

**The Influence of First Language Aptitude and Print Exposure (Arabic) on Foreign Language
Learning Performance (English)
And the Effectiveness of the General Aptitude Test in Saudi Arabia**

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**A thesis submitted in partial fulfilment of the requirements of Liverpool John Moores
University for the degree of Doctor of Philosophy**

March 2020

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0.0 Abstract

This study seeks to examine areas of influence of the first language on the second language that have not yet been explored, supported or evaluated in the domain of language skills transfer. The extent that one's ability in one's first language (L1) can predict success and performance in learning a second language (L2) is of special interest to researchers of second language acquisition (SLA). This area of study seeks to better understand language learners and the factors involved in learning a new language.

Cross-linguistic influence (CLI) is a phenomenon the presence of which is confirmed by investigations into speakers' language performance in many aspects of language. However, most of the studies have been concerned with Indo-European languages which use the Latin script. This study investigated the influence of Arabic, which is a Semitic language that uses a different script to that used in English. It focuses on reading skills and exposure to print deriving from the premises of the interdependence hypothesis that all languages share common cognitive mechanisms. This study aimed to report on CLI for English FL adult learners. Moreover, the study examined the role of other influential factors for foreign language learning (FLL) that are thought to affect the relationship, such as motivation and learning strategies.

Understanding the relationship between performance in Arabic as a first language and English as a second language is important because, in Saudi Arabia, admission to English language courses at university is determined by the General Aptitude Test (GAT) which is a test of students' aptitude in Arabic. This study, therefore, evaluates the effectiveness of the GAT to predict students' performance on English courses. Previous studies have found the GAT is effective in predicting overall performance at university, but this study focusses on English language performance and reading skills in particular. This study also analysed different constructs within the test to identify which ones may be more effective predictors of English language performance.

Data were collected from tests and questionnaire involving 248 students at a Saudi university. Analysis included correlation, regression and path analyses to test the study's hypotheses regarding the proposed relationships, whether directly or indirectly. The main findings were as follows: 1. There is a moderate and predictable relationship between aptitude in Arabic and English reading skills. 2. There is no relationship between print exposure in Arabic and performance in English. 3. The GAT is effective in predicting performance in English language courses at university. 4. Intrinsic motivation and problem-solving learning strategies can moderate the relationship between the L1 and L2.

These findings contribute to the body of research in relation to cross-linguistic influence, specifically in relation to Arabic speakers learning English. It also provides support for the application of the GAT as a requirement for university admission to English language courses in Saudi Arabia and can inform policymakers regarding the use of GAT in other Arabic-speaking regions. Aptitude in Arabic, with students having an intrinsic motivation for learning languages and adopting problem-solving strategies for learning can contribute to the prediction of performance in an English language programme at university.

Declaration

No portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

SIGNATURE _____



DATE 06/03/2020

Acknowledgement

All praise belongs to Allah alone Who blessed us with this life, created us with the best traits and granted us intellect, all to reflect, observe and endeavour to persevere our best and live the way He wants us to thereby. To Him we shall return; We seek refuge in Him and ask for His forgiveness for any flaws and mistakes.

Secondly, I send my prayers and blessings to our beloved and role model, Prophet Muhammed – peace be upon him – who conveyed to us the eternal pure message which we follow and according to which we practice our lives, adhering to his teachings and traditions to the best of our ability. Thereafter, acknowledgement should be given to two bodies in Saudi Arabia and to all of the people involved in making this research project possible. The two bodies that provided the data and made them accessible are The National Centre for Assessment and the Faculty of Languages and Translation at the Imam Muhammed Ibn Saud Islamic University (IMSIU). This study was funded by a scholarship granted by IMSIU and in cooperation with the Saudi Cultural Bureau in London.

Next, I would like to express my sincere gratitude to the main Director of Studies and the supervisory team, Amanda Mason, for the continuous support, guidance and passion about my research project and for the comprehensive and constructive feedback I have always received. I am also thankful to Brigitte Hordern and Catherine Groves for their time, feedback and support. Special thanks go to my loving and proud parents, Abdullah and Noura, and my beloved, wise wife, Nada, for their patience caring, sincere thoughts and prayers, and innumerable sacrifices. I am blessed with two children whom I cherish, Abdullah and Ghada; you bring joy to my life. I am happy to see you grow up, learn and prosper. Finally, a word of sincere appreciation must be given to my family members and in-laws, close friends, colleagues, inspired teachers, people at conferences and any others who stood by me during my learning journey and during my stay in the United Kingdom for their advice, thoughts and support. “He who does not thank the people is not thankful to Allah” (Prophet Muhammed ﷺ, Sunan Abi Dawud, no. 4811). To those who read, cite or benefit from my work, thank you. I hope you find it useful. Any flaws found within are the result of my human imperfection!

I dedicate this work to the dearest of grandmothers, Haya and Monera.

Key Terms

The terms below are frequently used throughout this thesis. In order to clarify their usages herein, brief explanations are given:

- **Achievement:** Achievement refers to language competence either in the L1 or the L2 that is exhibited in the performance of the language.
- **Aptitude:** Aptitude is the ability to learn a language, whether a first or a subsequent one. It is regarded as innate but can also be enhanced by experience.
- **Cross-linguistic influence and skills transfer:** The influence of one's language on another language. In the present study, it refers to the positive impact of skills gained from the L1 to foster learning of the L2. Skills transfer is usually a synonymous term for cross-linguistic influence.
- **Individual differences:** This refers to the differences exhibited between learners due to the individual traits that each has, such as motivation for learning, language aptitude and opportunities that lead to improving language proficiency, such as print exposure.
- **Language acquisition and learning:** Language acquisition is sometimes distinguished from language learning when the two terms are used together. Language acquisition may occur without conscious effort and language learning occurs with conscious efforts. However, the two terms are used interchangeably in this thesis, whether meaning learning an L1 or L2 consciously or unconsciously.
- **Learning performance:** Learning performance refers to the achievement a learner can exhibit in any form of output. In the present study, it also refers to scores in English language courses.
- **Moderator and interactor:** These are statistical terms referring to the role of a factor that works or interacts to moderate or to strengthen the relationship between two other variables in a regression analysis. For example, motivation for learning English as a foreign language affects L1 skills transfer.
- **Predictor:** If a factor or a score on a test can predict another, this means the higher the score is the higher the predicted factor will be. For example, the higher the score a student obtains in the General Aptitude Test before going to university, the higher his or her score will be in English language tests at the university.
- **Print exposure:** This is the amount of literacy-related activities and the environmental experiences in which a person is involved, and which is considered to enhance one's exposure to printed language such as the availability of reading resources. Print exposure can improve language achievement.
- **Second language and foreign language:** Learning a second (L2), a third, a fourth, etc. language may take place during childhood, especially in a country that recognises the L2 as an official language or where it has a particular cultural or historical status. A foreign language (FL), on the other hand, is one that a country regards as a foreign language or that students learn after childhood. Since L2 is a broader term, L2 and FL are used interchangeably in this study to refer to the language learned during adulthood, particularly where that learning takes place in a classroom.
- **Variances:** This refers to how much a variable can explain variances in another variable.

For example, language aptitude can account for X percentage of the score on a university language course. Other portions of the percentage value are attributed to non-cognitive factors, such as time spent studying.

List of Abbreviations

CLI	Cross-linguistic influence
EFL	English as a foreign language
FLL	Foreign language learning
GAT	General Aptitude Test
GPA	Grade point average
ID	Individual differences
IMSIU	Imam Muhammed Ibn Saud Islamic University
L1	First language
L2	Second language
LT	Language transfer
LS	Learning strategy
NCA	National Centre for Assessment
OLAT	Oriental Languages Aptitude Test
PE	Print exposure
SLA	Second language acquisition

Chapter One

Introduction

1.1 Introduction

This study aimed to investigate the influence of aptitude in reading-related skills and that of exposure to print in the first language (Arabic) to predict performance in the second language (English) for university students in Saudi Arabia. Chapter One introduces the study by providing a background for the main concepts and contexts of the study, namely first language acquisition, second language learning, cross-linguistic influence, learning to read in the second language, print exposure, learning English in Saudi Arabia, higher education in Saudi Arabia, the General Aptitude Test and the Oriental Languages Aptitude Test. This is followed by a statement of the problem as well as the justification and importance of the study. The aims of the study, the research questions and the objectives come at the end of the chapter.

1.2 Background of the study:

1.2.1 First language acquisition

First language acquisition refers to the process of learning the first language (L1), or mother tongue, that a child encounters. Learning the mother tongue occurs naturally as a part of the maturation process and is inevitable (Corder, 1967) in normal circumstances. This exposure and learning of the L1 starts from birth. However, a child's first language ability can be influenced by brain development during gestation and the conditions of that gestation (Laplante et al., 2004). Several social factors and cognitive development affect language acquisition during the initial years of development. This, in turn, can determine differences in language ability between first language learners (Clark, 2009).

Language itself consists of intricate features that learners acquire at different stages. Individuals may differ in the degree and stage of acquisition even if they are in the same age (Dabrowska and Street, 2006). Thus, language ability is what the individual is capable of in terms of language production. Language aptitude is the potential and special capacity for learning and developing the language and exhibited in language competence (Ellis, 2015). Aptitude is often discussed in terms of readiness of learning a second language. However, it is also applicable to discussing the first language different abilities (Kormos, 2013; Bylund, et al., 2010).

Aptitude has a complex set of characteristics (Biedroń and Szczepaniak, 2009) and they differ widely (Ellis, 2015). In the case of first language constructs, they are inferencing, analysing, patterning and reasoning (Al Saud, 2009). These skills of aptitude may develop during the developmental processes through which individuals pass in their first language learning. These skills may vary from one person to another due to the various learning conditions each individual's experiences. These eventually shape the learner's own unique system.

This research explored and analysed how the first language influences the second language on the assumption that similar cognitive processing underpins learning them. More discussion is given in the first part of the literature review with regard to theories and concepts in language acquisition.

1.2.2 Second language acquisition

Second language acquisition (SLA) refers to the process of language learning that takes place after acquiring the mother tongue (Ellis, 2015). The field of SLA pertains to studying the practices of language learning (VanPatten and Benati, 2015). Learning a second language (L2) usually begins after the first language has matured. In this case, learning the L2 interacts with an existed and established one, i.e. the L1 (Corder, 1967). Hence, the predisposition of the L1 is affected by another force (ibid).

In fact, learning a second language may take place either during childhood, while the first one is still developing, or during adulthood, after the L1 is established. SLA studies seek to understand how learners acquire this additional language. Ellis (2015) states that when studying SLA, it should begin with the effect of L1 acquisition. This is because the key issue lies in the differences and similarities between the acquisition of each. While learning the first language appears to be somewhat effortless and relatively quick, learning a new language, particularly in adulthood, is a long and quite difficult journey (Ortega, 2009), requiring motivation that is not applicable in learning the L1 (Corder, 1967).

However, the degree of difficulty and learning rate differ from one learner to another (Dörnyei, 2015). Various factors contribute to this phenomenon; these factors have been and continue to be the subject of research. This issue of difficulty in language learning can be traced back to the fact that language, as a part of human nature, consists of varied yet intricate aspects, making learning it a highly complex process. Thus, its learning outcomes cannot be predicted simply from one or a few factors (Ellis, 2015).

There are different factors involved in shaping the unique system of a second language learner. Learning performance in the L2 can be attributed to variant forces related both to the learner and to the context where learning takes place (Ellis, 2015). These learner-related factors can be, for instance, language aptitude, learning achievement, motivation and learning strategies adopted.

They can also be context-related factors, such as exposure to print, environmental support and experience in learning (Han 2015). These factors need to be integrated into a model that can provide a more accurate prediction of L2 learning as this study sought. This study seeks to create a learning model that incorporates and explains the complexity inherent in second language acquisition through a cross-linguistic approach between Arabic (L1) and English (L2). A review of second language learning was covered with regard to these factors in the literature chapter.

1.2.3 Cross-linguistic influence

Cross-linguistic influence (CLI) is “the influence of a person’s knowledge of one language on that person’s knowledge or use of another language” (Jarvis and Pavlenko, 2007, p.1). This can be in the production or competence in the target language. It can also extend to the behaviours related to the way speakers of the target language use it, such as gesturing, reaction time and even conceptual knowledge (Jarvis and Pavlenko, 2007; Jarvis, 2012). CLI is clearly exhibited in the influence of the L1 on the L2 as it characterises the learner's initial state of mind when beginning to learn the L2 (Chomsky, 1989; 2000).

Second language learners play an active role in utilising knowledge and experience gained from one language in learning another language (Kuo and Anderson, 2008; Han, 2015), but in which aspects of skills/sub-skills? A number of studies have shown that students with more highly developed first language skills, such as decoding, acquiring complex structures early and phonological awareness, exhibit stronger second language skills than those with less developed first language skills (Koda, 2009; Sparks et al., 1998; Dabrowska and Street, 2006; Sparks et al., 2012). However, what really transfers? In what conditions? Which tasks are involved?

From the early stages of learning the L1, language aptitude develops and is well-established before adulthood. Hence, this trait of aptitude may contribute significantly to the commencement and development of an L2 later in life. Language aptitude involves many skills that can contribute to the rate of learning the L2 (Ellis, 2015). These are phonemic coding, grammatical sensitivity, ability in inductive language learning, rote-learning ability and making associations between L1 and L2 (Carroll and Sapon, 1959). It also involves processes which the learner uses. These are noticing abilities of the L2 input, constructing patterns of the L2, controlling the input and then processing the input as chunks rather than rules (Skehan, 2002). These skills and processes may make cross-linguistic influence occur because they were developed and affected by the L1 acquisition. Moreover, learners may vary to different degrees in their ability in these skills.

Cross-linguistic influence is thus seen as central to L2 learning as previously developed L1 ability affects competence of L2 despite the apparent differences between the two languages as stated by the interdependence hypothesis (Cummins, 1979; 2000). In this hypothesis, Cummins claims that linguistic skills a child has from the L1 could foster the ability to learn an L2. However, Cummins's early work accounted for bilingual children learners.

With regard to adult learners, the studies in the literature still present conflicting results. Based on the interdependence hypothesis premise, Cummins developed the threshold hypothesis whereby he states that skills transfer will not occur until a learner reaches a minimum level of L2. This minimum baseline of proficiency is not consistent in the literature, perhaps due to the different contexts in which this hypothesis has been investigated. Therefore, defining the level where learners can transfer skills from the L1 is necessary for learners from different L1 backgrounds and L2 target languages.

Moreover, most of the previous studies have examined these hypotheses between languages of the same alphabetic scripts; the Latin script within Indo-European languages. This study seeks to contribute to the understanding of the relationship found between Arabic and English.

From another angle, languages differ in their features, such as the sound range, grammatical structures and writing systems. These differences may affect acquisition across languages and depending on each language's features and what each allows (Clark, 2009) in terms of, for instance, phonemic or grammatical rules. For example, Arabic does not have a fixed word order while English requires the words to be in a certain order. Hence, these differences between languages and between learners make it a vital area of inquiry that seeks to define, explore and investigate what they provide to explain the nature of the relationship between first and second languages, as well as the role that L1 ability plays to influence learning the L2.

In addition, in order to better understand the nature of CLI, this study considered motivation and learning strategies as facilitators for the influence to occur. The reason for this is that

motivation is seen as the driving force for learning and the learning strategies represent the steering wheel for the learning journey. Combining these factors when studying cross-linguistic influence will help provide an explanatory framework for SLA and the relationship between abilities in Arabic (L1) and English (L2).

1.2.4 Learning to read in the second language

Reading is one of the four main skills that second language learners learn. It is, in fact, a key part of studying at university level, which is the level at which the present study takes place. In addition, high-stakes tests, such as the GAT, rely heavily on reading and its sub-skills in order to make valid assumptions about test takers and their ability to perform at university. Reading skills are, therefore, a crucial element for success in formal education.

Reading is a multi-task skill that involves many cognitive processes. These processes are universal across languages (Grabe, 2009; Koda, 2005). The processes include, but are not limited to, visual recognition of print, corresponding letters to sounds and synthesising text for comprehension. Reading uses metalinguistic knowledge which is universal and grasps the general functioning in the abstract structures of language in areas such as phonological, semantic, morphological, syntactic and grapheme awareness and once it is well-developed, it regulates the linguistic input perception and interpretation and can guide the learning process (Kuo and Anderson, 2008).

However, most of the studies in reading have examined its process and the behaviours involved rather than its product or outcomes, such as comprehension. Thus, the current research employed reading as a focus on aspects of cross-linguistic influence from the L1 on the L2. Koda (2005) explains that cross-linguistic influence occurs in reading because of mind habits developed during L1 development that instil certain processing mechanisms that can be used while reading in the L2. Hence, in order to better understand SLA reading, the role of L1 literacy skills ought to be investigated (Hudson, 2007) from a wide range of L1 backgrounds.

1.2.5 Print exposure and achievement

Print exposure (PE) refers to the quantity of literacy-related activities, such as extensive reading outside school, and environmental experiences, such as being surrounded by avid readers and availability of resources that expand one's exposure and access to printed materials (Stanovich, 2000). PE enriches first language achievement (Hayes and Grether, 1983; Stanovich, 2000) which will exhibit differences between learners in their language abilities.

Hurmuz (1987) and Kamal (1997) state that early literacy experience in Arabic enhances future achievements. However, there is little evidence in the literature about this role and the role of print exposure during the school years to enhance cognitive development in the same language, Arabic, and also in the development of the L2, English. The question is, given that PE in a language improves learning and developing the same language, can PE in one language affect learning another language? This study was conducted to analyse PE in the L1 and its impact for future L2 learning between Arabic and English.

1.2.6 Learning English in Saudi Arabia

English is considered a foreign language in Saudi Arabia, where it has no historical or governmental presence (Bolton and Kachru, 2006). English in Saudi Arabia is in the expanding circle of World Englishes according to Kachru's model¹. However, the level of English performance in Saudi Arabia is considered generally low and is combined with ineffective teaching practices (Al-seghayer, 2011; Al-seghayer, 2017). English was introduced into state schools as a subject of study in 1960 (Al-seghayer, 2011). Since 2011, students start to learn English as a school subject at the age of ten which is late in the primary phase. Before 2003, however, students used to begin learning English at the age of thirteen. From 2003 to 2011, English was taught from the age of twelve in state schools. Since 1982, the number of weekly periods of English has varied between the different types of schools from one forty-five-minute class per week to four forty-five-minute classes throughout late primary, intermediate and high school (Ministry of Education, 2016; Al-seghayer, 2011).

Once students graduate from high school and proceed to university, they usually begin with a foundation year depending on which major they are going to study. The number of weekly hours of English in the foundation year for an English undergraduate is twenty, compared with sixteen for other majors across most Saudi universities including the present research setting, Imam Muhammed Ibn Saud Islamic University in Riyadh (IMSIU, 2016). Participants were chosen for the present study from classes in the foundation year who are going to study English language and literature at the undergraduate level

English learning in Saudi education before university suffers from insufficient teaching hours and language practice inside and outside of school, but at university, students are exposed to intensive English. The current study targeted adult learners of English progressing towards competency in a context in which English is regarded as a low priority foreign language. Thus, this study explored the influence of Arabic as an L1 has on English as an L2 in the case of university students in Saudi Arabia.

1.2.7 Higher education in Saudi Arabia and the General Aptitude Test

Higher education in Saudi Arabia began in the 1950s. However, it was unpopular to go to university at first; only 21 students enrolled in 1957 when the first university was founded in the capital city of Riyadh (Al-Shaikh, 1972; KSU, 2020). There are two possible reasons for this: First, the population of the city was only 80,000 at that time (Alriyadh, 2020). Second, the vast majority of the population was either spread out in different rural towns and villages or were nomadic Bedouins moving around the desert. So, students rarely completed their basic learning or were involved in labour, trading or farming occupations.

¹ According to Kachru (2006), the concept of 'world Englishes' gives a framework for understanding English language spread and function around the globe. It presents three categories, or circles, where English is spoken in a certain region and what variety it is there. The first set includes the Inner Circle where English is the original language and is dominant, in countries, such as the UK, US and Australia. The second is the Outer Circle where English has a long history and an official status, such as Nigeria, India and the Philippines. The third is the Expanding Circle where English varieties are developing mainly for international use and innovation such as Japan, China and Korea.

With the boom in the country's oil industry, radical changes occurred, including urbanisation, with increasing numbers of people moving to cities, which had an impact on social development. For example, Riyadh's population had risen to around 6,500,000 by 2018 (Alriyadh, 2020) and the number of high school graduates stood at 345,320 in the same year (MOE, 2020).

The number of schools built therefore increased, and various new jobs were created. As a result of this as well as many government initiatives, the number of university applicants who would go on to fill these jobs in the future increased dramatically in the following decades of the initial years of higher education inception and around 95% of high school graduates would head to university at the present (MOE, 2020).

In response to the number of applications for admission and the uncertainty related to the reliability of high school exams (Albilad, 2019) and because of the inflation of high school grades (Al Saud, 2009; NCA, 2016), the government commissioned the National Centre for Assessment (NCA) to "provide comprehensive and integrated solutions that scientifically measure and evaluate knowledge, skills, and aptitude with the purpose of achieving fairness, maintaining quality and satisfying development needs" (NCA, 2016, line 1).

The NCA then introduced a standardised high-stakes test in 2003 called the General Aptitude Test (GAT) and continues to expand the use of its versions and applications. Several other countries now use it for university admissions, such as Oman and Bahrain.

The General Aptitude Test is in Arabic. It is intended to help higher education institutes choose those applicants who are likely to succeed in their chosen areas of study. The test has, in fact, caused frustration among parents and students and is considered a burden for both. It is seen as unfair to give such weight to the test in terms of admission decisions in light of twelve-years of study prior to university (Akhbar 2013; Hashem, 2009; Alriyadh, 2013). The test has enormous ramifications every year for students who have to take it. The number of students who sat its sessions in 2017 (NCA, 2020) was 314,113 which indicates a high impact on a large population.

There is debate regarding using the GAT as a requirement for university admission and its power and validity to predict students' success (Albilad, 2019; Okaz, 2019) whenever the test takes place because of the impact it has on students' future academic and professional lives.

Nevertheless, high-stakes standardised tests and university admission tests are claimed to be good predictors of academic performance (Misanchuk, 1977). This also applies to the GAT (Alanazi; NCA, 2016; Al Saud 2000). However, there is continuous research and investigation into the test as the developer, NCA, is keen to improve its products (NCA, 2020).

Most of the studies conducted have investigated the test's total scores as a predictor of university final semester or year grade. There is no evidence available about the GAT's ability and its breakdown constructs to predict particular university courses, such as English BA major, and language performance. Thus, this study evaluated the GAT as a predictor for university success in studying English as a foreign language.

Academic success has been predicted from cognitive factors, such as performance in a test (Pentages & Creedon, 1978; Alshumrani, 2007). However, there is also a need to include other non-cognitive factors, such as print exposure, motivation and learning strategies, to use them to form a model that is able to predict university performance in English major at a university in Saudi Arabia. This is the gap that the present study sought to fill.

In conclusion and from a practical perspective, this study reported its findings on the assumption that L1 has an influence on the L2 to ascertain the efficacy of the high-stakes standardised test that is used for university admission across Saudi Arabia to predict applicants' performance in English BA major.

1.2.8 The Oriental Language Aptitude Test

The Oriental Languages Aptitude Test (OLAT) is an admission test developed by the Faculty of Classics at Oxford University in partnership with Cambridge Assessment. It aims to test the language aptitude of those applicants seeking admission to one of the Classics or Oriental languages, such as Greek, Turkish and Arabic (Oxford, 2018).

The test is based on a shortened version of an invented language test wherein examinees try to understand its grammar and vocabulary aided by an English translation. It is thought that the outcomes of the test will reveal the ability to understand how a language works. Thus, it may predict learners' ability to learn any other real foreign language. Admission decisions at the Faculty of Classics are not yet based on the OLAT; however, sitting the test is a requirement (ibid). Since studies on the OLAT have not been published (Dixon, 2017) and its ability to predict students' performance in foreign languages has not been tested, the current research evaluated the test's ability to predict performance in English.

1.3 Statement of the problem

In the light of the background given in the previous sections, there are several problems that this study sought to resolve. First, the GAT as a high-stakes test that has a crucial impact on more than 350,000 students every year in Saudi Arabia where 30% to 40% of admission assessment weighting is given to the test.

This impact of this test is on two levels: One is whether the applicant will be offered a place. The other is whether the applicant will be able to go his/her faculty of choice. In fact, the test is based on Arabic and is used for all university undergraduate degrees including English as a foreign language. It is also administered and required in other countries, such as Oman and Bahrain. Although its general ability to predict overall performance at university is proven, the assumption that aptitude in Arabic (L1) can be transferred to English (L2) needs to be tested.

Moreover, the GAT and its breakdown constructs, as well as the total scores, have limited evidence of the test's ability to predict performance in given major courses, rather than reporting on the general point average (GPA) for the academic semester or final year.

Second, the OLAT is required for applicants to the Classic and Oriental languages programmes at Oxford University. However, the effectiveness of the OLAT as an admission test to predict language learning needs evaluation as it has not been tested in published studies. Although passing the OLAT is not a criterion for university admission, it is given a certain a weighting along with other admission requirements. It is also required where there is stiff competition between applicants. Thus, this research is an exploratory in seeking to discover the OLAT's potential to predict the performance of Arabic speaker learners of English as a foreign language.

Third, cross-linguistic influence (CLI) has been predominantly examined and found among Indo-European languages using the Latin script. There is little evidence for the CLI of Arabic, which does not use a Latin alphabet and is from the Semitic group of languages, on English for adult

learners. This requires further exploration to better understand the role of the L1 in framing the L2 and contributing to the SLA field of studies. In addition, CLI can encompass different aspects of learning a language. One of these is reading skills where most studies have examined the learners' behaviour in reading rather than the outcomes of reading. The current study sought to examine the effect of reading comprehension as an essential part of university studies.

Fourth, there is insufficient evidence for print exposure's role in future cognitive development in Arabic as well as its impact on learning a second language. The effect of print exposure on the same language has been studied in different contexts. The importance given to print exposure is reflected in daily practices in those contexts such as improving public libraries, encouraging younger learners to free-read and providing many initiatives and resources increasing public exposure to print. However, there is a serious need for research in the context of Arabic societies in general and Saudi Arabia in particular in order to inform policy-makers with evidence-based findings and translate them to impact engagement.

Fifth, deciding what makes a university student academically successful or successful in learning a new language should not only be limited to the current type of admission requirements such as admission tests. There is a requirement for a model that consists of cognitive and non-cognitive factors that can predict university performance in every major, including English, in Saudi Arabia. Although it may seem impractical to use such a model in admission processes, it can serve as a guide for student advisors.

Sixth, if other factors that may facilitate its impact are accounted for, this could mean a better examination of CLI. Motivation and learning strategies are seen as influential factors in learning a language. The current research considered these two factors in terms of the influence occurring. By incorporating the factors used in the present research, i.e. language aptitude, print exposure, reading skills, motivation and learning strategies, a better understanding of CLI can be informed.

1.4 Justification for and significance of the study

There are two main reasons for conducting this research: one for a practical perspective and the second for a theoretical perspective. First, with the huge impact of the GAT on people's lives and careers with it affecting more than 350,000 people who take the test annually competing to fill the 310,000 places at higher education institutes, a thorough and continuous evaluation of the test is necessary for two reasons: The first is to ensure fairness among university applicants. The second is to present a quality test that can contribute scientifically to reflect future academic achievement so that higher institutes can confidently rely on it to select who is most suitable for and likely to succeed in a given major. The findings of this study will inform policymakers in Saudi Arabia and other countries and will assure other stakeholders, such as universities and applicants, of the fairness and effectiveness of the test in predicting performance at university. The results of the study can also be generalised to a larger context to include the Arab world as the language used in the test is Modern Standard Arabic (MSA) and the test's developer is considering promoting it in more countries (NCA, 2020).

Second, the study will contribute to the body of SLA research into the complexity inherent in learning the L2. It reveals some factors of competence deriving from the components modelled in

this research which are cross-linguistic influence in reading comprehension, and individual differences including aptitude, motivation, and learning strategies. It also draws attention to the effect of print exposure on two levels: Contribution of print exposure in Arabic to achievement in the same language and the contribution of print exposure to second language development, namely English in the current context. This also is of interest to policymakers, drawing their attention to the importance of enhancing literacy for community prosperity.

1.5 Potential contribution to knowledge

It is anticipated that the results of this study contribute to existing knowledge by providing extra evidence within the study's context that has not yet been fully explored to support or reconsider current theories and practices in the field of second language acquisition and psychometric studies. First, it investigates the ability of the GAT as an admission requirement to predict students' success at university but in English as a foreign language and by using its breaking scores as well as university course scores. In addition, it evaluates the OLAT for the first time in literature in terms of its ability to predict language learning and as an admission requirement.

Second, this research investigated whether the interdependence hypothesis holds true for adult Arabic speakers learning English, given that the literature features conflicting results. It contributes to this hypothesis in its explanation for EFL adult learners, rather than younger learners who have dominated previous studies. It also defines a baseline L2 proficiency required for L1 influence to occur. This informs the threshold hypothesis. The study will provide a new perspective on CLI outside Indo-European languages between Arabic and English for reading skills and reading comprehension.

Third, regarding individual differences, the study contributes to knowledge by examining the constructs of language aptitude and their ability to predict language performance which is not settled in the literature. It also considers the role of motivation and learning strategies within this relationship as this influential effect is not included in previous studies.

Fourth, the study contributes to the literature on the Arabic context pertaining to the effect of print exposure in future development and achievement in the L1 and L2 alike. It will, therefore, devise a new index for print exposure which can be used for further exploration in Arabic. Finally, it creates a novel model for predicting performance in the English language at a Saudi university.

1.6 Aims of the study

The main aim of the present study is to investigate potential relationships between aptitude and exposure to print in the first language (Arabic) of university students and their performance in a foreign language (English), with a focus on reading-related skills. The potential relationship is examined through the effect of motivation and learning strategies. Moreover, this study aimed to analyse the effectiveness of two aptitude tests (the General Aptitude Test and the Oriental Languages Aptitude Test) to predict the performance of L1 Arabic speakers in learning English. Finally, the study sought to create a model that can predict English language performance at university.

