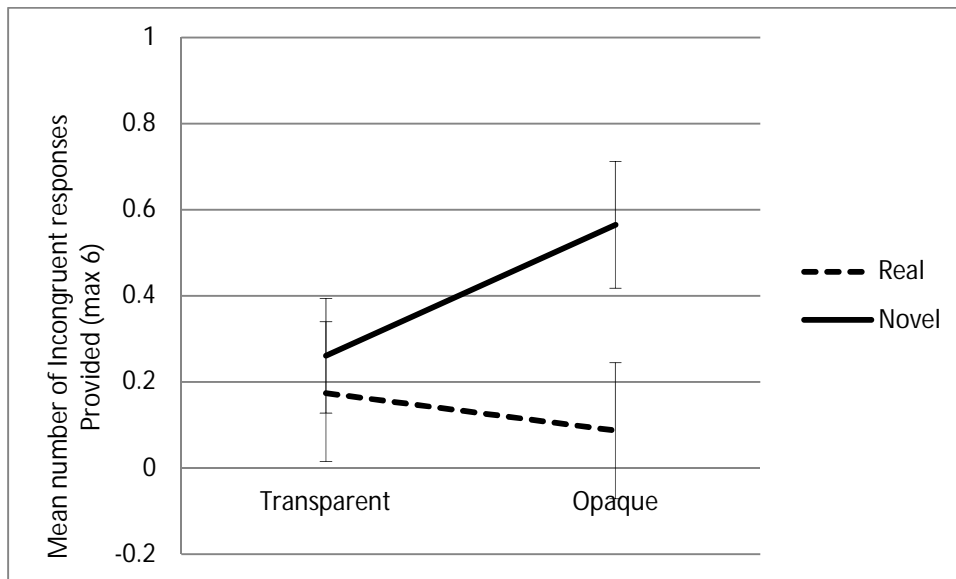


Figure 14 EL1 Mixed ANOVA Incongruent Responses in Context: Interaction between Realness*Transparency for the EL1 Above Average Group



The Realness*Transparency*Reading Group interaction was further examined by using 4 pairwise *t*-tests. The α -level was set at 0.0125 to account for the 4 comparisons (0.05 divided by 4). The difference between the number of Incongruent responses given by the EL1 Above Average group in the Novel Opaque Context condition (mean = 0.57) in comparison to the Real Opaque Context condition (mean = 0.09) is significant $p < 0.0125$ (c.f. Figure 14). No other significant pairwise differences were found (all $ps > .05$).

The significant Realness*Reading Group interaction found in the initial omnibus *F*-test on Incongruent responses (c.f. Figure 10) was not found in either the EAL or EL1 Mixed ANOVA on Incongruent responses. However, this Realness*Transparency*Reading Group interaction found in the EL1 mixed ANOVA clarifies the presence of this Realness*Reading Group interaction.

5.3.11 Literal Response Options in Isolation: EAL Mixed ANOVA

5.3.11.1 Between-participant effects

Like the omnibus ANOVA on Literal responses, there is a significant between-participants effect of Reading Group with significantly more Literal responses being given in Isolation by EAL Average (mean = 1.85) than by EAL Above Average readers (mean = 1.14), $F(1, 44) = 9.79, p < .01$, partial $\eta^2 = .18$.

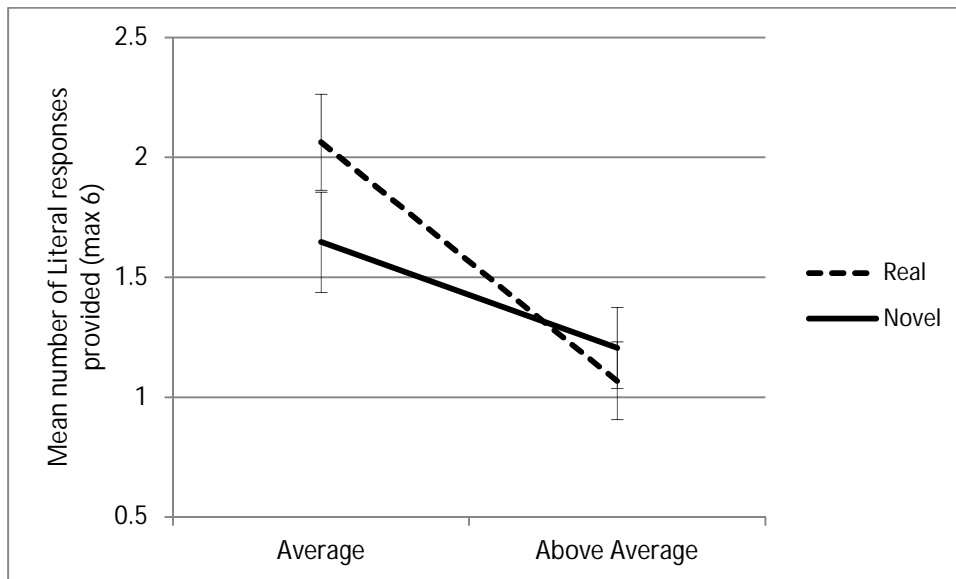
5.3.11.2 Within-participant effects

There is a significant within-participant effect of Transparency ($p < .001$) with more Literal responses being provided for Opaque (mean = 1.92) than for Transparent idioms (mean = 1.07), but no significant within-participant effect of Realness ($p > .05$). The pattern of within-participant effects mirrors those found in the initial omnibus ANOVA on Literal responses.

5.3.11.3 Interaction effects

Distinct from the omnibus F -test on Literal responses, there is a significant interaction effect of Realness*Reading Group, $F(1, 44) = 4.62, p < .05$, partial $\eta^2 = .10$. In line with this omnibus F -test, there is a significant interaction effect of Realness*Transparency, $F(1, 44) = 6.05, p < .05$, partial $\eta^2 = .12$. The Realness*Reading Group interaction is illustrated in Figure 15.

Figure 15 EAL Mixed ANOVA Literal Responses in Isolation: Interaction between Realness*Reading Group

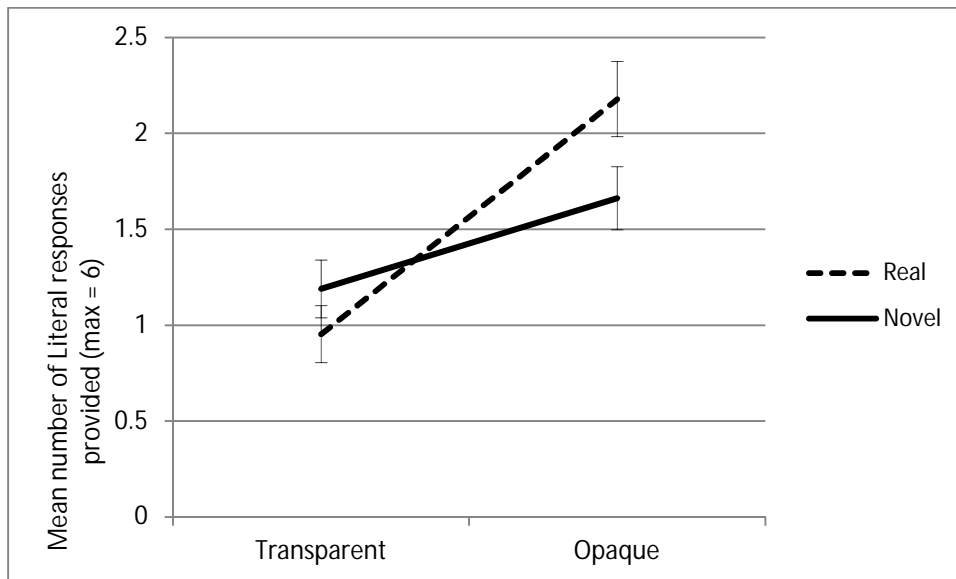


Two pairwise *t*-tests were carried out to further investigate this significant interaction. The α -level was set of 0.025 (0.05 divided by 2) to account for the 2 comparisons. The difference between the number of Literal responses given for Real idioms in the Isolation condition (mean = 2.06) and the number of Literal Responses given for Novel idioms in the Isolation condition (mean = 1.65) approached significance for the EAL Average group, $t(23) = 2.35, p = 0.028$. This difference was non-significant for the EAL Above Average group ($p > .05$).

The Realness*Transparency interaction is illustrated in Figure 16.

Figure 16 EAL Mixed ANOVA Literal Responses in Isolation: Realness*Transparency

Interaction



Two pairwise *t*-tests were carried out to further investigate this interaction. The α -level was set at 0.025 (0.05 divided by 2) to account for the 2 comparisons. While there is no significant difference in the number of Literal responses given by EAL participants in the Real Transparent Isolation condition (mean = 0.95) and the Novel Transparent Isolation condition (mean = 1.19), ($p > .05$), significantly more Literal responses are given by EAL participants for idioms in the Real Opaque Isolation condition (mean = 2.18) than in the Novel Opaque Isolation condition (mean = 1.66), $t(45) = 2.51$, $p < 0.025$. This interaction elucidates that found in the initial omnibus ANOVA for Literal responses.

5.3.12 Literal response options in isolation: EL1 Mixed ANOVA

5.3.12.1 Between-participants effects

In line with the omnibus ANOVA on Literal responses and with the EAL Mixed ANOVA on Literal responses, there is a significant between-participants effect of Reading Group with significantly more Literal responses being given in Isolation by EL1 Average (mean = 1.74) than by EL1 Above Average readers (mean = 1.23), $F(1, 45) = 4.60, p < .05$, partial $\eta^2 = 0.9$.

5.3.12.2 Within-participant effects

Again, in line with the omnibus ANOVA on Literal responses and with the EAL Mixed ANOVA on Literal responses, there is a significant within-participant effect of Transparency, $F(1, 45) = 41.85, p < .001$, partial $\eta^2 = .48$, with more Literal responses being given for Opaque (mean = 2.03) than for Transparent idioms (mean = 0.94), and no significant within-participant effect of Realness ($p > .05$).

5.3.12.3 Interaction effects

Distinct from the omnibus ANOVA on Literal responses and the EAL mixed ANOVA on Literal responses, there are no significant interaction effects (all $ps > .05$). Table 43 provides an overview of the various effects found in the ANOVAs relevant to Research Question 2a.

Table 43 Research Question 2a: ICM Effects found in the Omnibus *F*-test and in the EAL and EL1 Mixed ANOVAs on Congruent, Incongruent and Literal Responses

	Omnibus <i>F</i> -test	EAL Mixed ANOVA	EL1 Mixed ANOVA
Congruent			
Between-Groups Effects			
Reading Group	$p < .05$, partial $\eta^2 = .05$	n.s.	$p < .05$, partial $\eta^2 = .10$.
Language Group	n.s.		
Main Effects			
Realness	n.s.	n.s.	n.s.
Transparency	$p < .05$, partial $\eta^2 = .06$	$p < .05$, partial $\eta^2 = .12$	n.s.
Interaction Effects			
Realness*Reading Group	n.s.	n.s.	n.s.
Realness*Transparency	n.s.	n.s.	n.s.
Realness*Transparency*Reading Group	n.s.	$p < .05$, partial $\eta^2 = .10$	n.s.
Realness*Transparency*Reading Group*Language Group	$p = .056$, partial $\eta^2 = .04$		
Incongruent			
Between-Groups Effects			
Reading Group	$p < .001$, partial $\eta^2 = .22$	$p < .01$, partial $\eta^2 = .19$	$p < .001$, partial $\eta^2 = .26$
Language Group	n.s.		
Main Effects			
Realness	n.s.	n.s.	n.s.
Transparency	n.s.	n.s.	n.s.
Interaction Effects			
Realness*Reading Group	$p < .05$, partial $\eta^2 = .05$	n.s.	n.s.
Realness*Transparency	n.s.	n.s.	n.s.
Realness*Transparency*Reading Group	n.s.	n.s.	$p < .05$, partial $\eta^2 = .13$
Realness*Transparency*Reading Group*Language Group	$p < .01$, partial $\eta^2 = .08$.	n.s.	n.s.
Literal			
Between-Groups Effects			
Reading Group	$p < .001$, partial $\eta^2 = .13$	$p < .01$, partial $\eta^2 = .18$	$p < .05$, partial $\eta^2 = 0.9$
Language Group	n.s.		
Main Effects			
Realness	n.s.	n.s.	n.s.

	Omnibus <i>F</i>-test	EAL Mixed ANOVA	EL1 Mixed ANOVA
Transparency	$p < .001$, partial $\eta^2 = .48$	$p < .001$, partial $\eta^2 = .48$	$p < .001$, partial $\eta^2 = .48$
Interaction Effects			
Realness*Reading Group	n.s.	$p < .05$, partial $\eta^2 = .10$	n.s.
Realness*Transparency	$p < .05$, partial $\eta^2 = .05$.	$p < .05$, partial $\eta^2 = .12$	n.s.
Realness*Transparency*Reading Group	n.s.	n.s.	n.s.
Realness*Transparency*Reading Group*Language Group	n.s.	n.s.	n.s.

5.3.13 Research Question 2a: summary

5.3.13.1 Congruent responses

While more Congruent responses were provided by EL1 Average participants than by EL1 Above Average participants ($p < .05$), the EAL Average and Above Average groups did not differ in the number of Congruent responses provided ($p > .05$). While idiom-type did not significantly affect the number of Congruent responses provided for the EL1 participants, significantly more Congruent responses were given by the EAL Average group for Real Opaque Context idioms than for Real Transparent Context idioms ($p < .05$).

5.3.13.2 Incongruent responses

For EAL participants, idiom type has no significant bearing on the number of Incongruent responses provided. The EL1 Above Average group, however, provides more Incongruent responses in the Novel Opaque Context condition than in the Real Opaque Context condition.

5.3.13.3 Literal responses

For both EAL and EL1 participants, more Literal responses are provided for Opaque than for Transparent idioms. For EAL participants, this pattern is clarified by a significant Realness*Transparency interaction: significantly more Literal responses are given for Real Opaque idioms than for Novel Opaque idioms. In addition, a significant Realness*Reading Group interaction for the EAL group shows that the EAL Average group provided more Literal responses for Real idioms than for Novel idioms. No significant interaction effects exist for the EL1 group.

5.3.14 EAL/EL1 group differences in vocabulary and working memory

As was the case in RQ1b, it is important to rerun the above ANOVAs as ANCOVAs, covarying out the vocabulary and working memory subtests on which the EAL/EL1 groups have been shown to differ. For each of the 3 erroneous response-types (Congruent, Incongruent and Literal) a series of 3 ANCOVAs, each with a between-groups factor of Reading Group and within-groups factors of Realness and Transparency, was carried out with a) Expressive Vocabulary, b) Multiple Contexts and c) Backwards Digit Recall as covariates. For Congruent and Incongruent responses, these ANCOVAs were carried out on idioms in Context only. For Literal responses, these ANCOVAs were carried out on idioms in Isolation only. Each ANCOVA was run for EAL and EL1 participants separately. These ANCOVAs will provide information regarding whether the tendency to choose Congruent, Incongruent or Literal responses on the idiom comprehension measure is differentially affected by performance on the TOWK

Expressive Vocabulary, the TOWK Multiple Contexts or on the WMTB-C Backwards Digit Recall for EAL/EL1 groups.

5.3.15 Congruent response options in context: EAL Group Mixed ANCOVAs

5.3.15.1 Between-participants Effects

As is the case in the EAL Mixed ANOVA on Congruent responses, there is no significant between-groups effect of Reading Group for Congruent response options when Expressive Vocabulary, Multiple Contexts or Backwards Digit Recall are used as covariates (all $ps > .05$).

5.3.15.2 Within-participant effects and interaction effects

When either Expressive Vocabulary or Multiple Contexts are used as covariates, no significant within-participant effects and no significant interaction effects remain (all $ps > .05$). These findings suggest that the significant within-participant effect of Transparency and the significant interaction effect of Realness*Transparency*Reading Group in the EAL Mixed ANOVA on Congruent responses may be explained by the EAL group's performance on either Expressive Vocabulary or Multiple Contexts.

When Backwards Digit Recall is used as a covariate, there are no significant within-participant effects (all $ps > .05$). However, there is a significant 2-way interaction effect between Realness*Transparency, $F(1, 43) = 6.73, p < .05$, partial $\eta^2 = .14$. The pattern of this interaction is similar to that illustrated in Figure 11. However, Reading Group no longer interacts with Realness*Transparency in this ANCOVA, suggesting that for all EAL participants (rather than for EAL Average readers alone), more Congruent responses

are provided in the Real Opaque condition than in the Real Transparent condition when Backwards Digit Recall is partialled out.

5.3.16 Congruent response options in context: EL1 Group Mixed ANCOVAs

5.3.16.1 Between-participants effects

In contrast to the EL1 Mixed ANOVA on Congruent responses above, there are no significant between-groups effects of Reading Group when Expressive Vocabulary, Multiple Contexts or Backwards Digit Recall are used as covariates (all $ps > .05$). These findings suggest that the greater tendency for EL1 Average participants than EL1 Above Average participants to provide Congruent responses may be explained by either Expressive Vocabulary, Multiple Contexts or Backwards Digit Recall.