1.7 Research questions

1. Is there a relationship between aptitude in Arabic as a first language and performance in English as a foreign language?
2. Is there a relationship between print exposure in Arabic as a first language and performance in English as a foreign language?
3. To what extent are the Arabic General Aptitude Test and the Oriental Languages Aptitude Test effective in predicting the performance of L1 Arabic speakers in learning English as a foreign language?

1.8 Objectives of the study

This study sought to achieve the following objectives:

1. To analyse the relationship between aptitude in Arabic and reading and grammar in English.
2. To analyse the relationship between print exposure in Arabic and reading and performance in English.
3. To evaluate the effectiveness of the General Aptitude Test in predicting performance in learning English as a foreign language.
4. To evaluate the effectiveness of the Oriental Languages Aptitude Test in predicting performance in learning English as a foreign language.
5. To examine the moderating effect of motivation and learning strategies for the relationship between aptitude in Arabic and performance in English.
6. To develop a model that consists of cognitive and non-cognitive factors that can predict students' performance in the English language at university.

The next chapter covers literature related to cross-linguistic influence and the effect of L1 on L2. It starts by introducing several concepts in SLA that explain the similarities and differences between first and second language acquisition. The chapter also covers literature on individual differences, reading in L2, writing systems, differences between Arabic and English, and university.

Chapter Two

Review of Literature to Cross-linguistic Influence and the Role of L1 Achievement in L2 Performance

2.1 Introduction

A variety of theories and concepts relate to the study of second language acquisition, all of which attempt to explain the processes and factors underpinning SLA. Thus, the main aim of this chapter is to highlight some of these concepts which can be employed to study cross-linguistic influence. This chapter deals with a review of frameworks and previous studies related to the variables being investigated in this study. This chapter, however, begins with theoretical orientations and concepts that contextualise the research by providing background information on first and second language acquisition. There are different theories in the literature regarding how the second language is acquired and how this acquisition compares to acquiring one's first language. This review is necessary for that it presents notions of how language as an abstract concept works in the minds of human beings. This will lead to explaining and establishing the relationship between languages with respect to the acquisition process and proposing that such influence does exist in order to help achieve the objectives of the present research. This part is concluded by a theoretical framework that is adopted in the research.

In the domain of cross-linguistic influence (CLI), there are two major theoretical positions upon which studies draw: The contrastive analysis hypothesis and the linguistic interdependence hypothesis both of which will be discussed in this review. Based on these two positions, CLI as a phenomenon can be attributed to two levels: Languages themselves as systems including their distinctive features, and the bearer of languages – human per se – including the individual differences (IDs) among them. Before discussing the IDs, and since this study pays special attention to the role of IDs in reading skill as an object of investigation, one section will address how reading is learned across languages and thus what influence one's ability in one's first language reading can have on reading in the second.

The IDs section takes into account the differences that characterise people in terms of language ability, achievement, and the environmental factors surrounding them. The discussion will touch upon how these IDs affect mastery of either first or second language and how can they inform the CLI. This includes the methods adopted in other studies on how IDs have been observed and measured. Next, a discussion will follow with the issue of using high-stakes tests as admission requirements for universities. This discussion includes a review of studies conducted to examine the General Aptitude Test.

Thereafter, a conceptual framework of the study is presented to synthesise the components of the proposed relationship among the study's variables. The framework is assumed to link and highlight the role of some of the factors that contribute to learning a second language and characterise a successful language learner. The discussion of this review will identify the current gaps in the literature which will be compiled at the end of this chapter.

2.2 Theoretical orientations and concepts of language acquisition and development

This section aims to briefly explain some of the major theories, hypotheses and concepts related to acquiring languages, both L1 or L2, and how the second is similar or different from acquiring the first. There are other theories and approaches to language acquisition that are not included in this review as it is primarily concerned with those that hold that there are common characteristics between the acquisition of the first language and the second for the discussion of cross-linguistic influence. The purpose of this review is to set out the grounds that show how language acquisition and learning is perceived in the literature to establish a framework of the current study on the cross-linguistic influence that is derived from these discussed theories and concepts.

In order to better understand how our minds work and process learning a language in childhood and adulthood, several theories have emerged and evolved attempting to explain this psychobiological species-specific matter. These theories, which are fundamental difference hypothesis, behaviourism, nativism, cognitivism, interlanguage, and universal grammar all seek to answer the main questions of the nature of language acquisition. These much-debated enquiries are:

- Is there a role for imitation in learning a language?
- Is language a genetically rooted and an innate part of the human mind, or is it something related to general cognitive skills like any other mental skill?
- What role do environmental factors play in the learning process?

Unlike children learning their native language effortlessly and learning the first language is inevitable, it is clear that learning a second language needs and requires effort (Corder, 1967). There may also be other external factors contributing to their ability to achieve native-like language ability. The ultimate attainment of second language knowledge varies from individual to individual in the different domains of language, the sounds of the language, vocabulary, structure and the appropriate use of the language in a given context (Ortega, 2009; Dabrowska, 2012).

While it is not likely in most cases that adults will master a second language to the same standard that they mastered the first during childhood (Ellis, 2015), the question arises as to why it is that difficult for them to acquire it compared to the first. What therefore makes them different or even alike in certain aspects of the acquisition process? The following theories and concepts attempt to tackle these issues where the views have been interpreted differently which will finally lead to establishing a theoretical framework to adapt in this research.

2.2.1 Fundamental difference hypothesis:

The fundamental difference hypothesis (FDH) proposed by Bley-Vroman (1989) holds that the process underlying learning a second language is totally different from that underlying first language acquisition. This is because, while children are equipped with an innate language acquisition device (LAD – a concept developed by Chomsky in the 1950s that denotes biologically

determined factors)², which guides the development of a language, this device is not available (or might only be partially available) to adults who have passed the critical period of acquisition, roughly at the age of puberty (Dulay, 1982). Language is acquired more effectively during this earlier period of life, until approximately the age of puberty (Lenneberg, 1967).

Adults rely on other general cognitive skills to learn another language as if they were learning mathematics using problem-solving strategies. However, they may also utilise their knowledge of the first language (Bley-Vroman, 1989). Bley-Vroman argues that it is not simply transferring 'well-formed sentences' from the first language, but it is the accessibility of "the full range of subtle intuition which native speakers possess" (Bley-Vroman, 1989, p.1) This will be discussed in greater depth in the universal grammar section of this review, 2.2.6, – universal grammar being the antithesis of FDH. The notions of FDH are also shared by some nativists (see Eckman, 1996). However, other nativists hold the opposite view, which will be presented later. The reason for discussing different and opponent views of language acquisition is to set the ground to a theoretical framework that can be adopted in this research.

2.2.2 Behaviourism:

Behaviourism is a psychological theory of general learning that it is adopted for interpreting language learning (Ellis, 2015). It was shaped primarily by Skinner during the 1950s and 1960s (see Skinner, 1957; 2014). The behaviourist position stands in opposition to the aforementioned FDH hypothesis. Behaviourism holds that children are not equipped with innate knowledge to master a language. Rather, it is through association, imitation and feedback that language learning occurs.

Behaviourists claim that learning a second language occurs by way of a process similar to the one by which the first is processed, which is centred on using imitation and receiving feedback from care-givers (Ellis, 2015). Simply put, children, in their natural development environment, listen to and see adults talking, so they associate the objects to which adults refer with the sounds. After they begin producing the language and building sentences, they receive prompt feedback for correction or support. This is also the case for second language learners but in an instructional context (Ellis, 2015). Thus, behaviourists disregard the existence of innate-oriented knowledge and regard learning a language as a matter of learning skills using imitation, association, and receiving feedback. The behaviourism, thus, supports the role of the environment as a stimulus for behaviour, see (Skinner, 2014).

The behaviourist view of first language acquisition has suffered in terms of popularity as the result of the work of Chomsky (1959) and has been seen not immediately linked to the theory of second language acquisition (Corder, 1976). However, its premise that first language acquisition and second language acquisition are fundamentally similar has been adopted by other theorists, such as nativists, but with different reasoning, as presented below.

² This Chomskian notion of an innate linguistic knowledge explained by Chomsky (1988): *'Language learning is not really something that the child does; it is something that happens to the child placed in an appropriate environment, much as the child's body grows and matures in a predetermined way when provided with appropriate nutrition and environmental stimulation'* p.134.

2.2.3 Nativism:

As mentioned previously, nativism has two approaches to SLA: general and special. This section presents the special approach. The nativism general approach is discussed in section 2.2.6 in relation to universal grammar.

In the special approach, acquisition of the second language is somewhat similar to that of the first, whereby there is a language acquisition device in the brain devoted to language (Chomsky, 1988). This device guides the acquisition process and there are special principles for language learning. As language has a degree of complexity that makes it special, innate linguistic knowledge is required which we are born with (Lenneberg, 1967; Chomsky, 1975). This innate knowledge is applied to all languages in order to resolve that complexity (Gass and Selinker, 2008). Thus, nativists do not afford much consideration to the cognitive capacity that a learner endeavours to learn the language but rather an innate skill drives the learning process.

The difference between children acquiring their native language and adults learning a second language in terms of ultimate mastery is probably the language device functions less or because of the lack of sufficient internal factors, such as intrinsic motivation, or external factors, such as extrinsic motivation (Ortega, 2009), as discussed in section 2.7.4 of this chapter.

2.2.4 Cognitivism:

Cognitivism, sometimes called connectionism or constructivism, also hypothesises that first language acquisition and second language acquisition are fundamentally similar (Ellis, 2003; Saville-Troike, 2012). Nevertheless, cognitivists challenge the notion of innate knowledge. The similarity, for them, is due to general cognitive skills and working memory that everybody has and can use whether acquiring a native or a second language (Saville-Troike, 2012). This involves utilising pattern detection and noticing strategies consciously and unconsciously from the frequent input of language. This can be seen as an example in learning less frequent versus more frequent structures of the language where frequency in the input is acquired earlier (*ibid*). An example of the latter would be acquiring regular simple past tense verb forms compared to using the irregular.

This framework of acquisition “results from increasing strength of association (connections) between stimuli and responses” (Saville-Troike, 2012, p.28). Thus, if pattern detection is an essential skill for language acquisition, there should be individual differences between people that affect their comprehension and production of the language as they differ in their ability.

Hence, the cognitive approach for SLA supports the effectiveness of implicit learning that takes place through sensitive responses to regularities in language input. However, for second language learners, other factors may play a role in the acquisition, such as the quality of instruction received and the amount of interaction they have in the new language. Since the cognitive approach takes the implicit learning into account, the current study adopts this approach as it may entail that influence of L1 on the L2 can occur implicitly.

2.2.5 Interlanguage:

The idea that a learner develops a unique linguistic system has been expressed as a concept rather than a term in SLA field in Corder (1967) for an example, and in Tarone (2012) for a thorough review. However, interlanguage (IL), as an established term was coined by Selinker (1972) and it refers to the linguistic system of rules and meanings that every second language learner constructs while the language is developing. The learner’s language is seen as a separate

system distinct from the native and target language. Learners form a language system that derives data from the interaction of the L1 and L2.

Describing this system, Selinker hypothesised (1972) that adult learners have access to a latent psychological structure for learning a language. There are five psycholinguistic processes that can affect the construction of IL according to Selinker. They are central processes for L2 learning and can predict the language (Selinker, 1972). These are: "first, *language transfer*; second, *transfer-of-learning*; third, *strategies of second language learning*; fourth, *strategies of second-language-communication*; and fifth, *overgeneralization of TL linguistic material*" (Selinker, 1972, p.215). Examples of these processes including overgeneralising rules of the target language by applying a rule without its exceptions, resolving miscommunication by using alternative expressions in communication strategies process. Selinker gave an example where an L2 learner perceives a word from the L1 such as a table that refers to an object and the concept of a table of contents in a book. The learner may extend the same usage across the L2 whether it is accepted or not in the target language. Nevertheless, interlanguage with the given processes appears to be in the superficial perspective of cross-linguistic influence, i.e. it does not go deep into the undersurface relationship between languages as defined by universal grammar in section 2.2.6 next.

In terms of comparing first language acquisition to second, interlanguage concept seems to support the special view of the nativism hypothesis that there is an innate device that guides language acquisition and helps in constructing rules of a learned language. Corder (1967) and Selinker (1972) argue that similar to children learning their L1, second language learners have the ability also to construct rules that are not found in the L2 input. This argument is based on the analysis of errors that learners make. Like children learning their native language and making errors in developmental stages, adults learning a second language also make developmental errors (Corder, 1967).

For Dulay and Burt (1974) errors made by a learner show an incomplete form of that language that indicates the learner's attempt to make rules about the target language. For example, in learning English, omitting the verb *be* in a sentence or making an irregular past verb in the form of a regular one at an early learning stage are common errors for both children learning it as their first language and adults from different first language backgrounds learning English as a second language. This indicates that the acquisition process is universal, i.e. developmental patterns are found for all learners, and that first and second language acquisition are similar in that adult learners build their language through quite similar developmental stages. However, the difference between learners clearly lies in the ultimate attainment of the language in favour of children. It is suggested that this could be due to a set of parameters that have already been established in adults' brains for the first language (Adjemian, 1976) which make it difficult for a second language to be fully adopted. It is probably because of sociolinguistic forces such as a reluctance to be identified among the new language group and hold their original identity, or insufficient opportunities for both input and output of the L2 as reported by Tarone (2012). In essence, IL is significant in relation to the discussion of cross-linguistic influence as it accounts for transfer and developmental stages (Skehan, 2008) which the present study sought. This, in turn, should have implications for the awareness of L2 learning and teaching characteristics.

2.2.6 Universal grammar:

This section aims to explain the unity of language acquisition aspects across all languages. Although the idea of universal grammar (UG) is controversial in nature, it is the most relevant theoretical concept in relation to cross-linguistic influence and it is adopted in the framework of this study. Nevertheless, the current research does not cover extensive details of the UG types and evidence as it is not the direct scope of this research.

UG is reviewed and proposed as a grounding stage for cross-linguistic influence in this research as cognitive processes of comprehension and production are constrained by properties of a given language (Koda, 2005). Universal grammar is seen central to the development of all languages. All-natural languages are produced by a language acquisition device that is wired universally in the brain.

The language faculty, an “assumption that there is some part of the mind-brain, which is dedicated to the knowledge and use of language” (Chomsky, 2000, p.3), has an initial state theorised by universal grammar (UG) (Chomsky, 2000, p.54). Chomsky’s definition of UG is “the system of principles, conditions, and rules that are elements or properties of all human languages” (1975, p.29) and these rules guide language acquisition (Whong and Marsden, 2013). They are rooted in the deep structures of all languages compared to the surface structure which includes their physical features. Thus, UG consists of rules about language that are wired in the language acquisition device (LAD) in the initial state of language faculty. The LAD mediates between this initial state and the state of attainment (Chomsky, 2000, p.55) of a specific language.

UG is a nativist approach in its special view that there is an innate ability unique to language learning in the human mind. UG theory considers language as complex cognitive representation and supposes that all-natural languages share a set of abstract principles of core grammars and that for each language there are parameters particular to that language (Gass and Selinker, 2008). An example of these principles is the distinction between lexical categories (noun, verb, etc.) and functional categories that serve to build structures (determiners such as *the* and *a/an*). The principles predetermine “part of the mental representation of language, and it is this mental grammar that mediates between the sound and meaning of language” (Gass and Selinker, 2008, p.160). Similarly, VanPatten and Benati (2015, p.62) state that UG “consists of an inventory of features from which languages may select principles that regulate all human languages and basic syntactic operations”.

Chomsky coined the term ‘language organ’ which “is intended to focus attention on what appear to be components of complex systems, with identifiable properties and function” (Chomsky, 2000, p.54). Thus, it is an abstract notion, which makes it undetectable. In fact, it is *‘not really known’* whether “the sensorimotor systems, the articulatory-perceptual systems which access information that is given to them by the language faculty ... [is] part of the language faculty?” (Chomsky, 2000, p.5).

The evidence for the innateness of UG constraints in both L1 and L2 is seen in what is the state that is called ‘poverty of stimulus’. This term refers to the inadequate input that one receives or is exposed to in a language compared to the output. L1 and L2 learners produce language aspects and process the language that they are not explicitly taught (Chomsky, 2000). The nativists argue that UG is available (or partially available) for L2 learners in that they acquire aspects of grammars that are not likely taught or inferred from the input which is an abstract phenomenon

(Whong and Marsden, 2013). However, learners can show knowledge of such aspects without making gross errors. For example, in a sentence such as “Mary thought that Susan blamed herself*” compared to “Mary blamed herself” (Eckman, et. al., 2013 p.66), L2 learners would judge this sentence as ungrammatical even though it does not occur in real speech as English does not allow the pronoun to be in another clause. Hence, this reveals a hidden capacity takes a role that can compromise the missing from input. In fact, growth that takes place under natural environmental conditions shows that information is not sufficient to direct “ a highly specific, closely articulated uniform process” (Chomsky, 2000, p.7); thus, it is “inner-directed” (ibid). Moreover, the infinite set of sentences that a language can generate – represented in a speaker of the language - is evidence that this ability is not likely to be learned. This is what Chomsky calls ‘generative grammar’ (Chomsky, 1986) where a sentence can have an infinitive string of clauses. In addition, inferences of an utterance can be derived even if such inferences are not verbalised.

This theory of UG is in a sense applicable to both first and second language acquisition. However, a fundamental difference for the second language learner is the *initial state* available when starting to learn another language and what he or she brings to the learning task and the role of the first language. VanPatten and Benati (2015, p.13) state that “there are two basic positions on the initial state of second language acquisition – with some degrees in between-: (1) the learner transfers all properties of the first language at the outset...; (2) the learner begins with universals of language” – draws on UG- and does not transfer L1 properties at the outset”.

Although UG has been the predominant concept in the field of language instinctiveness since the 1980s (White, 2012), there have been some criticisms recently or even a denial of the UG existence. Most of these criticisms came from the misunderstanding of the main concepts of UG that it is the pre-linguistic state available in the brain (Mendivil-Giró, 2018). Others did not originate mainly from a linguistic perspective rather than general cognitive science (ibid), such that of Evan and Levinson’s (2009), and Evan’s (2014). Evan confirms that neurocognitive discoveries have not shown any evidence of such a LAD (Evans, 2014). However, LAD has not been thought to be physically located in the brain; rather, it is a function or ‘sub-system organ’ representing the dedication for language in the brain “roughly analogous to the visual system which is also dedicated to a particular task” (Chomsky, 2000, p.3).

Evans (2014) argues that not all languages share the same principles for lexical categories or functional words, as some languages may not necessarily use all of them. An example of this is Latin where the context decides which concept of the article is perceived (i.e. *a*, *an*, or *the*). Nevertheless, this claim refutes itself for the reason that whatever a linguistic element or use of context is employed for a particular concept – such as a defining an object -, this will entail a common principle implied.

Evan and Levinson’s (2009) followed by McMurray & Wasserman (2009), Christiansen & Chater (2015), and coincided by Tomasello (2009) are all collectively and basically claim the diversity, emergence, development of languages are particularly due to environmental social and cultural factors driven by merely complex cognitive mechanism, psychological and cultural inventions and they neglect the idea of innatism of language originating. Nevertheless, Mendivil-Giró (2018) argued if that is the case, humans would develop cognitive systems that are fundamentally different among them and use them differently. These seem to be far from reality. In addition, critics’ alternative framework for language capacity seems to be in line with the

behaviourists' explanation for language acquisition which was refuted as discussed previously in section 2.3.2. In essence, Mendivil-Giró stated that the UG concept is accepted by more linguists than those who reject it.

When the transfer of skills is concerned, a learner unconsciously transfers the L1 properties and then starts to replace them with appropriate properties from the L2. This process is called 'parameter resetting' in the theory of universal grammar (VanPatten and Benati, 2015), in another word, reshaping what already is existed. Chomsky claims that it is a change of state from common parameters and the information in the language faculty changes during life. Changes happen "either because of internal maturational processes or certainly because of external experience" (Chomsky, 2000, p.6). This change is only in a superficial way and instructions are given by the language of the state to the performance systems (Chomsky, 2000).

Thus, if the UG is proposed as the base of a state that can be changed and that the starting point for a second language learner is the same as it is in childhood language acquisition, it can be then predicted that L1 and L2 acquisition as processes occur in the same way. However, the difference lies in performance-related factors rather than linguistic competence ones, of which the latter, should be invariant between learners and native speakers (Gass and Selinker, 2008) such as the stages of learning linguistic features and rules where the easier ones are learned before the harder ones.

Hence, it can be contended that the human mind is ready to learn and use any language. Consequently, it can be then assumed that the more one is involved in the first language, the more his or her ability is transferable to the new one due to the strong foundation from the main source of language capacity when appropriate conditions are met.

Nevertheless, this does not necessarily mean that a learner of a second language will achieve native-like language level nor that the first language's role will entirely shape the learner's interlanguage. Chomsky (2000, p.61) states that the possibility of acquiring a second language when a learner passes a certain age is "as a sort of growth on the language that you already have". Thus, the influence of the first language may help in learning the second.

Gass and Selinker (2008) noted that the discussion on UG requires a reconsideration of language transfer, especially what the UG can bring to the traditional view of transfer, namely the notion of contrastive analysis hypothesis, reviewed in a later section, 2.5.2. In light of this call for reconsideration, White (1992 cited in Gass and Selinker, 2008, p.177) offers newer views than previous debates on transfer. One of these is the argument of learnability, which is crucial to a perspective of the UG on second language acquisition where learners exhibit their ability – or acquirability - to build grammar, not necessarily based on the input received, along with the guide of UG principles (White, 2012). Thus, it is the interaction of both first and second languages and the learners that determine the accessibility of structures and sets/resets the parameters.

Hence, it is clear that the claim of UG theory in general, and according to learnability in particular, suggests that language is learned and influenced by previous inbuilt features in our brains by activating the required principles and that knowledge of the first language plays a role as it forms the initial state of the second language learning process.

In recent years, nativist researchers have begun to consider the role of linguistic experience in language learning together with innate linguistic knowledge. This turning point of research towards the direction of considering prior knowledge needs to go beyond the same

language and consider a cross-linguistic approach, as Koda (2005) states that data gained only from English-speaking participants in such research have been challenged. Hawkins (2008) emphasises the importance of considering experience in learning a language within the nativism approach such as the UG: "I accept that the time is right for nativist approaches to SLA to take more serious account of the role that linguistic experience plays in determining the kinds of grammar that L2 learners deduce" (Hawkins, 2008, p.614). A discussion of this link between experience in learning L2 and influence of L1 will be reviewed in interdependence and threshold hypotheses section, 2.5.4.

In conclusion, the current study adopts the premises of the UG as these factors mentioned to support its claim in addition to the complexities of language, indicate that there must be an innate faculty involved other than the input that makes it possible to learn a language. This innateness of language faculty influences and guides learning the L1 and subsequent languages. Metaphorically, languages are rooted in the same soil and feed on the same minerals but can grow into different plants. Thus, the basic nature of all languages could be brought about from the same source and any language is constrained by the properties of the UG, whether for children learning their first language or adults in their interlanguage.

Thus, studying a phenomenon of cross-linguistic influence deriving from the perspective of UG is a crucial ground for the current research. Next section will provide a theoretical framework that is adopted in this study inspired from the above-mentioned theoretical concepts into the study of SLA in order to set the ground for the discussion of CLI and help achieve the researches' objectives.

2.3 Theoretical framework of the study

This discussion of the previous theories and concepts paves the way to choose the most relevant to adaptation for the current study and frame its theoretical background. This study, thus, is grounded within the framework of cognitivism (connectionism) and complements the universal grammar perspective. The hypothesis that first language acquisition and second language acquisition are fundamentally similar is based on general cognitive skills and working memory that everyone has and can use whether acquiring a native or a second language by utilising pattern detection and noticing strategies consciously and unconsciously from the input of language (Ellis and Shintani, 2013; Wen, Biedroń, & Skehan, 2017).

This framework of acquisition "results from increasing strength of association (connections) between stimuli and responses" (Saville-Troike, 2012, p.28). It is in fact a matter of reactivation of patterns that have already been stored. If the processing mechanisms required for the L2 is similar to that of L1, only a certain addition of experience is needed to trigger influence on the L2 (Hawkins, 2008).

As language acquisition and learning exert cognitive mechanisms to improve competence, cognitivism is the most practical approach that can accommodate for cross-linguistic study. Studying a language implies conscious and unconscious utilising of input, information processing and association with what is already known, which is in turn strengthened by the amount of exposure, from the connectionist perspective. Thus, prior knowledge can influence what is to be developed and that may denote a facilitation role.

This justification should also account for the universal grammar's view of language acquisition which establishes innate ability to guide the acquisition and then prior knowledge and *learnability* as rocks for new learning (White, 2012). The study's theoretical framework and conceptual framework for second language learning are driven by an integrated framework between nature, influenced by biological factors, and nurture, which upholds external factors after conception. Synthesising the theoretical concepts of language acquisition and then extracting the relevant ones in the framework, set the scene to the next section which will turn to related reviews of the cross-linguistic influence.

2.4 Cross-linguistic Influence

2.4.1 Introduction to language transfer and cross-linguistic influence:

This section and the following sub-sections take into account how and why the influence of L1 occurs on the L2 which will inform the research's objectives 1 and 2. It aims to describe some of the most relevant concepts and theories of cross-linguistic influence relevant to this study. It is divided into four main parts. It first introduces the concept of cross-linguistic influence and skills transfer to setting out the discussion of the section. Then it follows by presenting the contrastive analysis hypothesis. Next, the third sub-section introduces the concept of metalinguistic awareness as a foundation to understand the next part. The fourth describes and discusses the interdependence hypothesis which is the adopted hypothesis in the current research.

Before discussing that, two terms that appear in the literature should be clarified. These are transfer and cross-linguistic influence. Transfer and cross-linguistic influence (CLI) are often used interchangeably. However, when there is a specific form of effect from one language on another, it is more accurate to describe this as a transfer. An example of transfer would be Arabic speakers pronouncing /p/ sound in English as /b/ because the former does not exist in Arabic. Cross-linguistic, which is the focus of this study, on the other hand, refers to the general phenomenon of the "influence of one language on another" (Kellerman and Sharwood-Smith, 1986; Jarvis, 2012). The influence may occur in either the comprehension or production of language, as well as in any behaviour that is language-related, such as gesturing, and the cognitive process and mental representation of the language. Hence, learner's role in this regard would also be crucial, as Kuo and Anderson assert, "second language learners play a more active role in utilising knowledge and experience gained from one language in the learning of another language" (Kuo and Anderson, 2008, p.55).

In the light of the study's theoretical framework, cross-linguistic interaction is seen as central to L2 processing (Mei et. al, 2014). Learning a language is highly complex which makes it difficult to make an accurate prediction of learner performance. Perhaps this is because of the different factors embedded in shaping the unique system of a language learner. One of these factors is the influence of the first language as it characterises the initial state of a learner when beginning a new language learning experience. Singleton (2003) suggests four alternative groups of factors: cross-linguistic factors, general cognitive factors, motivational factors and educational factors. All of these will be discussed in this section and the following section on individual differences, 2.7, with regard to adults learning a foreign language. The following sections, however, are interlinked in terms of their scope where the studies discussed in each of them can also fit perfectly in another section. Thus, the studies may not be reiterated even though they are related.

Views on the role of the first language in learning a second language have been interpreted differently on the basis of similarity of acquisition mechanism. As explained in the previous section, one view suggested that native language is a crucial factor in acquiring a second language. Another stated that the native language barely affects learning the second one. Between these two views, it has been posited that native language does play a role, but is somewhat complicated in that many other factors also share this influence on second language acquisition (Sparks et al., 1998; Dabrowska and Street, 2006; Sparks et al., 2012). This view is adopted in this research where many factors are used to investigate the proposed relationship.

Although languages appear different in terms of characteristics, they share some common features. These common features are not necessarily linguistic forms; they go beyond that and share features that are rooted in their genetic structures as explained in the universal grammar section, 2.2.6. A number of studies (Sparks et al., 1998; Dabrowska & Street, 2006; Sparks et al., 2012) have found that students with more highly developed first language skills exhibit stronger second language skills than those with less developed first language skills. Hence, knowledge of the L1 may accelerate the learner's progress through the learning stages of L2 (Ortega, 2009). These observations suggest that there are cross-linguistic effects. However, this phenomenon of influence from one language to another still lacks enough evidence of what constitutes it and which skills are transferred from L1 because views are continuously changing regarding how a second language is learned (Koda and Zahler, 2008, p.70). Ortega (2009) points out that transfer is a complex interrelationship between the L1 and L2. In fact, more studies are needed that investigate the different perspectives of cross-linguistic influence and break down its components.

Everybody is born with mental capabilities that are ready to operate and acquire any language once the circumstances are optimal for acquiring the language. Generally, by the time an individual grows up, this ability to acquire a language as a native starts to decline until they reach a point when learning a new language gradually becomes different to how it was in childhood.

However, the impulse of operating a language remains the same and the processing routines that have been used in the L1 will be transferred to learning the second language. Thus, if one's ability in processing his or her first language is at a high level, this ability is presumably also transferred to the new language, as the previous experience "embeds habits of mind, instilling specific processing mechanism" (Koda, 2009, p.9).

In addition to this, attributing these capacities to the wide scale of literary experiences, Koda suggests that "diversity in L1 experience, therefore, can induce *qualitative* procedural differences, whereas variances in L2 experience may yield *quantitative* efficiency differences" (ibid), which may explain how one's exposure to L1 could foster learning the L2.

This study focused on reading skills in particular, as there are distinctive factors that contribute to learning the different language skills (Rubin, 1978), which make them more complex to identify and analyse in a single study. Before discussing learning to read across languages, a review will follow to introduce major aspects and theories that seek to explain the concept of cross-linguistic influence, addressing how there is a cognitive connection between acquiring and learning L1 and L2.

Thus, in order to better understand and adequately analyse L2 competence, the interaction between the experiences in the L1 and L2 should be studied using a cross-linguistic approach. In such a cross-linguistic approach, one's performance in the second language is examined against one's ability in

the first language in order to uncover any influence and this is what the current research sought to investigate. This discussion of this section informs and is in relation to the research's objective one (analysing the relationship between aptitude in Arabic and reading and grammar in English) and two (analysing the relationship between print exposure in Arabic and reading and performance in English) in terms of cross-linguistic influence.

2.4.2 Contrastive analysis hypothesis

In accordance to the view that ascertains that native language is a crucial factor in acquiring a second language, many studies have demonstrated that cross-linguistic influence is an important factor in second language acquisition, particularly those investigating languages that have some features in common. According to Lado's (1964), contrastive analysis hypothesis (CAH), the more similar or closer the native and second languages are, the easier learning the second will be to learn. This means the opposite is true, i.e. the more differences there are between the two, the more difficult learning the second will be. 'Similarity' means that the languages are close in their language-family relationship, they share some grammatical or sound features, or the writing system is similar. Furthermore, the CAH may best account for the decoding efficiency when comparing orthographic systems of two close languages as Muljani et al. (1998) suggested (different writing systems and scripts are discussed in more details in languages of different writing systems section 2.5.3).

CAH can be criticised for its explanation of cross-linguistic influence particularly in that it explains errors made by learners as being due to the fact that the correct target structures in the second language do not exist in their first language. However, learners from different L1 backgrounds may make the same errors which are considered a part of language development (Corder, 1967). This notion of developmental language leads to what has been discussed previously, interlanguage phenomena (Tarone, 2012) as the CAH's claims were not necessarily built on reliable evidence (ibid). It can, however, be speculated that if the two languages have similarities, a learner might become confused in using the similar form correctly in the new language or overuse it. "Researchers began to discover that when it comes to acquisition at the segmental level, the learner's L1 phonology leads to more difficulties when the L2 is similar than when it is different" (Young-Scholten, 2013, p.210). An example of this is an English native learning French confuses between the sound /u/ in *vous* 'you' in French with the vowel /y/ in *vu* 'see' which is front-rounded sound and this vowel in English is back-rounded (ibid). Thus, similarities between L1 and L2 cannot necessarily predict L2 performance. Rather, it could be argued that learning a language with distinctive features different from the L1 might be significantly easier as learners develop a unique language system. This argument is supported by Kat & Frost (1992) in relation to reading in a new language, as reader learners adapt their strategies to fit the orthographical system of that language. This argument, therefore, supports the hypothesis adopted in the current research that reading abilities in Arabic as an L1 can influence reading skills performance in English as an L2.

With regards to the reading process, it consists of more than simply decoding the spoken language; it is a multi-task demanding skill which involves cognitive processes that cannot be analysed with only one layer of input, decoding for example. The demanding is even more for L2 learners as language processing for them involves more brain activities (Liu and Cao, 2016). The written language, as Goodman (1973) states, is not a secondary representation of speech but equivalent to it for a

proficient reader. Thus, this indicates the complexity involved in reading and speaking skills alike where CAH cannot fully account for. Thus, knowledge of language may not only be identified as the ability to speak or understand a given language but rather it involves cognitive mechanisms that could be transferred across languages.

Additional to challenging the idea of the CAH to account for facilitating language learning, Genesee et al. (2006, p. 6-A-4), “the contrastive analysis hypothesis cannot account for the existence of cross-language relationships in literacy constructs that are more psychological in nature, such as metacognitive strategies that are used in the first and second languages”. The interdependence hypothesis (Cummins 1979), on the other hand, which posits that first and second language acquisition are developmentally interdependent and that the development of L1 may influence the development of the L2, explains such psychological constructs and is discussed in 2.4.4 section. Although the contrastive analysis hypothesis received a volume of investigations and is adapted in many studies in terms of language transfer and cross-linguistic influence, the current research does not follow its premises for the reasons expressed above. This research adopts the interdependence hypothesis instead which will follow in section 2.4.4.

2.4.3 Metalinguistic Awareness

Metalinguistic awareness (MA) can be defined as “the ability to think about and reflect upon the nature and functions of language” (Tunmer, Pratt and Herriman, 1984, p.2). Thus, this definition entails that, as language is seen as an object of thought, individuals and users of all languages have access to cognitive abilities, such as identifying and analysing, that deal with the different forms of language which can account for the language aptitude.

This notion of MA draws upon the effect of prior literacy experience in the first language on the second (Koda and Zehler, 2008). Therefore, reading as a skill that is embedded between spoken and written systems uses MA as an abstract force to guide the reading process. Koda and Zehler (2008) explain the relationship between one of the above-mentioned abilities – decoding – and prior literacy experience and how this serves as a facilitator for learning another language:

decoding is the process of extracting linguistic information from print, it benefits directly from metalinguistic awareness ... decoding can be an index of an impact stemming from prior literacy experience, thereby serving as a basis for estimating such an impact on second-language learning to read. (Koda and Zehler, 2008, p.4)

It is a reciprocated process between literacy and metalinguistic awareness (Koda, 2005). Thus, this process can enhance the cross-linguistic transfer of skills. However, it is not fully known which skill is involved, nor would that transfer be applicable across all skills. Moreover, the question that remains unanswered is to what extent this impact applies to language learners of diverse first language backgrounds and in which aspects of skills/sub-skills? For example, Kahn-Horwitz et al. (2014) examined the orthographic proximity between languages where the existence of phonemes and orthographic characteristics in the first or previously learned languages and a newly learned language with different a script facilitates acquiring them in the new one. They examined this proximity in new script acquisition by comparing the performance of 10-year-old quadri-literate Circassians (L1) biliterate Hebrew (L1) speakers learning English (L2) (Circassian and Hebrew have different script systems to English).

Results revealed that the Circassian group outperformed the Hebrew group and showed a significant advantage in decoding and spelling conventions, but there were no significant differences between the groups in decoding and spelling the silent /e/, which proved challenging for both groups. These findings support the notion that where orthographic and phoneme features exist in both first and a second language, this facilitates the learning process even when the script is different. However, the results of this research cannot be generalised to a wide range of different languages with a different age group of learners, i.e. adults in particular (Koda and Zahler, 2008, p.69) with regard to orthographic proximity found in both languages facilitating learning.

Kuo and Anderson (2008) state that “metalinguistic knowledge can be universal, rather than language-specific” and it includes abstract structures of language in areas such as phonological, semantic, morphological, syntactic and grapheme awareness. As MA is distinct from any language in its specific details, it, however, grasps the general functioning of language. Once it is well-developed, it seems to regulate the linguistic input perception and interpretation where it can guide the learning process (Koda, 2005).

Furthermore, people who read and write more in their L1 with guided instruction might improve their language-related abilities and increase their metalinguistic awareness more, thereby performing better than those with less guided instruction (Dabrowska, 2009). Other studies suggested a similar claim that learners who spend more time writing carefully might enhance their language cognitive-related skills and enable some complex structures to be attained later (Perera, 1986).

Hence, since prior knowledge of L1 accounts for MA, measuring prior knowledge and its influence on L2 for adult learners whose first language has already been established can yield a clearer picture of the nature of cross-linguistic influence. The discussion of metalinguistic awareness informs the reasons for cross-linguistic to occur and to achieve the research’s objective one (analysing the relationship between aptitude in Arabic and reading and grammar in English) and two (analysing the relationship between print exposure in Arabic and reading and performance in English).

2.4.4 The linguistic interdependence and threshold hypotheses

Cummins’ (1979, 2000) interdependence hypothesis holds that first and second language acquisition are interlinked due to certain shared aspects. He claims that proficiency in L1 affects proficiency in L2 despite the apparent differences between the two languages. He contends that the L2 level of competence for bilinguals is highly affected by the previously developed L1 ability. Thus, Cummins argues that the linguistic skills a child has from his L1 could foster an ability to learn an L2 (Cummins, 2000). Cummins uses the term “common underlying proficiency” to refer to a base set of skills which develop from the first language. These cognitively demanding proficiencies, such as problem solving, abstract thinking and literacy, do not differ across languages; therefore, any improvement benefits both languages. They also can be referred to the language aptitude a learner develops from early L1 acquisition, as discussed in individual differences section of language aptitude, 2.6.2.

In comparison to the contextualised mode of communication, such as in face to face conversation which could be easier to master, reading processes require a cognitive base and linguistic knowledge for contextualising the target text. Therefore, Cummins considers ability in L1 reading to be a major factor in developing L2 reading and sees prior capability as essential before extensive L2

exposure takes place. However, if poor skills have been developed in L1, there is still a possibility that reading can be learnt, but it will to an extent result in limited learning achievement. Moreover, Cummins's hypothesis holds that difficulties encountered by readers are due to a deficit in central processing and this problem manifests itself in any language.

In response to and a development of the interdependence hypothesis, Cummins offers the threshold hypothesis, which indicates the level of linguistic competence required before the transfer occurs. Cummins' threshold hypothesis also explains that, in order to achieve a particular competence in the L2, one must reach a minimum proficiency in L1 in the critical period of learning a language (Cummins, 2000). Learners who reach the threshold can perform differently on academic and cognitive tasks (Cummins, 1979). As a result, if a student's capacity in L1 is limited, their capacity in the L2 will be limited in the same way. However, foreign language ability cannot be predicted until learners reach the level of threshold of competence in L2. Some researchers defined the threshold on the basis of the vocabulary size a learner has in the L2 in order to fulfil reading comprehension. For example, Laufer (1992, p.24) states that "the level at which good L1 readers can be expected to transfer their reading strategies to L2 is 3,000-word families". However, the explanation of interdependence and subsequently the threshold hypotheses is not restricted to proficiency in reading or knowledge of vocabulary as languages compose of features other than vocabulary knowledge such as knowledge of grammar. Therefore, defining such a threshold of proficiency would not be consistent. The threshold line might be variable, given that different types of task demands determine which baseline is required to exhibit a certain skill level. Nevertheless, Laufer (1992) and Laufer and Ravenhorst-Kalovski (2010) considers such vocabulary size is a crucial turning point to predict reading comprehension at a given percentage of text coverage.

Several empirical studies have provided evidence supporting the interdependence hypothesis. These include Legarreta's (1979) longitudinal study of Spanish speaking children and Verhoeven's (1994) study which examined predicting L2 ability based on L1 ability among Turkish children learning Dutch. He found a positive relationship in literacy, pragmatic and phonological skills. Moreover, Sparks et al. (2009) investigated the role of long-term crosslinguistic transfer of skills from L1 to L2 in reading, vocabulary, phonological awareness, spelling and listening for elementary students speaking English as a first language and learning French, German or Spanish as a second language. In addition, Proctor et. al (2017) found that syntax of Spanish can predict the growth of English oral and reading skills for bilingual children. Their findings also provide support for Cummins' hypothesis in that skills found in the L1 in early schooling are related to achievement and proficiency in the L2 when learned several years later. A study by Abu-Rabia and Siegel (2003) – presented in reading across languages section, 2.5, – also supports the interdependence hypothesis. Other studies have also shown that success in the foreign language seems to correlate with ability in the L1 (Sparks and Ganschow, 1991; Crombie, 1997; Lundberg, 2002; Mushait, 2003; Van Gelderen et al., 2007).

Masrai and Milton (2017) investigated the role of vocabulary knowledge in L1, general and academic vocabulary in L2 and intelligence (IQ) on academic performance for Saudi EFL. They found a positive significant correlation and prediction relationship. However, the criterion variable that was predicted by these factors is the GPA which gives an overall performance grade of different subjects not limited to English courses. Thus, there is a need to measure the relationship and influence of L1

knowledge on L2 language performance more closely.

In contrast, Cochran, McCallum, & Bell (2010) investigated the success factors for foreign language learning and found that native language ability is not a strong predictor of success in a foreign language. However, the authors have argued that their results were due to the fact that their study sample consisted only of students with a high level of native language aptitude. The absence of low levels students makes it unreliable to compare higher with lower achievers and come to their conclusion. Additionally, Sierens et. al (2019) found that it is the individual differences of bilingual children (Turkish and Flemish), discussed in section 2.6 that can account for developing vocabulary skills rather the common underlying proficiency skills stated by the interdependence hypothesis. This may be in line with what Li (2016) stated that language aptitude cannot predict learning vocabulary of the L2.

Moreover, Artieda (2017), investigated L1 literacy (reading comprehension and spelling) impact on L2 reading achievement for beginners and intermediate adults Spanish speakers learning English. She found a moderate correlation between L1 reading comprehension and L2 achievement but for the beginner group. These findings suggest that L1 influence occurs in early learning of the foreign language. These results may indicate that role of L1 start to disappear as learners progress in the L2. Further research is needed in order to confront or support such findings since the time Koda (2005) has pointed out that studies of L1 influence on L2 reading for adults “yielded somewhat conflicting results”, p. 23.

In conclusion, Cummins tested his hypothesis for bilingual speakers starting to learn an L2 at an early age whose L1 literacy was not yet fully established. In contrast, the current study tested the same hypothesis for learners who have passed the critical period for acquiring a language to see whether having a solid foundation in L1 will ease learning the L2 and whether there is a positive relationship between one’s skills in the two languages, particularly in reading comprehension. A number of studies called for investigating the interdependence hypothesis effect for EFL adult learners (Artieda 2017). It is posited that older learners with higher L1 literacy experience develop reading competence in L2 faster than younger learners (Koda, 2005).

Although several studies have been carried out in an attempt to investigate the skills exhibited in L2 reading processes or behaviours of readers, little is known about the product of reading, e.g. comprehension. Thus, more information is still required in order to better understand the nature of reading and the interrelationship between languages in terms of reading skill. It is hoped that the present investigation will help explain why some learners achieve higher than others when learning a second language learning. Thus, having discussed the concept of cross-linguistic influence in general to inform the research’s objective one, a discussion of this influence with regards to reading skills will now be discussed which also relates to the same objective.

2.5 Learning to read across languages

2.5.1 Introduction to learning to read

This section reviews cross-linguistic influence from the perspective of reading skill as it is the focus of the current study. It is divided into the following sub-sections: Introduction to the phenomenon of reading and learning to read, description of different writing systems, features pertaining to Arabic and English, how transfer occurs in reading skills, and a reviewing of more studies relevant to the themes covered.

The importance of understanding language through reading is as stated by Smith (1973, p.2): “language is obviously central to human mental behaviour, and it has often been remarked that many of cognitive psychology’s greatest questions might be resolved if a full understanding could be gained of how we comprehend language through reading”. Although reading and its centrality to this study have been discussed in previous sections, a more in-depth description and discussion are presented here in terms of the nature of reading, transfer in reading, the case of languages with different scripts and some experimental studies on the cross-language influence of reading skill.

Written objects in any language are somewhat a representation of the oral form of that language. The act of reading such materials is intended to obtain meaning from the given print. In order to learn the process of reading, one needs to be able to encode the written symbols that represent the language (Perfetti and Dunlap, 2008). These symbols – or graphics – are converted into linguistic concepts by the reader. This process is at work among speakers of any language with a writing system (Perfetti and Dunlap, 2008, p.13).

Both first and second language speakers use the same strategy. However, in the case of adults learning a second language, the first language has an advantage in that it is based on a settled system of language that has been acquired subconsciously and naturally, while the second language is learned consciously with much effort, particularly in a formal instruction setting (Perfetti and Dunlap, 2008; Krashen, 1982).

Grabe (2009, p.110) states that:

there are aspects of reading that are very likely universal. Most of these aspects have to do with the nature of cognitive processing mechanisms more generally and universal concepts of language knowledge. All readers make use of visual word-recognition processes while reading and engage in phonological processing in reading at the earliest possible moment that the orthography allows.

In teaching reading, there are two main approaches which are applied to learner readers of many languages but may vary in the way they are used separately or together until the skill is mastered. These approaches are phonics and whole word. Phonics is concerned with letter-sound correspondences associated with rules governing them, the whole word method stresses the sight of the word aided by memorisation or familiarity of the surrounding context (Rayner et al., 2002).

According to Gough and Tunmer (1986), the simple view of reading (in alphabetic languages for people who are not severely disabled) is that there are two components: the ability to comprehend oral language and the ability to decode it by using letter-to-sound correspondences. Beyond these conditions, one needs to activate his or her background knowledge in order to arrive at a point of comprehension. Mikulecky (2008) refers to and extends this notion in her definition of literacy as “a set of attitudes and beliefs about the ways of using spoken and written language that are acquired in the

course of a person's socialisation into a specific cultural context".

2.5.2 Languages of different writing systems

It is widely accepted that learning a language is distinct from learning a writing system (Cook, 2016). However, written language is parallel to spoken in that it involves multi-layers of input processing. Thus, learning the writing system of a second language is an additional task for the learner as different languages' writing systems function differently and as L2 processing is more demanding than processing the L1 (Liu and Cao, 2016). Moreover, learning another language with a different script than the L1 may also be considered a further burden on the learner. This may also be the case for those from language backgrounds sharing the same script such as a Spanish speaker learning English as the rules of reading in the two languages differ significantly. This review will look at learning languages across different scripts and writing systems and whether it makes a difference to learners in learning a language's script that differs from their first language.

Coulmas (1999, 2003 cited in Cook and Bassetti, 2005, p.3) gives definitions of writing system and script. A writing system "is a set of visible or tactile signs used to represent units of language in a systematic way". Thus, each language has its own unique system where the linguistic unit is represented whether the writing system is meaning-based on morphemes (the smallest unit of meaning) or sound-based on phonemes (the smallest unit of speech) -whether consonantal or alphabetic- and syllables (Cook and Bassetti, 2005). A script, therefore, is the "graphic form of the units of a writing system" and it could take different forms, such as Roman and Greek within alphabetic writing systems or Arabic and Hebrew with consonantal writing systems. Orthography, "is the set of rules for using a script in a particular language" (Cook and Bassetti, 2005) such as English, and its rules that govern spelling and symbol-sound correspondences. Thus, the distinction between languages in terms of their writing system types and scripts certainly leads to differences in reading skills for learners. However, learner readers have -to some extent- access to their knowledge of universal aspects of what the reading process is about and how to convert graphemes into meaningful input. Thus, the present study sought to examine the extent skills of speakers of Arabic in reading would influence their learning of English reading. A comparison between the Arabic writing system and English is provided in the next section.

The awareness degree of reading and writing knowledge and the addition to the knowledge of first the new language's phonology (sounds) plus its morphology (word formation) interact with each other and may determine the level of difficulty in learning the new script (Liu and Cao, 2016). Goodman (1973, p.21) asserts that "all written languages, whatever their visual characteristics, have both deep and surface structure, and the reading always involves sampling from the physical representation in order to confirm or disconfirm predictions about meaning". Therefore, reading characteristics are essentially processed universally as the reader's target is to assess his own prediction of meaning in the brain. Goodman states that visual information is used in order to confirm such predictions and that the reading process is similar in all languages; the variations lie in the orthographic and grammatical structures that need to be accommodated (ibid).

2.5.3 Arabic and English writing systems

Arabic and English as sound-based languages are both phonemic (languages that their sounds represented in spelling). The Arabic writing system is alphabetic consonantal (based

primarily on consonant letters) with 28 letters. English is alphabetic (all of the phonemes are represented by the letters in the writing) with 26 letters (Aoun et. al, 2009).

Arabic script is therefore considered “deep³” when the writing is unvowelised and “shallow” (transparent) when it is vowelised (it is usually vowelised for beginner texts by using ‘diacritics’ as two words with same letters, but different diacritics may give two different meanings). English script is also deep in that letter-sound correspondence is not always consistent. Irregularities in both languages writing require a reader to be acquainted with them through extensive exposure. Additionally, in unvowelised Arabic texts, a reader should be able in many cases to interpret context, syntactic structures, and may need to some sort of prior knowledge in order to read and comprehend a word correctly.

In terms of text writing direction, Arabic, unlike English, is written from right to left. In terms of word formation, or morphology, Arabic vocabulary consists mainly of three or four consonant root letters and the shape of the letter varies depending on its position within the word. The root word can receive inflectional affixes to add meaning to it. In English, both inflectional (where a suffix changes the grammar) and derivational (where an affix changes the meaning) affixes are used (Aoun et. al, 2009).

However, there is a major difference between Arabic and English with regard to language form. Arabic is a diglossic language, meaning that the spoken language first learned at home is quite different from that of literary Arabic that is written and taught at school. When children are introduced to literary Arabic, they may find it like a second language (Fender, 2008).

Thus, Arabic’s diglossic nature, its special morphology and the need to apply contextual and prior knowledge in order to understand a text together mean a high demand on the reader’s cognitive attention. The question is, therefore, given these differences and similarities between Arabic and English, to what extent would an adult native speaker of Arabic learning English utilise knowledge gained from the L1 in learning the. As this study examines the interdependence hypothesis in relation to languages that use different scripts and among two different language families, this section, thus, informs the objective one of the research (analysing the relationship between aptitude in Arabic and reading and grammar in English) and two (analysing the relationship between print exposure in Arabic and reading and performance in English).

2.5.4 Transfer in reading

Anderson (2003) affirms that learning how to read is only true for the L1, while learning how to read in the L2 implies a transfer of skills from what has already been learned. Moreover, unlike beginning to read in the first language, L2 learner readers have not established an oral system before they commence learning to read in the new language. Rather, they usually develop the two in tandem, i.e. decoding development and oral language comprehension are learned simultaneously (while previously learned language is involved). It is, in fact, an incremental process for a second language learner where he or she brings prior knowledge and expectations to the text from the first language until he/she establishes a well-grounded literacy level in the second language (Koda, 2005; 2008).

Nevertheless, as Miller (1973, p.10) demonstrates, “only a small part of the information necessary for reading comes from the printed page”. He adds, “not all the visual information on the

³ Deep orthography means that sound-symbol correspondence is inconsistent while shallow orthography indicates a high regularity of such a writing system which makes it easier to learn (Cook and Bassetti, 2005).

printed page is significant for reading, and not all differences of meaning are represented in writing". Thus, reading is a deeper process that exhausts cognitive skills than only processing information from surface, i.e. orthographic decoding and words meaning. Additionally, learning to read can also be associated with metalinguistic awareness as it involves understanding functions of oral language with its correspondence to the writing system and the process involved in this link, i.e. transfer in reading (Koda, 2008).

In light of conclusion in the previous paragraph and Anderson's remark, they drew attention to more discussion of the concept of transfer of skills or first language influence on the second. Additionally, the influence on reading can also draw upon the individual differences and their variables mentioned later in section 2.6 along with the formulation of interdependence and threshold.

According to Koda's (2005, p.9) explanation of the occurrence of cross-language transfer in reading, "the central assumption underlying the cross-linguistic approach is that L1 experience embeds habits of mind, instilling specific processing mechanism, which frequently kick in during L2 reading". It is important to understand what role L1 literacy plays in order to better understand L2 reading (Hudson, 2007). When starting to learn an L2, an on-going interaction and adjustment is involved between the prior and new languages to accommodate disparate requirements (Grabe, 2009). This, in turn, explains the key elements of reading in cross-linguistic analysis and its complexity in L2 compared to L1. Thus, it has been suggested by many scholars in the field that being literate in L1 forms the base for experiments for developing L2 literacy. An example of this is Peregoy and Boyle (2000).

The universal view of all languages holds that success in reading relies on conceptual processing and using prior knowledge and guessing strategies confirmed by further information while reading texts (Goodman, 1973; Koda, 2005). Skills derived from L1 could go through developmental stages during L2 reading development as the transfer occurs. This is not to say that each learner brings the same thing from previous experience; rather, learners coming from varying backgrounds may use different cognitive strategies.

As was explained in the introduction to this section, 2.5, on how reading is learned, reading is clearly viewed as a cognitive process (Grabe, 2009; Koda, 2005). Readers assess ideas, being able to infer from the text and link to previous knowledge in order to comprehend and evaluate, and at a more advanced level generate new ideas, all of which utilise the functions of working memory (Robbins, 2020).

Moreover, Carver (1990; 1997; 2000 cited in Koda, 2005, p.5) proposes that the purposes of reading determine the level of processing needed on a scale of cognitive demands. If, for example, an individual is scanning to locate lexical information in a text, grasp main ideas and achieve basic comprehension or learning something new, the degree of cognitive challenge increases along with these three levels in the scale. The scanning process seems to be the least cognitively challenging, while reading for comprehension requires analysis for the structures in order to consolidate information, which is a more taxing job (Koda, 2005). Meanwhile, learning new concepts through reading requires more effort than other tasks. Thus, IDs may become more visible when shifting upward on the scale of reading cognitive tasks from easier to hardest one (Grabe, 2009). These cognition skills are found in everyone and readers can access and employ them while reading whatever the language is. However, it occurs on different scales. That is, depending on whether it is in the reader's native or second language, the degree of understating and reaction to a text varies with respect to the proficiency level of that reader in the target language and the skills developed.

Comprehension is based on both proficiency or knowledge of the L2 and the skills used to attain comprehension. Thus, if there is difficulty in reaching a level of comprehension, the reading outcome is ultimately affected relatively due to such factors. Nevertheless, it is suggested that if the skills developed while acquiring the first language are robust and strengthened, the likelihood of being able to transfer this ability to a new language is high provided that other facilitating factors are met, such as the appropriate level of proficiency in the L2 (Laufer, 2010).

One of the key factors for success in reading comprehension is vocabulary development. It is widely-accepted that word recognition as the most frequent cognitive process of reading that occurs at the lower-level (Han, 2015). Thus, if vocabulary size and vocabulary knowledge in L1 are high, it is likely the skills associated with that are transferred to the L2. Masrai and Milton (2015) examined this association between the L1 lexical organisation (where a learner develops an understanding of vocabulary ruling), L1 vocabulary size, and L2 vocabulary development for Arabic high school students learning English and found a positive relationship between these factors. This confirms that the development of mental lexicon during L1 acquisition would influence L2 acquisition which, in turn, will enhance reading comprehension. Thus, this can support the relationship proposed in the present research objective, one, that this study seeks to examine, between reading comprehension in Arabic and reading performance in English.

In essence, variances in reading ability in L2 are affected by L1 reading ability and proficiency in L2 (Alderson, 1984); this theory fits within the framework of interdependence and threshold hypotheses. It is proposed by Jolly (1978) and Coady (1979 cited in Alderson, 1984), that successfully reading a foreign language heavily draws from ability in first language reading, that old skills are transferred and that “foreign language reading is a reading problem and not a language problem”, Alderson (1984, p.2).

Alderson followed his question “Is second language reading a language problem or a reading problem?”, and concluded that “the answer, perhaps inevitably, is equivocal and tentative – it appears to be both a language problem and a reading problem” (Alderson, 1984, p.24) determined by the conditions of the individual learner. Hence, it can be argued that it is either lack of knowledge in L2 or lack of effective ability in reading that leads to less effective reading in the L2. However, if reading skills developed in L1 are considered along with strategies employed while learning L2, better accounting of variances is understood.

If students struggle in foreign language reading, that is because the old skills were not sufficiently mastered in L1 or have not been transferred successfully to the L2 (Alderson, 1984). Therefore, in order to overcome this dilemma, learners must be taught reading skills that have not been learned in the first language (Coady, 1979 cited in Alderson, 1984).

Furthermore, learning a second language may occur at a range of ages. Thus, prior knowledge and literacy experience are essential factors on which the learner draws while learning the new language and they may facilitate learning. However, linguistic knowledge and processing skills do not necessarily develop as a consequence. It is, therefore, crucial to address and assess knowledge and the use of knowledge as different constructs (Koda, 2005). Hence, this notion further supports the possibility to transfer skills while developing L2 proficiency.

As discussed throughout the previous sections how the skills in the L1 could influence the L2, the differences in L1 and L2 experiences may lead to qualitative and quantitative procedural and efficiency variances. This necessitates a cross-linguistic analysis that can reveal subtle ways where L1

and L2 meld and interface while L2 reading learning is developing (Koda, 2005). Moreover, transfer in reading can be assessed based on language-specific factors and non-linguistic processes. This may, therefore, offer insights into individual differences in L2 reading which will be discussed in section 2.6.

Little is known about the nature of first language contribution in facilitating mastery of L2 reading, the conditions promote skill transfer in reading, and whether reading in a foreign language requires more language knowledge or more skill knowledge to be transferred. Thus, this research attempted to fill the gap with regards to the transfer of reading-related skills and some of the conditions involved such as those exhibited in individual differences.

2.5.5 Studies on cross-language reading influence

Reflecting on the previous section of languages of different writing systems 2.5.2 and learning to read across languages, 2.5, the following are some examples of studies that sought to find out how is it different for learners to learn a language of a new script. Koda (2005) contends that the linguistic knowledge required for L2 reading competency and the corresponding processing skills vary across languages. Thus, a great deal of research across languages has been carried out to investigate L1 influence such as Jiang (2011), Abu-Rabia and Siegel (2003), Verhoeven (1994), and Mushait (2003). This cross-language approach gives a powerful measurement to report on how learning development differs between individuals from various backgrounds.

For example, Jiang (2011) investigated the role of L1 literacy knowledge in L2 reading from a non-alphabetic language (logographic Chinese) in an alphabetic language (English) for 246 Chinese college students learning English. She examined the interrelationship between L1 (Chinese) literacy, L2 (English) proficiency and L2 reading comprehension. The results revealed that a correlation between literacy in L1 and L2 reading that was relatively low, but between literacy in L1 and L2 proficiency it was moderate. The same was found to be true between L2 proficiency and L2 reading. L1 only accounted for 6% of variances in L2 reading, whereas L2 proficiency accounted for up to 35%. This indicates that L1 literacy in Chinese does not play an important role in L2 English reading.

However, the measures used for assessing the L1 were not tested for reliability and the language form used in the test consisted of two varieties, classical and modern, and contained reading and writing. Additionally, the L2 reading tests differed in difficulty level and the participants' English was still at a low level which did not meet the conditions of threshold hypothesis whereby transfer occurs only after a learner reaches a minimum point in L2 proficiency. Therefore, this research might not reveal reliable results.