5.3.16.2 Within-Participant Effects and Interaction Effects

In line with the EL1 ANOVA on Congruent responses, no significant within-participant effects and no significant interaction effects (all $ps > .05$) are found when either Expressive Vocabulary or Multiple Contexts are used as covariates. In contrast to the EL1 ANOVA on Congruent responses, there is a significant main effect of Transparency, with more Congruent responses being provided by EL1 participants in the Opaque Condition (adjusted mean = 1.17) than in the Transparent Condition (adjusted mean = 1.03) when Backwards Digit Recall is partialled out, $F(1, 44) = 4.69, p < .05$, partial $\eta^2 = .10$. Table 44 provides a summary of effects found for Congruent responses in the above ANCOVAs.

Table 44 Research Question 2b: Summary of ANCOVA results on Congruent Responses for the ICM

	EAL (Expressive Vocabulary as a Covariate)	EL1 (Expressive Vocabulary as a Covariate)	EAL (Multiple Contexts as a Covariate)	EL1 (Multiple Contexts as a Covariate)	EAL (Backwards Digit Recall as a Covariate)	EL1 (Backwards Digit Recall as a Covariate)
Between-Groups Effects						
Reading Group	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Main Effects						
Realness	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Transparency	n.s.	n.s.	n.s.	n.s.	n.s.	$p < .05$, partial $\eta^2 = .10$.
Interaction Effects						
Realness*Transparency	n.s.	n.s.	n.s.	n.s.	$p < .05$, partial $\eta^2 = .14$	n.s.

5.3.17 Incongruent response options in context: EAL Group Mixed

ANCOVAs

5.3.17.1 Between-Groups Effects

In contrast to the EAL Mixed ANOVA on Incongruent responses, there is no significant between-groups effect of Reading Group when Expressive Vocabulary or Multiple Contexts are used as covariates (both $ps > .05$). This finding suggests that the tendency for EAL Average participants to provide more Incongruent responses than EAL Above Average participants may be explained by either Expressive Vocabulary or Multiple Contexts. When Backwards Digit Recall is used as a covariate, however, there is a significant between-groups effect of Reading Group, with more Incongruent responses

being provided by EAL Average (adjusted mean = .73) than by EAL Above Average participants (adjusted mean = .34), $F(1, 43) = 7.77$, $p < .01$, partial $\eta^2 = .15$, in line with the EAL Mixed ANOVA on Incongruent responses.

5.3.17.2 Within-participant and interaction effects

For the EAL Mixed ANOVA on Incongruent responses, there are no significant within-participant or interaction effects (all $ps > .05$). In contrast, when Expressive Vocabulary is partialled out, there is a significant main effect of Realness with more Incongruent responses being provided by the EAL participants for Real (adjusted mean = .55) than for Novel (adjusted mean = .53) idioms, $F(1, 43) = 7.76$, $p < .01$, partial $\eta^2 = .15$. The within-participant effect of Transparency approaches significance when Expressive Vocabulary is used as a covariate, with more Incongruent responses being provided for Opaque (adjusted mean = .59) than for Transparent (adjusted mean = .49) idioms, $F(1, 43) = 3.65$, $p = .063$, partial $\eta^2 = .08$. There are no significant interaction effects (all $ps > .05$).

When Multiple Contexts is used as a covariate, the within-participant effect of Realness approaches significance with more Incongruent responses being given for Real (adjusted mean = .55) than for Novel idioms (adjusted mean = .53), $F(1, 43) = 3.93$, $p = .054$, partial $\eta^2 = .08$. There are no other significant within-participant or interaction effects (all $ps > .05$).

In line with the EAL Mixed ANOVA on Incongruent responses, when Backwards Digit Recall is used as a covariate, there are no significant within-participant effects and no significant interaction effects (all $ps > .05$).

5.3.18 Incongruent response options in context: EL1 Group Mixed ANCOVAs

5.3.18.1 Between-participants Effects

In line with the EL1 Mixed ANOVA on Incongruent responses, there are significant between-participants effects of Reading Group with more Incongruent responses being provided by the EL1 Average group than by the EL1 Above Average group when: i. Expressive Vocabulary has been partialled out (Average adjusted mean = .62, Above Average adjusted mean = .34) $F(1, 44) = 6.60, p < .05$, partial $\eta^2 = .13$; ii. when Multiple Contexts has been partialled out (Average adjusted mean = .67, Above Average adjusted mean = .29), $F(1, 44) = 10.59, p < .01$, partial $\eta^2 = .19$ and iii. when Backwards Digit Recall has been partialled out (Average adjusted mean = .70, EL1 Above Average adjusted mean = .26), $F(1, 44) = 15.89, p < .001$, partial $\eta^2 = .27$.

5.3.18.2 Within-Participant and Interaction Effects

In the EL1 mixed ANOVA on Incongruent responses, there are no significant within-participant effects (both $ps > .05$). This finding is mirrored when i. Expressive Vocabulary and ii. Backwards Digit Recall are partialled out. When Multiple Contexts is used as a covariate, the within-participant effect of Realness approaches significance, with more Incongruent responses being provided for Novel (adjusted mean = .53) than for Real (adjusted mean = .43) idioms, $F(1, 44) = 3.64, p = .063$, partial $\eta^2 = .08$.

In the EL1 Mixed ANOVA on Incongruent responses, there is a significant interaction effect of Realness*Transparency*Reading Group which is mirrored when Backwards Digit Recall is used as a covariate, $F(1, 44) = 6.98, p < .05$, partial $\eta^2 = .14$, (c.f. Figure 13

and Figure 14). However, when Expressive Vocabulary or Multiple Contexts are used as covariates, there are no significant interaction effects (all $ps > .05$). These findings suggest that this 3-way interaction between Realness*Transparency*Reading Group may be explained by either Expressive Vocabulary or Multiple Contexts.

Table 45 summarises the effects found for Incongruent responses in the above ANCOVAS

Table 45 Research Question 2b: Summary of ANCOVA Results on Incongruent responses for the ICM

	EAL (Expressive Vocabulary as a Covariate)	EL1 (Expressive Vocabulary as a Covariate)	EAL (Multiple Contexts as a Covariate)	EL1 (Multiple Contexts as a Covariate)	EAL (Backwards Digit Recall as a Covariate)	EL1 (Backwards Digit Recall as a Covariate)
Between-Groups Effects						
Reading Group	n.s.	$p < .05$, partial $\eta^2 = .13$	n.s.	$p < .01$, partial $\eta^2 = .19$	$p < .01$, partial $\eta^2 = .15$	$p < .001$, partial $\eta^2 = .27$
Main Effects						
Realness	$p < .01$, partial $\eta^2 = .15$	n.s.	$p = .054$, partial $\eta^2 = .08$	$p = .063$, partial $\eta^2 = .08$	n.s.	n.s.
Transparency	$p = .063$, partial $\eta^2 = .08$	n.s.	n.s.	n.s.	n.s.	n.s.
Interaction Effects						
Realness*Transparency	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Realness*Transparency*Reading Group	n.s.	n.s.	n.s.	n.s.	n.s.	$p < .05$, partial $\eta^2 = .14$

5.3.19 Literal response options in isolation: EAL Group Mixed ANCOVAs

5.3.19.1 Between-Groups effects

In the EAL Mixed ANOVA on Literal responses, there is a significant between-groups effect of Reading Group, with more Literal responses being provided by EAL Average participants than by EAL Above Average participants. This finding is mirrored when Backwards Digit Recall is partialled out (EAL Average adjusted mean = 1.80, EAL Above Average adjusted mean = 1.20), $F(1, 43) = 6.73, p < .05$, partial $\eta^2 = .14$.

However, when Expressive Vocabulary and Multiple Contexts are used as covariates, no significant between-groups effect of Reading Group remains (both $ps > .05$), suggesting that this between-groups effect in the original ANOVA may be explained by either Expressive Vocabulary or by Multiple Contexts.

5.3.19.2 Within-Participant Effects and Interaction Effects

In line with the original EAL ANOVA on Literal responses, there are significant within-participant effects of Transparency in all 3 ANCOVAs with significantly more Literal responses being provided for Opaque than for Transparent idioms: Expressive Vocabulary (Opaque adjusted mean = 1.93, Transparent adjusted mean = 1.08), $F(1, 43) = 7.44, p < .01$, partial $\eta^2 = .15$; Multiple Contexts (Opaque adjusted mean = 1.93, Transparent adjusted mean = 1.08), $F(1, 43) = 4.71, p < .05$, partial $\eta^2 = .10$; Backwards Digit Recall (Opaque adjusted mean = 1.92, Transparent adjusted mean = 1.07), $F(1, 43) = 4.37, p < .05$, partial $\eta^2 = .09$. Where Expressive Vocabulary and Backwards Digit Recall are used as covariates, there are no further within-participant or interaction effects (all $ps > .05$). Where Multiple Contexts is partialled out, the within-participant effect of

Realness approaches significance, with more Literal responses being given by EAL participants for Real (adjusted mean = 1.58) than for Novel idioms (adjusted mean = 1.43), $F(1, 43) = 3.96, p = .053$, partial $\eta^2 = .08$. There are no significant interaction effects (all p s > .05). It seems, therefore, that the significant Realness*Reading Group (Figure 15) and Realness*Transparency (Figure 16) interaction effects found in the EAL Literal responses ANOVA may be explained by either of these 3 covariates.

5.3.20 Literal response options in isolation: EL1 Group Mixed ANCOVAs

5.3.20.1 Between-Groups effects

The significant between-groups effect of Reading Group found in the original EL1 Mixed ANOVA on Literal responses is replicated when Backwards Digit Recall is used as a covariate: significantly more Literal responses are provided by EL1 Average Readers (adjusted mean = 1.76) than by EL1 Above Average Readers (adjusted mean = 1.21), $F(1, 44) = 4.71, p < .05$, partial $\eta^2 = .10$. When either Expressive Vocabulary or Multiple Contexts are used as covariates, however, there are no significant between-groups effects of Reading Group (both p s > .05). It seems that this significant effect of Reading Group may be explained by either Expressive Vocabulary or by Multiple Contexts.

5.3.20.2 Within-Participant Effects and Interaction Effects

The significant within-participant effect of Transparency found in the original EL1 Mixed ANOVA on Literal responses is mirrored when Multiple Contexts is used as a covariate. Here, more Literal responses are provided by EL1 participants for Opaque (adjusted mean = 2.03) than for Transparent idioms (adjusted mean = .95), $F(1, 44) = 7.52, p < .01$,

partial $\eta^2 = .15$. When Expressive Vocabulary and Backwards Digit Recall are used as covariates, no significant within-participant effects are present. There are no significant interaction effects in the original ANOVA, and indeed no significant interaction effects in either of the 3 ANCOVAs (all $ps > .05$).

These effects are summarised in Table 46 below.

Table 46 Research Question 2b: Summary of ANCOVA Results on Literal Responses for the ICM

	EAL (Expressive Vocabulary as a Covariate)	EL1 (Expressive Vocabulary as a Covariate)	EAL (Multiple Contexts as a Covariate)	EL1 (Multiple Contexts as a Covariate)	EAL (Backwards Digit Recall as a Covariate)	EL1 (Backwards Digit Recall as a Covariate)
Between-Groups Effects						
Reading Group	n.s.	n.s.	n.s.	n.s.	$p < .05$, partial $\eta^2 = .14$	$p < .05$, partial $\eta^2 = .10$
Main Effects						
Realness	n.s.	n.s.	$p = .053$, partial $\eta^2 = .08$	n.s.	n.s.	n.s.
Transparency	$p < .01$, partial $\eta^2 = .15$	n.s.	$p < .05$, partial $\eta^2 = .10$	$p < .01$, partial $\eta^2 = .15$	$p < .05$, partial $\eta^2 = .09$	n.s.
Interaction Effects						
Realness*Transparency	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.
Realness*Transparency*Reading Group	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.

5.3.21 Research Question 2b: summary

As was the case in Research Question 1b, it seems like Backwards Digit Recall has a weaker effect than either Expressive Vocabulary or Multiple Contexts on the tendency of participants to choose Congruent, Incongruent or Literal responses.

5.4 Research Question 3

What is the relationship between idiom comprehension and a) participant familiarity ratings and b) participant transparency ratings for EAL and EL1 Average and Above Average Readers?

5.4.1 Research Question 3a.

For each of the 4 groups, the relationship between idiom comprehension and participant familiarity ratings was investigated first of all through a series of correlation analyses. Mean familiarity ratings (max = 4) were derived for each idiom type: Real Transparent; Real Opaque; Novel Transparent; Novel Opaque. Lower scores indicate greater familiarity. The mean familiarity rating for each idiom type was used in a bivariate correlation with the mean number of Idiomatic responses selected for each idiom type in a) Isolation and b) Context (max = 6).

With 4 groups involved, the number of individual correlations carried out was high. The full set of correlation results may be found in Appendix 5.12 In order to gain insight into the predictive power of familiarity, those correlations which were significant (or which approached significance) were re-run as bivariate regressions, with mean number of

idiomatic responses in the relevant condition as the dependent variable and the mean familiarity rating as the independent variable.

Table 47 shows that for the EL1 Above Average group, a negative correlation which approaches significance exists between mean score for recognition for Real Transparent idioms, and the mean number of Idiomatic responses chosen in the Real Transparent Isolation condition. This pattern suggests that the EL1 Above Average group provided more Idiomatic responses for idioms which they judged to be more familiar and fewer Idiomatic responses for idioms which they judged to be less familiar.

Table 48 suggests that for the EL1 Above Average group, familiarity accounts for 11% of the variance in choosing an idiomatic response in the Real Transparent Isolation condition.

Table 47 Correlating the Mean Recognition Score for Real Transparent Idioms with the Mean number of Idiomatic Responses Chosen in the Real Transparent Isolation Condition: EL1 Above Average Readers

EL1 Above Average		Idiomatic responses chosen in the real transparent isolation condition (max=6)
Mean Score for Recognition in the Real Transparent Condition (max = 4)	Pearson Correlation	-.388
	Sig. (2-tailed)	.068
	N	23

Table 48 Regressing the Mean Recognition Score for Real Transparent Idioms onto the Mean Number of Idiomatic Responses Chosen in the Real Transparent Isolation Condition: EL1 Above Average Readers

		B	SE B	β	Sig
1	(Constant)	5.765	1.078		.000
	Mean Score for Recognition in the Real Transparent Condition (max = 4)	-.709	.368	-.388	.068

Note: Adjusted $R^2 = .11$

In the same vein, the correlation illustrated in Table 49 is significant and negative.

Despite the fact that the EL1 Above Average participants had never encountered the Novel Transparent idioms before, those Novel Transparent idioms in Isolation which they judged to be more familiar elicited more Idiomatic responses.

Table 50 shows that familiarity accounts for 27% of the variance in choosing an idiomatic response for idioms in the Novel Transparent Isolation condition for EL1 Above Average readers.

Table 49 Correlating the Mean Recognition Score for Novel Transparent Idioms with the Mean Number of Idiomatic Responses in the Novel Transparent Isolation Condition: EL1 Above Average Readers

EL1 Above Average		Idiomatic Responses in the Novel Transparent Isolation Condition (max = 6)
Mean Recognition Score in the Novel Transparent Condition (max = 4)	Pearson Correlation	-.551**
	Sig. (2-tailed)	.006
	N	23

Table 50 Regressing the Mean Recognition Score for Novel Transparent Idioms onto the Mean Number of Idiomatic Responses in the Novel Transparent Isolation Condition: EL1 Above Average Readers

		B	SE B	β	Sig
1	(Constant)	10.526	2.515		.000
	Mean Recognition Score in the Novel Transparent Condition (max = 4)	-2.077	.687	-.551	.006

Note: Adjusted $R^2 = .27$

The negative correlation between mean score for recognition in the Real Opaque condition and the mean number of Idiomatic responses provided in the Real Opaque Context condition approaches significance for the EL1 Above Average participants.

Table 51 shows that the more familiar the EL1 Above Average participants judge these idioms to be, the more likely they are to provide an Idiomatic response. Table 52

indicates that familiarity accounts for 12% of the variance in choosing an idiomatic response for idioms in the Real Opaque Context condition for EL1 Above Average readers.

Table 51 Correlating the Mean Recognition Score for Real Opaque Idioms with the Mean Number of Idiomatic Responses in the Real Opaque Context Condition: EL1 Above Average Readers

EL1 Above Average		Idiomatic Responses in the Real Opaque Context Condition (max = 6)
Mean Score for Recognition in the Real Opaque Condition (max = 4)	Pearson Correlation	-.399
	Sig. (2-tailed)	.060
	N	23

Table 52 Regressing the Mean Recognition Score for Real Opaque Idioms onto the Mean Number of Idiomatic Responses in the Real Opaque Context Condition: EL1 Above Average Readers

		B	SE B	B	Sig
1	(Constant)	7.748	1.460		.000
	Mean Score for Recognition in the Real Opaque Condition (max = 4)	-.836	.420	-.399	.060

Note: Adjusted $R^2 = .12$

The opposite pattern is found in the Novel Transparent Context condition where the EAL Above Average participants are concerned (c.f.

Table 53). Here we see a significant positive correlation: the more familiar the EAL Above Average group judge these idioms to be, the less likely they are to provide an Idiomatic response. Table 54 indicates that familiarity accounts for 22% of the variance in choosing an idiomatic response in the Novel Transparent Context condition for the EAL Above Average participants.