Nevertheless, the result could be an indication that due to the writing system of which Chinese is built (logographic), its native speakers have developed a distinctive cognitive mechanism that operates differently to how it would had they been accustomed to an alphabetic language. Thus, transfer especially for reading skills, may not be applicable in this case. Liu and Cao (2016) found that brain activities process differently for bilinguals of languages of different levels of orthograph transparency where deeper processing is involved in a language of less transparent orthography. Hence, such distinction may also applicable to Chinese speakers. Also, Mei et. al, (2014) and Toyoda and Scrimgeour (2009) states that the processing of word reading in Chinese and English is critically different due to the different awareness of structures and functions of words and this can be detected in neural activities.

A study in Hebrew, English and Arabic by Abu-Rabia and Siegel (2003) investigated the interconnections between these three orthographically different languages (though Hebrew has a

somewhat similar orthography to Arabic, but with a different alphabet). They assessed reading, language and working memory for 70 trilingual native Arabic adolescent students (aged 14-15). The tests covered the three languages and included word and pseudo-word readings. The results generally revealed a significant relationship between word acquisition, pseudo-word reading skill, working memory, and syntactic knowledge among these languages. These findings may indicate a positive influence between the languages despite the different orthographies involved in this study which give further support to the interdependence hypothesis. However, learners may be required to an adequate level of exposure in the L2 and motivation in learning the languages which the current study was seeking to investigate.

Mushait (2003), investigated the relationship between L1 reading ability (Arabic) with L2 reading comprehension (English) for Saudi university students. He uses the reading aloud protocol, to identify the strategy implemented by participants and to help explain the nature of the relationship between L1 and L2. The researcher found that ability in the L1 did contribute to L2 reading comprehension. However, the current research used a different approach by using validated language tests including examining the predictability of a high-stakes admission test - discussed in section 2.7 - as well as inserting other factors into the proposed relationship between L1 ability and L2 performance such as motivation and learning strategies.

Thus, regardless of the distance between L1 and L2 writing systems and language typology, it is likely that well-developed L1 reading skills activate L2 input and with the accumulative experience of L2, skills transfer become more available. Next section will review the role individual differences play in enabling cross-linguistics influence to occur. The next section also includes factors related to reading skills such as that of print exposure.

2.6 Individual Differences

2.6.1 Introduction

This section aims to introduce the impact of the differences among learners which make learning outcomes vary in order to inform all of the research's objective. It is considered in this research as a major factor to facilitate the influence of L1 on the L2. The section is divided into the following taking into consideration the cognitive, affective, procedural, and environmental factors respectively: Introduction to individual differences, language aptitude, working memory, motivation, learning strategies, achievement and print exposure, and then the Mathew effect in reading.

In fact, language competency varies from learner to learner. These differences among learners arise the question of why learners differ in their performance. This enduring area of inquiry is discussed in the literature of second language acquisition under what is known as individual differences (IDs) where it covers a wide range of areas. There are obviously various possible variables that bring about such differences; some of these are discussed in this section.

The discussion of IDs in this research will be in relation to cross-linguistic influence. Despite previous concepts of metalinguistic awareness and hypotheses of interdependence and threshold competing with one another to theoretically conceptualise the differences between individuals, variances can mainly be attributed to other disparate forces which, in turn, affect the transfer of skills from L1 to L2 (where cross-linguistic influence occurs). These factors are either learner-related, such as language aptitude, motivation, learning strategies adopted and learning achievement, or context-related factors, such as exposure to print, environmental support and

experience in learning. These forces can also be re-classified as cognitive (e.g. aptitude), affective factors (e.g. motivation) or procedural (e.g. learning strategies). Once these elements are in place, even to varying degrees, it is expected that transferred skills will facilitate L2 learning and that influence will cross from language to language. Thus, the source of such influence should be the central focus when investigating the requisite factors for successful learning via cross-linguistic analysis.

These variables are believed to mark the individual variations, and by doing cross-linguistic analysis, the underlying skills needed and their potential to be transferred could be identified as well as their relative contributions to L2 performance. Conducting research that compares competency for learners of different levels that highlight ID helps identify characteristics of both poor and skilled learners. Such multi-analysis should draw clearer inferences of the complex components associated with processing two languages. Much of the previous research into cross-linguistic influence has been restricted to a small range of L2 competence components and prerequisites or mostly have been examined such factors separately. Thus, in order to avoid capability analysis overgeneralisation, the present research attempted to establish and model a multi broad predictive factors interrelationship of L1 influence on L2 performance.

2.6.2 Language aptitude

Aptitude as a general capacity for language learning can be fitted within the debate of "nature vs nurture" in the respect that a common recurring feature and a main theme of scholarship in language acquisition discusses the idea that human language involves deep cognitive processing of the relationship between symbols and meaning (Lust and Foley, 2004). How this capacity evolved, and from where it develops comes the roles of nature and nurture. The process of making a relationship between linguistic elements and meanings is enabled by biological factors in minds and fed by linguistic input from the environment where language development happens.

The question of whether this ability of language aptitude is innate or environmental driven has drawn a long debate since the seminal work of Carroll and Sapon (1959). In recent years, the interest in researching aptitude began to resurge as language development for adults is perceived constrained by the degree of language aptitude (Doughty, 2019). Furthermore, the revival of discussing aptitude evolves as a result of rapid developments and discoveries in cognitive psychology and neuroscience (Wen, Biedroń, & Skehan, 2017). Language learning by default commences as early as birth (Corder, 1967). However, a child's first language ability can be influenced by brain development during gestation and the conditions of that gestation (Laplante et al., 2004). When learning a second language is concerned, after the first is established, ageing is a central factor for individual differences (Dörnyei, 2015). These differences manifest more clearly among L2 learners than L1 speakers. However, Skehan (2014) states that aptitude as a basic ability to facilitate L2 learning for adults is a residue of development in their L1. Skehan (1989) suggested that some of these language abilities start to emerge after the age of three. It is evident that language aptitude measures do not adequately predict children's mastery of a second language compared to adults (Dörnyei, 2015). However, it is not very clear for adults which of the roles (i.e. innate and environment) influences most of the L2 learning (ibid).

Robinson (2005; 2012), though, declares that the notion of innate aptitude for languages is an old view. He argues that aptitude is not a monolithic construct, nor is it independent of instruction treatment. Tasks such as working memory, problem-solving, analysing and reasoning, and noticing features in the input are of paramount significance to language aptitude. Such tasks of complex demands for aptitude are better associated by profiling individuals to their ability in L2 learning (Robinson, 2005; 2007). According to Cattell's (1943) proposal of intelligence taxonomy, which became later a part of the Cattell-Horn-Carroll's model of cognitive abilities, intelligence is divided into fluid and crystallised. The nature part of language learning is related to the fluid intelligence, where deep and abstract aspects of language are processed as manifested in reasoning tasks. The nurture part, on the other hand, that is enhanced by the experience of specific language domains is explained by the crystallised intelligence. Language tasks that derive from this later intelligence are basically dependent on skills developed from the L1 (Kormos, 2013). Therefore, the natural aptitude for adult learners which started to develop from an early age is enhanced by triggering latent cognitive capacities according to their abilities by nurture intakes. Dörnyei (2015) states that aptitude is clearly found to be relevant to L2 learning either in an explicit or implicit learning context. Adults continue to benefit significantly from implicit learning as children do as long as comprehension is met (Krashen, 1994). Since implicit learning works unconsciously, this assumes language aptitude and language learning performance go hand in hand. Hence, the discussion of nature and nurture can be balanced as Gould and Marler (1987) in their seminal work, concluded that nature and nurture do not contradict, noting that nature provides the foundation of learning possibility where nurture feeds it in a reciprocal process.

Adult language learners vary in terms of individual differences in their internal ability to learn a second language. This inherent trait has an equal bearing on research to that of environmental factors. In order to discover language aptitude potentials, much research is needed to disclose what it is composed of and to what extent it helps learners learn a new language. The discussion of language aptitude relates to the influence of skills in Arabic on learning English as proposed in the research's objective one which aims to analyse the relationship between aptitude in Arabic and reading and grammar in English. Language aptitude is enhanced by metalinguistic awareness as discussed in section, 2.4.3, and is also a basis for the premises of the interdependence hypothesis, 2.4.4.

Language aptitude or ability is the current talent that can reveal the potential to achieve in learning a language at a later age. Carroll (1981 cited in Li, 2016, p.3) identifies language aptitude as a factor distinct from the other individual differences, such as motivation, in that it is a cognitive variable that is not affected by external factors. It is an inherited trait neither affected by experience nor training. Aptitude can predict the ease and speed of learning a foreign language but, importantly, not the ultimate learning success. In essence, language aptitude refers to the prediction rate of how well an individual, compared relatively to others, can learn a new language within a given time and under given conditions (Carroll and Sapon, 1959).

Many tests have been developed to identify individuals with potential aptitude in learning a foreign language. The purposes of these tests vary, but the most obvious rationale is linked to admission to language programmes such as in the armed forces and at language colleges. One of the most popular tests is the Modern Language Aptitude Test (MLAT) developed by Carroll and Sapon (1959). The components of this test are ability in phonemic coding, grammatical sensitivity, ability in inductive language learning and associative memory. There are other tests that focus on motivation,

learning strategies and styles, tolerance for ambiguous information, working memory and verbal ability i.e. vocabulary knowledge. However, aptitude tests found to be strong predictors of L2 general proficiency rather than learning vocabulary or writing (Li, 2016).

In general, researchers have found that performance in such tests is a good predictor of part of learning a second language, especially with regard to vocabulary and morphosyntax. However, aptitude has recently been viewed as a complex of characteristics and traits that distinguish high and low learners (Stansfield and Winke, 2008; Biedroń and Szczepaniak, 2009; Wen, Biedroń, & Skehan, 2017). Some researchers, such as de Bot (2006) have also discussed brain plasticity differences between individuals. Wen, Biedroń, & Skehan (2017) expressed the move towards new areas of discoveries with regards foreign language aptitude after an era of neglecting with enthusiasm to cover interdisciplinary fields such as cognitive neuroscience and educational psychology. The question remains as to which components are more active for high achieving in a foreign language and in which areas. Li (2016) states that the different components of aptitude can yield different predictions of language learning. Hence, are there any techniques for developing instruction so that learners can benefit from the different types of aptitude? In other words, which type of aptitude is coachable? How could the current aptitude tests be better developed?

It has been suggested that aptitude as a language talent is associated with personality (Hu and Reiterer, 2009), which would involve how a person cognitively processes the language. If this theory is correct, it would necessitate that, no matter what the language is and whether it is a first or a second language, transfer of skills or cross-linguistic influence is in operation. According to Dörnyei and Ryan (2015, p.39), "individual differences in one's native language skills are related to a learner's capacity to master a second language". This study links between first language knowledge, aptitude, transfer, and other IDs variables as presented and integrated into the research's conceptual framework, section 2.8.

2.6.3 Working memory

Working memory (WM) is defined as the ability to retain information in the short-term. According to Ellis (2012, p. 309), WM is the mental abilities "refers to those mental functions responsible for storing and manipulating information temporarily". However, according to Robbins (2020), the previous definition refers to auditory working memory and WM is the ability to process the retained information and reproduce it in a different way. Working memory differs greatly between learners (Siegel and Ryan, 1988a). With respect to reading skill, WM plays a significant role in decoding, recognising, and synthesising text components while reading tasks are taking place (Grabe, 2009). Thus, WM is a major factor when considering L2 learning success and establishing how it can help with cross-linguistic influence is of prime importance (Wen, Biedroń, & Skehan, 2017). Although WM is not considered as a main construct in this research, it is assumed to be part capacity of the other constructs involved.

2.6.4 Motivation

Motivation is one of the most important affective factors and central to learning. Gardner and Lambert (1972) and Gardner (1985) stress the significance of motivation and attitude as influential factors in learning a new language. Dörnyei (2015) affirms that motivation is a prerequisite for all other factors involved in SLA and that it is the driving force for sustaining long learning process.

This should come as no surprise as learning a new language can be a tedious endeavour that requires unwavering perseverance and motivation. According to Dornyei (2015), motivation can compensate for deficiencies in one's aptitude and poor conditions for learning. Thus, inserting this key factor of SLA within a relationship that arises cross-linguistically, would offer a valuable insight into how cross-linguistic influence is driven.

Motivation involves being highly conscious of the goal of learning the language and the reason for doing it, accompanied by a desire to achieve that goal with a positive attitude and the effort required. The effect of motivation has been reported in a great deal of research into the relationship between learning performance and motivation. Generally, a motivated learner makes more effort to learn and can achieve more than one who is less motivated. However, research on motivation can be much more solid once other variables are also considered.

The current study benefited from a validated questionnaire developed and examined by Zubairi and Sarudin (2009) which defines motivation as being composed of two orientations: extrinsic – where external environmental factors are the motive for learning; and intrinsic – where internal and personal factors are the motive. Dornyei (2015) notes that these two psychological needs have been among the great influential constructs of motivation. However, no clear-cut evidence which motivation or strategies can predict (Newstead and Hoskins, 2003). Zubairi and Sarudin (2009) conducted a study on Malaysian university students' motivation to learn a foreign language and found both orientations in the students. However, the study did not consider the effects of motivation on achievement in language learning.

Thus, considering motivation as a factor when conducting a cross-linguistic analysis will help in identifying the prerequisite of transfer of skills from L1 to L2 and fit this manifestation of IDs within the cross-linguistic influence by determining its effectiveness and this help achieves the research's objective, five, to examine the moderating effect of motivation for the relationship between aptitude in Arabic and performance in English and objective six to develop a model that consists of cognitive and non-cognitive factors that can predict students' performance in the English language at university.

2.6.5 Learning strategies

In the previous section, 2.6.4, motivation was presented as an affective influential factor for SLA. The same can be said for the strategies as a procedural factor that a learner adopts while learning a language. The power of these factors lies in the fact that they are a part of the learner's personality which is the centre of learning and they are within the domain of choice by the learner to some degree.

Learning strategies that learners take to aid their learning are believed to be among the factors that help to identify how well they will learn a foreign language (Griffiths, 2018). These strategies include the ways and techniques L2 learners use to acquire, store and retrieve information in order to improve their learning progress (Oxford and Crookall, 1989; Oxford, 1990). Bialystok (1981) identifies strategies that are assumed to reflect on language learning achievement depending on the extent of their use. These strategies are formal and functional practising, monitoring and inferencing strategies, developed in a questionnaire. Bialystok (1981) examined how frequently these strategies were used by 157 high school students during their skills achievement tests in learning French. He found that using functional practice and monitoring

strategies led to positive results. Thus, the consciousness a learner holds about the way he or she implements in learning appears to foster learning development.

Oxford (1998; 2012) developed an inventory of strategies for language learning which consists of six categories measuring how frequently a learner uses each. These categories include learners' use of memory, cognitive strategies, compensation, metacognitive, affective and social strategies. Several studies have examined the relationship between the frequency of using the strategies and second language achievement. Many of them have used Oxford's inventory, such as Alhaisoni (2012) who investigated the type and frequency of strategies used by 701 Saudi university students learning English as a foreign language. The results showed that students tend to more often use the cognitive and metacognitive strategies. Thus, it will be interesting to investigate whether students in such a case, i.e. using cognitive strategies more than other strategies, will yield a significant contribution to studies on cross-linguistic influence and the transfer of prior skills to the new language.

It could, therefore, be speculated that experience in learning the new language can be integrated with the strategies used. The current study aimed to incorporate learners' experience in L1 and L2 as an enhancement for skill transfer. Abu-Rabia (2003) discussed in studies on cross-language reading influence section, 2.5.5, notes that experiences in L1 and L2 do not necessarily need to be equal for transfer to occur, however, in some aspects over others. Hence, it is vital to investigate how different using certain strategies in L1 and L2 will yield among learners.

Thus, among the other factors mentioned in exhibiting individual differences for learning another language, learning strategies and experience are part of the conceptual framework of cross-linguistic influence of this study in order to examine the effect they present in the transfer of skills and inform the research objective, five, to examine the moderating effect of learning strategies of the relationship between aptitude in Arabic and performance in English and objective six to develop a model that consists of cognitive and non-cognitive factors that can predict students' performance in the English language at university.

2.6.6 Achievement and print exposure

There is no doubt that one's achievement and progress in literacy development in a language promote mastery of skills of the same language where IDs would become obvious, such as spelling (orthography knowledge) and "processing lexical meaning (the ability to get context-appropriate meaning from words)" (Perfetti, 1985, 2001). Koad (2008) posits that "prior literacy-learning experience fosters an explicit understanding of what is to be accomplished in the task, and this, in turn, may expedite the process by allowing learners to be more reflective and strategic". Studies such as those of Perfetti (2001; 2007) have observed these skills for skilled readers having these differences apparent. Studies in Arabic have also supported such observation where early literacy experience will enhance future (Hurmuz, 1987, and Kamal, 1997).

In addition, different studies have extended this investigation to explore the role of achievement in the first language in yielding such individual variances in learning a second language (Sparks et al., 1998; Dabrowska and Street, 2006; Sparks, et al., 2012). Others have argued that the amount of exposure to print in L1 is one of the key factors that contribute to unique individual differences in orthographic processing ability i.e. the ability to recognise and understand L2 writing (see Sears et al.,

2008; Sparks et al., 2012).

Sparks et al. (2012) investigated if the late L1 reading volume and achievement would predict variance in the L2 oral and written skills among 54 high school students who have completed foreign language courses in French, German, or Spanish. They employed and obtained the data from a large battery of instruments to measure these variables, reading achievement and exposure, in predicting L2 performance. The instruments included subtest scores of different literacy and verbal skills tests for the L1 (English) and the L2s, cognitive skills test, foreign language aptitude test, and questionnaires and checklists for print exposure. They found that higher L1 reading achievement and print exposure contributed to L2 written and oral proficiency. Also, they supported that idea that the cognitive mechanism that learners utilize from while reading for comprehending and the idea that the opportunities that they have had for learning explained the differences in the L2 vocabulary and language knowledge. Nevertheless, besides the limited number of the participants, the L2s were French, Spanish, and German and the L1 was English—all closely related within the family of Indo-European languages—it may not be as relevant to the role a non-Indo-European L1 would have on English as an L2 in essence that the considerable variances among languages in syntax, functions, and use may yield different results among their speakers (Parry & Child, 1998).

Masrai and Milton (2018), investigated the influence of pre-schooling on children's L1 (Arabic) vocabulary development and its role of a future learning of an L2 (English). They found that pre-schooling did contribute to L1 vocabulary which impacted the mental lexicon size and subsequently benefited L2 acquisition. However, further research is needed to examine this impact on Arabic adult learners of English as their study recruited children learners of English at their primary schooling.

In Dabrowska's (2012) review, which called into question the assumption that all native speakers reach ultimate attainment, it has been suggested that education plays an important role in L1 and L2 proficiency (Dabrowska's, 2012). For example, Dabrowska and Street (2006) argued that speakers of a language do not master the constructions of their language at the same level. Rather, they claim that the individuals' linguistic experience plays a role in their proficiency of a specific structure. In their study, they examined the individual differences in interpreting the passive construction of English. They stated that speakers who have had more formal education were more likely to perform better at a task that includes processing the passive structure since this construction is found predominantly in academic written texts. In order to test these claims, the different levels of attainment and the role of linguistic experience, they recruited native and non-native speakers of English who have been exposed to education differently. The participants were forty, and their age ranges from 18 to 50. They were asked to determine the agents of different kinds of passive structures and semantic connotations (i.e. the transitivity of the verbs varies and some of the actions are plausible and some are not). They found that both the more educated natives and non-native speakers performed better than those of less linguistic experience, native speakers and non-native learners of English. These findings suggest that education may play a role in the level of ultimate attainment for native speakers and also suggest that education enhances the metalinguistics awareness for non-native speakers to perform well in their second language learning since language attainment feeds ultimately the general achievement of an individual.

Stanovich and West (1989) developed new measures for print exposure using different

checklists. One of these checklists uses a method whereby the participants self-report their reading habits and experience. They found that exposure to print contributes to the individual differences in reading and orthographic processing. Researchers have established the validity and reliability of these checklists (Stanovich, 2000), and they continue to be used, updated and adapted by others, such as Acheson, Wells and MacDonald (2008).

Thus, the key question as Goodman (1973) asked, how much the reader brings from his background to the specific reading? and how much background can influence second language reading? Hence, this is crucial to the inquiry of the current research in order to reveal the role of achievement and the amount of exposure to print in the L1 to influence learning the L2. This section and the next one sets the scene to achieve the research's objective two of analysing the relationship between print exposure in Arabic and reading and performance in English.

2.6.7 The Mathew effect

While the previous section takes into account print exposure and achievement a learner has in general, this section presents exposure from environmental perspective. In literacy development, early and effective acquisition of reading skills results in faster development of achievement in reading and other cognitive skills (Stanovich, 2000). A major factor that contributes to this achievement is related to environmental effects. Stanovich termed this the "Mathew effect" which is believed to account for the variances among individuals in their literacy accomplishments due to the opportunities and the privilege of environment that they have experienced. The Mathew effects "refer to rich-get-richer and poor-get-poorer effects embedded in the sociodevelopmental context . . . and good comprehenders may tend to read more" (Stanovich, 2000, p.307). A good example of this is a study conducted by Hayes and Grether (1983) which looked at the development of reading comprehension for thousands of students during the school and summer vacations. It found that students who had been involved in reading activities during the summer exhibited higher achievement than those who had not.

Stanovich (2000, p.185) suggests that several factors may contribute to the Mathew effect for reading development. These factors are attributed to, for example, growing up in a household that encourages reading activities and being surrounded by avid readers. Sullivan and Brown (2013) conducted a cohort study of adolescent students in the UK to investigate the effects of inequalities in socio-economic factors in cognitive test scores (vocabulary, spelling and mathematics). They found that reading during childhood accounted substantially for the participants' cognitive progress. Therefore, as print exposure and language achievement a learner encounters and possesses throughout life enrich their experience, it is likely that the learner is able to carry what he possesses to even a second new language as the current study proposed. Having discussed the topics related to language acquisition, cross-linguistic influence, learning to read, and individual differences, now the review turns to the discussion of using tests for university admission.

2.7 Testing for university admission, the General Aptitude Test, and the Oriental Languages Aptitude Test

This section aims to introduce the literature related to using admission tests as a university requirement in order to achieve the research's objective 3 and 4 of evaluating the General Aptitude Test (GAT) and the Oriental Languages Aptitude Test (OLAT) in predicting performance in learning English as a foreign language. It also reviews some of the studies that investigated GAT used in

Saudi Arabia which is a major construct of the current research in order to report its effectiveness in predicting students' performance at the university.

Using tests in academia has been a major method to assess students' ability, skills, or knowledge in a given context. The importance of tests varies depending on the target of the test. It could be used to determine one's suitability to enter a college, move from one level to another, or used as an instrumental method in experimental researches. Therefore, these high-stake tests must be examined to serve the purposes they are made for.

The high-competitive rate of universities admission demanded to set some requirements that can help in advance predict the performance of applicants and then choose from them who are believed to be successful in university. Misanchuk (1977), stated that future academic success can be predicted based on non-cognitive factors such as socioenvironmental variables and cognitive factors such as tests results. High-stakes standardised tests and universities admission tests have been found to be good predictors of college performance such as the Scholastic Aptitude Test (SAT) in the United States and the General Aptitude Test (GAT) in Saudi Arabia (Alshumrani, 2007).

This topic has been studied tremendously from the perspective of academic success. However, GAT is still debated over its application as a high stake admission test to Saudi universities and since this study sought to investigate cross-linguistic influence using GAT as an instrument, there is still a need to explain and explore more issues related to the power of this test in predicting performance as most of the studies that have been conducted in this area have used coarse-grained measures such as the total score of a test as a predictor and the Grade Point Average (GPA) – final total grade in every term or last year - of college as a criterion variable. This study, though, sought to use fine-grained yet thorough measures deriving the breakdown scores of the test and also a more in-depth analysis of participants' previous experience that may impact their future learning success for a specific major, namely English as a foreign language. Implementing these variables all together in this study may reveal a better understanding of academic and learning success factors giving the fact that the core of prediction is how accurate a factor can predict – compared to others- (Wolfe and Johnson, 1995) rather than does it predict solely or not.

A considerable amount of research and technical reports have been conducted by the developer of the GAT, the National Centre for Assessment (NCA), and individual researchers to investigate the test constructs, characteristics, reliability, validity, and the characteristics of the examinees. This review focuses on some of the studies that have investigated the test's power in predicting university students' performance.

First of all, it is worthwhile mentioning that the reliability coefficient of the test was reported reliable and has never been less than .91 when using alpha coefficient and when using test-retest method for any version, the coefficient was .88 (Alshumrani 2007; AlQataee, n.d.). Additionally, in a report by the NCA (2011 cited in AlQataee, n.d., p.2), a correlation has been established between the GAT and other measures (such as high school grade point average (GPA) and university first-year GPA) and compared to similar standardised tests (such as the Standardised Achievement Admission Test - another test by NCA -). The report showed that there was a moderate to moderate-high relationship among the variables. Al Saud (2009) reported that the relationship between the GAT and first year's GPA is moderate (0.45) or even more in some scientific majors.

Several studies have investigated the test's validity of prediction. In Alshumrani's (2007) study, he examined the validity of the GAT score and high school percentage in predicting the first-year GPA at different colleges for Saudi undergraduate students. He found that there was a significant correlation and predictive relationship between the predictors when weighted together and the criterion variable, the GPA in different majors. AlQataee (n.d.) investigated the construct validity of the GAT and the differential validity among high and low scores of the test who achieved high in high school grades. The relationship between the GAT scores and first-year university GPA has been established and the findings revealed that the changes in the GAT score determine the GPA. Moreover, Alghamdi and Al-Hattami (2014) examined the predictive validity of the GAT, the Scholastic Achievement Test, and high school GPA as admission criteria in three university colleges in Saudi Arabia. Their findings indicated that high school GPA was a strong predictor of college performance whereas the GAT score was not a strong predictor for students in humanities faculties. However, when calculating the weighted scores of the predictors, the results revealed significant prediction. The predictability of the GAT was strong for students in non-humanity college either when it is a sole or a weighted predictor.

In support of these findings, Alnahdi (2015) confirms that a weighted combination of the GAT score and high school GPA shows a prediction power of performance in university. Further, the GAT score in this study exhibited a stronger prediction when the criterion is the graduation GPA. Similarly, Alanazi (2014) found that the GAT score can be a strong predictor for each of its sections or as a total score regardless of student's major in high school and that the GAT score explains 13.2% of variances in first semester's GPA.

While the previous studies have looked at the general performance of university students drawn upon their GPAs against the GAT total score as a predictor, this study was intended to draw upon students' performance in specific courses, namely foreign language skills, utilising the data of GAT breakdown scores, final exams and coursework scores. Hence, the present proposed study is using the GAT from a different perspective as a tool of cross-linguistic influence using a fine-grained method in collecting the data and predicting students' academic performance.

The relationship between language skills coursework and exams scores and the GAT's total and sub-sections scores will be established to see if the GAT is valid in predicting students' performance in the given skills. Additionally, since it is language-oriented research, a breakdown of the GAT verbal section score is obtained in order to best explain the latent relationship between the components of the verbal skills (reading comprehension, sentence completion, verbal analogy, and context error detection) in Arabic as a first language (L1) to English reading skills as a foreign language (L2). Eliciting this potential relationship will help advance our understanding of the role of L1 that plays on learning L2 while controlling for proficiency in the L2 and the moderating factors such as motivation and learning strategies.

Another example of an admission test, which is used also in this study as an experimental tool, is the Oriental Languages Aptitude Test (OLAT). OLAT was developed by the Faculty of Classics at Oxford University in partnership with Cambridge Assessment and tests applicants' responses to learning a foreign language using an invented language. However, this test has not been fully examined yet with regards to its power to predict student performance in a foreign language. Dixon, Academic Administrative Officer at the Faculty of Classics (2017) says, "to the best of my knowledge, no large-scale analyses have been undertaken comparing performance in the

aptitude test with performance in exams taken during the degree courses in Classics”.

University admission tests clearly have significant implications for policy makers with regards to support their decisions and for other shareholders such as parents and applicants to raise their awareness of the effectiveness of such tests. This study integrated the investigation of cross-linguistic influence and its factors with examining the GAT and the OLAT in order to provide both theoretical and practical perspectives of the main theme of the thesis. Now, this review of the literature shall lead to providing a suggested conceptual framework that incorporates the factors related to the scope of this study based on the literature.

2.8 The conceptual framework of the study

The current research attempted to establish facets and multi-factor interrelationships that describe the components of SLA competence in the following proposed framework. This framework which is based on the previous reviews will help to create the research’s model after revealing the findings and achieve the final objective of the research, six, to develop a model that consists of cognitive and non-cognitive factors that can predict students’ performance in the English language at university.

The components listed are considered as prerequisites for the phenomena of cross-linguistic influence, especially in reading. The studies discussed have shown that there are clear differences in reading performance between individuals, including skills such as orthographic and phonological awareness. These differences are not only related to processing skills but are also linked to environmental effects and the amount of exposure to print that an individual is given. Thus, this framework attempts to integrate factors that contribute to cross-linguistic influence, particularly for reading skills.

This framework (figure 2.1) below describes the general components of the research and how they are linked and processed together. First, what is meant by achievement is the language knowledge that one has accumulated throughout the course of one’s life at home and school from natural exposure and directed teaching and learning. The GAT is an index of achievement as well as a questionnaire about print exposure. These factors, along with the cognitive abilities with which one is

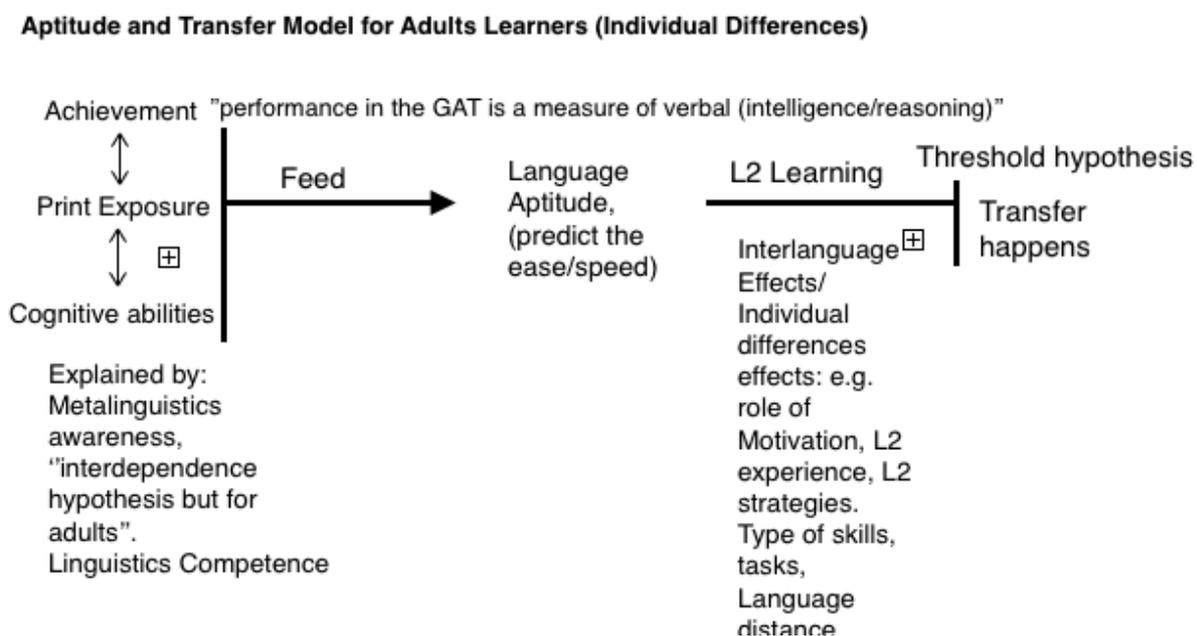


Figure 2.1 The study’s conceptual framework

endowed, are interrelated and enhance each other. In turn, they are assumed to feed the trait of aptitude. Thus, the more one achieves in L1 and the more language competence develops, the stronger aptitude becomes, making it easier to learn a foreign language.

Once L2 learning is in progress, other affective factors play their role in the acquisition of the second language. One of these important factors is motivation which keeps the learner going during this difficult journey. The phase of interlanguage, where L1 and L2 interact, and the language distance between them may determine a part of the transfer; transfer will not occur until the learner reaches a threshold of L2 proficiency as explained by the threshold hypothesis. At this minimum baseline, skills developed in the L1 will be activated for use in the L2 inspired by the learner's aptitude in the language.

This framework is expected to contribute to knowledge in the way that it presents and links aptitude and what feeds it in order to show the influence of L1 on L2 and how it happens. This may help in simplifying the complexities underlying the concept of aptitude and cross-linguistic influence and their constituents as well as the role that they play in learning a new language. The framework summarises the gaps that the current study attempted to fill which is explained below.

2.9 The study's gap

In conclusion, this research aimed to explore some areas of language skills transfer and cross-linguistic influence, in particular, to what extent an individual can use and extend his or her potential skills in reading comprehension and benefit from the volume of prior literacy experience when learning a new language. Most of the previous studies have examined this relationship for bilingual speakers of languages that have the same scripts i.e. Latin scripts. The question that is still not fully answered is to what extent the impact of prior literacy experience extends across languages for learners from diverse first language backgrounds and in which aspects of skills/sub-skills.

Moreover, the study introduces the notion of exploring the power of motivation and learning strategies to moderate the influence of L1 on L2. This study mainly aimed to investigate the proposed relationships between Arabic as a first language of university students and their achievement in English as a second language. It also examines the ability of the General Aptitude Test and its breakdown constructs to predict given major courses, namely English. It also examines the Oriental Language Aptitude Test to predict students' performance in English.

Next, after this discussion of a wide range of topics related to the current study, the methodology chapter follows which attempts to utilise the literature to adopt methods that can reveal the existence of L1 influence on the L2.

Chapter Three

Methodology

3.1 Introduction

The main goal of this research is to examine whether aptitude and print exposure in the first language (Arabic) can influence performance in learning a second language (English) while considering the moderating power of motivation and learning strategies within the proposed relationship.

The first section of this chapter presents the methodology followed in the study explained with regard to the philosophy and approach executed as well as the rationale for that. Thereafter, the research design is described including the variables used. Following that, the sampling strategies are set out. Next, the justification for using the methods is explained in relation to what has been stated in the aim and objectives of the study.

In the second section, the methods used in the research are explained. It begins by stating the sampling procedures along with information concerning the setting of the study and the participants. Following that are details of the variables and the design of instruments used. Then, the procedures of the study are explained including how the participants were recruited and the ethical issues involved. Next, the distribution of the questionnaire used, administration of the test and retrieval of tests scores are discussed. Linking the data set and the method of analysis are presented in the final section of the chapter.

Conducting this research and answering the research questions, exploring the existence of L1 effects on the L2 and in what aspects could lead to further experimental research to examine in greater depth how these effects occur and whether the relationship is in fact causal. As the aim of the study stated in the introduction of this research, it is intended to approach the research problem of first language influence on the second by identifying some of its components. Thus, a clearer picture of the likely interrelationship between the components can be achieved by fitting in the small parts. This approach is how a field consisting of many parts and interacting systems should be studied according to Seliger and Shohamy (1989).

3.2 Methodology

This section explains the rationale for the philosophy of the study and approach used. It also presents the research design including the variables, sampling strategies and justification of methods used in relation to the aim and objectives of the research.

3.2.1 Philosophy

Identifying a research philosophy and following it is a crucial element to seek and understand knowledge to avoid confusion and leave personal beliefs or choices out of influence (Richard, 2003). Adopting a philosophy will direct ultimately the data collection, analysis, and discussion of the phenomenon in question without losing the way. This philosophy is explained by a chosen paradigm that can elicit world knowledge to establish the truth (Lynham et. al, 2011) by an approach undertaken for the data collection and process it to achieve the research objectives. Thus, the description and understanding of different paradigms of their nature in relation to reality

and how that is achieved shall lead to identifying the chosen one as Guba and Lincoln (1994) suggests. A brief discussion of the positivism, postpositivism, critical theory paradigms and constructivism will follow respectively in this section. Each paradigm is described according to three dimensions stated by Guba and Lincoln (1994, p.108): The ontology, meaning “what is the form and nature of reality”, the epistemology, meaning “what is the nature of the relationship between the knower or would-be knower and what can be known?”, the methodology, meaning “how can the inquirer (would-be knower) go about finding out whatever he or she believes can be known?”

3.2.1.1 Positivism

According to Guba and Lincoln (1994), the positivism is a long-standing paradigm that dominates inquiry of social and physical sciences. Its ontology is “an apprehendable reality is assumed to exist, driven by immutable natural laws and mechanisms” p. 109. Its epistemology is “the investigator and the investigated "object" are assumed to be independent entities, and the investigator to be capable of studying the object without influence it or being influenced by it” p. 110. Finally, its methodology is “questions and/or hypotheses are stated in propositional form and subjected to empirical tests to verify them; possible confounding conditions must be carefully controlled ... to prevent outcomes from being improperly influenced” p.110.

3.2.1.2 Postpositivism

According to Guba and Lincoln (1994), the postpositivism came to reform some of the positivism’s flaws. Its ontology is the “reality is assumed to exist but to be only imperfectly apprehendable because of basically flawed human intellectual mechanisms and the fundamentally intractable nature of phenomenon” p. 110. Its epistemology is “dualism is largely abandoned as not possible to maintain, but objectively remains a "regulatory ideal"; special emphasis is placed on external "guardians" of objectivity such as critical traditions (Do the findings "fit" with preexisting knowledge?) and the critical community.” p. 110. Finally, its methodology is the “emphasis is placed on "critical multiplism" ... as a way of falsifying (rather than verifying) hypotheses.” p.110.

3.2.1.3 Critical theory

According to Guba and Lincoln (1994), the critical theory holds alternative many paradigms and also offers breakaways of sub-strands. Its ontology is “a reality is assumed to be apprehendable that was once plastic, but that was, over time, shaped by a congeries of social, political....factors, and then(refined) into a series of structures that taken as "real" p. 110. Its epistemology is “the investigator and the investigated object are assumed to be interactively linked, with the values of the investigator inevitable influencing the inquiry” p. 110. Finally, its methodology is “the transactional nature of inquiry requires a dialogue between the investigator and the subjects of the inquiry... to transform ignorance ... into ... consciousness” p.110.

3.2.1.4 Constructivism

According to Guba and Lincoln (1994), the constructivism takes a relative view of knowledge of the world, i.e. no absolute truth as knowledge is complex. Its ontology is “realities are apprehendable in the form of multiple, intangible mental contractions, socially and experientially based, local and specific in nature... and dependent of their form...” p. 110. Its epistemology is “the investigator and the object of investigation are assumed to be interactively linked so that the "findings" are *literally created* as the investigation proceeds” p. 111. Finally, its methodology is “the variable and personal (intramental) nature social constructions suggest that individual constructions

can be elicited and refined only through interaction *between and among* investigator and respondents” p.111.

3.2.1.5 The study's paradigm

Having described the paradigms, the most relevant one would be the positivisms for several reasons. First, besides being an established paradigm in the history of philosophical inquiry, the other ones are still tentative (Guba and Lincoln, 1994). Second, it can be distinguished and framed clearly in terms of its principles while the other seem to be interlinked and loose. Third, it caters primarily for quantitative research as it sets out the research questions and hypotheses in advance. The objectives of the present study are basically driven by assumptions that were developed as hypotheses which need to be tested. Fourth, it ascertains the avoidance of influence between the investigator and the investigated objects which this study also attempted to consider while testing its hypotheses and achieve its objective. For these reasons and in addition to the fact that the present study does not fall into the others' framework in terms of social interaction, the positivism paradigm is adopted. Nevertheless, the paradigms should not be seen as competing to elicit knowledge of the world; rather, they complete each other depending on the available resources.

Since this research aims to explore the relationship between student aptitude in the first language and their aptitude in the second language by using objective measurements, questionnaires and tests, the paradigm on which it is based on is the positivist philosophy. Dörnyei (2007, p. 9) states that positivism “referred to a scientific paradigm and worldview that assumes the existence of an objective and independent social reality ‘out there’ that can be researched empirically with standardized scientific instruments”. These methods measure the development of what Phakiti (2014) terms *cognitive phenomena*, justifying the use of the positivist paradigm on the grounds that there may be a cause and effect relationship between different variables in one's mind that needs to be tested using measures that can elicit data of this relationship. This can be approached by investigating the individual differences exhibited in test scores and questionnaires within the best sources available to elicit such factors.

Studying second language acquisition (SLA) is a complex task where biological, psychological and social systems on one hand interact with the characteristics of different levels of language, i.e. syntax, phonology, etc., on the other (Seliger and Shohamy, 1989; Ellis, 2012). Seliger and Shohamy argue that SLA should not be investigated from only one perspective or factor; more interlinked factors should be studied. Hence, according to the aim and objectives of the research, the influence of the first language (L1) aptitude and print exposure, motivation for learning the foreign language (L2) and the learning strategies applied for learning the foreign language have been considered crucial factors in SLA. This proposed relationships in the objectives denote primarily a correlational and a causal-comparative study. Fraenkel and Wallen (2003) refer to such research as *associational research* wherein the relationship between variables is investigated without attempting to manipulate them. The purpose of such research is “either to help explain important human behaviour or to predict likely outcomes” (Fraenkel and Wallen, 2003, p.332). The present research evaluated, examined, and analysed the relationship proposed and the prediction of some factors of others as stated in the objectives.

The several factors involved in learning an L2 should not be investigated from only one single perspective, i.e. whether L1 can influence L2 performance, as discussed in the literature chapter of

the present research. Nevertheless, other factors that result in differences between individuals should not be neglected, such as external and internal motivation, and learning strategies. This is because SLA is determined by the circumstances around it and the tools used to study it (Seliger and Shohamy, 1989), where the motivation for learning and learning strategies play respectively as powerful examples for success in learning a foreign language. Thus, researching the influence of L1 on L2 may be unclear without exploring the learners' motivation for learning the foreign language and learning strategies in place. Consequently, according to the objectives of the research, the relationship between these factors is examined in order to achieve objective five.

In fact, many other factors contribute to learning the L2. However, for the abovementioned justifications and as well as the limited scope of a PhD research, the focus of this research is limited to the factors defined in the objectives. Moreover, in order to inform the threshold hypotheses – discussed in the literature –, examining the subjects' tests scores along with questionnaire responses in these factors is believed to manifest the baseline of the threshold of L2 proficiency. This is the threshold that is needed to trigger and make L1 influence come to the surface.

3.2.2 Research approach

In order to accomplish the objectives of the research and choose the research methods, a quantitative approach was implemented. Aliaga and Gunderson (1999) explain that the purpose of quantitative research is to explain a phenomenon by numerical data collection. The data are analysed using statistics as a mathematic method to elicit casual-like relationships in quantitative research (Phakiti, 2014). This casual-like relationship method is adopted especially that it is difficult to obtain data from direct access to phenomena such as aptitude and motivation. Thus, this relationship can be elicited through inferences from data. Aliaga and Gunderson explain what statistical methods provide in research: "Statistics method is a procedure for systematically pursuing knowledge ... provide us with a collection of principles and procedures for obtaining and summarizing information in order to make decisions" p.1 after formulating theories, and it is an iterative process (1999). This study derived the data from tests scores and questionnaire results. The statistical tests used for the analysis are discussed later.

Other instruments can also be used to achieve the objectives of the research, i.e. finding out about participants exposure to print, motivation for learning and learning strategies. These instruments include, but are not limited to, interviews, writing diaries and think-aloud methods. Although these instruments are useful in qualitative research and can be implemented with a limited number of participants, this study had the privilege of being able to access a large number of participants and adopted a collective approach to recruitment for the sake of broad coverage. In addition, a quantitative approach is more appropriate for looking for relationships and prediction between variables. Thus, the approach maintained had to be quantitative, especially that the data will be analysed based on parametric tests where the scores are normally distributed.

3.2.3 Research design

This section overviews the strategies undertaken according to the research approach to define the methods used for the data collection and the rationale behind that. Table (3.1) below summarises the overall factors involved in this research and the instruments to measure them. What these instruments measure and their constructs will be given in details in the methods section, 3.3.

Quantitative Approach			
Independent Variables	Instruments	Dependent Variables	Instruments
Arabic aptitude	Language tests	Performance in learning English	Language tests - coursework
Print exposure	Questionnaire	Performance in learning English	Language tests - coursework
Motivation	Questionnaire	Performance in learning English	coursework
Learning strategies	Questionnaire	Performance in learning English	coursework

Table 3.1 Overview summarising the research design and major variables

3.2.3.1 Questionnaire

First, the present study measured the factors proposed using questionnaires. Using a questionnaire, the questions of which require participants to give answers to stimuli, as an instrument makes the questions easier to answer, quantify and analyse for a phenomenon that is not easy to observe such as self-concept, background information of participants and motivation (Seliger and Shohamy, 1989). Hence, in order to find out about participants exposure to print, motivation for learning and learning strategies, a questionnaire is a suitable tool. As discussed in the literature section, literacy experience activates metalinguistic awareness which is, in turn, transferable to the learning of new languages. Thus, this experience was approximated using such a self-reporting instrument where an individual gave information and described himself/herself.

Most of the questions were extracted from established, widely used and validated questionnaires and studies that can offer an insight into the objectives of the study. For the sake of practicality, the questionnaire took the format of closed-item questions with 5-point Likert scales, statements and multiple-choice alternatives. According to Robson (1993), this format of questionnaire makes the researcher determine the possible answers from which the participants can choose. Moreover, the objectiveness and uniformity of this type of measurement make it more reliable. In order to eliminate, or at least minimise, the confounding found in reading activity surveys where participants may tend to exaggerate in reporting their reading habits (Stanovich, 2000), some of the questions asked for specific details.

It should be mentioned that using a closed-question questionnaire in research may have certain disadvantages. One major drawback is that they do not give space for participants to express their responses freely. This is particularly pronounced where the options are given do not reflect their own experiences. The questions themselves may not be as conducive to yielding useful data like other types of instruments, mentioned below, that can perhaps elicit more information. However, in order to overcome such limitations, a wide range of questions have been chosen to increase the likelihood of the questionnaire, in general, providing an index of print exposure as well as informing the participant's motivation and covering the maximum possible strategies used for learning.

3.2.3.2 Tests

The present study also measured the proposed factors using language tests. Tests are a common instrument in research where there is a learning-and-cognition aspect (Phakiti, 2014). This is because tests "assess students' language ability, tell how well a person knows something or can

do something, discover how successful students have been in achieving the objectives of a course of study, etc.” (Phakiti, 2014, pp. 117-118). Thus, in order to establish the relationship between aptitude in Arabic and reading and grammar in English, this study utilised the results of language tests that students had taken before and during their university study.

The General Aptitude Test, which is itself used to measure Arabic aptitude in the study, and the Oriental Languages Aptitude Test, which is based on an invented language, were used to achieve the study's objective of exploring their effectiveness in predicting performance in learning English as a foreign language.

Using multiple measures, such as reading and grammar skills, adds more value to the research as Grabe (2009) stresses. Reading and grammar were chosen to measure performance in the foreign language as they are perhaps easier to measure objectively. More importantly for reading, it is a core skill and key element in academic and university study, which is the setting in which the research is set. Moreover, combined performance in these skills gives a good sense and an index of the individual's understanding of the new language.

It was intended that investigating the relationship between performance in both first and second languages using tests scores would help understanding how a foreign language is acquired. It was also hoped that it would help reveal the value of admission tests such as the General Aptitude Test and the Oriental Languages Aptitude Test for English Faculty.

3.2.4 Analysis

Three main statistical tests are used in testing the research hypotheses and analysing the results. These are correlation tests, linear regression models and path linear path regression analysis using Sobel (1982) methods to test the viability of the proposed model. Sobel methods are useful for testing complex models in psychology studies and it uses correlation and regression techniques to test theories (Woodrow, 2014). A correlation test is used to investigate the general relationship between variables and how a change in the value of one can change the value of another (Salkind, 2011). Meanwhile, linear regression is used to test correlation as a basis for predicting one variable from another. According to Salkind (2011, p.267), this “is a very powerful tool” for research in social and behavioural sciences. These statistical tests can reveal the relationships between the variables mentioned in the study's objectives.

Additionally, in order to investigate the direction of effect and causality between the variables, path regression was used. This is useful as the proposed relationship between variables is postulated based on a theoretical relationship. Path regression examines and tests the substantiality of the relationship based on the data (Salkind, 2011). In fact, path regression is different from ordinary regression, where it can be estimated whether there is an indirect effect on a dependent variable through a mediator.

Moreover, the results of the fitted relationship using these methods can imply a prediction or causal relationship between the variables. This is perhaps the case as Kuo and Anderson (2008, p.58) note that, for methodological issues in regard to comparing metalinguistic awareness and cross-language transfer, “a correlation, even one consistently found, falls short of providing direct evidence for cross-language transfer, because transfer inherently entails a causal relationship”, or “causal-like effect” as expressed by Phakiti (2014, p.) for indirect proofs of relationship.

A detailed explanation of the measures of the independent and dependent variables used and their constructs as well as the analysis process is presented in the methods section.

3.2.5 Sampling strategy

The target population for this study is students majoring in English at Saudi universities. It is estimated that there are 50,000 such students in over than 30 universities and colleges (MOE, 2016). For easy access to one of these universities' administration body and students, a convenience sampling strategy was identified. As Dörnei (2007) states, this strategy is the most common in L2 research for its practicality and for the convenience of the researcher for the sample availability, he acknowledges that they have certain "key characteristics that are related to the purpose of the investigation", p. 99.

Participants and setting

This section identifies the rationale for choosing the participants and setting in the present study. The details, however, are given in the next section of methods. In terms of main the characteristics of the large pool of population, it is any participants who were native speakers of Arabic studying English as a foreign language could be selected based on this strategy in order to achieve the objectives of the study. The setting is Imam Muhammed bin Saud Islamic University in Riyadh, the capital city of Saudi Arabia. It is deemed that this the chosen setting, a state-funded university in the capital city, involves participants who are reasonably representative of the target population. According to the university admission census (IMSIU, 2016), participants reflect a diverse stratum of the population in terms of economic and demographic backgrounds, and achievement level in first and second languages. Thus, the diverse population targeted in this setting may satisfy the generalisation of the present research findings. It was intended that having participants from the same L1 background, compared to other studies, would help in discriminating between high and low learners, which would then yield better results in defining the variables responsible.

3.2.5.1 Inclusion and Exclusion

The inclusion criteria for participants were any student who speaks Arabic as a first language, is majoring in English as a foreign language in Saudi Arabia and has been studying it at a college for at least one year or has just enrolled in a foundation course of English. This is because the main objective of this study is to establish the relationship between first language ability and aptitude on one hand and performance when learning a second language on the other. Any student who had been exposed extensively to English prior to entering the university, for example being in an English-speaking country studying in the medium of English for at least one year, was to be excluded from the study because the study seeks to examine the abovementioned relationship when learning a new language at a university level.

The study identified several inclusion and exclusion criteria for participants, including participants:

1. Being non-native English speakers
2. Being native Arabic speakers
3. Having taken the General Aptitude Test (which is a requirement for admission in all Saudi universities)
4. Studying English as a foreign language at a university.

On the other hand, students should not have spent significant time in an English-speaking country and should not have been fully fluent in English prior to study at the university where the study was to be conducted. Implementing the inclusion and exclusion criteria would help achieve

the objectives of the study that target a population of native speakers of Arabic who are learning English as a foreign language.

3.3 Methods

This section presents in greater details the setting of this research, sample size, the variables of the study, procedures of data collection, and analysis.

3.3.1 Setting

The setting is the College of Languages and Translation at Imam Muhammed bin Saud Islamic University in Saudi Arabia (IMSIU). According to IMSIU (2020), it was founded in 1950 as the Riyadh Sharia Institute followed by the College of Sharia Sciences in 1953. A few other colleges and institutes were opened around the country of the Arabic language, education, and humanities and later on science, medicine, and engineering which then affiliated and formed the current IMSIU offering undergraduate, postgraduate degrees, and research chairs. IMSIU now has thirteen colleges and higher institutes, and seventy secondary institutes throughout the county and abroad where it operates in Indonesia, Japan, and Djibouti. Over 200,000 female and male students are enrolled in the university and more than 6,000 are working staff (IMSIU, 2020). In terms of the College of Languages and Translation where the study was conducted, it was founded as a department of English and Literature in 1981 then it became an independent college in 2001. More than 4,000 students are enrolled in its foundation, BA, MA, and PhD programs and it has more than 400 teaching staff (IMSIU, 2020).

3.3.2 Sampling procedures and sample size formula

There were two procedures for calculating the minimum number of the sample size to obtain valid results. The first was according to Yamane's formula (1967):

$$n_Y = N / (1 + Ne^2)$$

where n = sample size, N = population, and e = chosen percent confidence interval at (.092)

$$n_Y = 50,000 / (1 + 50,000(0.0064))$$

$$n_Y = 50,000 / 320$$

$$n_Y = 156$$

Based on Yamane's formula for a population size of 50,000 (approximate number of students majoring in English across Saudi Arabia), the minimum number of participants for this study was 156.

The second was based on the number of variables associated with the type of statistical tests. The sample size of participants was decided according to the number of the main variables in the study. These variables were treated using different statistical analyses such as regression tests and correlation tests. As a rule of thumb, 30 participants are recommended to every predictor variable used for regression or correlation tests (Phakiti, 2014). Thus, the sample size was calculated as there is a need for at least 120 participants based on four variables. In terms of the foundation students, it is based on two variables. According to Dörnie (2007), several scholars agree that based on the specific quantitative method, a rough estimate requires at least 30 participants for correlation research and 80-100 for regression. The total number reached approximately 300 but is reduced to 248 due to missing data and withdrawal of participants. Thus, the number of participants exceeds the minimum sample size required, which could help in minimising the margin of error.

3.3.3 Participants

The table below provides an overall number of participants.

Student level	Male	Female
Foundation	84	0
Level two	127	37

Table 3.2. Number of participants

The data were obtained from 211 undergraduate male (where 84 were from foundation level and 127 from level two) and 37 female (level two) students at the abovementioned university. Participants' ages ranged from 18 to 22 years. Those who were recruited from level two had been studying English in the Faculty of English for at least one and a half years and those in the foundation level had recently begun studying at the university. The data for the later participants were obtained after they finished their first semester which lasted for four months.

Admission requirements for the faculty are based on the total final high school grade mark and the General Aptitude Test. The student's total final grade mark represents 60% of the accumulative score needed for admission, and the General Aptitude Test (GAT) represents 40%. The minimum required scores are 70% in the General Aptitude Test and 80% in the final grade mark⁴ (IMSIU, 2016). Before beginning level one in the college, students complete a foundation level (intensive English course) which lasts for one semester (almost four months). At the end of this semester, they take a final English skills test. Those who achieve a score of 80 or above out of 100 can proceed to level one and those who achieve between 60 and 79 are given another opportunity for a second intensive course.

⁴ This mark indicates their general performance at high school for many subjects including English; the specific English grade at high school is not taken into consideration because it is not considered to be a good reflection of English proficiency needed to study in the faculty, as Al-Seghayer (2014 and 2011) pointed out that students' performance is generally low in proficiency.

3.3.4 Variables

Table 3.3 presents the variables and summarises the hypothesised relationships between them followed by a paragraph restating what these variables measure.

V. no.	Independent variables	Instruments	Dependent variables	Instruments
1	Print exposure	Questionnaire	English reading ability	English reading final examination and coursework (level two)
			English grammar ability	English grammar final examination and coursework (level two)
			English performance	Final English examination(foundation level)
2	Arabic aptitude	General Aptitude Test	English reading ability	English reading final examination and coursework (level two)
			English grammar ability	English grammar final examination and coursework (level two)
			English performance	Final English examination(foundation level)
3	An invented language aptitude	Oriental Languages Aptitude Test	English performance	Final English examination(foundation level)
4	Motivation (two types)	Questionnaire	English performance	English reading final examination and coursework (level two)
5	Learning strategies (six types)			English grammar final examination and coursework (level two)

Table 3.3. Research variables and instruments

There are six main variables (independent and dependent) in the study and two moderator variables. The first independent variable is print exposure in Arabic, which was measured using a validated and adapted questionnaire (including the different constructs of which it is made) as explained later in section 3.3.5. The second independent variable is aptitude in Arabic and reading comprehension, which was measured using the General Aptitude Test (GAT) that students take before entering the university as explained in section 3.3.6 and 3.3.6.1. The third independent variable is testing the ability to learn and analyse how languages work using an invented language, which is measured by the Oriental Languages Aptitude Test (OLAT) as explained in section

3.3.6.1. The fourth and fifth dependent variables are the second language (English) reading and grammar ability for students in level two, which were measured using the final English exams in the English Faculty, where all students take a unified examination of their reading and grammar skills. The sixth dependent variable is the performance in English for foundation level students before entering level one in the college, which is also measured by way of a final exam. These tests are explained more in section 3.3.6.1.

Other variables, which are the motivation for language learning and language learning strategies were introduced as moderator variables for the proposed relationship between first and second language. These moderator variables are thought to affect the relationship between L1 and L2. Thus, this will help understand the relationship between L1 and L2 and the components of learning a second language.

3.3.5 The questionnaire design

Each instrument is described in detail with regards its design and constructions, and also each is provided in the appendices, 1 for the questionnaire, 2, 3, and 4 for the tests. The first instrument is the questionnaire where the major construct of the questionnaire was divided into four sections and sub-constructs: biodata, print exposure, motivation for learning English, and learning strategies as the below table, 3.4, shows.

Section	Constructs	Source
Biodata	Living abroad - gender – level – school major – pre-school	
Print exposure	Reading habits/ time spent on reading/ print exposure index	Adapted from Acheson, Wells and MacDonald (2008).
Motivation	Intrinsic and extrinsic motivation	Adapted from Zubairi and Sarudin (2009).
Learning strategies	Cognitive, metacognitive, affective, social, compensation and memory strategies.	Adapted from Oxford (1989 and 2012).

Table 3.4. The questionnaire design

The sections were presented in closed-item questions with 5-point Likert scales, statements and multiple-choice alternatives due to their practicality. It was written in Arabic as it was mainly intended to measure the exposure volume to print for the participants in their first language (Arabic).

Biodata

The first section is about the participants' biodata in terms of living in an English-speaking country, gender, level of study in the college, major in high school, and pre-schooling. This section is designed to discover more about the participant's literacy background. First, it asks whether the participant has studied a considerable amount in an English-speaking country; if so, they will be excluded from the study. Second, there is a question to specify the participant's level of study in the college where the study is taking place, to see to what extent progressing in studying the foreign language is affected by first language literacy experience. Third, there is a question to establish whether gender yields a difference. The fourth question pertains to the participant's major at high school (roughly equivalent to A' levels in England and Wales). This variable is considered a contributor to the amount of print exposure. In the Saudi Arabian education system, the high school offers two areas of study: humanities and science. In the humanities major, students are exposed

to more literary subjects, such as reading and comprehension, poetry, syntax, rhetoric and composition. The opposite holds true for the science major. Students in both areas can apply to the Faculty of English (Saudi Ministry of Education, 2016). It was felt that the fifth question had variables that might need to be controlled with respect to the extra time spent learning English compared to one's colleagues. Fifth, pre-schooling (six years of age and under) is not mandatory in Saudi Arabia. According to the Mathew effect theory, as discussed in the literature review, learning to read early in life, in preschool, for example, helps developing reading skills later in school. Thus, it is believed that students who have attended preschool may develop better literacy skills in their first language and later in second languages than those who have not. This question, therefore, asks whether the participant attended preschool.