Table 53 Correlating the Mean Recognition Score for Novel Transparent Idioms with the Mean Number of Idiomatic Responses in the Novel Transparent Context Condition: EAL Above Average Readers

EAL Above Average		Idiomatic Responses in the Novel Transparent Context Condition (max = 6)
Mean Recognition Score in the Novel Transparent Condition (max = 4)	Pearson Correlation	.466 [*]
	Sig. (2-tailed)	.029
	N	22

Table 54 Regressing the Mean Recognition Score for Novel Transparent Idioms onto the Mean Number of Idiomatic Responses in the Novel Transparent Context Condition: EAL Above Average Readers

		B	Std. Error	Beta	Sig
1	(Constant)	-.541	2.158		.805
	Mean Recognition Score in the Novel Transparent Condition (max = 4)	1.428	.607	.466	.029

Note: Adjusted $R^2 = .22$

5.4.2 Research Question 3b.

Due to time constraints, participant Transparency ratings were collected for only a subset of participants; only 5-7 participants in each group completed Transparency ratings.

Because of the small numbers involved, it was deemed inappropriate to carry out bivariate regressions therefore correlation analyses only are presented. Indeed, the findings from these correlation analyses should be treated with caution and should be considered as indicative rather than as conclusive. Mean Transparency ratings (max = 4) for each of the 4 idiom types: Real Transparent; Real Opaque; Novel Transparent; Novel Opaque were derived for each of the 4 groups. Lower scores mean that the participant judged the idiom to have higher transparency. These mean Transparency ratings were used in bivariate correlations with the mean number of Idiomatic responses selected in a) Isolation and b) Context. As with the correlation analyses for idiom Familiarity above, a large number of analyses were carried out. Only those analyses which reach statistical

significance are included in this chapter. The full set of correlation analyses may be found in Appendix 5.12.

For the EL1 Average group, the negative correlation between mean score for Transparency in the Novel Transparent condition and the mean number of Idiomatic responses provided in the Novel Transparent Context condition approaches significance. This finding suggests that the more transparent the participants judge the idiom to be, the more likely they are to provide an Idiomatic response. This correlation is illustrated in Table 55.

Table 55 Correlating the mean Transparency Score for Novel Transparent Idioms with the Mean Number of Idiomatic Responses in the Novel Transparent Context Condition:
EL1 Average Readers

		Idiomatic Responses in the Novel Transparent Context Condition (max = 6)
Mean Score for Transparency in the Novel Transparent Condition (max = 4)	Pearson Correlation	-.876
	Sig. (2-tailed)	.052
	N	5

However, the opposite pattern is found, where the EL1 Average participants are concerned, in the correlation between the mean score for Transparency in the Novel Opaque condition and the mean number of Idiomatic responses provided in the Novel Opaque Isolation condition (c.f.

Table 56). This correlation achieves significance and is positive, showing that the more Transparent the participants judged these idioms to be, the less likely they were to offer an Idiomatic response.

Table 56 Correlating the Mean Transparency Score for Novel Opaque Idioms With the Mean Number of Idiomatic Responses in the Novel Opaque Isolation Condition: EL1 Average Readers

		Mean Score for Transparency in the Novel Opaque Condition (max = 4)
Idiomatic Responses in the Novel Opaque Isolation Condition (max = 6)	Pearson Correlation	.917*
	Sig. (2-tailed)	.029
	N	5

5.5 Research Question 3: summary

Overall, it seems that neither participant familiarity ratings nor participant transparency ratings play a major role in Year 5 EAL and EL1 Average and Above Average readers' idiom comprehension. However, it is notable that significant (or near-significant) relationships exist only for Above Average readers for familiarity and only for EL1 Average readers for transparency.

5.5 Research Question 4

Does Idiom Comprehension predict variance on YARC Comprehension over and above that predicted by vocabulary for EAL and EL1 Average and Above Average Readers?

Given the relatively small numbers of children participating in each of the 4 groups in this study, care was taken to limit the number of predictors in each regression model. For this reason, the 6 vocabulary subtests were not entered into any regression model as 6 individual predictors. Rather, 3 composite predictors were created: Mean TOWK All (for which the 6 individual vocabulary subtest raw scores were added together and divided by 6 to achieve a mean); Mean TOWK Expressive (for which the 3 Expressive vocabulary subtest raw scores were added together and divided by 3; and Mean TOWK Receptive (for which the 3 Receptive vocabulary subtest raw scores were added together and divided by 3).

Analyses were carried out for each group separately. For each of the individual idiom types (e.g. Real Transparent Isolation), 3 separate partial correlations were carried out between the mean number of Idiomatic responses selected, and the mean YARC Comprehension ability score: the first controlling for Mean TOWK All; the second controlling for Mean TOWK Expressive; and the third controlling for TOWK Receptive. As a very large number of partial correlations were carried out, only those which yielded a significant result are included in this chapter. All other partial correlations are non-significant (all $ps > .05$) and are included in Appendix 5.13. Research Question 4 specifically asks whether idiom comprehension *predicts* YARC comprehension over and above vocabulary. Partial correlations alone cannot provide information about whether performance on one variable predicts performance on another variable. For this reason, a hierarchical regression was carried out to further investigate each significant partial correlation. This technique allows the researcher to exert control over the order in which

predictors are added to the model and to see clearly whether idiom comprehension predicts YARC Comprehension over and above vocabulary.

5.5.1 EAL Average

5.5.1.1 Novel Opaque Isolation condition

For the EAL Average group, there are significant partial correlations between YARC Comprehension and the mean number of Idiomatic responses provided in the Novel Opaque Isolation condition when a) Mean TOWK All, $r = .43, p < .05$, b) Mean TOWK Expressive, $r = .42, p < .05$ and c) Mean TOWK Receptive, $r = .46, p < .05$ have been partialled out. Table 57 - Table 59 illustrate that idiom comprehension in the Novel Opaque Isolation condition significantly predicts YARC Comprehension over and above each of these vocabulary composites. Idioms in the Novel Opaque Isolation condition do not allow participants, when attempting to interpret the idioms, to draw upon either knowledge of the idiom derived from previous exposure, semantic clues in the wording of the idioms themselves or supportive context. This result is therefore surprising and will be considered in greater detail in Chapter 6.

Table 57 Regressing Mean TOWK All and Mean Idiomatic Score in the Novel Opaque Isolation Condition onto YARC Comprehension for the EAL Average group

	B	SE B	β
Step 1			
Constant	45.64	4.09	
Mean TOWK All Subtests	.65	.23	.52**
Step 2			
Constant	45.74	3.77	
Mean TOWK All Subtests	.47	.23	.37
Mean Idiomatic Score in the NOI Condition	2.16	.98	.40*

Note: Adjusted $R^2 = .24$ for Step 1, $\Delta R^2 = .14^*$ for Step 2, ($*p < .05$, $**p < .01$)

Table 58 Regressing Mean TOWK Expressive and Mean Idiomatic Score in the Novel Opaque Isolation Condition onto YARC Comprehension for the EAL Average group

	B	SE B	β
Step 1			
Constant	45.55	3.53	
Mean TOWK Expressive	.77	.23	.59**
Step 2			
Constant	45.45	3.29	
Mean TOWK Expressive	.58	.23	.44*
Mean Idiomatic Score in the NOI Condition	1.99	.95	.37*

Note: Adjusted $R^2 = .31$ for Step 1, $\Delta R^2 = .11^*$ for Step 2, ($*p < .05$, $**p < .01$)

Table 59 Regressing Mean TOWK Receptive and Mean Idiomatic Score in the Novel Opaque Isolation Condition onto YARC Comprehension for the EAL Average group

	B	SE B	β
Step 1			
Constant	47.03	4.43	
Mean 3 TOWK Receptive	.50	.21	.44*
Step 2			
Constant	46.97	4.03	
Mean 3 TOWK Receptive	.33	.21	.29
Mean Idiomatic Score in the NOI Condition	2.37	1.00	.44*

Note: Adjusted $R^2 = .16$ for Step 1, $\Delta R^2 = .17^*$ for Step 2, ($*p < .05$)

5.5.1.2 Novel Transparent Context condition

Where the EAL Average group are concerned, there are significant partial correlations between YARC Comprehension and idiom comprehension in the Novel Transparent Context condition when a) Mean TOWK All, $r = .48$, $p < .05$, b) Mean TOWK Expressive, $r = .42$, $p < .05$ and c) mean TOWK Receptive, $r = .54$, $p < .01$ are partialled out. Table 60 - Table 62 illustrate that idiom comprehension in the Novel Transparent Context condition significantly predicts YARC Comprehension over and above each of these 3 combinations of vocabulary.

Table 60 Regressing Mean TOWK All Subtests and Mean Idiomatic Score in the Novel Transparent Context Condition onto YARC Comprehension for the EAL Average Group

	B	SE B	β
Step 1			
Constant	45.64	4.09	
Mean TOWK All Subtests	.65	.23	.52**
Step 2			
Constant	46.27	3.68	
Mean TOWK All Subtests	.17	.28	.14
Mean Idiomatic Score in the NTC Condition	2.13	.85	.57*

Note: Adjusted $R^2 = .24$ for Step 1, $\Delta R^2 = .17^*$ for Step 2, ($*p < .05$, $**p < .01$)

Table 61 Regressing Mean TOWK Expressive and Mean Idiomatic Score in the Novel Transparent Context Condition onto YARC Comprehension for the EAL Average Group

	B	SE B	β
Step 1			
Constant	45.55	3.53	.59**
Mean TOWK Expressive	.77	.21	
Step 2			
Constant	45.67	3.28	
Mean TOWK Expressive	.31	.30	.23
Mean Idiomatic Score in the NTC Condition	1.85	.87	.49*

Note: Adjusted $R^2 = .31$ for Step 1, $\Delta R^2 = .12^*$ for Step 2, ($*p < .05$, $**p < .01$)

Table 62 Regressing Mean TOWK Receptive and Mean Idiomatic Score in the Novel Transparent Context Condition onto YARC Comprehension for the EAL Average Group

	B	SE B	β
Step 1			
Constant	47.03	4.43	
Mean 3 TOWK Receptive	.50	.21	.44*
Step 2			
Constant	47.19	3.81	
Mean 3 TOWK Receptive	.06	.24	.05
Mean Idiomatic Score in the NTC Condition	2.36	.80	.62**

Note: Adjusted $R^2 = .16$ for Step 1, $\Delta R^2 = .24^{**}$ for Step 2, ($*p < .05$, $**p < .01$)

5.5.2 EL1 Average

Distinct from the EAL Average group, no significant partial correlations between YARC Comprehension and idiom comprehension are found in any condition where the EL1 Average group is concerned (all $ps > .05$). No regression analyses were, therefore, carried out. It is clear that for the EAL and EL1 Average groups, differences exist in the relationships between idiom comprehension, vocabulary and reading comprehension, at least where Novel Opaque Isolation and Novel Transparent Context idioms are concerned.

5.5.3 EAL Above Average

5.5.3.1 Real Transparent Isolation Condition

For the EAL Above Average group, there are significant partial correlations between the mean number of Idiomatic responses provided in the Real Transparent Isolation condition and the mean ability score obtained on the YARC Comprehension when a) Mean TOWK All, $r = .62, p < .01$, b) Mean TOWK Expressive, $r = .66, p < .01$ and c) Mean TOWK Receptive, $r = .58, p < .01$ have been partialled out. Table 63 - Table 65 present the results of regression analyses which show that for this group, mean average score in the RTI condition significantly predicts YARC Comprehension over and above these 3 combinations of vocabulary subtest.

Table 63 Regressing Mean TOWK All Subtests and Mean Idiomatic Score in the Real Transparent Isolation Condition onto YARC Comprehension for the EAL Above Average Group

	B	SE B	β
Step 1			
Constant	53.09	3.78	
Mean TOWK All Subtests	.77	.16	.73***
Step 2			
Constant	52.14	3.06	
Mean TOWK All Subtests	.60	.14	.57***
Mean Idiomatic Score in the RTI Condition	1.31	.38	.45**

Note: Adjusted $R^2 = .50$ for Step 1, $\Delta R^2 = .18^{**}$ for Step 2, (** $p < .01$, *** $p < .001$)

Table 64 Regressing Mean TOWK Expressive and Mean Idiomatic Score in the Real Transparent Isolation Condition onto YARC Comprehension for the EAL Above Average group

	B	SE B	β
Step 1			
Constant	58.14	3.32	
Mean TOWK Expressive	.64	.168	.65***
Step 2			
Constant	55.25	2.67	
Mean TOWK Expressive	.51	.13	.52**
Mean Idiomatic Score in the RTI Condition	1.49	.39	.52**

Note: Adjusted $R^2 = .40$ for Step 1, $\Delta R^2 = .25^{**}$ for Step 2, (** $p < .01$, *** $p < .001$)

Table 65 Regressing Mean TOWK Receptive and Mean Idiomatic Score in the Real Transparent Isolation Condition onto YARC Comprehension for the EAL Above Average Group

	B	SE B	β
Step 1			
Constant	54.23	4.16	
Mean 3 TOWK Receptive	.62	.16	.67**
Step 2			
Constant	53.61	3.48	
Mean 3 TOWK Receptive	.46	.14	.49**
Mean Idiomatic Score in the RTI Condition	1.35	.43	.47**

Note: Adjusted $R^2 = .42$ for Step 1, $\Delta R^2 = .19^{**}$ for Step 2, (** $p < .01$)

5.5.3.2 Real Transparent Context condition

There is no significant partial correlation, where the EAL Above Average group is concerned, between and YARC Comprehension idiom comprehension in the Real Transparent Context condition when Mean TOWK All is partialled out, $p > .05$. There is, however, a significant correlation between these 2 variables when Mean TOWK Expressive is partialled out, $r = .45$, $p < .05$ and indeed when Mean TOWK Receptive is partialled out, $r = .44$, $p < .05$. Table 66 - Table 67 illustrate that idiom comprehension in the Real Transparent Context condition significantly predicts YARC Comprehension over and above Mean TOWK Expressive and Mean TOWK Receptive respectively.

Table 66 Regressing Mean TOWK Expressive and Mean Idiomatic Score in the Real Transparent Context Condition onto YARC Comprehension for the EAL Above Average Group

	B	SE B	β
Step 1			
Constant	58.14	3.32	
Mean TOWK Expressive	.64	.17	.65**
Step 2			
Constant	55.98	3.19	
Mean TOWK Expressive	.49	.17	.49**
Mean Idiomatic Score in the RTC Condition	1.15	.52	.38*

Note: Adjusted $R^2 = .40$ for Step 1, $\Delta R^2 = .12^*$ for Step 2, (*, $p < .05$, ** $p < .01$)

Table 67 Regressing Mean TOWK Receptive and Mean Idiomatic Score in the Real Transparent Context Condition onto YARC Comprehension for the EAL Above Average Group

	B	SE B	β
Step 1			
Constant	54.23	4.16	
Mean 3 TOWK Receptive	.62	.16	.67**
Step 2			
Constant	53.13	3.87	
Mean 3 TOWK Receptive	.48	.16	.51**
Mean Idiomatic Score in the RTC Condition	1.11	.52	.36*

Note: Adjusted $R^2 = .42$ for Step 1, $\Delta R^2 = .11^*$ for Step 2, (*, $p < .05$, ** $p < .01$)

5.5.3.3 Real Opaque Context condition

For the EAL Above Average group, there were no significant partial correlations between YARC Comprehension and idiom comprehension in the Real Opaque Context condition when a) Mean TOWK All Subtests or b) Mean TOWK Receptive were used as covariates (both $ps > .05$). However, when Mean TOWK Expressive was used as a covariate there was a significant partial correlation, $r = .44$, $p < .05$. Table 68 illustrates that idiom comprehension significantly predicts YARC Comprehension over and above Mean TOWK Expressive.

Table 68 Regressing Mean TOWK Expressive and Mean Idiomatic Score in the Real Opaque Context Condition onto YARC Comprehension for the EAL Above Average Group

	B	SE B	β
Step 1			
Constant	58.14	3.32	
Mean TOWK Expressive	.64	.17	.65**
Step 2			
Constant	55.82	3.25	
Mean TOWK Expressive	.45	.18	.45*
Mean Idiomatic Score in the ROC Condition	1.39	.65	.39*

Note: Adjusted $R^2 = .40$ for Step 1, $\Delta R^2 = .11^*$ for Step 2, (*, $p < .05$, ** $p < .01$)

5.5.4 EL1 Above Average

5.5.4.1 Real Transparent Isolation condition

Where the EL1 Above Average group is concerned, there is a significant partial correlation between YARC Comprehension and Idiomatic responses provided in the Real Transparent Isolation condition when Mean TOWK Receptive has been partialled out, $r = .52$, $p < .05$. Table 69 illustrates that for the EL1 Above Average group, idiom comprehension in the Real Transparent Isolation significantly predicts YARC Comprehension over and above Mean TOWK Receptive. This pattern echoes that found for the EAL Above Average group but is weaker. For the EL1 Above Average group, unlike their EAL counterparts, no significant partial correlation is found between Idiomatic response in the Real Transparent Isolation condition and YARC

Comprehension when Mean TOWK All or Mean TOWK Expressive are partialled out (both $ps > .05$).