Print exposure

The second section of the questionnaire is intended to measure print exposure was adapted from the validated questionnaire by Acheson, Wells and MacDonald (2008) which was originally developed by Stanovich and West (1989) and continued to be used, updated and adapted by others (Stanovich, 2000; Acheson, Wells and MacDonald, 2008). It measures the participants' reading habits and exposure to print as illustrated later in this section. It was adapted by adding some other question items to reflect the cultural context of the research and to discover more about the background of the participants in terms of print exposure and literacy-related aspects.

The design of this section contains two major constructs. One identifies the amount of time a participant dedicates to reading activities and the other seeks to explore the environmental factors that may contribute to one's exposure to print. It is as follows: The first part was adapted from Acheson, Wells and MacDonald's (2008) study which they divided into three sections. In the first section (Time Spent Reading), participants are asked to estimate the time that they spend in reading specific types of material during a typical week. In the second section, (Time Spent Writing), participants are asked to estimate the time they spend on writing different materials. In the third section, (Comparative Reading Habits), they are asked to give a comparison between themselves and their peers in regard to reading habits. The reading habits in this comparison include how much time is spent reading, how complex the materials are, the extent of enjoyment while reading, speed in reading and reading comprehension rate.

The second part of the print exposure section is also designed to discover more about participants' background with regards experience in literacy within the context of the study. For example, it is common in Saudi Arabia for students to memorise parts or even the whole text of the Quran which is heavily loaded with rhetorical expressions and a wide range of Arabic vocabulary. This memorisation may be done at home, school or evening school. Thus, this question, asks how many chapters of the Quran the participant has memorised. The next question of this part is related also to the Mathew effect theory which states that children need to learn to read until they reach a point where they can read to learn. This question is, therefore, intended to see when the participant started to read books. Next question, since storytelling as a social act is deemed to enhance individuals' literacy skills, this question, therefore, asks whether the participants' parents used to read and tell them stories.

The remaining questions fall into theories of environmental effects in the volume of exposure to print such as the impact of having a library at home, receiving books as gifts, being surrounded by avid readers and regular activities related to literacy. For instance, question 17 is

intended to see whether the participant is involved in reading activities or any other personal development courses during holidays, in contrast to the first part of the questionnaire, which is concerned with a typical week of the year (not holidays). The final question is added to see whether modern technology plays a role in the participant's life in the form of using a smart device for reading.

The responses to the above questions were scored and totalled to give an index for print exposure. In addition, the different constructs of which the questionnaire is made were used separately in order to see the extent to which they would yield variances among individuals in regard to skills and performance in the foreign language. The results from the questionnaire were linked to the test scores as discussed later in the analysis section. The purpose of this section is to provide an insight into the theories of interdependence, metalinguistic awareness, and Mathew effect. Thus, the findings would inform the notion of print exposure in the first language, its influence and whether the skills and abilities are extended to learning the second language.

Motivation

The third section was intended to measure motivation for learning a foreign language. Motivation was used in this study as a moderator to test its power within the relationship between first language and its influence on the second language. This section was based on a previously validated questionnaire for a study by Zubairi and Sarudin (2009) for its comprehensive coverage, yet limited in the number of items so that it will not cause participation fatigue, and driving upon the most two salient constructs of motivation synthesised on items manifested in the literature of motivation. This section was divided according to two orientations: intrinsic and extrinsic motivation. These constructs differ in the orientation of each target, one for intrinsic factors and the other for extrinsic. The intrinsic motivation includes twelve items and the extrinsic includes five items. Participants chose from the following options on a five-point Likert scale to express their motivation for learning the language: strongly disagree(1), disagree (2), neutral (3), agree (4) or strongly agree (5).

Learning strategies

The fourth section was dedicated to the strategies used for learning the language. Learning strategies were also used in this study as moderators to test their power within the relationship between first language and its influence on the second language. Learners' strategies for language learning was adapted from a renowned inventory developed by Oxford (1989 and 2012). The basic construct of the original inventory was divided into cognitive, metacognitive, affective, social, compensation and memory strategies. Learners report the frequency of using these types of strategies in order to examine the strengthening power of each strategy to affect the relationship between L1 and L2. The original inventory is divided into six types. In the current study, these types are applicable as follows: cognitive (8 items), metacognitive (4 items), affective (2 items), social (4 items), compensation (6 items) and memory strategies (5 items). In order, participants state/describe their learning strategies and tell "how true of you the statement is"(1989). They choose from the following statements:

- 1 Never or almost never true of me
- 2 Usually not true of me
- 3 Somewhat true of me
- 4 Usually true of me
- 5 Always or almost always true of me

3.3.5.1 Reliability

In terms of reliability, defined as the consistency of the results to be replicated (Fraenkel and Wallen, 2003), parts of the questionnaire were checked and validated from previous studies (see above) and the remainder was tested and approved consistent by conducting Cronbach's alpha estimate. The validity was reviewed by colleagues and it was also verified in a pilot study.

This section described the questionnaire design and contracts. Next, a description of the tests' constructs will follow.

3.3.6 Test design

Five tests were used to collect data. An overview of these tests is given below in table 3.5 followed by general descriptions and then the tests' constructs.

Test	Constructs	Source
General Aptitude Test	Arabic aptitude (word analogy, context error, sentence completion, and comprehension reading)	National Centre for Assessment
Oriental Languages Aptitude Test	An invented language aptitude	Oxford University
English reading final exam (level two)	Reading comprehension	College of Languages and Translation
English grammar final exam (level two)	English grammar	College of Languages and Translation
English final exam (foundation level)	Reading, grammar, and vocabulary	College of Languages and Translation

Table 3.5. Tests and their constructs

The first test was the General Aptitude Test that the students had taken before joining the university to measure their ability and aptitude in Arabic reading and comprehension. The second is the Oriental Languages Aptitude Test which tests learners' ability in understanding and solving problems in a made-up language and was administered to a number of the students in the foundation level. The third and fourth are the final English reading comprehension examination and final English grammar comprehension examination that they take at the end of the first year in college (level two). The fifth is the English final examination that students in foundation level (before entering level one at the college) take. It tests grammar, reading and vocabulary in English. These last tests measure the students' ability to understand English as a second language. Choosing reading and grammar as main variables of the foreign language is crucial as they are indexes for understanding the language. The construction of each of these tests is described below.

3.3.6.1 Test construction

General Aptitude Test (GAT)

As given in the background section of chapter one of this research, the General Aptitude Test (GAT) was designed by the National Centre for Assessment in Saudi Arabia and it started in 2003. Students take the GAT before joining the university (see appendix 2 for examples from the test). The GAT is designed to measure the analytical and deductive skills of students in two sections: The first section measures the ability and aptitude in written language, and the second measures the mathematical literacy. For the purpose of this study, it is the first section that is the subject of this investigation. The test is not based on the school curriculum nor did participants need to study especially for the test; rather, it is based on the student's cognitive ability that is developed throughout the years. It measures language skills in comprehension, inferencing, information retention and structure sensitivity all in a short time. It comprises multiple-choice questions in the reading comprehension, fragment statement completion tasks and questions regarding the relationship between lexical forms and the meanings of words (NCA, 2016). The test scores in these constructs were used as variables indicating the participant's aptitude and ability in his/her first language, Arabic. The reliability of the General Aptitude Test has been reported in previous studies at .90 (2016) which indicates that there is a high consistency of obtaining the same results if a test-taker repeats that test.

The Oriental Languages Aptitude Test

The second test is the Oriental Languages Aptitude Test (OLAT) which was developed by the Faculty of Classics at Oxford University in partnership with Cambridge Assessment and tests applicants' responses to learning a foreign language using an invented language. (see appendix 3 for examples from the test). "The test is designed to assess a candidate's ability to analyse how languages work, in a way which does not depend on their knowledge of any particular language" (Cambridge Assessment, 2019). The grammar of this fake language assumes inflectional awareness which makes it similar to that of Arabic. Thus, comparing its predictability with the GAT is worthwhile as it does not require any previous knowledge. The construct of this test focuses on skills that students are expected to be able to demonstrate while learning a foreign language, such as analysing words, identifying grammatical patterns, understanding sentence structures and analysing syntactical construction. Dixon, Academic Administrative Officer at the Faculty of Classics (2017) says, "to the best of my knowledge, no large-scale analyses have been undertaken comparing performance in the aptitude test with performance in exams taken during the degree courses in Classics".

Final English reading exam

The third test is the final English reading examination that the students take at the end of level two in the College of Languages and Translation in the English Faculty. It is designed to measure their ability to comprehend English text and related subskills required for reading. These skills include scanning and skimming for different purposes to gain information, guessing and inferencing to grasp meanings of words or phrases, understanding signal words and cause and effect, summarising and identifying particular features of a text including cultural interpretations and various texts, and understanding different points of view (IMSIU, 2016). The test scores were used

as an index of the participant's performance in English reading and comprehension after studying at the faculty for one year.

The fourth test is the final English grammar examination that the students take at the end of level two in the College of Languages and Translation in the English Faculty. It is designed to measure their ability to comprehend English grammar topics. These topics cover most fundamental aspects of English grammar, such as tenses, modals, conditions, questions, quantifiers and conjunctions (IMSIU, 2016). The test scores were used as an index of the participants' performance in English grammar after studying at the faculty for one year as a language's grammar is a crucial part of understanding language.

The fifth test is the English final examination that students in the foundation level take before entering level one of the faculty. This test measures students' performance in English as a second language after studying it for one foundation semester lasting four months. The test consists of 100 multiple-choice questions divided into three sections: reading comprehension, vocabulary meaning and explicit grammatical knowledge.

Samples of the English language skills tests can be seen in appendix 4 [Content removed for CR].

3.3.6.2 Validity

All of the English exams abovementioned are developed, reviewed and verified by the faculty members who are professors in linguistics and English language. The test development process undergoes careful construction and feedback involving analysis of the tasks and their connection to the objectives of the curriculum. According to Alnasser (2017), the Director of the Testing Centre, this process results in a valid test. Thus, these tests are believed to be suitable instruments for testing foreign-language performance for pre/upper-and-intermediate English language learners based on their constructive validity. This is congruent to what is defined by Fraenkel and Wallen (2003) who assert that validity for an instrument is that it measures what is intended to measure.

According to the specifications of the tests and the curriculum for which they are designed, they are roughly equivalent to the Common European Framework of Reference for languages (CEFR) (Council of Europe, 2019), level A2 (basic user) for foundation students and B2 (independent user) for students in level two. Hence, theoretically, the tests can be calibrated against/ between levels 4 and 6 on the International English Language Test System (IELTS) according to a comparison between IELTS band scores, CEFR levels description and the curriculum and test specifications (IMSIU, 2019 and Alnasser, 2017).

3.3.7 Procedures

This section identifies the procedures that the study underwent with regard to pre-data collection, the collection of data processes and analysing data. The figure below outlines the timeline of procedures chronologically followed by an overview and detailed descriptions.

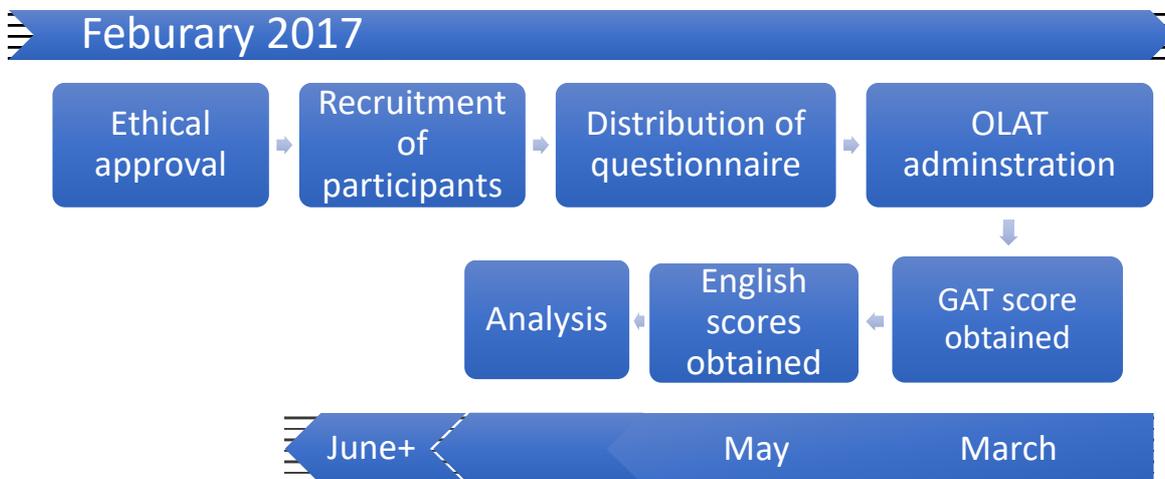


Figure 3.1. Approximate timeline diagram for the study's procedures

3.3.7.1 Overview

This section is an overview of the procedures for data collection followed according to the timeline presented above in figure 3.1; more details are given later under every respective heading. First, the ethics for collecting data and recruiting participants were approved by LJMU Ethics Committee. Thereafter, the recruitment process began by approaching the gatekeepers (the Dean of the College at IMSIU and NCA) from where the participants' data were collected, and approval was obtained. Then, the teachers of the classes received the consent forms for distribution to the students in their respective classes. During the following lesson (normally no less than one day), the teachers instructed the participants who had agreed to take part and had brought in their consent forms to fill in the study's questionnaire which was delivered online. Later, the OLAT test was administered to some of the classes in the foundation level by the researcher and in the presence of the classes' teachers. Next, after deriving the data from the questionnaire, the tests scores were collected as follows: The GAT test scores were collected from the NCA (from past tests). After the end of the semester, the English tests scores were collected from the Testing Office at the Faculty after students had taken them. Finally, linking the survey's responses with the tests and the analysis process commenced.

3.3.7.2 Ethical approval

Ethical approval was obtained mainly based on the recruitment procedures, the research instruments, questionnaire distribution, retrieval of tests scores and collection process as explained in their respective sections. The following two paragraphs explain the use of students' scores and IDs for the study.

The purpose of taking the tests scores from the two bodies mentioned, testing centres namely the National Assessment Centre (NCA) and the Faculty Testing Centre, is that, for the purpose of this study, the breakdown scores of the sections of the tests were obtained, particularly as the test takers received only the total score and were not provided with the breakdown scores.

Thus, in order to obtain the breakdown scores along with the total scores, the NCA and the faculty required the participants' IDs. They treated scores electronically to obtain detailed breakdown scores. The participants were asked to include their school and national ID numbers in the questionnaire so that all data sets could be linked.

In order to ensure the confidentiality of the personal data, all of the responses were kept on a secured computer coded with a unique code for each ID set in order to delete the real IDs permanently. The bodies responsible for providing certain data (i.e. tests score) sent them back to the researcher without IDs being identified. The NCA has its own procedures to ensure the confidentiality of disclosed data. It requires the consent forms, the research proposal and signing a form of a pledge. The process of sharing this data involved submitting it in person and via a secured electronically coded method. The participants' consent forms were copied and given to the NCA along with the gatekeeper's consent in order to release the data to the researcher.

3.3.7.3 Recruitment of participants

Consent forms

Initial consent via official written communication from the researcher was obtained from the College of Languages and Translation and from the National Centre for Assessment to collect the required data. All of the participants were from the English Faculty at Imam University in Saudi Arabia, level two and the foundation course. Consent from the main gatekeeper (the Dean of the College of Languages and Translation) was requested and obtained initially in order to gain access to the participants (see appendix 6 and 7). After approval was obtained from the gatekeeper, the Dean informed the class teachers in writing regarding the research being conducted. Then, the researcher handed the participant information sheets, the consent forms and the questionnaire access information to the teachers for distribution to the students (see appendices 7 and 8). The students would sign if they were willing to give their consent and to bring the form the next day. The teacher emphasised that participation was voluntary and the decision to take part would not affect their course grade.

Participation

In a later class (no less than one day), the teachers instructed the students who had brought back the consent forms and given consent to participate in the study by giving them a link to access the questionnaire online and fill it in. The teacher collected the consent forms and returned them to the researcher immediately after the class session ended. The participants were from different classes, with the number of students in each class being 40 on average. The total number reached approximately 300 but is decreased to 248 due to missing data because of withdrawn participants.

3.3.7.4 Distribution the questionnaire

During the day on which the questionnaire was distributed, participants in level two received a link to the complete questionnaire. Meanwhile, students in the foundation level were given the questionnaire in its two sections, biodata and print exposure. Participants were given enough time to complete the questionnaire at the beginning of the class on their mobile phones. Students who did not participate in the study were engaged in other classwork as directed by the class teacher.

The online responses for the questionnaire were recorded and sent to the researcher. The questionnaire was delivered via a secured website, called Online Surveys (formerly BOS), to which

Liverpool John Moores University had subscribed. It is also compliant with all UK data protection laws according to the Online Survey (2017).

The reason that all of the sections of the questionnaire were given to students in level two at the faculty of English as they spent a considerable length of time (one and a half years) learning a foreign language (English) so that their performance in the foreign language could be measured and compared to their prior experience in their first language and the measures of motivation and learning strategies are applicable for that reason. Meanwhile, students in the foundation level who were given the questionnaire in its two sections, biodata and print exposure, early in their learning so that the other two sections, motivation and learning strategies, were not given to them. Having students from two different levels was for the purpose of comparison between them and to inform the threshold hypothesis.

3.3.7.5 Administration of the OLAT

Those who participated in the OLAT test were students from the foundation level as they just started learning English at the university. They received training from the researcher for twenty minutes in the presence of their teachers. Then, the test was administered for forty minutes. The test was scored immediately after it was administered, and the score was also linked to the questionnaire and Arabic and English tests results.

3.3.7.6 Retrieval of tests scores (GAT scores – English scores)

In the questionnaire, students were asked to provide ID numbers so that their test scores could be collected and linked to the questionnaire data while maintaining anonymity. Using the ID numbers, the various exams scores could be obtained.

The scores for the General Aptitude Test were collected from the Saudi National Centre for Assessment. The OLAT was scored by the researcher and double-checked for accuracy. Scores of the English reading comprehension exam, English grammar examination and the final English examination were taken from the Testing Office at the Faculty of English in the College of Languages and Translation at the end of the semester. This process was conducted in order to link the scores with questionnaire responses according to table 3 for analysis to explore the relationship between aptitude and print exposure in the first language (Arabic) and performance in learning the foreign language (English) as well as the moderating variables.

3.4 Analysis

After receiving the data set, linking the questionnaire and the results of the tests was based on the coding generated previously as explained earlier, the analysis hence was conducted. Several inclusion and exclusion criteria of participants were applied as explained previously in sampling strategies. In addition, the data were checked and cleaned before conducting the analysis. Then, a descriptive analysis was given of participants' print exposure index and tests scores.

Performance in learning English as a foreign language is likely to have a relationship/correlation with other variables that were identified. The relationship and correlation were measured statistically using appropriate tests so that decisions could be made in terms of the underlying assumptions of the research objectives and thus the research hypotheses could be tested. In this study, the relationship of prediction was investigated using linear regression models, whereas the degree of the relationship was measured by simple or multiple linear correlations using

the Statistical Package for Social Sciences (SPSS) to answer the research questions and test hypotheses in order to achieve the research objectives.

Linear regression models and path regression analysis were used to test the same hypotheses. Path regression is different from ordinary regression, where Path regression can be estimated if there is an indirect effect on a dependent variable through a mediation. The results of this fitted relationship using these methods can imply a prediction or causal relationship between the variables. This may be the case as Kuo and Anderson (2008, p.58) note for methodological issues in regard to comparing metalinguistic awareness and cross-language transfer that “a correlation, even one consistently found, falls short of providing direct evidence for cross-language transfer, because transfer inherently entails a causal relationship”.

Gender and school major were controlled for while conducting the analysis of the variables stated in the methodology. Moreover, t-tests were employed in order to establish whether gender and school major yield a difference among participants in terms of the identified dependent variables.

Amount of print exposure was calculated from the questionnaire. Based on the related questions that measure aspects of print exposure in the questionnaire, each question was assigned a score and then the total of the scores formed an index of the respondents' exposure.

The moderating variables interacted in the analysis process within the relationship between the variables of General Aptitude Test and English performance in the regression model with their types identified, i.e. intrinsic and extrinsic motivation, and the six types of learning strategies (cognitive, metacognitive, compensation, memory, affective and social). Each statement of the answers was assigned a score (out of five) according to its position on the scale.

These statistical tests were all used to test the research hypotheses:

- a. There is no relationship between aptitude in Arabic and reading and grammar in English.
- b. There is no relationship between print exposure in Arabic and performance in English.
- c. The General Aptitude Test is not effective in predicting performance in learning English as a foreign language.
- d. The Oriental Languages Aptitude Test is not effective in predicting performance in learning English as a foreign language.
- e. Motivation and learning strategies do not moderate the relationship between aptitude in Arabic and performance in English.

3.4.1 Simple and multiple correlations

Correlation is mainly used to measure the strength of a linear association between two quantitative variables. The direction of correlation can be identified if one variable increases or decreases in relation to an increase or decrease in the other variable. One of the most common measures for correlation is Pearson's simple correlation, often denoted as r , which ranges from + 1 through 0 to - 1. The rule of thumb suggested for the values of correlation is: strong relationship: $r = \pm 0.5$, moderate relationship: $r = \pm 0.3$, and weak relationship: $r = \pm 0.1$ (Cohen, 1988). If the sign of the correlation is positive, there is a positive relationship, meaning that, when a variable increases, the other will increase. If the sign of the correlation is negative, there is a negative relationship, meaning that, when a variable increases, the other will decrease. The relationship is said to be very weak if the correlation is close to zero.

Multiple correlation coefficient is used to measure the strength of any relationship between a set of variables (independent variables) with one variable (dependent variable). It ranges from 0 to 1. The square of multiple correlation is known as the determination of coefficient, R^2 , which determines the proportion of the variation in the dependent variable that is explained by the set of independent variables (Draper and Smith, 1998). It ranges from 0 to 100%.

3.4.2 Multiple linear regression analysis

The multiple linear regression technique is used to perform a statistical model to identify the effect of independent variables on one dependent variable. The effect of each variable is measured by the regression coefficient (B). In addition, the effect of the independent variable can be identified by having a significant effect on the dependent variable using a t-test (Madoala, 2001). If the sign of the coefficient is positive, there is a positive effect; otherwise, if the sign of the coefficient is negative, the effect is negative. The standardised coefficient is used to determine the importance of independent variables on the dependent variables (Draper and Smith, 1998).

After fitting the regression model, it is important to check that the model assumptions are satisfied by looking at normality, constant variance and that there is no multicollinearity. The assumption of residual normality was assessed using the graphic Q-Q-plot, while the constant variance of residuals was assessed using a scatter plot between fitted values of the dependent variable and residuals. To detect the presence of multicollinearity between variables, variance-inflation factors (VIF) was used. Any variable that showed $VIF > 10$ (Maddala, 2001), was dropped from the model so that the harmful effects of multicollinearity caused by this variable are removed.

3.4.3 Mediation with Regression Analysis

When one variable has an effect on another, and the second, in turn, has an effect on a third, the second variable can be considered as a mediator (intervening variable) (see figures 3.2 and 3.3). In this study, for example, it was hypothetically proposed that GAT may “mediate” the relationship between OLAT (a predictor) and English performance using regression path analysis for foundation students. From figure 3.2, paths from OLAT and English performance are called direct effects. The mediational effect, in which OLAT leads to English performance through GAT, is defined as the indirect effect. In figure 3.3, the English reading test score is set to mediate the relationship between print point and reading time (predictors) with the verbal section of the GAT. This was for students in level two. Adding indirect and direct effects gives the total effect. The regression coefficient of indirect effects is tested using the Sobel test (Sobel, 1982)

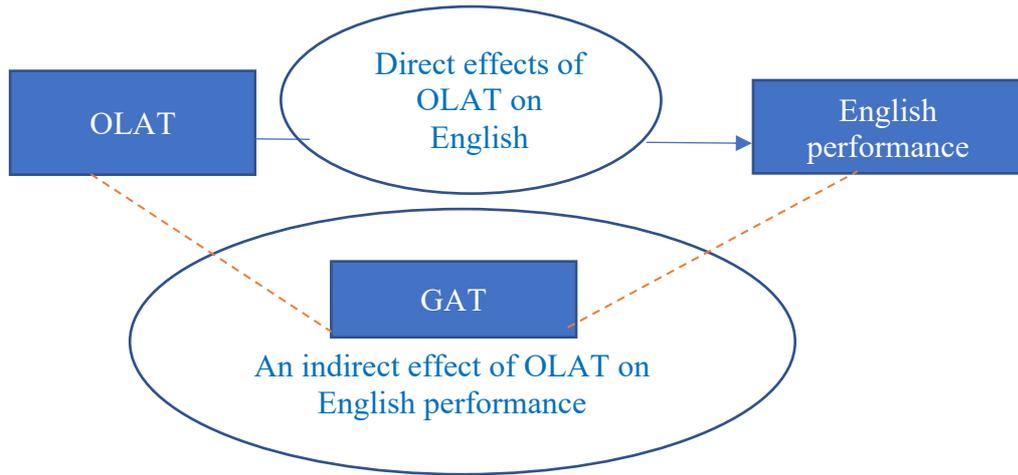


Figure 3.2: Path regression model to estimate direct and indirect effects on English performance for foundation students

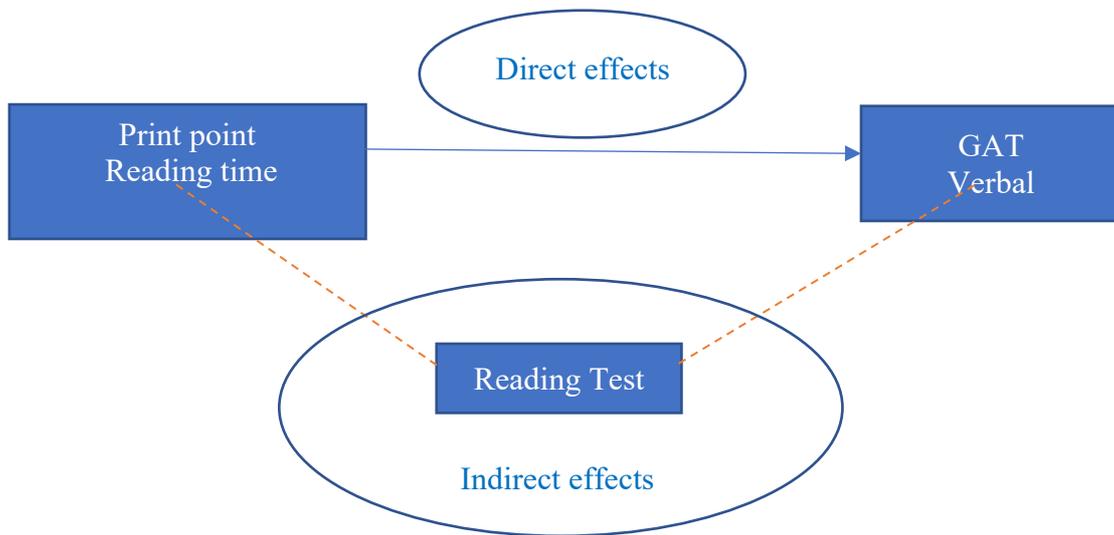


Figure 3.3: Path regression model to estimate direct and indirect effects on GAT verbal for level two students

3.4.4 Moderation with Regression

A moderator variable identifies a condition under which an independent variable is related to an outcome. Moderation is also defined as an interaction effect, where introducing a moderating variable is likely to change the effect (direction/magnitude) of an independent variable on a dependent variable (Salkind, 2011). A moderating effect could be “(a) enhancing interactions, in which both the predictor and moderator affect the outcome variable in the same direction and together they have a stronger effect than a merely additive one; (b) buffering interactions, in which the moderating variable weakens the effect of the predictor variable on the outcome; and (c) antagonistic interactions, in which the predictor and moderator have the same effect on the outcome but the interaction is in the opposite direction” (Cohen et al., 2003, p. 258).

Hierarchical multiple regression was used to assess the effects of the moderating variables. To test moderation, a particular investigation of the interaction effect between the independent variable (GAT, the verbal section) and the moderators (motivation: intrinsic, and extrinsic, learning strategies: cognitive, metacognitive, compensation, memory, affective and social) and whether or not such an effect has significant strength in the dependent variables English reading and English grammar (See figure 3.4).

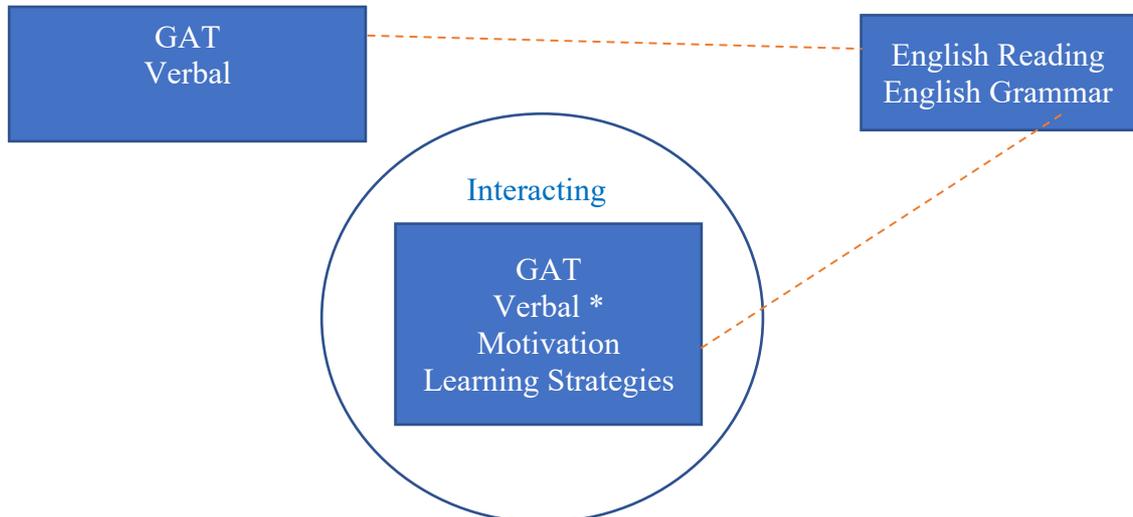


Figure 3.4: Regression model for moderators interacting with the dependent variables.

Thus, after stating the methods undertaken in the thesis in this chapter and the analysis proposed to test the hypothesis and achieve the objectives, the next chapter shows the findings.

Chapter Four

Findings

4.1 Overview

The first section of this chapter presents the results arranged according to the group of participants. In order to answer the research questions, the research objectives are given where appropriate among the findings. A summary of the findings is presented for each group. At the end of this chapter, tables that summaries the relationship between the study's variables are given.

In order to achieve the research's objective, the first, second, third, fourth, and fifth research objectives are formulated as null hypotheses. The sixth objective will be derived from the other objectives and given in the discussion. In order to test them as hypotheses, different statistical tests were employed which are: Correlation, linear regression models, and path regression analysis tests using the Statistical Package for Social Sciences (SPSS).

These null hypotheses are as follows:

- a. There is no relationship between aptitude in Arabic and reading and grammar in English.
- b. There is no relationship between print exposure in Arabic and performance in English.
- c. The General Aptitude Test is not effective in predicting performance in learning English as a foreign language.
- d. The Oriental Languages Aptitude Test is not effective in predicting performance in learning English as a foreign language.
- e. Motivation and learning strategies do not moderate the relationship between aptitude in Arabic and performance in English.

4.2 Results

The results are arranged into two main sections according to the group of participants (i.e. foundation students and then level two students). In each section, the results are presented with the respective research objective/ objectives.

4.2.1 Results for Foundation Students

The results begin with descriptive statistics, table 4.1 below, followed by a correlation matrix of the relationship between the variables, table 4.2. Then, three models were built to fit a regression model of the relationships between OLAT, GAT total, print exposure index, and reading time score (independent variables) and performance in learning English as a foreign language (dependent variable).

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Print Exposure Index	83	1	18	8.81	4.278
GAT total 2	71	54	85	68.59	7.741
Verbal section	71	50	89	69.46	9.956
Artificial language	51	0	23	9.20	4.996
Foundation test without writing	83	6	46	30.47	10.352
Valid N (listwise)	48				

Table 4.1: Descriptive statistics of the print exposure index and tests used for foundation students

4.2.2 The relationship between print exposure in Arabic and reading and performance in English

For a sample of 69 foundation students, table 2 shows that English performance was negatively correlated with reading time score ($r=-.262$, $p\text{-value}=.030$), while the correlation between print exposure index and English performance did not show any significant value.

		Print exposure index	Reading time score	GAT total 2	Quantitative section	GAT verbal section	OLAT	English performance
Print exposure index	Correlation	1	.197	.038	-.024	.082	.289*	-.046
	p-value		.104	.757	.847	.504	.016	.710
Reading time score	Correlation		1	-	-.163	.008	-.053	-.262*
	P-value			.078	.523	.182	.950	.666
GAT total 2	Correlation			1	.757**	.890**	.337**	.137
	P-value				.000	.000	.005	.261
Quantitative section	Correlation				1	.393**	.238*	.050
	P-value					.001	.049	.684
GAT verbal section	Correlation					1	.283*	.176
	P-value						.019	.147
OLAT	Correlation						1	.171
	P-value							.161
English performance	Correlation							1
	P-value							

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Table 4.2: Correlation matrix between the variables of foundation students

Model 1:

The results of the English performance test are shown in Table 4.3 below. The model assumptions (normality, constant variance and VIF) were examined and found valid (see Appendix 9). The independent variables, print exposure index and reading time together, could only explain

6.9% of the variation in the English performance test. However, only the reading time score showed a significant effect on the test, which is negative (B=-6.023, p-value=.033).

The findings for the above model did not reveal a relationship between print exposure in Arabic as a first language and performance in English as a foreign language for foundation students.

Model	Unstandardized Coefficients		Standardized Coefficients	T	p-value	Collinearity Statistics
	B	SE				
(Constant)	37.156	3.975		9.348	.000	
Print exposure index	.015	.286	.006	.053	.958	1.040
Reading time score	-6.023	2.770	-.263	-2.175	.033	1.040

R²=0.069 F(ANOVA)=2.438 p-value=.095

Dependent variable: English performance

Table 4.3: Multiple regression for English performance (Model 1)

4.2.3 The relationship between aptitude in Arabic and reading and grammar in English, the effectiveness of the General Aptitude Test performance in learning English as a foreign language, and the effectiveness of the Oriental Languages Aptitude Test in predicting performance in learning English as a foreign language

Model 2:

The regression model for the effect of OLAT and GAT verbal on English performance test is shown in Table 4.4. The model assumptions (normality, constant variance and VIF) were examined and found valid, see Appendix 9. The total variation of the model was low (4.7%). Neither variables showed any significant effect on English performance. Using standardized coefficients, the contribution of the GAT verbal variable seemed to be somewhat similar (.139) to the OLAT (.131).

Model	Unstandardized Coefficients		Standardized Coefficients	t	p-value	Collinearity Statistics
	B	Std. Error				
(Constant)	16.731	8.878		1.885	.064	
GAT verbal section	.147	.132	.139	1.112	.270	1.087
OLAT	.339	.323	.131	1.049	.298	1.087

R²=0.047 F(ANOVA)= 1.629 p-value=.204

a. Dependent variable: English performance

Table 4.4: Regression for foundation test without writing (Model 2)

Model 3: Mediation regression

As shown in table 4.5, the GAT has a direct predicting relationship with the OLAT. The GAT could mediate the effect of the OLAT; meaning that there might be an indirect effect on English

performance. However, the indirect effect of the OLAT on English performance was not statistically significant. This resulted, thus, in an insignificant total effect of the OLAT with the GAT. Nevertheless, as stated above, the OLAT showed only a significant positive effect directly on the GAT ($B=.649$, $p\text{-value}=.005$). The GAT did not show any significant effect on English performance.

The above model did not show an effect for the Arabic General Aptitude Test and the Oriental Languages Aptitude Test on predicting the performance of L1 Arabic speakers in learning English as a foreign language for students in foundation level.

OLAT	B	SE	Sobel test	p-value
Indirect effect	.0779	.125	1.27	.2017
Effect of OLAT on GAT total				
OLAT	B	SE	t-test	p-value
Constant	62.81	2.17	28.92	<.001
GAT total	.649	.222	2.926	.005

Table 4.5: Direct, indirect and total effect of OLAT on English performance

4.2.4 Summary of findings for foundation students:

Results for foundation students show that English performance was negatively correlated with Arabic reading time score, while the correlation between Arabic print exposure index and English performance did not show any significant value. However, the two variables, reading time and print exposure index together, could explain 6.9% of the variation in the English performance test, which is considered low.

The findings also show that the effect of OLAT and GAT (verbal section) have a low total variation of (4.7%) in the dependent variable, i.e. English performance test. Both variables did not show any significant effect on English performance. The contribution of the GAT verbal section variable seemed to be slightly similar to that of the OLAT.

However, the GAT is likely to have a relationship with the OLAT. Thus, theoretically, the GAT could mediate the effect of the OLAT, meaning that there might be an indirect effect on English performance. However, since the indirect effect of the OLAT on English performance was not statistically significant, this resulted in an insignificant total effect of the OLAT with the GAT. Nevertheless, the OLAT showed a significant positive effect only directly on the GAT. The GAT did not show any significant effect on English performance for foundation students.

4.2.5 Results for level two students

The results for level two begin with descriptive statistics, table 4.6 below, followed by correlation results of the relationship between the variables, see appendix 9 for the correlation matrix. Then, ten models of regression are provided.

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Print Exposure Index	163	1	21	7.87	4.115
GAT total	151	49	97	72.83	8.182
Verbal section	151	38	99	74.96	9.647
Analogy breakdown	115	29	80	65.17	10.229
Context error breakdown	115	38	81	65.05	10.234
Sentence completion breakdown	115	36	83	65.28	10.005
Comprehension Reading breakdown	115	40	88	65.56	10.025
Reading Test	74	27	60	45.59	8.893
Reading Course	126	46	100	81.36	11.312
Grammar Test	80	22	59	48.28	8.186
Grammar Course	125	44	100	85.34	10.270
Valid N (listwise)	40				

Table 4.6: A descriptive statistics of the print exposure index and tests used for level two students

Correlation Results

A simple correlation was used to measure the strength of association of variables for students in level two (169 in total). Reading course had no significant correlation with print Exposure index and reading time. It showed positive strong correlation with other variables such as GAT total (corr= .459, p-value<.001), quantitative section (corr=0.394, p-value<.001) and verbal section (corr=0.436, p-value<.001). English reading test score showed no significant positive association with the type of the GAT test and print exposure index. The correlations between predictors were not high, indicating that the issue of collinearity was not present (see appendix 9 for the complete correlation matrix).

4.2.6 The relationship between print exposure in Arabic and reading and performance in English

Model 1: English reading course

Two independent variables (print exposure index and reading time score) were regressed on reading score, table 4.7. The model was controlled by gender. Looking at the model assumptions, it was found that the residuals were normally distributed and had constant variance. Also, the issue of multicollinearity was not present (VIF<10). The variables did not explain the variation in the reading course (1.0%). The fitted model was insignificant (F=.413, p-value=.774).

Model	Unstandardized Coefficients		Standardized Coefficients	t	p-value	Collinearity Statistics VIF
	B	SE				
(Constant)	79.648	3.739		21.300	.000	
Print exposure index	-.218	.264	-.082	-.827	.410	1.219
Reading time score	1.665	1.866	.084	.892	.374	1.103
Gender	.865	2.456	.034	.352	.725	1.154

R²= .010
F(ANOVA)=.413 p-value=.744
Dependent variable: Reading course

Table 4.7: Multiple regression for reading course

Model 2: English reading test score

Two independent variables (print exposure index and reading time score) were regressed on the English reading test score (table 4.8). The model was controlled by the type of test. Looking at the model assumptions, it was found that the residuals were normally distributed and had constant variance. Moreover, the issue of multicollinearity was not present (VIF<10). The variables did not explain the variation in the English reading test score (1.30%). The fitted model was insignificant (F=.507, p-value=.786).

Neither of the two models presented above showed a relationship between print exposure in Arabic as a first language and performance in English as a foreign language for students in level two.

Model	Unstandardized Coefficients		Standardized Coefficients	t	p-value	Collinearity Statistics VIF
	B	SE				
(Constant)	83.081	5.334		15.577	.000	
Reading time score	-2.334	1.550	-.136	-1.505	.469	1.091
Print exposure index	.488	.220	.213	2.222	.250	1.224
Type of the test	-4.592	2.283	-.185	-2.011	.674	1.131

R²= .013
F(ANOVA)=. 507 p-value=.786
Dependent variable: Reading test

Table 4.8: Multiple regression for English reading test score

4.2.7 The relationship between aptitude in Arabic and reading and grammar in English, and the effectiveness of the General Aptitude Test performance in learning English as a foreign language

Model 3: GAT (verbal section)

Like models 1 & 2, the two independent variables (print exposure index and reading time score) were regressed on the GAT verbal section, Table 4.9. The model was controlled by the type of test. Looking at the model assumptions, it was found that the residuals were normally distributed and had constant variance. Moreover, the issue of multicollinearity was not present ($VIF < 10$). The model explained 10.3% of the variation in GAT verbal section and was statistically significant ($F=4.611$, $p\text{-value}=.004$). However, a positive significant effect on GAT verbal section was due to reading time score ($B=1.024$, $p\text{-value}=.028$).

Model	Unstandardized Coefficients		Standardized Coefficients	T	p-value	Collinearity Statistics
	B	SE				
(Constant)	47.658	4.854		9.817	.000	
Reading time score	1.024	1.411	.069	.726	.028	1.091
Print exposure index	-.231	.200	-.116	-1.155	.135	1.224
Type of the test	-.877	2.078	-.041	-.422	.047	1.131

$R^2 = .103$,

$F(\text{ANOVA}) = 4.611$ $p\text{-value} = .004$

Dependent variable: GAT verbal section

Table 4.9: Multiple regression for GAT (verbal section)

Model 4: Mediation effect of English reading test score

As the results in table 4.10 show, neither reading time nor print exposure index had a significant indirect effect on GAT verbal section.

Indirect effect of reading time on GAT verbal using English reading test score as a mediator				
			Sobel test	
	B	SE	Test statistic	p-value
Indirect effect	.281	0.285	0.9829	0.325
Indirect effect of print exposure index on verbal using English reading test score as a mediator				
			Sobel test	
	B	SE	Test statistic	p-value
	-.0964	0.098	-0.9800	0.327

Table 4.10: Mediation effect of English reading test score on the GAT verbal section

Model 5: GAT verbal with English reading test score

The GAT verbal was regressed on the English reading test score (see table 4.11). Looking at the model assumptions, it was found that the residuals were normally distributed and had constant variance. The variable explained 17.6% of the variation in the English reading test score. Based on regression coefficients, the GAT verbal had a significant positive effect on English reading test score (B=.363, p-value<.001).

Model	Unstandardized Coefficients		Standardized Coefficients	t	p-value	Collinearity Statistics
	B	SE				
(Constant)	18.235	5.368		3.397	.001	
Verbal section	.363	.070	.420	5.150	.000	1.00

R²= .176
 F(ANOVA)=26.52 p-value<.001
 Dependent variable: Reading test

Table 4.11: Multiple regression for verbal with reading test

Model 6: Breakdown of GAT verbal with English reading test score

Four sub-constructs of GAT verbal section, which are analogy, contextual mistake, sentence completion, and reading comprehension, were regressed on the English reading test score (see table 4.12). Checking the model assumptions, it was found that the residuals were normally distributed and had constant variance. Moreover, the issue of multicollinearity was not present (VIF<10). The independent variables were able to explain 19.1% of the variation in the English reading test score. The fitted model was statistically significant (F=5.751, p-value<.001). Only the contextual mistake breakdown score showed a significant value (B=.194, p-value.015).

Model	Unstandardized Coefficients		Standardized Coefficients	t	p-value	Collinearity Statistics
	B	SE				
(Constant)	14.394	6.670		2.158	.033	
Analogy	.143	.092	.167	1.548	.124	1.706
Contextual mistake	.194	.079	.221	2.455	.015	1.182
Sentence completion	.101	.100	.110	1.012	.314	1.742
Reading comprehension	.044	.093	.045	.474	.636	1.344

R²= .191
 F(ANOVA)= 5.751 p-value<.001
 Dependent variable: Reading test

Table 4.12: Multiple regression for English reading test score

Model 7: GAT verbal with English grammar test score

The GAT verbal was regressed on the English grammar test score (see table 4.13). Looking at the model assumptions, it was found that the residuals were normally distributed and had constant variance. The variable explained 11.8% of the variation in the English grammar test score. Based on regression coefficients, the GAT verbal had a positive significant effect on the English grammar test score (B=.245, p-value<.001).

Models 3, 4, 5, 6 and 7 revealed a relationship between aptitude in Arabic as a first language and performance in English as a foreign language for level two students.

Model	Unstandardized Coefficients		Standardized Coefficients	t	p-value	Collinearity Statistics
	B	SE				
(Constant)	31.011	4.574		6.779	.000	
GAT verbal section	.245	.060	.344	4.079	.000	1.00

R²= .118

F(ANOVA)=16.63 p-value<.001

Dependent variable: Grammar test

Table 4.13: Multiple regression for verbal with English grammar test score

Comparison of gender and type of tests (school major) for GAT and dependent variables (reading course and grammar course)

Comparing gender, males (mean=81.22) and females (mean=81.74) showed a very similar mean reading course. A t-test showed no significant difference (see table 4.14). For English grammar course score, males (mean=84.02) showed lower scores than females (88.32); hence, the difference was statistically significant (t=-2.571, p-value=.012).

In terms of test type, humanities (mean=85.94) and scientific (mean=84.93) groups showed very similar means in their English grammar course scores. The humanities (mean=45.78) and scientific (mean=45.62) groups also showed very similar means in their English reading test scores. On the other hand, the humanities (mean=80.34) showed a higher mean in GAT (verbal section) compared to the scientific group (mean=74.26), which showed a significant difference (t=2.791, p-value=.006). Thus, gender and school major can contribute differently to English performance.

	Gender	Mean	SD	t-test	p-value
Reading course	Male	81.22	11.466	-.234	.818
	Female	81.74	11.043		
Grammar course	Male	84.02	11.049	-2.571	.012
	Female	88.32	7.087		
	Test type	Mean	SD	t-test	p-value
Grammar course	"humanities"	85.94	9.417	.426	.671
	scientific	84.93	10.608		
Reading test	"humanities"	45.78	7.728	.083	.934
	scientific	45.62	8.762		

GAT verbal section	"humanities'	80.34	10.373	2.791	.006
	scientific	74.26	9.396		

Table 4.14: Comparison of dependent variables between gender and type of tests

4.2.8 The moderating effect of motivation and learning strategies for the relationship between aptitude in Arabic and performance in English

Cronbach's alpha for moderators

Assessing the assumption for the reliability of the moderators' constructs is shown in table 4.15 below. Cronbach's alpha for intrinsic motivation construct was somewhat high (0.85), indicating that the reliability for this dimension was good. The consistency of memory strategy construct was low (.488), but after dropping an item, the Cronbach's alpha considerably improved (.685). Affective strategy construct showed weak reliability (.488); it is likely that this was only based on two items, and hence it was dropped from the analysis. The other constructs showed acceptable consistency.

Motivation and learning strategies	No. of items	Cronbach's Alpha	Deleted item	Cronbach's Alpha
Intrinsic motivation	12	.803		
Extrinsic motivation	5	.709		
Memory strategy	5	.488	1	.685
Metacognitive strategy	5	.744		
Cognitive strategy	8	.778		
Social strategy	4	.609		
Affective strategy	2	.459		
Compensation strategy	6	.785		

Table 4.15: Cronbach's Alpha results

Model 8: Motivation and learning strategies moderating the effects of GAT verbal section on reading course

The moderation effect was investigated using a hierarchical multiple regression model of interaction of motivation and learning strategies with the GAT verbal section. All variables used in interaction were centred to avoid the issue of collinearity. The fitted model of reading course is shown in table 4.16. The issue of multicollinearity was not present, as all VIFs for entire independent variables were less than 10. Moreover, the residuals were normally distributed and had constant variance. Firstly, without the moderation effect, the regression was statistically significant ($F=6.79$, $p\text{-value}<.001$) with 32% variation (adjusted R square), see table 16. Then, after adding the interaction variable, moderators did not contribute significantly to the regression model of reading course. The amount of variance accounted for with the interaction is not significantly more than the first step (without the interaction) with 5.5% extra variation. The interaction between motivation and learning strategies and GAT verbal section was not significant ($p\text{-value}>.05$), suggesting that the effect of the GAT verbal section only significantly depended on compensation strategy ($B=.147$, $p\text{-value}=.03$).

Model	Unstandardized		Standardized	t	p-value	Collinearity Statistics VIF
	Coefficients		Coefficients			
	B	Std. Error	Beta			
1	(Constant)	76.304	6.402		11.919	.000
	GAT verbal	.521	.094	.443	5.568	.000
	Intrinsic motivation	4.595	2.437	.212	1.885	.057
	Extrinsic motivation	-3.204	1.683	-.182	-1.904	.005
	Metacognitive strategy	2.744	1.887	.218	1.454	.906
	Memo strategy	-.061	1.333	-.005	-.046	.832
	Cognitive strategy	-4.865	2.664	-.311	-1.826	.576
	Social strategy	4.681	1.519	.338	3.082	.126
	Compensation strategy	.378	1.722	.026	.219	.334
	Gender	.230	2.262	.009	.102	.048
	Type of the test	2.618	2.513	.091	1.042	.109
	(Constant)	72.645	6.489		11.195	.000
	GAT verbal	.519	.096	.441	5.425	.000
Intrinsic motivation	4.185	2.477	.194	1.690	.031	
Extrinsic motivation	-1.841	1.764	-.104	-1.043	.007	
Metacognitive strategy	2.128	1.891	.169	1.125	.893	
Memo strategy	-.893	1.368	-.075	-.653	.686	
Cognitive strategy	-2.946	2.723	-.188	-1.082	.388	
Social strategy	4.694	1.543	.339	3.043	.193	
Compensation strategy	.275	1.761	.019	.156	.229	
Gender	1.168	2.313	.046	.505	.071	
Type of the test	4.103	2.540	.143	1.615	.066	
2	GAT verbal intrinsic motivation	.021	.247	.008	.085	.461
	GAT verbal extrinsic motivation	.341	.188	.158	1.817	.268
	GAT verbal metacognitive strategy	-.261	.248	-.167	-1.052	.564
	GAT verbal memory strategy	-.007	.142	-.005	-.050	.374
	GAT verbal cognitive strategy	.157	.307	.082	.510	.130
	GAT verbal social Strategy	.218	.174	.142	1.256	.460
	GAT verbal compensation strategy	.147	.213	.090	.692	.030

a. Dependent Variable: Reading Course

Model	R	R Square	Adjusted R Square	Change Statistics		
				R Square Change	F Change	p-value. F Change
1	.613	.375	.320	.375	6.790	.000
2	.656	.430	.339	.055	1.460	.189

Control variables: Gender, type of test.

Table 4.16: Hierarchical multiple regression of reading course with GAT verbal section (predictor)

Model 9: an additional model for motivation only moderating the effects of writing time and print exposure on reading

Using a hierarchical multiple regression model, the moderation effect was based on the interaction of motivation with writing time and print exposure. The fitted model of reading is shown in table 4.17. The issue of multicollinearity was not present as all VIFs for entire independent variables were less than 10. Moreover, the residuals were normally distributed and had constant variance. The relationship was statistically significant before the interaction ($F=3.554$, $p\text{-value}=.01$) with 11.8% of the variation. The multiple regression revealed that adding the interaction variable contributed by increasing 5.5% of the variation. The interaction between writing time and intrinsic motivation was significant ($B=34.07$, $p\text{-value}=.032$), as well as with extrinsic motivation ($B=-23.28$, $p\text{-value}=.023$). There was a significant interaction effect of print exposure but only with the intrinsic motivation ($B=-29.57$, $p\text{-value}=.011$).

Model		Unstandardized Coefficients		Standardized Coefficients	t	p-value	Collinearity Statistics
		B	Std. Error	Beta			
1	(Constant)	45.961	.940		48.882	.000	
	Writing time_C_intrinsic_C	34.073	15.508	.583	2.197	.032	7.143
	Writing time_C_extrinsic_C	-23.284	9.949	-.464	-2.340	.023	3.979
	Print_C_intrinsic_C	-29.572	11.241	-.537	-2.631	.011	4.231
	Ptint_C_extrinsic_C	2.730	7.554	.062	.361	.719	2.945

a. Dependent variable: Reading

Model	R	R Square	Adjusted R Square	R Square Change	Change Statistics	
					F Change	Sig. F Change
1	.406 ^a	.165	.118	.165	3.554	.011
2	.635 ^b	.403	.218	.238	1.652	.092
3	.677 ^c	.458	.251	.055	1.850	.149

Table 4.17: Three hierarchical multiple regressions of reading

Model 10: Motivation and learning strategies moderating the effects of GAT verbal section on English grammar course score

Using hierarchical multiple regression model, the moderation effect was based on the interaction of motivation and learning strategies with GAT verbal. All variables used in interaction were centred to avoid the issue of collinearity. The fitted model of English grammar course score is shown in table 4.18 below. The issue of multicollinearity was not present, as all VIFs for entire independent variables were less than 10. Moreover, the residuals were normally distributed and had constant variance. Firstly, without the moderation effect, it was statistically significant ($F=4.586$, $p\text{-value}<.001$) with 28.9% of the variation. The multiple regression revealed that, after adding the interaction variables, they contributed by increasing 6.8% of the variation and reached the amount of variance equal to 35.6%. The English grammar course score was positively affected by the GAT verbal ($B=.396$, $p\text{-value}<.001$), and intrinsic motivation ($B=5.243$, $p\text{-value}=.031$), while extrinsic motivation had a negative effect ($B=-4.688$, $p\text{-value}=.007$). Only the interaction between GAT verbal and compensation strategy and was significant ($B=.452$, $p\text{-value}=.030$).

Results of the moderation models showed that motivation and learning strategies can moderate the relationship between aptitude in Arabic and performance in English for students in level two.

Model	Unstandardized Coefficients		Standardized Coefficients	t	p-value	Collinearity Statistics	
	B	Std. Error	Beta				VIF
1	(Constant)	72.494	6.209		11.676	.000	
	GAT verbal	.442	.091	.413	4.868	.000	1.144
	Intrinsic motivation	4.543	2.364	.231	1.922	.057	2.298
	Extrinsic motivation	-4.706	1.632	-.294	-2.884	.005	1.649
	Metacognitive strategy	-.217	1.831	-.019	-.119	.906	4.073
	Memo strategy	-.275	1.293	-.025	-.212	.832	2.254
	Cognitive strategy	1.450	2.583	.102	.561	.576	5.234
	Social strategy	2.272	1.473	.180	1.543	.126	2.174
	Compensation strategy	-1.621	1.670	-.125	-.970	.334	2.638
	Gender	4.382	2.193	.189	1.998	.048	1.429
	Type of the test	3.934	2.437	.151	1.614	.109	1.384
2	(Constant)	71.477	6.269		11.402	.000	
	GAT verbal	.396	.092	.370	4.277	.000	1.231
	Intrinsic motivation	5.243	2.393	.267	2.191	.031	2.441
	Extrinsic motivation	-4.688	1.705	-.293	-2.750	.007	1.865
	Metacognitive strategy	-.247	1.827	-.022	-.135	.893	4.206
	Memo strategy	-.536	1.321	-.049	-.405	.686	2.440
	Cognitive strategy	2.281	2.631	.160	.867	.388	5.626
	Social strategy	1.954	1.490	.155	1.311	.193	2.306
	Compensation strategy	-2.057	1.701	-.159	-1.209	.229	2.836
	Gender	4.076	2.234	.176	1.824	.071	1.537
	Type of the test	4.555	2.454	.174	1.856	.066	1.453

GAT verbal intrinsic motivation	-.177	.239	-.075	-.740	.461	1.668
GAT verbal extrinsic motivation	.202	.181	.103	1.114	.268	1.413
GAT verbal metacognitive strategy	.139	.240	.098	.578	.564	4.683
GAT verbal memory strategy	-.122	.137	-.099	-.893	.374	2.010
GAT verbal cognitive strategy	-.453	.297	-.262	-1.524	.130	4.864
GAT verbal social strategy	.125	.168	.089	.742	.460	2.368
GAT verbal compensation strategy	.452	.206	.303	2.197	.030	3.122

a. Dependent variable: Grammar course

Model	R	R Square	Adjusted R Square	R Square Change	Change Statistics	
					F Change	Sig. F Change
1	.537 ^a	.289	.226	.289	4.586	.000
2	.597 ^b	.356	.253	.068	1.589	.147

Control variables: Gender, type of the test.

Table 4.18: Hierarchical multiple regression model

4.2.9 Summary of findings for level two:

Results for students in level two show that the English reading course score had no significant correlation with the Arabic print exposure index nor with reading time. However, it showed strong positive correlations with other variables such as GAT total, and GAT (verbal section). As for the English reading test score, it showed no significant positive association with the type of the GAT test (which represents school major) or print exposure index.

In the regression model, the fitted models for print exposure and reading time were also insignificant and the variables did not explain any considerable variation on English reading course score or test score.

When the models of print exposure index and reading-time score were regressed on GAT (verbal section), the fitted model appeared to explain 10.3% of the variation in GAT (verbal section) and it was statistically significant. However, the positive significant effect was due to the reading time score, not to the print exposure index.

It seems that neither reading time nor print exposure index had any significant indirect effect on the GAT verbal section through the mediation of the English reading test score.

On the other hand, the GAT (verbal section) could explain 17.6% of the variation in the English reading test score. The GAT verbal had a positive significant effect on the English reading test score.

When the four sub-constructs of the GAT verbal section are considered, which are analogy, contextual mistake, sentence completion, and reading comprehension, and regressed on the English

reading test score, all of these independent variables were able to explain 19.1% of the variation in the English reading test score. The fitted model was statistically significant. However, only the contextual mistake breakdown score showed a solely significant value.

The GAT (verbal section) explained 11.8% of the variation in the English grammar test score and there is a positive significant effect on the English grammar test score.

Comparing gender showed very similar means between male and female in the English reading course. A t-test showed that there was no significant difference. For the English grammar course score, males scored lower than females; the difference was statistically significant.

In terms of test type of the GAT which represents school major, students who had studied the humanities and those who had studied science at high school showed very similar means in the English grammar course scores and in the English reading test scores. On the other hand, the humanities showed a higher mean in the GAT verbal section compared to the science group, which showed a significant difference.

In terms of the moderation effect of the interaction of both motivation and learning strategies with GAT, the verbal section was statistically significant before the moderation effect was inserted, accounting for 32% of the variation. Then, after adding the interaction variables, the moderators did not contribute significantly to the regression model of the English reading course scores. The amount of variance that is accounted for (with the interaction) is not significantly more than it was in the first step (without the interaction) with 5.5% extra variation. The interaction between motivation and learning strategies and GAT (verbal section) was not significant, except the effect of the compensation strategy on the English reading course score. However, this interaction model was fitted for motivation and learning strategies. Next, a different model that used only motivation showed different results.

The moderation effect of the interaction of motivation with Arabic writing time and print exposure shows a significant relationship before the interaction with 11.8% of the variation in English reading course score. After adding the interaction variables, they contributed by increasing 5.5% of the variation. The interaction between writing time and intrinsic and extrinsic motivation was significant. There was also a significant interaction effect of print exposure but only with intrinsic motivation.

Finally, the moderation effect of the interaction of motivation and learning strategies with GAT verbal section show a statistical significance before interaction with 28.9% of the variation of English grammar score. The multiple regression revealed that, after adding the interaction variables, they contributed by increasing 6.8% of the variation and reached an amount of variance equal to 35.6%. The English grammar course score was positively affected by GAT (verbal section) and with the intrinsic motivation, while extrinsic motivation had a negative effect. For learning strategies, only the interaction between GAT (verbal section), and compensation strategy and was significant for the English grammar course score.