Table 69 Regressing Mean TOWK Receptive and Mean Idiomatic Score in the Real Transparent Isolation Condition onto YARC Comprehension for the EL1 Above Average Group

	B	SE B	β
Step 1			
Constant	61.16	4.11	
Mean 3 TOWK Receptive	.38	.15	.49*
Step 2			
Constant	57.95	3.79	
Mean 3 TOWK Receptive	.31	.13	.40*
Mean Idiomatic Score in the RTC Condition	1.37	.50	.46*

Note: Adjusted $R^2 = .21$ for Step 1, $\Delta R^2 = .20^*$ for Step 2, (*, $p < .05$)

5.5.4.2 Novel Opaque Isolation condition

There is a significant correlation for the EL1 Above Average group between Idiomatic response in the Novel Opaque Isolation condition and YARC Comprehension when Mean TOWK Receptive is controlled for, $r = .43, p < .05$. Table 70 shows that idiom comprehension in this condition also significantly predicts YARC Comprehension over and above Mean TOWK Receptive. This pattern is similar to that found for the EAL Average group but is again weaker, with no significant partial correlations being found between idiom comprehension in the Novel Opaque Isolation condition and YARC Comprehension when Mean TOWK All or Mean TOWK Expressive have been partialled out (both $ps > .05$).

Table 70 Regressing Mean TOWK Receptive and Mean Idiomatic Score in the Novel Opaque Isolation Condition onto YARC Comprehension for the EL1 Above Average Group

	B	SE B	β
Step 1			
Constant	61.16	4.11	
Mean 3 TOWK Receptive	.38	.15	.49*
Step 2			
Constant	61.02	3.81	
Mean 3 TOWK Receptive	.29	.14	.38
Mean Idiomatic Score in the NOI Condition	1.58	.75	.39*

Note: Adjusted $R^2 = .21$ for Step 1, $\Delta R^2 = .14^*$ for Step 2, (*, $p < .05$)

In summary, it appears that significant relationships between idiom comprehension and reading comprehension are more prevalent for EAL participants than for EL1 participants. For EAL Average participants, it seems that choosing an idiomatic response for NOI and NTC idioms significantly predicts performance on YARC Comprehension over and above vocabulary whereas for EAL Above Average participants, providing an idiomatic response for RTI, RTC and ROC idioms predicts YARC Comprehension over and above vocabulary. Where the EL1 participants are concerned, the links between idiom comprehension and reading comprehension are weaker than for EAL participants. For the EL1 Above Average group, providing an idiomatic response for RTI and NOI idioms significantly predicts reading comprehension over and above Receptive vocabulary only. Where the EL1 Average group is concerned, on no occasion did idiom

comprehension emerge as a significant predictor of YARC Comprehension over and above vocabulary.

5.6 Chapter 5: summary

This chapter has described the analyses which have been carried out in order to address this study's Research Questions and has presented the results of these analyses. These findings will be discussed and interpreted in Chapter 6. Chapter 7 will describe conclusions which will be drawn on the basis of these analyses.

Chapter 6: Discussion

In Chapter 2 of this thesis, a detailed examination of the UK EAL literature revealed 2 major issues. Firstly, the focus of this literature has exclusively been on EAL children who struggle with reading comprehension. Secondly, only word-level receptive and expressive vocabulary measures have been used when investigating the semantic abilities of EAL children in the UK. The current study has tackled these issues by building upon previous UK EAL research in 2 main ways: i. by investigating groups of EAL children who do not struggle with reading comprehension and ii. by administering a broader range of semantic measures than has been used in previous UK EAL studies. In so doing, this study challenges the prevailing view in the UK literature that EAL children are a homogenous, underachieving group in terms of their reading comprehension abilities. This study also provides a more comprehensive picture of the semantic skills of EAL children than has been provided in previous UK studies. This chapter will provide an in-depth discussion of the current study's major findings with specific reference to these 2 innovations.

6.1 Investigating groups of EAL children who do not struggle with reading comprehension

6.1.1 Screening Phase

The *status quo* for the UK EAL research literature to date has been to view EAL children as a homogenous, underachieving group in terms of reading comprehension, as illustrated by the following assertion, "EAL children experience difficulties with comprehension

relative to their monolingual peers” (Burgoyne et al., 2009, p.7). A key intention of this thesis is to challenge this simplistic statement and to emphasise that in EAL as in EL1 samples, there is heterogeneity in reading comprehension ability. In order to realise this intention, a 2-phase sampling procedure was employed.

In the first instance, convenience sampling was used to recruit 115 EAL and 109 EL1 participants to the Screening Phase of the study (c.f. section 3.4.1). These participants were tested on reading accuracy, rate and comprehension, nonword decoding and nonverbal ability. While the primary function of this Screening Phase was to allow for informed selection of participants for the Main Phase of the study, the Screening Phase also provides information regarding the performance of EAL and EL1 participants on a range of reading-related and background measures, thereby allowing for comparison with trends in the existing UK EAL literature. Table 10 suggests that for this study’s Screening sample, the trends observed in previous UK EAL literature are mirrored here: EAL participants exhibit good decoding but poor comprehension in comparison to their EL1 peers. In terms of both decoding and reading comprehension, however, the current study builds upon previous UK EAL research.

6.1.1.1 Decoding

Where decoding is concerned, previous UK EAL studies have shown that EAL children tend to score either as well as (c.f. Beech & Keys, 1997; Hutchinson et al., 2003; Stuart, 2004; Burgoyne et al., 2009) or higher than (c.f. Rosowsky, 2001; Burgoyne et al., 2011a) their EL1 peers on measures of single word reading (e.g. BAS; WRAT-3) or word reading in context (e.g. NARA-R Accuracy). The current study builds upon this body of work by examining the performance of EAL children both on a measure of word reading

in context (NARA Accuracy) and on a measure of ‘pure’ decoding which provides no semantic or syntactic information and therefore forces participants to rely solely on graphophonic cues (TOWRE PDE). While there were no significant differences in the performance of EAL and EL1 participants on the NARA-R Accuracy, the EAL group significantly outperformed their EL1 peers on the TOWRE PDE. When semantic and syntactic cues are available, as is the case in the NARA-R Accuracy, the EL1 participants’ performance is in line with that of their EAL peers. When only graphophonic cues are available, however, the EL1 participants’ performance is adversely affected in comparison to that of their emergent bilingual peers. These findings suggest that the EAL and EL1 children in this study are not identical in the way in which they approach word reading tasks; the EL1 children rely more on semantic and syntactic cues than their EAL peers.

It is important to note that the TOWRE PDE has a speed component whereby participants are required to accurately read as many nonwords as possible within 45 seconds. Non-UK studies which have compared EL1 and EAL children on measures of nonword reading have tended to use the word attack subtest of the Woodcock Reading Mastery Test (1987; WRMT, Woodcock, 1973). This test requires the child to read an increasingly difficult list of nonwords according to English phonological rules. Unlike the TOWRE PDE, however, the WRMT does not include a speed component. Canadian researchers have compared groups of typically-developing EAL and EL1 children on the word attack (nonword reading) subtest of the WRMT and on the word reading subtest of the same measure (e.g. Da Fontoura & Siegel, 1995; D’Angiulli, Siegel & Serra, 2001; Abu-Rabia & Siegel, 2002; Chiappe, Siegel & Wade-Woolley, 2002). With one small exception (11-

13 year old Italian/English bilinguals outperformed their EL1 peers on nonword reading in D'Angiulli et al., 2001), these studies showed no significant group differences on either word reading or nonword reading.

The different pattern of results obtained in the current study and in these Canadian studies raises the question of whether the addition of a speed component in a nonword reading test differentially affects EAL and EL1 children. Are EAL children equally accurate as, but relatively quicker than their EL1 peers at nonword reading? A further possibility for consideration is that EAL children's English (L2) decoding skills are affected by the particular L1 they speak. Italian, the L1 spoken by the EAL participants in the D'Angiulli et al. (2001) study, is more orthographically transparent than English. All bilingual Italian/English participants in this study were learning to read Italian through a Heritage Language Program at school, a fact which may affect these participants' decoding skills in the L2. While the L1s spoken by the EAL children participating in the Screening Phase of this study were diverse, the possibility that experience of reading an orthographically more transparent language than English may have a facilitative effect on English decoding should be raised. These are areas for further research.

6.1.1.2 Reading comprehension

Where reading comprehension is concerned, previous UK EAL studies have not looked beyond the overall trend that EL1 children tend to outperform EAL children on measures of reading comprehension. The current study looked beyond these overall trends to show how, when all YARC Comprehension scores were ranked, the odds of a child having a YARC Comprehension score in the lower third of the dataset was 1.97 times higher if s/he was EAL than if s/he was EL1, while the odds of having a YARC Comprehension

score in the higher third of the dataset was 3.06 times higher if s/he was EL1 than if s/he was EAL. As all previous UK EAL studies have considered group mean scores only, the distribution of scores within groups has been obscured. This is the first UK EAL study to look beyond group mean scores to take account of within-sample variation of reading comprehension ability. In doing so, this study complicates the simplistic view that EAL children, by definition, have poor reading comprehension abilities. While relatively more EAL than EL1 children ranked within the lower third for YARC Comprehension, 25 EAL children ranked within the higher third on this measure. At this point, it would seem appropriate to modify Burgoyne's claim to argue that some, but not all EAL children 'experience difficulties with comprehension relative to their monolingual peers' (Burgoyne et al., 2009, p.7).

The studies which focus on the reading comprehension skills of UK EAL children variously attribute the trend for EAL children to score significantly below their EL1 peers on measures of reading comprehension to: low L2 vocabulary (Hutchinson et al., 2003; Burgoyne et al., 2009; Burgoyne et al., 2011a; 2011b); a focus on correct decoding at the expense of meaning due to the influence of intensive Qur'anic literacy experiences outside school (Burgoyne et al., 2009; Rosowsky, 2001); a lack in terms of 'general aspects of language knowledge which enables [EAL learners] to predict from context (Frederickson & Frith, 1998, p.127); or under-developed text-search strategies, context use or comprehension monitoring skills in comparison to their EL1 peers (Burgoyne et al., 2011b).

With the exception, perhaps, of Frederickson and Frith's reference to EAL participants lacking 'general aspects of language knowledge' (Frederickson & Frith, 1998), each of

these explanations focuses on discrete skills or strategies. There is no doubt that these studies provide valuable information. However, this focus on individual skills and strategies does not encourage EAL learners to be viewed as emergent bilinguals whose L2 is still developing. Rather, these children are more likely to be viewed on the basis of these studies as individuals whose comprehension-related underachievement is endemic. Inspired by Strand and Demie (2005) and Demie and Strand (2006), this study investigated the relationship between the EAL participants' level of English language proficiency (as rated by the child's teacher) and the child's rank on the YARC Comprehension. This approach allowed EAL participants' reading comprehension score to be viewed in relation to their level of English language development.

6.1.1.3 L2 Proficiency

All EAL children participating in this study had been in full-time education for at least 2 full years on the date of the Screening session. As such, it is not surprising that no EAL children were described by their teachers as being 'new to English' (c.f. section 4.1). It is clear, however, that the EAL children in this Screening sample are at a range of levels of English language development according to their teachers. Results of loglinear analysis suggest that EAL children who are rated by their teachers as being not yet fully proficient in English are almost 4 times more likely to be in the lower comprehension group than are EAL children who are judged by their teachers to be proficient in English. This finding suggests that these (not fully proficient) children's lower comprehension scores are linked to the fact that their English language skills are still developing. This is an important point, as previous UK EAL studies have tended to view the trend for EAL children to experience difficulties with reading comprehension in terms of a deficit, rather

than as a developmental issue. However, as so little research has been carried out on secondary school EAL students in the UK, it is not possible to say how the comprehension skills of the not yet fully proficient EAL children in the current study will develop.

6.1.2 Screening Phase: summary

Two main findings emerge from an analysis of the Screening Phase data. Firstly, not all EAL children experience difficulties with reading comprehension; 25 EAL children had YARC Comprehension scores within the top third of the Screening sample. Secondly, for those children who do experience difficulties in reading comprehension, a lack of proficiency in English is likely to be a contributing factor. These findings are important contributions to the UK EAL reading comprehension literature. It is important to note that while the Screening Phase sample is not statistically representative of the population, it bears resemblance to national patterns in terms of ethnicities represented in the EAL and EL1 groups and L1s represented in the EAL group. Participating schools are diverse in terms of religious character and size. The relatively low uptake of FSM in the Screening Sample, however, suggests that the children participating in the Screening Phase are of higher SES than the national average (c.f. section 3.4.1). These sample features should be taken into account when considering the relevance of these Screening Phase results to the wider UK EAL population.

6.1.3 Good and Poor Comprehenders

The original intention of this study was to recruit groups of EAL and EL1 Good Comprehenders (GCs) and Poor Comprehenders (PCs) (c.f. Footnote 1 [section 2.5.2])

and section 3.4.2). PCs exhibit good word reading accuracy but experience specific difficulties in understanding what they read. The underlying conceptualization for designs which compare GCs and PCs is the idea, central to the A-frame, that reading comprehension difficulties may stem from deficits in language comprehension ability, decoding ability or both. Despite the trends emerging from UK EAL studies that EAL children tend to exhibit good word reading but poor comprehension, no UK EAL study had explicitly investigated the specific PC profile in EAL samples. Moreover, no UK EAL study had yet suggested that some EAL children do exhibit good comprehension.

Oakhill and colleagues (e.g. Oakhill, 1982; Oakhill, Yuill & Parkin, 1986) were the first to compare groups of GCs and PCs in the UK EL1 literature. The original version of the NARA (Neale, 1966) was used to select groups of children who were matched on the Accuracy component of the test but who differed on the Comprehension component. During the 1990s and 2000s a great deal of further work has examined the causes and correlates of EL1 PCs' difficulties. This research has identified a wide range of potential sources of reading comprehension difficulty in a wide range of skills and processes, including semantic skills (e.g. Nation & Snowling, 1998;1999; Nation, Marshall & Snowling, 2001; Cain et al., 2005; Cain & Towse, 2008). The current study aimed to build upon this work by investigating the semantic skills of EAL and EL1 GCs and PCs.

During the past 3 decades, the NARA (and later the NARA-R) has been the UK measure of choice when selecting groups of GCs and PCs. There has been variation in the ways in which GCs and PCs have been selected, most notably, Nation and colleagues' recent insistence on using an independent, standardised measure of nonword reading to tap into decoding skill (rather than the Accuracy component of the NARA-R). In Nation and

colleagues' work, the GC and PC groups are matched (at the very least) for chronological age, gender, nonverbal ability and nonword decoding, but differ in reading comprehension. There are, however, no specific criteria for specifying a PC profile, with small differences in selection criteria in almost every study. For example, Pimperton and Nation (2010a; 2010b) specify that PC reading comprehension standard scores on the NARA-R should be <90 while Ricketts and colleagues (Ricketts et al., 2007; 2008) specify that PC reading comprehension standard scores on the same measure should be <85. Overall, however, it is estimated that c.10% of school-age children in the UK display good decoding but poor comprehension (e.g. Yuill & Oakhill, 1991; Nation, 2005).

From the Screening sample in the current study (224 participants), 10 EAL and 6 EL1 participants had YARC Comprehension standard scores of below 90. These 15 children comprise only 6.7% of the whole screening sample. Of these, only 2 EAL and 3 EL1 children fit the basic PC criteria set by the current study (nonverbal ability and nonword decoding within the average range). If YARC Comprehension standard scores of below 85 were required, only 1 EL1 participant fit these criteria. In other words, insufficient numbers of either EL1 or EAL PCs were available in the Screening sample to proceed with this study's original design.

It is important to ask why so few participants in the Screening Phase sample fit the PC profile. The criteria for eligibility for the Screening Phase were kept purposefully broad. All Year 4 children in participating schools were invited to take part in the study with the sole exceptions of those who: i. Joined the UK educational system after Year 3; ii. Had a statement of Special Educational Need; iii. Were not planning to return to the school for

Year 5 (to the school's knowledge). Two aspects of the current study were notable: the YARC was used instead of the NARA-R to select children; the FSM uptake in the schools taking part in this study was lower than the national average, and the FSM uptake within the Screening sample itself was low, suggesting that the SES of the Screening sample is higher than the national average.

The YARC was chosen for use in the current study as it has a number of advantages in comparison to the NARA-R in terms of its more recent standardisation (on a population which included a sizeable proportion of EAL learners) and the efficiency with which it may be administered. The underlying theoretical framework for the YARC is the Simple View of Reading (c.f. Gough & Tunmer, 1986), which argues that difficulties in reading may stem from difficulties in decoding, from language comprehension, or from both. Central to this measure, therefore, is the understanding that it is possible for a child to have strong decoding skills but poor language comprehension skills. Indeed, one of the 'sample reports' offered on the YARC website is that of a PC (GL Assessment, 2012). It is not the case, therefore, that the structure of the YARC precludes the possibility of identifying PCs.

A further question is whether the YARC tends to inflate Comprehension standard scores in comparison to the NARA-R. The concurrent validity of the YARC was examined by comparing the performance of a subset of the standardisation sample from each year group on both the YARC and on the NARA-R. Where Year 5 children are concerned, 19 girls and 18 boys were tested on both the Form A of the YARC and on the NARA-R.

Table 71 shows that the standard scores obtained on the accuracy, rate and comprehension aspects of each test were similar, with slightly higher mean scores on the NARA-R than on the YARC on each occasion. It seems that the YARC does not tend to inflate Comprehension scores in comparison to the NARA-R. There is no evidence, therefore, that the lack of PCs within the Screening sample in the current study can be explained by the choice of comprehension test used.

Table 71 Mean, Standard Deviation and Range Scores for the Accuracy, Rate and Comprehension Aspects of the NARA-R and Form A of the YARC for a Subset of the Year 5 Standardisation Sample

	NARA-R	YARC Form A
Accuracy Mean and SD	108.61 (11.43)	106.29 (10.95)
Accuracy Range	88 - 127	85 - 124
Rate Mean and SD	104.39 (12.03)	101.6 (12.60)
Rate Range	80 - 122	81 - 127
Comprehension Mean and SD	106.35 (12.95)	103.97 (11.12)
Comprehension Range	81 - 131	75 - 117

It is important to consider the possibility that SES may have played a part in explaining the comprehension profiles of the Screening sample. For the current study, uptake of FSM was used as a proxy for economic disadvantage where the Screening sample is concerned. Data on FSM uptake has been widely used in this manner in UK educational studies investigating a diverse range of topics including, amongst others, investigations of pupil attainment (e.g. Sammons, West & Hind, 1997; Strand & Demie, 2005; Demie & Strand, 2006;) and studies of school composition (e.g. Strand, 1997; Schagen & Schagen, 2005). In the literature, both FSM ‘eligibility’ and ‘uptake’ are referred to. In fact, in terms of the school databases from which FSM information is taken, these terms are

synonymous; the guidance notes for the mandatory annual School Census state that a child should be noted in the census as being eligible for FSM only if s/he is eligible for *and claiming* FSM (Department for Education [DFE], 2012d).

The use of FSM as a proxy for economic disadvantage has been questioned in the literature. Hobbs and Vignoles (2007, p.23) states, “researchers should be cautious in drawing inferences from research reliant on the FSM measure. When used as the variable of interest, FSM status is an imperfect proxy of low income or ‘workless’ families, or one-parenthood.” It does seem, however, that uptake of FSM is linked to lower educational attainment. Hobbs and Vignoles (2007) examined data from the Avon Longitudinal Study of Parents and Children (ALSPAC, University of Bristol, 2012) and found that the mean Key Stage 2 English score of girls in receipt of FSM was 0.67 standard deviation units lower than for girls who were not taking FSM. Where national data is concerned, in 2011, 17% fewer pupils in receipt of FSM achieved the expected level at the end of Key Stage 2 in English in comparison to their non-FSM peers (Department for Education [DFE], 2011c). It is possible, therefore, that the fact that FSM uptake in the Screening sample was lower than the national average may be linked to the low incidence of PCs in this sample. It will not be possible to say for certain, however, why the incidence of PCs in this study’s Screening sample is lower than would be expected given the results of previous UK studies.

While it was initially desirable to sample groups of EAL and EL1 GCs and PCs, the central objective of running the Screening Phase was to show that there is heterogeneity in the reading comprehension skills of UK EAL children; not all EAL children experience reading comprehension difficulties. Given the children who participated in the Screening Phase, it was possible to achieve these objectives by sampling groups of EAL and EL1 Average and Above Average Readers for the Main Phase of this study. The term ‘readers’ rather than

‘comprehenders’ is used here to account for the fact that the participants in the Main Phase of the study exhibit not only average and above average comprehension skills but also average and above-average reading rate, accuracy and nonword decoding skills. The current study is unique amongst UK EAL studies in investigating EAL children who do not struggle with reading comprehension.

6.1.4 Main Phase

With the exception of Beech and Keys (1997) and to a certain extent Rosowsky (2001), none of the 8 studies which have focused on the reading comprehension skills of UK EAL children have provided a detailed description of their EAL participants’ linguistic and personal backgrounds. This lack of detail is problematic in that it reinforces a simplistic notion that EAL children comprise a homogeneous group. Given the uniqueness of this study’s sample in UK EAL research, it is particularly important to provide a detailed description of linguistic and background factors which may affect performance on the YARC Comprehension and the ICM, the central variables in this study. Although by no means exhaustive, both the LBQ and the PLBQ provide adequate information to inform both a detailed description of the study’s participants and insight into the relationship between the background and central factors of this study.

6.1.4.1 The Language Background Questionnaire (LBQ)

Of initial descriptive interest is the extent to which EAL children use different languages for different functions. Although all EAL children were recruited into the study on the basis of a high degree of oral L1 exposure in the home (those EAL children who reported on the Screening questionnaire that both parents/caregivers spoke Always/Mostly English

did not progress to the Main Phase of the study), no information was collected regarding language use when other media is concerned e.g. computer use and exposure to print in the home. The LBQ provides separate English/L1 scores for both aspects and allows a comparison of within-participant English and L1 use for each. Although both EAL Average and Above Average readers live in L1-rich environments in terms of interpersonal communication, both groups had significantly higher English than L1 scores for both computer use and exposure to print in the home. These results suggest that even in homes with strong L1 communication practices, English is the dominant language in terms of computing and print for the EAL participants in this study.

Section D English (which assesses the degree to which English language printed materials e.g. newspapers, magazines, books are available in the EAL children's homes) is the only section of the LBQ on which the EAL Average and Above Average readers differ: EAL Above Average readers report significantly more exposure to English language print in the home than EAL Average readers. The link between a print-rich home environment and higher reading attainment is in line with findings for England from the large-scale Progress in International Reading Literacy Study (PIRLS, Twist et al., 2007). The PIRLS does not specifically report upon the relationship between exposure to print in the home and reading attainment for EAL children. However, the participating sample was statistically representative of Year 5 children in England in 2006, when 12.5% of primary school pupils in England spoke EAL (NALDIC, 2012d).

In addition to allowing for comparison between the EAL Average and Above Average groups, a central function of the LBQ is to provide information regarding the relationship between home language variables, the YARC Comprehension and the ICM. Further

evidence for the importance of a print-rich home environment is provided by the significant, positive correlation between the EAL Average group's overall scores on the ICM and their score for Section D L1 (exposure to L1 print materials in the home) on the LBQ. This result is particularly pertinent in light of the finding that both EAL Average and Above Average participants live in homes which have significantly more English than L1 printed material.

This finding that increased exposure to L1 printed material is positively correlated with an L2 outcome (the ICM) may be explained in terms of Cummins' 'common underlying proficiency' (CUP) principle, which he describes as follows:

The interdependence or common underlying proficiency principle implies that experience with *either* language can promote development of the proficiency underlying both languages, given adequate motivation and exposure to both either in school or in the wider environment.

(Cummins, 1984, p.22)

The CUP principle provides theoretical support for the importance of developing both the L1 and the L2 in EAL children.

Further support for the CUP is found where the EAL Above Average group is concerned. For this group, there are significant, positive correlations between YARC Comprehension ability and total scores on both section A (interpersonal interaction) and B (L1 media exposure), suggesting that greater L1 exposure both in conversation with other L1 speakers and through television, films, music and the radio is related to higher English

reading comprehension scores. The evidence provided by the LBQ provides support for the value of maintaining and developing EAL children's L1s in terms of interpersonal interaction, audio/visual media and L1 print environment in the home.

There were no EAL Average/Above Average differences in either Section E or Section F. This result suggests that there were no group differences in the extent to which these groups were learning to read in an L1 or in Arabic for religious purposes. Given the significant, positive relationship between amount of L1 printed material in the home and the ICM for the EAL Average group, and indeed the results of a number of studies carried out in North America, it is surprising that there were no significant correlations for either group between Section E or F results and either the ICM or the YARC Comprehension (these LBQ findings were also mirrored in data collected from the PLBQ). These North American EAL studies have provided evidence of the additive effects of L1 literacy to L2 literacy development (e.g. Collier, 1987; Reese et al., 2000; Royer & Carlo, 1991) and of parallel literacy abilities across languages (e.g. Jimenez, Garcia and Pearson, 1996; Jimenez, 2000; Langer, Barolome & Vasquez, 1990).

There are a number of differences, however, between these studies and the current study which may explain these differing patterns of results. As the current study was carried out exclusively through English, no conclusive information was available regarding the L1 reading ability of EAL participants; only information regarding the frequency of L1 reading instruction was gathered using the LBQ. The prevailing suggestion in these North American studies is that L1 literacy ability must develop to a certain level if it is to benefit L2 literacy. It is possible, therefore that the L1 reading skills of the EAL Average

and Above Average readers in this study were not sufficiently developed for a significant relationship with either YARC Comprehension or the ICM to become manifest.

Although correlation does not imply causation, the results of the LBQ suggest that a rich L1 environment in terms of interpersonal interaction, audio/visual media and exposure to L1 printed materials may be beneficial for EAL children's English reading comprehension. This result raises the question of whether increased L1 computer use may also be beneficial; this was an area in which English was found to be dominant. The LBQ also points to the importance of access to L2 printed material in the home for developing L2 reading outcomes for EAL children. The LBQ has therefore succeeded in providing detailed information regarding home language use in a number of domains and has pointed to the value of the L1 in supporting L2 reading outcomes.

6.1.4.2 The Parental Language Background Questionnaire (PLBQ)

The first piece of information provided by the PLBQ is that the majority of EAL participants in this study are 2nd generation immigrants. While the results of this study are not statistically generalisable, they do show that it is possible for 2nd generation immigrants who speak EAL to achieve high levels of reading comprehension for their chronological age. It is important to stress this point given the bleak view of the reading comprehension abilities of UK EAL children portrayed in the literature.

Increased parental education, particularly where mothers are concerned has been linked to positive educational outcomes for children (c.f. Bornstein et al., 2003). Descriptively, there do seem to be variations in the number of years participants' mothers spent in full-time education between groups: mean values are descriptively higher for EL1 than for

EAL groups and for Above Average than for Average groups. These differences are not significant, however. The only significant correlation between mother's level of education and performance on either the YARC Comprehension or on the ICM was for the EAL Average group's score on the YARC Comprehension: fewer years spent in full-time education by EAL Average participants' mothers was linked to lower scores on the YARC Comprehension.

Although all of the EAL participants in this study reported that they are frequently exposed to the L1 in the home, it is clear from the PLBQs returned that there is wide variation in both the extent to which these EAL children were exposed to English before starting school and indeed their current L1 ability in comparison to their L1-speaking peers. It is not the case, however, that there are EAL Average/Above Average differences in either domain; neither are there any significant relationships between pre-school English ability or current L1 ability and either the YARC Comprehension or the ICM. These findings are important as they show that even those EAL children who start school with no or limited English and/or who have achieved high levels of L1 ability may perform at average or even above average levels in measures of English reading comprehension. Indeed, Cummins' threshold hypothesis suggests that developing high levels of competence in more than 1 language may confer positive cognitive effects (Cummins, 1979).

For the purposes of providing more detailed information regarding the socio-economic circumstances of participants in the Main Phase of this study, post code data was collected using the PLBQ. As is the case with FSM uptake information, post code data provides an imperfect proxy for SES given the possibility of individual households not

reflecting the wider Lower Layer Super Output Area (LSOA) in which the postcode is situated. In addition, as only 52 post codes were received from parents of Main Phase participants it was not possible to run statistical analyses using this data. With these cautionary points in mind, post codes (when linked to LSOAs and in turn to the English Indices of Deprivation [EID]) provide a host of detailed information regarding numerous variables linked to SES. It has been pointed out already in this chapter that the FSM uptake of participants in the Screening Phase of this study is lower than the national average (c.f. Table 4). The number of Main Phase participants in each of the 4 groups taking FSM is also very low (1 EAL Average, 1 EAL Above Average, 4 EL1 Average, 3 EL1 Above Average). It is not surprising, therefore, that those children whose parents provided post code data do not tend to live in areas which are most deprived in terms of: a composite score of multiple deprivation; income; education, training and skills; or the percentage of children living in low-income homes. This post code data has provided information which supports the FSM data collected from schools.

6.2 Investigating groups of EAL children who do not struggle with reading comprehension: summary

This study has contradicted the picture portrayed in previous studies by showing EAL children in the UK are not a homogenous, underachieving group in terms of reading comprehension. In fact, this study has shown that many EAL children achieve average or indeed above average reading comprehension scores for their chronological age. A lack of proficiency in English was linked to low scores in a standardised test of reading comprehension. This important finding suggests that for many EAL children, difficulties in English reading comprehension should be viewed as a language development issue,

rather than as a deficit. A further key finding is that a rich L1 home environment does not prevent EAL children from achieving high levels of L2 reading comprehension, supporting Cummins' 'common underlying proficiency' principle. The role of SES, however, should not be discounted. Both FSM and post code data have suggested that the EAL and EL1 participants in the Main Phase of this study tend not to represent the most deprived children nationally, a factor which may be linked to their relatively high achievement in reading and reading-related standardised measures. Further research is required to disentangle the relationships between L1 and L2 ability, SES and reading comprehension for EAL children in the UK.

6.3 Administering a broader range of semantic measures than has been used in previous EAL studies

The semantic skills of UK EAL children have been a central aspect of the literature. It is clear that there is a trend for these children to score more poorly than their EL1 peers on measures of receptive and expressive vocabulary and that the relationships between (in particular expressive) vocabulary and reading comprehension are stronger for EAL than for EL1 children (e.g. Hutchinson et al., 2003). The first way in which the current study built upon previous research was to administer a wider range of word-level measures than has been administered in previous UK EAL studies. It is important to point out that these word-level measures (6 subtests from the TOWK) are not included in this study as dependent variables. Rather, those TOWK subtests on which there are EAL/EL1 differences are included as covariates for Research Questions 1 and 2, and composite measures of the TOWK are used as predictors in regression models for Research Question 4. The second way in which the current study built upon previous research was

to use the ICM to examine the semantic skill of UK EAL children beyond the word level, i.e. at the sentence and discourse levels.

6.3.1 A wider range of word-level measures than has been administered in previous UK EAL studies

It has already been pointed out that recruiting groups of EAL and EL1 Average and Above Average readers emphasises the heterogeneity of the sample in terms of reading ability. A further benefit of purposively sampling Main Phase participants is the possibility of matching EAL and EL1 participants on a number of reading-related and background measures. This matching ensures that the results of any other measures administered will not be confounded by either demographic (e.g. gender, chronological age, free school meals), reading-related (e.g. reading comprehension, accuracy, rate, nonword decoding) or general intelligence (e.g. non-verbal ability) variables. An important aspect of the current study in comparison to other UK EAL studies in the literature is that the EAL/EL1 differences in TOWK Expressive Vocabulary and on the TOWK Multiple Contexts (in addition to the WMTB-C) may not be attributed to group differences in any of the above matching variables.

This study's finding that the EL1 participants outperformed the EAL participants on the TOWK Expressive Vocabulary subtest is in line with findings from previous UK EAL studies which have shown EAL children to lag behind their EL1 peers on similar measures of expressive vocabulary (Hutchinson et al., 2003; Burgoyne et al., 2009; 2011a). In this particular measure, the test administrator points to a picture (or an aspect thereof) and asks a question to elicit a one-word response from the participant, e.g. 'what

is the toy doing?'; 'what is this?' Each item lists a small selection of allowed responses. This test requires participants to identify the word form which may be used to express the target concept from their mental lexicon and to pronounce it correctly.

The current study built upon previous UK EAL studies by including not only measures of the number of words known (vocabulary breadth) such as the TOWK Expressive Vocabulary but also vocabulary measures which investigate how much a participant knows about words (vocabulary depth) such as the TOWK Multiple Contexts (c.f. Ouellette, 2006). In the current study, the EL1 participants significantly outperformed the EAL participants on this measure which no previous UK EAL studies have used. For the TOWK Multiple Contexts, participants are presented with a series of cards. Printed on each card is a homonym (e.g. bat, pound, bark). In order to be marked correct, the participant must give at least 2 independent meanings for each word. For the stimulus item 'pound' for example, if a child responded, 'when you pound on something and when you send a puppy to a pound' they would be marked correct. If they responded, 'when you pound on a table and when you pound on a wall' they would be marked incorrect. The baseline requirement for participating in this subtest is the awareness that 2 or more meanings may be expressed by words which share the same spelling and pronunciation. Participants must then link each written and orally produced (by the examiner) word form with 2 separate meanings and to express these meanings orally in order to be marked correct. It is of particular interest that the EL1 participants outperform the EAL participants on this measure but not on the ICM as the ICM is also based on multiple-meaning phrases (idioms).

In considering what these results tell us about EAL children's vocabulary skills, it is important not to assume that the EAL participants in this study lack knowledge of the concepts referred to in the TOWK Expressive Vocabulary and Multiple Contexts subtests. A large body of research has concluded that when both of a bilingual's languages are taken into account, bilingual and monolingual children possess a similar ability to refer to individual concepts but may be able to do so in only one of their languages (Pearson, Fernandez & Oller, 1993; Pearson, Fernandez & Oller, 1995; Pearson, Fernandez, Lewedeg & Oller, 1997; Pearson, 1998; Oller, Pearson and Cobo-Lewis, 2007). It is possible, therefore, that a child who in the TOWK Expressive Vocabulary subtest was unable to provide a target term 'lighthouse' (when shown a picture of a lighthouse and asked 'what is this?') would have been able to provide the target word in the L1 but not in the L2. When asked for 2 meanings of the word 'pound' in the TOWK Multiple Contexts subtest, the same EAL child might be able to produce the meaning 'a home for stray dogs' when presented with the appropriate word in his/her L1 but not in English. The results of the current study, therefore, do not show that the EAL participants are able to produce fewer words and meanings than their EL1 peers overall, but that they are able to produce fewer English words and meanings.

A further question is why the EL1 participants significantly outperformed the EAL participants on only 2 out of 6 TOWK subtests administered. It is notable that both the TOWK Expressive Vocabulary and Multiple Contexts subtests are described in the Manual as Expressive (as opposed to Receptive) subtests. The validity of the expressive/receptive distinction as a way of distinguishing between different types of knowledge has been the matter of some debate and is beyond the scope of this discussion

(c.f. Nation, 2001, p.24). Where testing is concerned, tests of expressive vocabulary typically require participants to produce (through either speaking or writing) a target word form or meaning whereas tests of receptive vocabulary typically require participants to identify word forms/meanings but not to produce them. In general, expressive tests tend to be more difficult than receptive tests (e.g. Stoddard, 1929; Waring, 1997). The fact that the EL1 participants in the current study outperformed their EAL peers on 2 out of 3 Expressive subtests but on none of the Receptive subtests suggests that there may be a test bias against EAL children where expressive tests are concerned, particularly expressive tests which were not specifically developed with EAL children in mind.

This EAL/EL1 difference on the TOWK Expressive Vocabulary and Multiple Contexts measures is important in showing that even EAL children with good English reading skills are not indistinguishable from their EL1 peers. In carrying out the fieldwork aspect of this study, the researcher was often told by teachers that certain EAL children were ‘totally fluent’ in English or ‘as good as’ and in some cases ‘better than’ their monolingual peers in English. Where English language vocabulary is concerned, even those EAL children with the strongest L2 reading skills will require support to develop expressive aspects of English vocabulary.

6.3.2 The working memory skills of EAL and EL1 children

In addition to these 6 TOWK subtests, a measure of working memory was administered to the Main Phase participants in the current study. Working memory, inhibition and shifting were identified as the three core components of executive control by Miyake and colleagues (Miyake et al., 2000). This interpretation has been widely accepted in the

literature. A solid body of work has established bilingual advantages in inhibition (the ability to suppress irrelevant information) in particular (c.f. Bialystok, 2001). This bilingual advantage in inhibition is argued to arise as the result of bilinguals having to target their attention on the language they are using even though both languages are active to some extent during comprehension and production. Previous studies have provided inconsistent evidence, however, regarding the working memory skills of EAL children in comparison to their EL1 peers. Some studies have suggested an EL1 advantage for working memory (e.g. Lesaux, Lipka and Siegel, 2006) while others have suggested an EAL advantage (e.g. Morales, Calvo and Bialystok, 2013) or no EAL/EL1 differences on working memory measures (e.g. Engel de Abreu, 2011).

Morales et al. (2013) suggested that these mixed results may be linked to working memory task type. The EAL participants in the Lesaux et al. (2006) and Engel de Abreu (2011) displayed weaker English verbal abilities than their EL1 peers. These authors' use of working memory measures which required participants to retain and manipulate words and digits may therefore have underestimated the bilingual children's working memory abilities. The working memory measures employed by Morales et al. (2013), on the other hand, were visuo-spatial in nature with low linguistic demands, and therefore minimised any potential confound with verbal ability.

The results of the current study are particularly interesting in this light. While the Backwards Digit Recall subtest of the WMTB-C does impose verbal demands on participants, it is likely that the 9-10 year old participants in this study were sufficiently familiar with digits from 1 – 9 that any potential confound of lower verbal ability on the part of the EAL participants was minimised. The results of the current study are therefore

in line with those of Morales et al. (2013) in suggesting a working memory advantage for this study's EAL participants in comparison to their EL1 peers. Further research is required, to establish the precise nature of any working memory advantage for bilingual children. For the purposes of the current study, the results of this working memory measure were, like those for the TOWK Expressive Vocabulary and Multiple Contexts, used as covariates for the study's main dependent variable, the ICM.

6.3.3 Beyond the word level – the Idiom Comprehension Measure (ICM)

The idiom comprehension measure is this study's dependent variable and is the focal point of each of the study's research questions. This measure goes beyond the word level to provide information about participants' semantic skills at the sentence level and at the discourse level.

In this section, the results of research questions 1-4 will be discussed through the lens of the 2 'main aims' of this study. These aims were stated in Chapter 3 of this thesis as follows: 1. to use an idiom comprehension measure (ICM) (c.f. Cain & Towse, 2008) to investigate the semantic abilities of UK EAL children, in comparison to those of EL1 children who are matched for reading ability; 2. to identify whether EAL and EL1 children with Average reading abilities perform differently to EAL and EL1 children with Above Average reading abilities on this idiom comprehension task. Language group and reading group differences will therefore be at the forefront of the following discussion.

6.3.3.1 Research Question 1a

Research Question 1a is as follows: Is the idiom comprehension of EAL and EL1 Average and Above Average Readers differentially affected by: i) Idiom Realness; ii) Idiom Transparency; iii) Presence of Supportive Context?

The results relevant to Research Question 1a suggest that both EAL and EL1 groups responded to Transparency and Context in the same way. More correct, idiomatic responses were provided by both groups for transparent than for opaque idioms and for idioms in context than in isolation conditions. One implication of this lack of significant language group effects for Transparency and Context is that the EAL and EL1 groups do not differ in their ability to engage with either semantic analysis or inference from context. In other words, while the EAL and EL1 groups do differ on certain word-level semantic measures (i.e. the TOWK Expressive Vocabulary and Multiple Contexts), these language groups do not significantly differ from each other in terms of semantic ability at either the sentence or discourse levels.

No previous UK EAL study has investigated the ability of participants to engage with semantic analysis, or to ‘derive alternate meanings of phrases’ (Cain & Towse, 2008, p.1539). In the current study, a language group difference in the Novel Transparent Isolation (NTI) condition would have suggested that one group was more able to engage in semantic analysis than the other. As the idiom is novel, the participant has never met it before and should therefore not be able to use previous experience of the idiom to aid in its interpretation. As the idiom is in isolation, the participant is unable to make use of surrounding context to aid in inferring its meaning.

This lack of language group effect on the NTI condition is in line with the finding that the EAL and EL1 groups do not differ on the receptive Figurative Usage subtest of the TOWK. This test requires participants to specify which one of 4 figurative phrases provided means the same thing as a target literal phrase. For example, for one of the demonstration questions, the examiner asks ‘Which one tells about someone who is **not** being noisy?’ The participant is required to choose one of 4 options which are presented in written and spoken form: ‘a. Busy as a bee; b. Quiet as a mouse; c. Sly as a fox or d. Eats like a bird.’ The results of this TOWK Figurative Usage subtest in addition to the lack of language group effects for Transparency suggest that both EAL and EL1 groups are equally able to engage in semantic analysis.

The results of Burgoyne et al. (2011b) suggest that no EAL/EL1 differences were found on comprehension questions which required participants to make inferences. This result is in line with the finding in the current study that EAL and EL1 participants are equally able to infer the meanings of unknown phrases (specifically Novel Opaque Context [NOC] idioms) from context. As NOC idioms are novel, participants can not draw upon prior experience in order to aid in their interpretation. As NOC idioms are opaque, participants are unable to use semantic analysis. Inference from context is the sole tool at participants’ disposal when faced with these NOC idioms.

In order to successfully infer the meaning of a novel opaque idiom from context, the participant must succeed in integrating contextual cues which are spaced throughout the text in order to achieve a coherent representation of the text and derive a complete meaning for the unknown idiom (c.f. Cain, Towse and Knight, 2009). Where the example in Appendix 3.13 is concerned, understand that ‘to be at the green’ has the

idiomatic meaning ‘to have too little money’, requires the participant to be clear that Tim wasn’t sure if he could go to the cinema due to a series of expensive events: his car repair ‘had cost more than he had expected’; he bought his girlfriend ‘a very expensive birthday present’ and today ‘he received several bills in the post.’ Crucially, we learn that he will not be able to go to the cinema until ‘after pay day’. The participant must integrate these contextual cues to gain a clear picture of Tim’s financial situation and link this information to their real world knowledge of needing money to go to the cinema in order to successfully infer the idiomatic meaning of this NOC idiom. The results of the current study in addition to those of Burgoyne et al. (2011b) suggest that the EAL and EL1 groups are equally able to infer the meaning of unknown phrases from context.

The main finding in Research Question 1a is that the EAL/EL1 participants are differentially affected by idiom Realness. For the EAL participants, no significant within-participant or interaction effects involving Realness are visible. For the EL1 participants, on the other hand, the 2-way interaction between Realness*Reading Group shows that the EL1 Above Average participants alone provided more idiomatic responses for Real than for Novel idioms while the EL1 Average participants, like both groups of EAL participants, made no distinction between Real and Novel idioms overall. This finding suggests that the EL1 Above Average group alone are able to use prior experience of these real English language idioms to aid in their interpretation.

There is a suggestion, however, that EL1 Average participants are not entirely unaffected by idiom Realness: the Realness*Transparency*Context interaction approaches significance for EL1 participants. As there is no interaction with Reading Group here, this finding suggests that both EL1 Average and Above Average participants provide

more idiomatic responses in the Real Transparent Isolation condition than in the Novel Transparent Isolation condition. The fact that this effect of Realness was found specifically for Transparent idioms in the Isolation condition suggests that when used in conjunction with semantic analysis, Realness has a facilitative effect for both EAL Average and Above Average readers. It appears, however, that the facilitative effect of supportive context is stronger than the facilitative effect of idiom Realness for these EL1 participants: in Context conditions, this effect of Realness disappears.

Idioms are prevalent in both spoken and written English (Wray, 2002). It stands to reason, therefore, that the more exposure children receive to a rich variety of oral and written language, the greater the likelihood that they will be exposed to idiomatic language. There is research evidence to suggest that there is a positive correlation between the amount children read and how well they read (e.g. Gorman, White, Orchard & Tate, 1981; Guthrie & Wigfield, 2000). While the current study did not collect information about the frequency with which participants read for pleasure, it is likely that the EL1 Above Average readers in the current study are frequent readers and that they are regularly exposed to English language idioms through their reading. In addition, as the EL1 Above Average group are exposed only to English in the home, there is ample opportunity for them to be exposed to the idiomatic nature of natural English speech. The EL1 Above Average group in the current study are able to use this experience to aid in their interpretation of Real in comparison to Novel idioms. For this group alone, idiom Realness has a significant facilitative effect. Where the EL1 Average group is concerned, idiom Realness in conjunction with idiom Transparency does have a facilitative effect although this effect does not quite reach statistical significance.

The EAL children either do not have sufficient experience of English language idioms, or are not able to use their prior experience of English language idioms to facilitate idiom comprehension. This is an important finding, particularly where the EAL Above Average group are concerned. While there is no doubt that these children possess strong English language skills, they differ from their matched EL1 peers in their ability to make facilitative use of idiom Realness when completing the ICM. This finding has important implications for EAL children's ability to understand text. While no specific analysis of the idiomatic content of British reading schemes for primary-aged children has been carried out to date, it has been found that 6 to 10% of sentences in American reading books designed for children between 8 and 12 years of age contain idiomatic expressions (Nippold, 1991). It is likely that text encountered by British children of a similar age is also idiom-rich.

6.3.3.2 Research Question 1a: summary

With reference to Aim 1, therefore, it can be concluded that while the EAL/EL1 groups do not differ on the number of idiomatic responses provided on the ICM overall, the language groups are not identical in their responses on this measure: the effect of idiom Realness on the EAL and EL1 groups is not the same. Addressing Aim 2 of the study with reference to Research Question 1a clarifies this finding. Overall, Above Average readers provide more idiomatic responses on the ICM than do Average readers, suggesting that this measure does discriminate between children with higher and lower reading ability for both EAL and EL1 participants. However, idiom Realness affects Average and Above Average readers differently. Specifically, idiom Realness provides a significant facilitative effect for the EL1 Above Average group alone.

6.3.3.3 Research Question 1b

This examination of Research Question 1a has shown that the performance of the EAL and EL1 participants on the ICM is similar but not identical. Research Question 1b provides a deeper examination of the skills used by the EAL and EL1 groups when engaging with the ICM. The EL1 participants in this study were found to significantly outperform the study's EAL participants on 2 measures of vocabulary (the TOWK Expressive Vocabulary and Multiple Contexts) while the EAL participants outperformed the EL1 participants on the Backwards Digit Recall subtest of the WMTB-C. The potential that these variables may be confounds when considering the EAL/EL1 participants' performance on the ICM could not be ignored. The mixed ANOVAs carried out in order to answer Research Question 1a were therefore rerun as a series of ANCOVAs which controlled for the influence of: i. Expressive Vocabulary; ii. Multiple Contexts; iii. the Backwards Digit Recall subtest of the WMTB-C. Separate ANCOVAs were carried out in order to isolate the influence of each of these 3 individual covariates on the ICM. Of initial interest was whether the differing effects of idiom Realness on EAL and EL1 participants may be explained by any of these 3 covariates.

Expressive Vocabulary as a Covariate

When the influence of Expressive Vocabulary was controlled for the EAL participants, neither the significant between-groups effect of Reading Group, the within-group effects of Transparency or Context or the interaction effects of Transparency*Context observed in the EAL Mixed ANOVA remained statistically significant. This finding suggests that the EAL children's performance on the Expressive Vocabulary measure entirely explains their performance on the ICM, a measure which taps not only participants' ability to

understand idioms but also their ability to engage with both semantic analysis and inference from context. Given that these EAL participants scored significantly below their EL1 peers on this Expressive Vocabulary measure, a key suggestion of this thesis is the importance of developing EAL children's Expressive Vocabulary skills to aid with their performance in these key comprehension-related skills.

Where the EL1 group are concerned, the relationship between Expressive Vocabulary and performance on the ICM bears both similarities and differences to this relationship where EAL participants are concerned. In terms of similarities, when the effect of the TOWK Expressive Vocabulary has been partialled out for the EL1 participants, the within-participants effects of Transparency and Context in addition to the Transparency*Context interaction which were significant in the EL1 Mixed ANOVA are no longer significant. This finding suggests that for EL1 participants, performance on the TOWK Expressive Vocabulary is linked to participants' ability to engage with semantic analysis and inference from context as is the case for their EAL peers.

On the other hand, a significant between-participants effect of Reading Group in addition to a significant interaction effect of Realness*Reading Group (both of which show identical patterns to those found in the EL1 Mixed ANOVA) are retained in this EL1 ANCOVA. These findings suggest that the EL1 participants make use of other skills in addition to those measured by the TOWK Expressive Vocabulary when completing the ICM.

A 3-way interaction between Realness*Transparency*Reading Group, moreover, approaches significance ($p = .055$) in this EL1 ANCOVA; this interaction was non-

significant in the EL1 Mixed ANOVA. The emergence of this interaction suggests that when the influence of performance on the TOWK Expressive Vocabulary has been partialled out, both EL1 Average and Above Average participants provide significantly more idiomatic responses for Real Transparent idioms than for Novel Transparent idioms. In the EL1 Mixed ANOVA, significantly more idiomatic responses were provided by EL1 participants for Real Transparent Isolation idioms than for Novel Transparent Isolation idioms but there was no difference between the number of idiomatic responses provided in the Real Transparent Context and Novel Transparent Context conditions. When the effect of Expressive Vocabulary has been partialled out, however, this facilitative effect of Context is no longer stronger than the facilitative effect of Realness where Transparent idioms are concerned. Performance on the Expressive Vocabulary subtest of the TOWK, therefore, is linked to the ability to infer from context for EL1 participants.

A further finding is that when Expressive Vocabulary is partialled out, significantly more idiomatic responses are provided by the EL1 Above Average group for Real Opaque than for Novel Opaque idioms. In the EL1 Mixed ANOVA, the facilitative effect of Context was again visible in that there were no significant differences in the number of idiomatic responses provided for Real Opaque Context and Novel Opaque Context idioms. When Expressive Vocabulary is controlled, the facilitative effect of Realness emerges, providing further evidence that Expressive Vocabulary is linked to the ability to use context to aid with the interpretation of idioms.

Expressive Vocabulary as a Covariate: summary

There are similarities and differences in the ways in which Expressive Vocabulary affects the EAL and EL1 participants' performance on the ICM. Where the EAL participants are concerned, performance on the ICM is entirely explained by their performance on the TOWK Expressive Vocabulary. The importance of developing the Expressive Vocabulary skills of these EAL children is therefore highlighted, given that this group scored significantly below their EL1 peers on this measure. Where the EL1 participants are concerned, this Expressive Vocabulary measure was shown to be important for both semantic analysis and inference from Context. It does not, however, exert as strong an influence over these children's performance on the ICM as is the case for EAL children; the EL1 participants in this study draw upon other skills in addition to those measured by the TOWK Expressive Vocabulary when completing the ICM. For the EL1 participants, the link between Expressive Vocabulary and the ability to use supportive context to aid in the inference of idioms is highlighted. Expressive Vocabulary, however, does not explain the differing effects of idiom Realness on EAL and EL1 participants.

Multiple Contexts as a Covariate

When the influence of TOWK Multiple Contexts on the EAL participants' performance on the ICM is controlled, the significant between-groups effect of Reading Group found in the EAL Mixed ANOVA is no longer significant. Likewise, the significant within-participants effect of Transparency in addition to the significant interaction effect of Transparency*Context disappears in this ANCOVA. In contrast to the ANCOVA with Expressive Vocabulary as a covariate, however, the within-group effect of Context

remains highly significant ($p < .001$). This pattern of results suggests that while the skills measured by TOWK Multiple Contexts explain the superior performance of EAL Above Average participants in comparison to EAL Average participants on the ICM in addition to the facilitative effect of idiom Transparency, they are not linked to the facilitative effect of supportive Context. It seems, therefore, that for the EAL participants, the skills required by TOWK Multiple Contexts are linked to semantic analysis but not inference from context.

When the nature of the TOWK Multiple Contexts is considered, this finding is not surprising. This TOWK subtest requires participants to provide 2 independent meanings for words. Engaging in semantic analysis, in a similar fashion, requires participants to provide alternative meanings for phrases. In order to succeed in both the TOWK Multiple Contexts and semantic analysis in the ICM, participants must not only understand that words which look and sound identical may have 2 or more independent meanings, they must also have access to more than 1 of these meanings.

Where the EL1 participants are concerned, a rather different pattern emerges. The significant between-groups effect of reading group found in the EL1 Mixed ANOVA remains, as do within-participant and interaction effects involving both Transparency and Context. Importantly, all within-participant and interaction effects involving idiom Realness disappear when TOWK Multiple Contexts is used as a covariate. These findings suggest that where the EL1 group is concerned, the skills required when completing the TOWK Multiple Contexts do not explain the superior ability of EL1 Above Average participants in comparison to EL1 Average participants to provide idiomatic responses on the ICM, neither are they linked to semantic analysis or inference

from context for these participants. On the other hand, they do explain all effects involving Realness. It has been argued that in order for idiom Realness to have a facilitative effect, the participant must have prior experience of this idiom and to be able to use this prior experience in order to reach a correct interpretation of the idiom. It seems that for EL1 participants, prior experience of idioms is associated with prior experience of homonyms. The EL1 participants in this study use their prior experiences with the English language to good effect when engaging with both the TOWK Multiple Contexts and the ICM.

Multiple Contexts as a Covariate: summary

Where the EAL participants are concerned, performance on the TOWK Multiple Contexts is linked to these children's ability to engage with semantic analysis. For the EL1 participants, performance on this Multiple Contexts subtest is linked to their ability to utilise their prior experience of polysemous words and phrases. As was the case when the Expressive Vocabulary subtest was used as a covariate, controlling the influence of the TOWK Multiple Contexts removed the significant between-groups effect for the EAL group but not for the EL1 group. This pattern suggests that the EAL group rely more heavily on their word-level semantic abilities when completing the ICM than do the EL1 group.

Working Memory as a Covariate

For both the EAL and EL1 participants, the results of the Backwards Digit Recall subtest of the WMTB-C exert a weaker influence upon participants' performance on the ICM than do either the TOWK Expressive Vocabulary or Multiple Contexts subtests. Both

groups retain a significant between-groups effect of reading group, suggesting that even when the influence of working memory (as measured by this test) is controlled, the Above Average participants continue to provide significantly more idiomatic responses than the Average participants on the ICM overall. The WMTB-C does appear to be linked to the ability of both groups to engage in semantic analysis: for the EAL group, no effects involving Transparency remain and for the EL1 group, the previously significant effect of Transparency*Context disappears when the influence of this measure is controlled.

Working Memory as a Covariate: summary

Neither the EAL nor the EL1 participants draw as strongly upon their working memory skills when completing the ICM as they do upon their semantic skills. In explaining this finding, the format of the ICM must be considered; one aim of this format was in fact to reduce the burden on working memory. In both the Isolation and Context conditions, the child is presented with a printed version of the test which the child was encouraged to read while the examiner read each question aloud. In the Context condition, participants were allowed to refer to the printed version of the supportive story when providing their response. While working memory is shown to play a part in participants' ability to engage in semantic analysis, it is a welcome finding that the ICM did not place excessive pressure on participants' working memory capacity.

6.3.3.4 Research Question 2a

Research Question 2a is as follows: Do the EAL and EL1 Average and Above Average Readers differ in the extent to which they choose: i. Congruent response options in

context; ii. Incongruent response options in context; iii. Literal response options in isolation? As was the case with Research Question 1a, this question will be discussed in terms of language group and reading group differences.

Congruent responses

This research question is concerned with whether there are group differences in the extent to which each of the 3 non-idiomatic responses are selected in relevant conditions.

Although selecting a Congruent response is technically an error, a participant who chooses a Congruent response in the Context condition has successfully engaged in inference from context. As such, examining the 4 groups' Congruent responses can offer further information regarding their ability to use supportive context to aid in the interpretation of idioms.

Turning again to the sample NOC idiom provided in Appendix 3.13, participants who chose the congruent response option for the idiom 'to be at the green' were successful in understanding and integrating contextual cues from throughout the text in order to understand Tim's financial situation (c.f. section 6.3.3.1). On this occasion, however, these participants moved beyond the information provided in the text to assume that Tim needed 'to save up some money', a response option which is congruent with and related to the information provided in the text but which lacks the specificity of the idiomatic response, 'to have too little money'. Choosing this congruent response as opposed to the idiomatic response suggests that while the participant was able to successfully process the information provided in the text and make a successful inference, perhaps s/he did not employ optimum comprehension monitoring strategies which require the participant to

“evaluate their understanding of the text and to regulate their reading” (Cain, Oakhill and Bryant, 2004p. 33).

In line with the findings from Research Question 1a, the lack of a significant between-groups effect of language group in the initial omnibus *F* test suggests that the EAL and EL1 participants are equally likely to engage in inference from context. However, the results of the separate mixed ANOVAs show that there are EAL/EL1 differences in Congruent response choice: while significantly more Congruent responses were chosen by EL1 Average than Above Average readers, there are no significant EAL reading group differences where Congruent responses are concerned. This finding provides further evidence for the fact that all EAL participants in the current study display strong inferencing skills. This argument is supported by the finding that the EAL Average participants provided more Congruent responses for Real Opaque Context idioms than for Real Transparent Context idioms. As the possibility of semantic analysis is not available to aid in the interpretation of a Real Opaque Context idiom, the EAL Average readers utilised inference from context on this occasion.

Incongruent responses

In selecting an incongruent response, on the other hand, the participant shows that s/he is unable to successfully use the contextual cues provided to infer an idiomatic or congruent meaning for the phrase. To look again at the example provided in Appendix 3.13, to understand that ‘to be at the green’ means ‘to be too busy to go out’, the participant must fail to integrate the list of details regarding Tim’s recent expenditure into a coherent representation of the text’s main message: that Tim was unable to go to the cinema until

‘after pay day’ because he had too little money. This failure could be due to a single factor or to a combination of factors. The processing demands may have been too high for the participant to integrate these different strands of information across the text, for example (c.f. Daneman, 1988) and/or the participant may have failed to exercise successful comprehension monitoring strategies. In contrast to selecting a Congruent response in the Context condition, selecting an Incongruent response specifically shows not only that the participant is unable to successfully infer idiom meaning from supportive context but also that the participant has not acknowledged that the Incongruent response is at odds with the context provided.

The initial omnibus *F* test shows that the EAL/EL1 participants do not significantly differ in their selection of Incongruent responses. This initial omnibus *F* test in addition to the separate Mixed EAL/EL1 ANOVAs shows that for both language groups, more Incongruent responses are provided by the Average than by the Above Average groups. These findings support the argument made with reference to Research Question 1a that for both EAL and EL1 participants, the ICM successfully discriminates between Average and Above Average readers. The only EAL/EL1 difference regarding Incongruent response selection is that the EL1 Above Average group provide more Incongruent responses in the Novel Opaque Context condition in comparison to the Real Opaque Context condition. This finding supports the argument, made in response to Research Question 1a, that idiom Realness has a facilitative effect for EL1 Above Average students in particular.

Literal responses

Due to the very small number of Literal responses provided in the Context condition, only those Literal responses which were provided in the Isolation condition were analysed using inferential statistics. Choosing a literal response in the Isolation condition (which was the first condition of the ICM administered to all participants) suggests that the child is not approaching the idiom as a literal rather than as a figurative phrase. Previous research has suggested that younger children (7 year olds) who have not yet grasped figurative language exhibit a literal processing tendency (e.g. Levorato & Cacciari, 1995). The results of the current study show that there are no significant differences in the number of Literal responses provided by EAL/EL1 participants; neither group exhibits a literal processing tendency in comparison to the other. On the other hand, significantly more Literal responses are provided by Average than by Above Average readers.

Both the EAL and EL1 participants provided more Literal responses for Opaque than for Transparent idioms, a finding which suggests that when the possibility of engaging in semantic analysis is not available, participants are more likely to interpret these phrases in a literal manner. In addition, a Realness*Reading Group interaction for the EAL participants showed that the EAL Average group provided more Literal responses for Real than for Novel idioms. This result suggests that EAL Average participants in particular are not familiar with English language idioms from their prior experience.

6.3.3.5 Research Question 2a: summary

The results of Research Question 2a have shown that the EAL and EL1 groups are equally likely to offer Congruent, Incongruent and Literal responses on the ICM overall. Average readers provide more Incongruent and Literal responses than do Above Average readers. This finding supports the argument that the ICM is able to discriminate between participants with differing reading abilities. The results of Research Question 2a support some of the main findings from Research Question 1. While EL1 Average participants provided more Congruent responses than EL1 Above Average participants, the EAL Average and Above Average participants did not differ in the number of Congruent responses they provided. This result confirms the ability of the EAL children (both Average and Above Average readers) in this study to successfully engage in inference from context. Further evidence for the differing effects of idiom Realness for EL1 and EAL participants is also provided. The facilitative effect of Realness for the EL1 Above Average group is clear in that they provided fewer Incongruent responses for Real Opaque Context idioms than for Novel Opaque Context idioms. In contrast, the EAL Average group showed that they are unfamiliar with the Real idioms used in the ICM. This group provided significantly more Literal responses for Real than for Novel idioms.

6.3.3.6 Research Question 2b

Research Question 2b is as follows: Do the EAL and EL1 Average and Above Average Readers differ in the extent to which they choose: i. Congruent response options in context; ii. Incongruent response options in context; iii. Literal response options in isolation when a) TOWK Expressive Vocabulary; b) TOWK Multiple Contexts; c) WMTB-C Backwards Digit Recall are used as covariates? The results for Research

Question 2b are in line with the results obtained for Research Question 1b and do not require further extended discussion.

6.3.3.7 Research Question 3

Research Question 3 asks: What is the relationship between idiom comprehension and a) participant familiarity ratings and b) participant transparency ratings for EAL and EL1 Average and Above Average Readers? The ICM employed in the current study was used in Cain and Towse (2008). In all of Cain and colleagues' work on the idiom comprehension of children, the categorisation of idioms as being Real/Novel and Transparent/Opaque was carried out on the basis of adult familiarity/transparency ratings. The results of Research Question 1 showed that while idiom Transparency (as judged by adults) had a facilitative effect on idiom comprehension for participants in each of the 4 groups, idiom Realness (which may be linked to familiarity) had a significant facilitative effect for the EL1 Above Average group alone.

The inclusion of Research Question 3 in this project is one of the ways in which the current study built upon the work of Cain and colleagues (e.g. Cain et al.; Cain & Towse, 2008). It was of interest in the current study to examine whether the children's own perceptions of idiom familiarity and transparency were linked to the groups' ability to choose the target idiomatic response. Previous research has suggested that for 11 year old EL1 children, idioms which they judge to be more familiar and transparent are easier to understand (e.g. Nippold & Taylor, 2002).

Research Question 3a

For EL1 Above Average participants, significant (or near-significant) positive relationships existed between idiom comprehension and participant familiarity ratings for Real Transparent idioms when presented in Isolation (RTI), Real Opaque idioms when presented in Context (ROC) and Novel Transparent idioms when presented in Isolation (NTI). Where the RTI and ROC idioms are concerned, these results build upon the findings in Research Question 1. Not only does idiom Realness have a facilitating effect upon idiom comprehension for these EL1 Above Average readers, but these participants are aware that they have encountered these idioms previously. In the case of the NTI idioms, it seems that idioms which are perceived to be familiar (even though they are not) are also easier to comprehend than those which are perceived to be less familiar.

Where the EAL Above Average participants are concerned, the picture looks somewhat different. For these participants, reported familiarity with Novel Transparent idioms had a significant negative relationship with the extent to which these participants were able to provide idiomatic responses for these idioms when presented in Context. In other words, the more familiar the EAL Above Average participants reported these NT idioms to be, the less likely they were to provide an idiomatic response for NTC idioms. This result builds upon the finding in Research Question 1 which suggested that for EAL participants, Realness does not have a facilitative effect for the ICM. Here, it is clear that even perceived familiarity does not have a facilitative effect for these participants. Only the EL1 Above Average participants are able to use prior experience with idioms to their advantage when answering the ICM.

Research Question 3b

Only a small subset of participants (5-7 in each group) completed an idiom Transparency rating due to the limited time available for testing. The results obtained from these Transparency correlations are therefore less reliable than those carried out for Familiarity. Only 2 correlations between perceived Transparency and successful idiom comprehension are significant or approach significance and both are found for the EL1 Average readers. The correlation between higher perceived Transparency for Novel Transparent idioms with the successful comprehension of idioms approaches significance when these idioms are presented in the Isolation condition (NTI). This finding suggests that the more transparent participants perceive NTI idioms to be, the more likely they are to provide an idiomatic response. The opposite pattern is found, however, where Novel Opaque idioms are concerned. Here, the more Transparent the EL1 Average participants judged Novel Opaque idioms in Isolation (NOI) to be, the less likely they are to provide an idiomatic response.

These patterns suggest that the more transparent the EL1 Average participants perceive these Novel idioms to be, the more likely they are to provide an idiomatic response for them. While this result provides some evidence for the reliability of these children's Transparency judgements, it is not clear why no significant or near-significant correlations were found for the other 3 groups in the study. The small sample sizes mean that no strong conclusions may be drawn from Research Question 3b.

6.3.3.8 Research Question 3: summary

The results of Research Question 3a in particular support the finding from Research Question 1a that the EL1 Above Average group alone are successfully able to draw upon their prior experience with English language idioms with answering the ICM. Familiarity ratings seem reliable for this group alone. While it seems that Transparency ratings are reliable for the EL1 Average group alone, the small sub-sample sizes used in these analyses mean that these results should be accepted with caution.

6.3.3.9 Research Question 4

Research Question 4 asks: Does Idiom Comprehension predict variance on YARC Comprehension over and above that predicted by vocabulary for EAL and EL1 Average and Above Average Readers? This question explores the relationships between the groups' ability to provide idiomatic responses in the various conditions and their performance on the YARC Comprehension. Of particular interest will be any differing relationships between reading comprehension and i. semantic analysis and ii. inferencing from context for the 4 groups. The relationships between vocabulary and reading comprehension have been shown to be particularly strong where EAL learners are concerned (c.f. Hutchinson et al., 2003; Stuart, 2004; Burgoyne et al., 2009; 2011a; 2011b). It was deemed important, therefore, to examine the relationships between idiomatic responses on the various conditions of the ICM and reading comprehension independently of vocabulary. The results for each of the 4 groups will be considered separately.

EAL Average

Where the EAL Average readers are concerned, there are significant relationships between reading comprehension and idiomatic responses in 2 conditions of the ICM: the Novel Opaque Isolation (NOI) condition and the Novel Transparent Context (NTC) condition. Providing idiomatic responses in the NOI condition significantly predicts performance on the YARC Comprehension over and above a composite measure of all 6 TOWK subtests. As stated in Chapter 5, this result is extremely surprising. Because NOI idioms are novel, participants should never have encountered them before participating in this study. As these idioms are opaque, participants are unable to use semantic analysis to aid in their interpretation. As these idioms are presented in an Isolation condition, participants are unable to make use of supportive context to aid in their interpretation. Theoretically, therefore, there should be no significant relationship between idiom comprehension in the NOI condition and reading comprehension.

An examination of the EAL Average participants' responses to each of the 6 NOI idioms shows that for 2 of these idioms, 'to promise to eat the leaf' and 'the turtle is covered,' idiomatic responses constituted the largest proportion of responses (with 50% and 33% of responses respectively). It is unclear why these idioms receive so many idiomatic responses from the EAL Average participants. It is also unclear why providing idiomatic responses to NOI idioms overall significantly predicts reading comprehension when vocabulary has been controlled. One possibility is that this is an example of a Type 1 error which occurs when we believe there is a genuine effect when in fact there is not. When the level of statistical significance is set at .05, the probability of a Type 1 error is 5%. Given the large number of statistical tests carried out in this study, it is not unlikely

that a small number of Type 1 errors will exist. While this is not an ideal situation, it is important, in any research, to acknowledge the possibility that not all effects are genuine.

Where the NTC idioms are concerned, it is easier to explain why providing an idiomatic response for this type of idiom significantly predicts reading comprehension for the EAL Average readers. As these idioms are transparent, it is possible to use semantic analysis to aid in their interpretation. As these idioms are situated in a supportive context, it is possible to use inferencing skills to infer the meaning of the idiom. These results suggest that where the EAL Average participants are concerned, both semantic analysis and inference from context skills significantly predict reading comprehension when vocabulary has been controlled.

EL1 Average

For the EL1 Average group, however, no significant relationships are found between idiom comprehension in any of the 8 ICM conditions and reading comprehension once vocabulary has been controlled. For these children, semantic analysis and inference from context are less powerful predictors of reading comprehension than vocabulary. In other words, word-level semantic skill is more important in explaining reading comprehension than either sentence-level or discourse level semantic skills for these children.

EAL Above Average

The results for the EAL Above Average group also provide some evidence that the skills measured by the ICM are important predictors of reading comprehension for these participants. Providing idiomatic responses for both the Real Transparent Isolation (RTI)

and Real Transparent Context (RTC) idioms significantly predicted reading comprehension when a composite measure of all 6 TOWK subtests had been controlled while providing idiomatic responses for Real Opaque Context (ROC) idioms significantly predicted reading comprehension when a composite measure of TOWK expressive subtests had been controlled. The fact that these are all Real idioms is particularly interesting given the suggestion in Research Question 1 that the EAL participants in this study do not discriminate between Real and Novel idioms. It appears that while these EAL Above Average participants do not differ in the extent to which they provide idiomatic responses for Real idioms in comparison to Novel idioms, providing idiomatic responses for these 3 types of Real idioms significantly predicts performance in reading comprehension. The ability to draw upon prior experience of these English language idioms is linked to success in reading comprehension. It is not possible, however, to separate the predictive effects of this prior experience from those of the other 2 main skills measured by the ICM: semantic analysis (RTI and RTC idioms) and inference from context (RTC and ROC idioms). It appears that where the EAL Above Average participants are concerned, each of the 3 main skills measured by the ICM are important predictors of reading comprehension.

EL1 Above Average

Where the EL1 Above Average participants are concerned, idiom comprehension in both the NOI and RTI conditions significantly predicts reading comprehension when the 3 TOWK receptive subtests have been controlled. Although this NOI finding is not as strong as for the EAL Average participants (it is no longer significant when expressive subtests have been controlled) it is nevertheless surprising. It is interesting, therefore,

that as was the case with the EAL Average participants, the same 2 NOI idioms received a majority of idiomatic responses: ‘to promise to eat the leaf’ (43.5% idiomatic responses) and ‘the turtle is covered’ (52.2% idiomatic responses). As both and EAL and an EL1 group showed an idiomatic response bias for these 2 NOI idioms, it cannot be argued that this bias exists for one language group alone.

As was suggested in the case of the EAL Average participants, this significant relationship between NOI idioms and reading comprehension for EL1 Above Average participants may be a Type 1 error. Given the similar response patterns found for both groups, however, it is important to consider the possibility that these 2 idioms should not, in fact, be classed as ‘opaque’. The classification of the idioms used in the current study as being either transparent or opaque was based on pilot work with adults; their Transparency classification is subjective and may be inappropriate. Any future work using this particular ICM should consider this possibility.

As was the case with EAL Above Average participants, the finding that providing idiomatic responses for RTI idioms suggests that both the ability to use prior experience of idioms to aid in their interpretation and semantic analysis play a role in the prediction of reading comprehension. Again, this EL1 Above Average finding is not as strong as was the case for the EAL Above Average participants in that idiom comprehension in the RTI condition predicts reading comprehension when receptive but not expressive vocabulary has been controlled for the EL1 Above Average group.

6.3.3.10 Research Question 4: summary

For all groups, with the exception of the EL1 Average group, there was some evidence of semantic skills at the sentence level (semantic analysis) and at the discourse level (inference from context) predicting reading comprehension when semantic skills at the word level (vocabulary) have been controlled. The results of Research Question 4 have suggested that the relationships between the skills measured by the ICM and reading comprehension are stronger for EAL than for EL1 students, however. This finding suggests the importance of concentrating on a range of semantic-related skills where EAL children are concerned. It is of particular interest that for the EAL Above Average group, only Real idioms significantly predicted reading comprehension. This finding suggests the importance of familiarising EAL children with English language idioms in speech and in print. Finally, it was suggested that the classification of 2 NOI idioms, ‘to promise to eat the leaf’ and ‘the turtle was covered’ may be inappropriate.

6.4 Chapter 6: summary

This chapter has provided a detailed discussion of the findings presented in Chapters 4 and 5 of this thesis. Specifically, the discussion has focused on the 2 major ways in which the current study builds upon previous UK EAL research: i. by investigating groups of EAL children who do not struggle with reading comprehension and ii. by administering a broader range of semantic measures than has been used in previous UK EAL studies. During the course of this discussion, a number of key findings have emerged. These key findings will be detailed in Chapter 7.

Chapter 7: Conclusion

The foundation of the current study is the body of literature which has examined the comprehension and semantic skills of EAL children in the UK. It was argued in Chapter 2 of this thesis (c.f. section 2.3.4) that this literature has 2 main limitations: i. it focuses exclusively on EAL children who struggle with reading comprehension; ii. only receptive and expressive measures of vocabulary breadth have been used to examine the semantic abilities of these children. The current study builds specifically upon these limitations. In so doing, it has succeeded in making a number of original contributions to knowledge. These contributions may be described as a set of ‘key findings’. This chapter will provide the following: a discussion of this study’s key findings; the limitations of the current study; some suggestions for future research directions; concluding remarks.

7.1 Key findings

7.1.1 The decoding skills of UK EAL children

The current study has clarified EAL/EL1 group differences where decoding, a fundamental aspect of the A-frame, is concerned (c.f. section 2.2.1). Previous UK EAL studies suggested that EAL children do not experience difficulties in either single word reading or word reading in context. The current study has built upon these findings by showing that while there were no significant differences in the performance of this study’s EAL and EL1 participants on the NARA-R Accuracy (a measure of word reading in context), the EAL group significantly outperformed their EL1 peers on the TOWRE PDE (a measure of nonword decoding). These findings suggest that the EAL and EL1

children in this study are not identical in the way in which they approach word reading tasks; the EL1 children rely more on semantic and syntactic cues than their EAL peers, who appear to focus more on graphophonic cues.

7.1.2 The reading comprehension skills of UK EAL children

The picture painted by previous studies is that UK EAL children are a homogeneous, underachieving group in terms of their reading comprehension ability. The current study challenges this simplistic view and shows that while it is true that relatively more EAL than EL1 children ranked within the lower 33.3% of the Screening sample for YARC Comprehension, 25 EAL children ranked within the higher 33.3% of the sample on this measure. These findings show firstly, that there is variation in the reading comprehension abilities of UK EAL children and secondly, while some EAL children do struggle with reading comprehension, others excel. The current study is unique amongst UK EAL studies in sampling EAL children who do not struggle with reading comprehension.

7.1.3 The relationship between L2 proficiency and L2 reading comprehension for UK EAL children

No previous studies in the UK have examined the relationship between the EAL children's familiarity with English and their L2 reading comprehension ability. The current study suggests that EAL children who are judged by their teachers to be not yet fully proficient in English are almost 4 times more likely to be ranked in the lower 33.3% of the Screening sample for reading comprehension than are EAL children who are judged by their teachers to be fully proficient in English. This finding suggests that these

(not fully proficient) children's lower comprehension scores are linked to the fact that their English language skills are still developing.

7.1.4 The value of the L1 in supporting L2 comprehension-related outcomes for UK EAL children

Information gathered from the LBQ suggests the value of the L1 in supporting L2 reading outcomes for UK EAL children. Specifically, there is evidence that greater L1 exposure in terms of printed materials is positively related to ICM outcomes for the EAL Average group. Furthermore, it appears that increased conversation with other L1 speakers and exposure to the L1 through television, films, music and the radio is related to higher English reading comprehension scores for the EAL Above Average group. These findings suggest the importance of maintaining and developing EAL children's L1s to enhance L2 educational outcomes.

7.1.5 EAL/EL1 differences on word-level vocabulary measures

The results of the current study suggest that even EAL children who excel in English reading comprehension score significantly below their EL1 peers (with whom they are matched on a range of reading-related variables) on both the TOWK Expressive Vocabulary and TOWK Multiple Contexts subtests. This finding suggests that EAL and EL1 children are not identical and that even those EAL children with the strongest L2 reading skills will require support to develop English vocabulary.

7.1.6 EAL children's working memory skills

The results of the current study suggest a working memory advantage for EAL children in comparison to their EL1 peers when a measure of Backwards Digit Recall is used. This finding suggests that these language groups are not identical in terms of executive function and points to the need for further research in this area.

7.1.7 Semantic analysis and inference from context

The results of the ICM showed that both EAL and EL1 participants in the current study were equally able to engage in semantic analysis and inference from context. In other words, these language groups do not differ in their semantic abilities at the sentence and discourse levels. Where both EAL and EL1 participants are concerned, Above Average readers are more able to successfully engage with these skills than are Average readers. These findings provide some evidence that the ICM is a reliable measure of these skills for both EAL and EL1 children.

7.1.8 Prior experience with English language idioms

The EL1 Above Average group alone were able to use prior experience with English language idioms to their advantage when answering the ICM. This finding provides evidence that the EAL and EL1 participants in this study are not identical in terms of their English language experience and abilities.

7.1.9 The skills used by EAL and EL1 children when completing the ICM

The EAL children's performance on the Expressive Vocabulary measure entirely explains their performance on the ICM. Given that these EAL participants scored significantly below their EL1 peers on this Expressive Vocabulary measure, a key suggestion of this thesis is the importance of developing EAL children's Expressive Vocabulary skills to aid with their performance in both semantic analysis and inference from context. Where the EL1 participants are concerned, performance on this Expressive Vocabulary measure was shown to be important for semantic analysis and particularly important for inference from context. It does not, however, exert as strong an influence over these children's performance on the ICM as is the case for EAL children.

Where the EAL participants are concerned, performance on the TOWK Multiple Contexts is linked to these children's ability to engage with semantic analysis. For the EL1 participants, performance on this Multiple Contexts subtest is linked to their ability to utilise their prior experience of multi-meaning words and phrases. As was the case when the Expressive Vocabulary subtest was used as a covariate, controlling the influence of the TOWK Multiple Contexts removed the significant between-groups effect for the EAL group but not for the EL1 group. This pattern suggests that the EAL group rely more heavily on their word-level semantic abilities when completing the ICM than do the EL1 group.

7.1.10 Relationships between performance on the ICM and reading comprehension

The relationships between the skills measured by the ICM and reading comprehension are stronger for EAL than for EL1 students. This finding suggests the importance of developing the semantic abilities of EAL children not only at the word level, but also at the sentence and discourse levels. The finding that only Real idioms significantly predicted reading comprehension for the EAL Above Average group suggests the importance of familiarising EAL children with English language idioms in speech and in print.

7.2 Limitations

This study has a number of limitations which should be borne in mind when considering the key findings and main arguments of this study.

7.2.1 Sampling

As non-probability sampling was employed for the Screening Phase, the participants in this study cannot be argued to be representative of the population and the results of the study will not be statistically generalisable to the population. In particular, the available FSM and postcode data suggests that the participants in both the Screening Phase and the Main Phase live in homes which are of higher SES than the national average. Given the link between higher SES and higher educational attainment (e.g. Hobbs & Vignoles, 2007; DFE, 2011c), it is likely that the achievements of this study's participants in measures such as the YARC Comprehension are higher than would be expected given a

representative sample. It was also not possible in this study to control for any potential school effects.

For the Main Phase, the number of participants in each of the 4 groups (EAL Average [n=24], EAL Above Average [n=22], EL1 Average [n=24], EL1 Above Average [n=23]) was rather low. Therefore, it is impossible to be certain that a Type II error does not exist where the 2-way ANOVAs carried out to ascertain whether EAL/EL1 participants were matched on Chronological Age, WASI Matrices, TOWRE PDE and YARC Accuracy, Rate and Comprehension are concerned (c.f. Table 5). The G*Power programme suggests that these ANOVAs have a β value of 0.08 to detect an effect of .1, a β value of .28 to detect an effect of .25 and a β value of .70 to detect an effect size of .4. The possibility of a Type II error can therefore not be discounted.

7.2.2 Measures used

In all research involving human participants, especially children, is necessary to strike a balance which allows the researcher to collect enough high-quality data to adequately answer the research questions while not exposing the participants to an excessively large battery of tests. It is acknowledged that measures which were used in this study did not capture the full extent of participants' knowledge and skills in terms of comprehension and semantics. However, care was taken to choose measures which yielded a good deal of rich data. This has contributed to an understanding of the comprehension and semantic skills of EAL and EL1 Average and Above Average readers.

A more pertinent concern regarding the use of English-only measures is the possibility of linguistic or cultural bias (c.f. García, McKoon & August, 2008, p.252-3). None of the

measures which were used in this study have been specifically developed with an EAL population in mind. However, the researcher is not aware of any standardized tests with UK EAL norms which could have replaced any of the standardized tests used in the current study. While the British Picture Vocabulary Scale, 2nd edition (BPVS-II, Dunn et al., 1997), a test of receptive vocabulary, does include a technical supplement with UK EAL norms, these provide standard scores for children up to the age of 8 years and 5 months only (the participants in the current study were 9-10 years old). Each individual standardized and unstandardised measure employed in the current study was deemed to be the most appropriate measure available for the purpose required (c.f. sections 3.6 and 3.7). However, the significant difference in scores between the EAL and EL1 participants on the TOWK Expressive Vocabulary and Multiple Context subtests raises the question of possible test bias against EAL participants (see section 7.3.3).

7.2.3 Constraints on time and resources

As is the case with most small-scale research projects, the time available for carrying out this research project was limited. As a result, some compromises had to be made. Specifically, it was possible to run the idiom Transparency rating with only a small subsample of each of the study's 4 groups. As such, the results of Research Question 3b should be treated with caution.

In addition, it was not possible to run any L1 measures with the study's EAL participants. While the LBQ in particular provided insight into participants' L1 use, more specific information regarding, for example, EAL participants' reading ability in their L1 was unavailable. It was not possible, therefore, to accurately examine the relationships

between L1 literacy and L2 comprehension-related outcomes in the current study. However, this information was not essential for answering the study's research questions.

It is important to stress the fact that this project is the first in the UK to investigate i. variations in the reading comprehension abilities of EAL children and ii. the broader semantic skills of these children beyond the word level. As such, this research is not intended to be definitive, but rather a much-needed first step in investigating these important and as yet under-studied areas.

7.3 Suggestions for future research

Throughout this thesis, a number of areas in which further research is required have been identified.

7.3.1 Decoding

In the Screening Phase of the current study, it was found that the EAL participants scored significantly higher than their EL1 peers on the TOWRE PDE, a measure of nonword reading which includes a speed component. Previous, non-UK research has suggested that EAL and EL1 participants tend not to significantly differ on measures of nonword reading which do not include a speed component. These differing findings raise the question of whether EAL children are equally as accurate as, but relatively quicker than their EL1 peers at nonword reading. The question of whether experience of reading an L1 which is orthographically more transparent than English (c.f. D'Angiulli et al., 2001) may have a facilitative effect on English decoding is also raised.

7.3.2 The relationships between SES, the L1, and L2 reading comprehension for EAL children

The results of the current study suggest that exposure to an L1-rich environment does not prevent EAL children from achieving high levels of L2 reading comprehension. As it was not possible to directly measure the EAL participants' L1 oral and literacy abilities, however, the precise relationship between L1 oral and literacy development and L2 outcomes requires further examination. The results of the current study also suggest that the role of SES should not be discounted. Both FSM and post code data have suggested that the EAL and EL1 participants in the Main Phase of this study tend not to represent the most deprived children nationally, a factor which may be linked to their relatively high achievement in reading and reading-related standardised measures. Further research is required, therefore, to disentangle the relationships between L1 and L2 ability, SES and reading comprehension for EAL children in the UK.

7.3 3 Vocabulary

In order to build upon the current project, it would be of interest to carry out research which has the aim of identifying more precise areas of vocabulary which pose difficulty for EAL children in comparison to their EL1 peers. It has been suggested in the current study that even those EAL children who excel in reading comprehension seem to lag behind their comprehension-matched EL1 peers on TOWK Expressive Vocabulary and Multiple Contexts. It is possible that EAL children also experience relative difficulties in other aspects of vocabulary which were not measured in the current study.

The issue of potential test bias was also raised in the current study. It is unclear whether the EAL participants in the current study lack the required semantic knowledge to perform on the TOWK Expressive Vocabulary and Multiple Contexts at the same level as their EL1 peers and/or whether the relative difficulty of expressive in comparison to receptive vocabulary tests is greater for EAL than for EL1 children. This issue requires further research.

7.3.4 Working memory

There have been mixed results in the literature regarding the working memory skills of emergent bilingual children in comparison to their EL1 peers (Engel de Abreu, 2011; e.g. Lesaux, Lipka and Siegel, 2006; Morales, Calvo and Bialystok, 2013). The results of the current study are in line with Morales and colleagues in suggesting that EAL children score significantly above their EL1 peers on a measure of working memory. Further research is required to tease out the reasons for these conflicting results in order to establish the precise nature of any working memory advantage for bilingual children. Particular emphasis should be placed on the impact of different working memory test types on the performance of EAL children.

7.4 Concluding remarks

The following main arguments are made on the basis of the current study:

1. Not all UK EAL children struggle with reading comprehension. For those who do, a lack of L2 proficiency is likely to be a contributing factor.

2. Even UK EAL children who excel in reading comprehension differ from their comprehension-matched EL1 peers on measures of expressive vocabulary breadth and depth.
3. It is particularly important to develop the vocabulary abilities of EAL children, as the relationships between word-level semantic skills and sentence/discourse level semantic skills are stronger for EAL children than for their EL1 peers.
4. The relationships between the knowledge and skills measured by the ICM (i.e. prior knowledge of English language idioms; semantic analysis; inference from context) and reading comprehension are stronger for EAL than for EL1 children, suggesting the importance of a comprehensive approach to the semantic development of EAL children.

These arguments represent an original contribution to knowledge beyond what was previously available. This study provides an important antidote to previous UK EAL research which has tended to view the L2 comprehension skills of EAL children in terms of a deficit and which has provided an overly-narrow examination of these children's semantic skills.

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