The following tables, 4.19, 4.20, 4.21, 4.22, 4.23, 4.24 and 4.25, summaries the key results for students in level two.

Independent	Dependent	Correlation	Regression
Arabic print exposure	English reading course	No correlation	No prediction
Reading time	English reading course	No correlation	No prediction
Arabic print exposure	English reading test	No correlation	No prediction
Reading time	English reading test		No prediction
Arabic print exposure	GAT total	Correlation	-
Reading time	GAT verbal	No correlation	Prediction
Arabic print exposure*	GAT verbal	Correlation	Only if fitted above
It seems that neither reading time nor print exposure index had a significant indirect effect on GAT verbal section through the mediation of the English reading test.			
GAT verbal	English reading test	Correlation	Prediction
GAT verbal	English grammar test	Correlation	Prediction

Table 4.19: Correlation and regression of variables

Independent	Dependent	Correlation	Regression
GAT verbal subconstructs: analogy, contextual mistake, sentence completion and reading comprehension	English reading test	Correlation	Prediction when fitted
Contextual mistake	English reading test	Correlation	Prediction

Table 4.20: Correlation and regression of GAT breakdown constructs

Gender	Reading course	Grammar course
Male	No difference	lower
Female	No difference	higher

Table 4.21: T-test for gender

School major	GAT verbal	Reading test
Humanities	Higher	No difference
Scientific	lower	No difference

Table 4.22: T-test for school major

	Before interaction	After interaction	
GAT verbal	Motivation / learning strategies	Only compensation strategy	English reading course

Table 4.23: Moderating effects of motivation and learning strategies with GAT verbal and English reading

	Before interaction	After interaction	
GAT verbal	Motivation / learning strategies	Intrinsic motivation / compensation strategy	English grammar course

Table 4.24: Moderating effects of motivation and learning strategies with GAT verbal and English grammar

	Before interaction	After interaction	
Arabic print exposure	Motivation	Only intrinsic motivation	English reading course
Arabic writing time	Motivation	Motivation	

Table 4.25: Moderating of motivation with print exposure and writing time and English reading

The next chapter discusses these findings. In addition, the key findings are discussed in relation to the literature.

Chapter Five

Discussion

5.1 Introduction

The main goal of this research is to examine whether aptitude and print exposure in the first language (Arabic) can influence performance in learning a second language (English). The research seeks to establish this relationship to also reveal the power of aptitude tests to predict performance in learning a foreign language. The motivation and learning strategies that a learner has are factors considered in moderating the suggested relationship. All of such will be concluded and will lead to developing a model that presents components of cross-linguistic influence that can also predict students' performance in learning the English language at a Saudi university.

In this chapter, the findings presented in the previous chapter are discussed in relation to the six research objectives with the respective literature in order to offer insights into the three research questions:

1. Is there a relationship between aptitude in Arabic as a first language and performance in English as a foreign language?
2. Is there a relationship between print exposure in Arabic as a first language and performance in English as a foreign language?
3. To what extent are the Arabic General Aptitude Test and the Oriental Languages Aptitude Test effective in predicting the performance of L1 Arabic speakers in learning English as a foreign language?

The discussion will lead to the implications and further research suggestions. This chapter is organised according to the research objectives regardless of the group of participants (i.e. findings for foundation students and level two students are discussed interchangeably where applicable).

5.2 Research objective 1: Analysing the relationship between aptitude in Arabic and reading and grammar in English

The findings show a relationship between aptitude in Arabic and reading and grammar in English for advanced learners. This, in turn, provides further support for Cummins' (1979; 2000) interdependence hypothesis. However, while Cummins' hypothesis was first developed to cater to children growing up bilingual, the present study is concerned with adult learners of languages, especially with different writing systems.

The relationship was specifically found among students in level two who are more advanced than foundation students and have spent at least one year and a half studying English at the university. The relationship findings between aptitude in the L1 and performance in L2 (English) reading are consistent with Sparks et al.'s (2009) study (L1s were Spanish, French and German). The findings, however, oppose Artieda's (2017) findings that there is no effect of L1 (Spanish) reading ability on L2 (English) for intermediate learners of English (equivalent to level two students in the present study).

Additionally, the findings confirm Mushait's (2003) findings of a relationship between reading the L1 (Arabic) and reading in the L2 (English). However, the present study differs from Mushait's in three regards in related to exploring evidence of a relationship. First, the present

research uses different methods involving more validated and reliable testing of the L1. Second, it includes exposure to print as another measure of the L1. Third, it proposes the relationship within a model that incorporates motivation and learning strategies to trigger the influence of the L1 on the L2. Nevertheless, Mushait's study can be credited with featuring a qualitative instrument, namely the reading aloud protocol, to identify the strategy implemented by participants and to help explain the nature of the relationship between L1 and L2. One limitation of the present research is that it could not have long access to the participants in order to observe or interview them to elicit the nature of L1 and L2 experiences more vividly. Thus, it is advisable to conduct a similar study utilising a qualitative tool for a longer time.

The variation percentage (i.e. how much the predictor can contribute to the criterion variable) that L1 aptitude as per English reading test score was reasonably good, at 17.6% when using the total GAT verbal score and 19.1% - when using the breakdown of the GAT verbal section in the analysis - which is similar to those in other studies. The variation average for this factor (first language literacy accounting for second language reading) in other studies is 20% (Bernhardt and Kamil, 1995). These results also are in concordance with those of Abu-Rabia and Siegel (2003) who found a positive influence between Hebrew, Arabic and English despite their different orthographies. Furthermore, as reading comprehension is primarily based on knowledge of vocabulary, Masrai and Milton's (2015) study also supports these findings; they report an association between the lexical organisation (as a mental ability), vocabulary size in L1 (Arabic) and vocabulary development in L2 (English). The results may also support Masrai and Milton's (2017) findings that L1 vocabulary knowledge and intelligence (IQ) can predict overall academic achievement for Arabic-speaking learners of English. However, their prediction model included other variables that are not considered in the present study: These are L2 knowledge of general and academic vocabulary, and the IQ test as it is based on non-verbal skills.

Similarly, the findings reveal a relationship between aptitude in Arabic and performance in English grammar but with less variation than reading. Aptitude in Arabic could contribute and explain 11.8% of the score in the English grammar test. Reading and grammar, thus, can both be seen as skills where aptitude developed in the first language can affect performance in certain skills in the second. Reading skill appears to outperform grammar within the proposed relationship, which could be attributed to the nature of reading or to the fact that the constructs used for aptitude are more closely related to reading skills. However, this is not to say that grammar is different to reading skills. Knowledge in both reading and grammar contribute significantly to the comprehension of the language. Nevertheless, reading measures in this study are more related to comprehension skills than are those of grammar, which mostly measure knowledge of English grammar. This makes it more logical that aptitude could predict reading more effectively than grammar could.

Connections, therefore, exist between aptitude in the first language and performance in the second language, particularly in L2 reading. The findings support Alderson's (1984) proposal that difficulty reading in a foreign language can be a reading problem more than a language problem. That is, high achievers among level two participants in the present study drew reading skills from the L1 (Arabic) and utilised them in the L2 (English). Those who are low achievers in the same level may lack the proper reading skills which are not available in their L1; therefore, those skills may not have been transferred successfully (Alderson, 1984). Nevertheless, the cause of this

problem can be better explained by individual differences explained by the moderating factors discussed in research objective five.

When the sub-constructs of aptitude were considered for the proposed relationship, the ability to detect context error could predict performance in English reading. This result supports the idea of problem-solving skills and their impact in learning a foreign language in general and reading in particular, as given in Cummins' (2000) definition of skills underlying proficiency that developed from the L1. One of these skills is problem-solving, which can be developed and accessed for both L1 and L2. To the best of this researcher's knowledge, there are no published studies examining the relationship between the breakdown of skills of Arabic language aptitude derived from the GAT verbal section and university success, not to mention language performance in particular.

The present study establishes a relationship between the two languages, Arabic and English, and discusses this type of relationship between other languages in the literature. The results, hence, may also give a distinction to the phenomenon of cross-linguistic influence occurring between languages with alphabetic writing systems (such as Arabic and English) in comparison with languages with logographic writing systems (such as Chinese). In this regard, Jiang (2011) found a low correlation between L1 literacy (Chinese) and L2 proficiency (English). This is perhaps because speakers who use an alphabetic writing system (wherein letters essentially represent their phonological counterparts) may have developed processing that operates similarly across languages and thus transfers skills when learning one of them. Further research with a greater focus on the nature of this processing mechanism is therefore suggested. Moreover, further research is needed to investigate the relationship between languages of logographic, logogram (written characters representing words or phrases) and alphabetic writing systems in order to confirm whether such a distinction really exists for cross-linguistic influence to occur. Moreover, since Chinese characters have a version of a writing system that is based on pronunciation, the Romanised Pinyin, it would be insightful to investigate its relationship with English for their learners.

The findings for foundation students did not reveal results for the proposed relationship. This should not be unexpected given the relatively short time that the foundation students have been studying English at university. Nevertheless, these findings give further support to the threshold hypothesis that there is a baseline of proficiency that needs to be reached in order to achieve the transfer of skills, as in the studies of Legarreta (1979), Verhoeven (1994) and Van Gelderen et al. (2007), which involved speakers of languages other than Arabic, as well as Mushait (2003) in his study of Arabic speakers. In light of the present findings, it would be recommended to conduct a further investigation involving level one students in order to determine the baseline point.

As discussed in the literature and confirmed in the findings, a well-established aptitude in one's first language is believed to be developed from learning the language at an early age and throughout schooling and is seen as a factor influencing second language learning. This is, therefore, a long-term process that can trigger aptitude in one's first language. Several studies have shown that L1 achievement years before the beginning L2 learning can influence L2 performance later (as reported in Artieda, 2017; Sparks et al., 2009; Sparks et al., 2012; Artieda and Muñoz, 2013).

On the whole, therefore, these findings appear to reveal a relationship between aptitude in Arabic and reading and grammar in English. In essence, and according to the findings of the

present research, an index of prediction could be made between aptitude in the first language and performance in the second. This is essentially based on how much time is spent learning the foreign language. Hence, this research's objective, 1, has been achieved.

5.3 Research objective 2: Analysing the relationship between print exposure in Arabic and reading and performance in English

The findings of the present research reveal no direct relationship between print exposure in Arabic and performance in English. Since the previous section discusses first language aptitude that has developed cognitively throughout the years and its influence on performance in the foreign language, this section discusses the environmental factors of language achievement.

Since there is a relationship between aptitude in Arabic and Arabic print exposure in the current study, the Matthew effect may then apply to the same language for adults where print exposure and experience in the L1 (Arabic) would benefit achievement in the L1 as stated by Kamal (1987), Hurmuz (1997), Stanovich(2000), Grether (1983) and Sullivan and Brown (2013). The Matthew effect holds that students in a better socio-economic environment who engage in reading activities during holidays will achieve higher in reading development during school days than those who do not fall into this category. Thus, it could be argued that, since there is a relationship between Arabic aptitude and English performance, as mentioned in the previous section, there is a possibility of an indirect effect of print exposure on English performance through the mediation of aptitude as print exposure enhances language aptitude.

Nevertheless, print exposure as an index of environmental factors that contribute to the literary experience, including estimated time dedicated for literary input in the first language, does not reveal significant results in terms of their influence on performance in the foreign language. Rather, the findings show a reverse effect for the foundation level students. That is, English performance was negatively related to the Arabic reading time score. This means that the more one reads in Arabic, the more negative the effects will be on learning the foreign language. These findings stand in contrast to Sparks et al.'s (2012) finding that engagement in L1 experiences improved L2 writing and exhibited differences among learners based on their L1 experience. However, their participants were monolingual English speakers learning German, Spanish or French at high school, which suggests that more closely related languages and languages using the same script may benefit from previous print exposure facilitating learning the second language.

The findings may be due to a shortcoming in print exposure questionnaire design. The questionnaire is primarily adapted from a validated one designed for American students. When adapting it to reflect the current study's context, one part, which includes names of authors and magazines from the US, was removed and substituted with questions reflecting the target participants. Nevertheless, this part of the questionnaire regarding print exposure is a contribution to the literature of the present study's context as it was designed to reflect it. Therefore, it can be used for future studies., Despite the findings of the present one, the question remains valid once appropriate methods have been carefully reviewed. Such methods may include measuring more specific indices and tangible outcomes of print exposure such as designing a test for a certain variable of print exposure and carrying out a longitudinal study with the same participants.

However, as discussed in the previous section, these results for foundation students could be due to the limited period of studying the new language, particularly as this type of effect did not

appear with students in level two. These findings, however, may not be well explained by the threshold hypothesis as it seems that it cannot account for L1 previous print exposure enhancing L2 performance when reaching a satisfactory L2 proficiency level. Moreover, the Mathew effect may not be applicable to print exposure in Arabic to exhibit differences in English even when print exposure of a learner and experience in the L1 were high. In contrast, individual differences were found in Masrai and Milton (2018), but for children learning English at an early age. They found the mental lexicon size may have been expanded during pre-schooling in the medium of L1, which ultimately impacts on L2. It is probable that print exposure effect exhibits differences in learning a second language at an early age rather than during adulthood. Needless to say, print exposure can yield differences within the same language. Dabrowska and Street (2006) assert that speakers of a language master their language to different degrees due to many factors such as an individual linguistic experience and more formal education. Although observing the relationship between print exposure and Arabic aptitude is not the aim of the present study, these findings could pave the way for further investigations for individual differences in print exposure and its effect in the long term for speakers of Arabic, particularly when considered that this area is insufficiently researched in the literature whether in the medium of Arabic or English.

In general, these results failed to establish a direct relationship between print exposure in Arabic and performance in English. Thus, this does not support the Mathew effect in its explanations cross-linguistically, contrary to expectations. Nevertheless, the study examines the impact of L1 print exposure on the L2 performance, which is rarely found in previous studies, especially for the current context. Thus, it sheds light on an area that requires further exploration. Therefore, the present study has achieved this objective, 2, by analysing the proposed relationship.

Research objective 3: Evaluating the effectiveness of the General Aptitude Test in predicting performance in learning English as a foreign language

The GAT was able to predict performance in English for both reading and grammar skills as well as for the coursework performance in general for students in level two. The prediction of the test means the higher a student scores in the test, the higher the score will be in the English language tests and course grades. This performance can, thus, represent success at university. The GAT measures language aptitude and uses the Arabic language as a means for aptitude. Thus, the assumption that aptitude in Arabic can be transferred to English was included in this study in order to be tested by exploring the test's effectiveness in predicting performance in English as a foreign language and to report cross-linguistic influence.

The findings for students in level two that the GAT could predict their performance at university are in line with the findings of Alshumrani (2007), AlQataee (n.d.), Alnahdi (2015) and Alanazi (2014) where they used general measures of the relationship between the GAT (i.e. only the total scores) and university GPA of different majors. The findings of the GAT predictability in the present study are different to those studies although it has revealed the test's power (with breakdown scores) to predict specific foreign language performance but not reporting on general GPA scores. Responding to the observation made by Alanazi (2014) that GAT score can be a stronger predictor for each of its sections or as a total score and his findings that GAT explains 13.2% of variances in the GPA (i.e. how much the GAT score can contribute to university GPA), the present study reports higher variances, at 17.6% and 19.1%, but not for the GPA. Rather, the

findings were for reading score and coursework. Thus, the GAT's effectiveness can at best, according to the present study, explain 19% of variances in performance in English reading-related skills. This shows that the GAT's prediction power is greater due to using particular subject areas as criteria. Nevertheless, the findings stand in contrast to Alghamdi and Al-Hattami's (2014) findings that the GAT did not predict students' university GPAs in a humanities faculty (College of Education) while it did in science faculties. However, they found that the GAT score can predict when it is weighted (or combined) with other variables, such as high school grade.

For foundation students, the test findings do not reveal any significant value for the prediction power in their English performance, for two possible reasons: The first is the same reason discussed previously; the relatively limited time that students had studying English. The second is that the test used to measure English performance is different from the one used for level two. The foundation test integrated many language skills, vocabulary, reading and grammar, where the total test score combined all the skills. This raises questions regarding the reliability of the test as the total score represented might not have given and reflect a reliable indication of performance. The tests for level two, on the other hand, are given separately, one skill (reading and grammar) per test.

In conclusion, the GAT is effective in predicting performance in learning English as a foreign language. By way of this discussion, the research objective, 3, of evaluating the GAT has been achieved.

5.4 Research objective 4: Evaluating the effectiveness of the Oriental Languages Aptitude Test in predicting performance in learning English as a foreign language

The OLAT was administered for the foundation students' group and was not able to predict their English performance. This test measures language aptitude using an invented language designed primarily for English speakers who want to learn oriental languages such as Arabic. Thus, it was employed in this study in order to test the assumption that it also can predict the success of Arabic speakers who want to learn English, by exploring its effectiveness in predicting performance in English as a foreign language.

Although the present study represents the first evaluation of its power to predict learning performance, there are four issues or limitations that need to be addressed. First, it was designed primarily for English speakers learning oriental languages. However, as discussed in the methodology, since it aims to target applicants for courses in Arabic and other oriental languages (Oxford University 2016), it may, then, give a similar index aptitude in Arabic. Thus, administering the OLAT for native speakers of Arabic learning English as a foreign language could be a reason for its inability to predict their performance in English. Therefore, it would be advisable for future studies to administer an alternative aptitude test that reflects English language structure to applicants for an English course. Second, the OLAT may be better administered before the foreign language is fully introduced for the students at the university level and in the Faculty of English to avoid the FL interfering with performance in the test. Third, tracking students' performance should be given longer to allow them to progress in the foreign language, which was not possible due to time constraints during the data collection phase. Fourth, in comparison to the GAT where students may have received training before taking it, the OLAT was completely new to them and they had received only 30 minutes of training in class. Training test takers for unfamiliar tests is of crucial

importance for their validity. This issue also raises a concern regarding the test's practicality due to it being time-consuming and demanding for both examiners and applicants.

Nevertheless, the OLAT has not been examined in the literature (Dixon, 2017) and there is no known evidence of its power to predict. Hence, this study serves as an exploratory study for future studies particularly considering the present study's methods in administering the OLAT and the issues and limitations discussed above considered for review and re-evaluation. Nevertheless, even with the findings for foundation students, there is a relationship between the GAT and the OLAT. Since the GAT, as a test for Arabic aptitude, proved to be an effective predictor for more advanced students, it also has a positive relationship with the OLAT. The OLAT, thus, can theoretically be a predictor for English performance if an indirect relationship is considered and once the optimal conditions for administering the OLAT are met. These conditions include giving the same time for students in level two (one year and a half) for the participants to progress in learning the new language. Also, it is necessary to train participants more for the test as it is based on an invented language that is completely new to them. The fact that the original test was made shorter in the present study for the sake of making it easier for participants might have affected the results.

In essence, the present study's findings could not provide evidence that the OALT is effective in predicting the performance of L1 Arabic speakers in learning English as a foreign language. Evaluating the OLAT in this study means that the fourth objective has been achieved.

5.5 Research objective 5: Examining the moderating effect of motivation and learning strategies on the relationship between aptitude in Arabic and performance in English

The findings reveal that the interaction effect of motivation, particularly intrinsic motivation, did moderate the relationship between aptitude and print exposure with general English performance. They also reveal that the learning compensation strategy could moderate the relationship between aptitude in the first language and performance in the foreign language.

The previous research one, three, and four objectives deal mainly with the concept of cross-linguistic influence, whereas objective two and this objective takes into account the effect of non-cognitive factors, namely motivation and learning strategies, as moderators affecting the strength of the relationship between L1 and L2. Transfer of skills should be assessed based on language-specific factors as well as non-linguistic ones in order to resolve the dilemma of whether reading is a language problem or skills problem, as raised by Alderson (1984) and discussed in the literature chapter. Hence, altogether, cognitive and non-cognitive factors can offer a reasonably clear picture of a number of crucial components in second language acquisition as discussed in the literature.

The findings reveal that motivation to learn the foreign language can predict English performance before being added to the relationship as a moderator. This was not unexpected as motivation has been seen as a vital factor in numerous studies as demonstrated by many experts in the field, such as Gardner and Lambert (1972), Gardner (1985) and Dornyei (2015). Once motivation acts as a moderator to see whether it changes the relationship between L1 and L2, the findings of the current study reveal that the interaction effect of motivation, particularly intrinsic motivation, did moderate and strength the relationship between time spent writing Arabic with general English performance in reading and grammar courses for level two students. These may

indicate that, when one spends more time on literacy activities, especially writing, this will be reflected in one's performance in learning the foreign language, namely English in the present study. This supports Perera's (1986) assertion that learners who spend more time writing have enhanced language and cognitive skills and that there is a positive relationship between ability in reading and writing skills in terms of learning complex structures.

Intrinsic motivation, as the findings show, can moderate the relationship between Arabic aptitude and performance in English grammar. Knowledge of grammar is related to cognitive abilities, as they deal with the sense of languages and share some common elements such as analysing skills. Hence, when motivation from within the learner is evoked, better performance in the grammar of the foreign language can be predicted from the aptitude level in the first language. However, when motivation was added to moderate the relationship between aptitude in the first language with performance in the English reading course, it did not show any effect. This simply means that aptitude in the first language does not necessarily depend on motivation when the latter is considered as a moderator for performance in English reading. Researching into motivation has recently begun to re-explore its factors using neuroscientific methods such as neuroimaging scans of brain activities in order to better understand learning and to reflect what can these studies report to help learners learn effectively (Robert, 2019). Such studies show that motivation increases when associated with reward-based learning (Robbins, 2020). It would also be useful to see what neuroscientific research can explore with regard to the cognitive processes found in motivated individuals and their aptitude capacities.

The findings explain the phenomenon that whoever has a degree of motivation typically spends more time in studying, which eventually leads to success in learning the foreign language. Thus, print exposure can be strengthened by motivation. For future research, it may be useful to focus on and explore the impact of the quantity of literary-related activities to which one dedicates oneself and its relationship with motivation, rather than measuring a detailed index of print exposure as the present study did in order to identify the relationship between a task and its characteristics with the degree of motivation. This would help us understand the role of motivation in promoting reading, thereby strengthening the relationship between previous exposure to print and learning an L2 (see Guthrie, 2001).

The results of the present study show that motivation can moderate the relationship between aptitude in Arabic and performance in English. This suggests and draws attention to the importance of motivation in enhancing the relationship between first language aptitude, high exposure to print and second language acquisition.

The findings show that with regards to learning strategies (LS) as moderators, the one that would strengthen the relationship the most between the L1 and L2, is the compensation strategy. It could moderate and strengthen the relationship between aptitude in the first language and performance in a foreign language. The findings also show that the effect benefited both reading and grammar skills alike.

Although learning strategies have long been seen as promoting success in language learning (Cohen, 2011; Griffiths, 2008), researching this topic and its relationship with learning has also been the subject of a great deal of controversy due to its complexity. Because of this complexity, the relationship has not been seen as straightforward to predict learning outcomes (Griffiths, 2015). Strategies that a learner uses may be affected by experience in a language learnt

previously (Porte, 1988). Porte found that low achieving language learners tend to use a large number of strategies for learning new vocabulary. This may not always be an appropriate way of learning unless learners can combine them effectively for a certain task (Griffiths, 2015).

Despite the findings in the present research, one's a primary concern when researching learning strategies ought to be cautious about the following. Reporting on how frequent using a particular learning strategy is not necessarily a good predictor of learning outcomes; rather, it is much more effective if there is a distinction between learning strategies according to the tasks performed. In addition, the criterion should not be always how frequent a strategy is used because there is no one size fits all strategy. Dörnyei (2015) cautioned the significance of researching learning strategies altogether. He favours self-regulation for the same reason mentioned earlier, i.e. that learners vary greatly in their preferences and choices and also for the ambiguity in practising learning strategies and the overlap among them. Nevertheless, Griffiths (2018) states that learning strategies and self-regulation are not two competing concepts in that sense. Rather, self-regulation can be studied with regards to the leaning task undertaken and also with the procedural strategies involved in learning.

Despite being a potential limitation of this study, it is merely an attempt to set out an indication of effective SLA components within the context of the present study, given that a relationship is proposed in general sense between first and second languages and what role motivation and learning strategies can play within this relationship.

It should be mentioned that both compensation strategy and context error detection skills – discussed previously as a subconstruct of the GAT– are significant in predicting performance in the foreign language as they both use problem-solving skills and exert on cognitive mechanisms to improve comprehension. This again reinforces the significance of problem-solving skills in SLA and how they are defined as a part of aptitude in the first language. This strategy and these skills may also corroborate Oxford's (2011) assertion that some learners orchestrate different strategies to overcome a difficult situation such as identifying relevant vocabulary needed before engaging in an expected conversation for the sake of achieving fluency. The findings, thus, confirm the importance of consciousness of one's way of learning for the development of foreign language learning.

While Alhaisoni (2012) found that the Saudi students in his research used metacognitive and cognitive strategies most often – as per the taxonomy proposed by Oxford (1990)- the present research found that participants used memory strategies most often. Although coordinating the above-mentioned types of strategy (i.e. metacognitive and cognitive strategies) is essential while learning and is always associated with successful learners (Oxford, 2011), further investigations are needed for rearranging the effective variables of the study's model utilising statistical factor analysis and confirmatory factor analysis to better understand the nature of these factors and learners' use of them.

In addition, while the present study surveyed the strategies for learning the foreign language, it is vital to compare one's adaptation of certain strategies in both L1 and L2 development and examine whether skills can be transferred while using similar strategies. Cohen (2011) suggests that most strategies are transferable in different reading, writing, listening and speaking tasks. However, she mentions that certain strategies may pertain to learning a language with a different writing system and others not. It would also be insightful if self-regulatory behaviour was considered for future research to explore how controlling one's emotions could yield a

difference. Dörnyei and Skehan (2003) and Dörnyei (2015) question researching learning strategies as theorised in SLA literature because of the complexity of SLA theories that contribute to LS. Instead, they called for research into the broader concept of self-regulation, which is a process of which LS is a product, and learners actively construct and manage (and change) their strategy according to the goal and context of learning (Oxford, 2011). However, Griffiths (2018) ascertains the significance of teaching, learning, and researching about learning strategies.

Hence, it appears that within the context of the research only learning strategy of compensation and particularly intrinsic motivation could moderate the relationship between aptitude in Arabic and performance in English. Examining the moderating effect of motivation and learning strategies for the relationship between aptitude in Arabic and performance in English as the objective, 5, of the present research has been achieved.

5.6 Research objective 6: Developing a model consists of cognitive and non-cognitive factors that can predict students' performance in the English language at university

A conceptual framework has been developed from the literature discussed that attempts to frame different components involved in cross-linguistic influence, which also was set to present factors of university success in learning English. However, after conducting the study, the findings revealed a model that can account for the proposed relationship between factors investigated. Hence, as a result of the findings, this study has developed a model that combined elements of cross-linguistic factors that can predict English language learning at the university. This model is based on cognitive and non-cognitive factors.

Generally speaking, the research presents this model that breaks down and integrates some of the complex elements inherent in SLA exhibited in the cross-linguistic phenomenon. It also offers an explanation of what causes variances in learning English as a foreign language and performance at university. This performance can be predicted from aptitude in Arabic, maintaining an intrinsic motivation for learning a foreign language, and employing problem-solving strategies during the learning process.

While this study, in its exploratory nature, has examined many more factors, including exposure to print, motivation types and different learning strategies, it ultimately refines the effective factors for the proposed relationship. The study informs this novel comprehensive model of cross-linguistic influence that incorporates first language aptitude and achievement, exposure to print, motivation and learning strategies with foreign language performance in the two skills of reading and grammar. The importance of devising a model containing a variety of components is to achieve accuracy of prediction. As Wolfe and Johnson (1995) noted that the purpose of a factor is not only if it predicts or not; rather, how accurate the factor can predict? Thus, combing the factors to generate a clear picture makes the prediction more accurately (See the model below in figure 5.1).

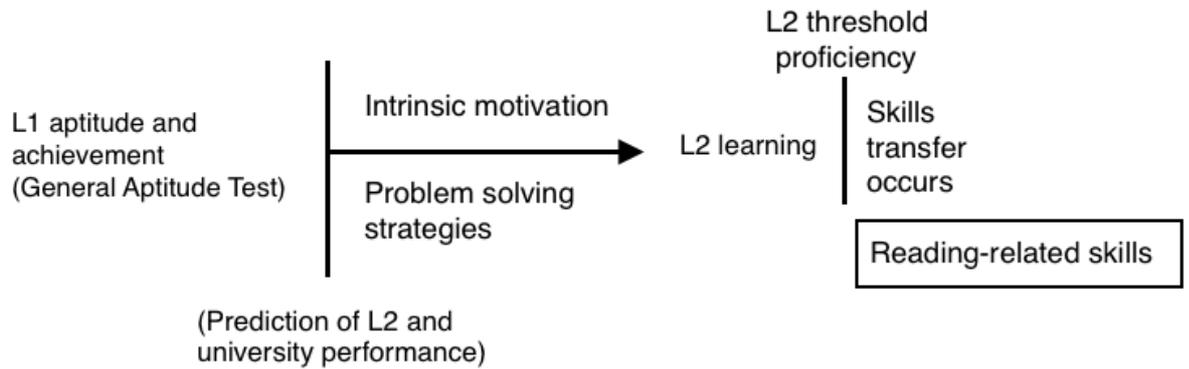


Figure 5.1. The model of the study

The study's findings highlighted the significance of problem-solving skills as an effective factor in learning English. This skill of solving problems is embedded in the detecting contextual error construct in the General Aptitude Test and also in the compensation learning strategy being the most effective strategy in strengthening the influence between aptitude in the L1 and performance in the L2. Problem-solving is a high-order cognitive process that simulates some linguistic activities such as reading in that the task taker decodes and identifies information, processes it, links it to relevant ones, and then filtering or choosing from the alternatives to reach solutions and comprehend the text. These cognitive tasks are based on both experience and analytical abilities.

The movement of critical thinking in education posed a significant challenge to the traditional didactic approach to learning in general and learning a foreign language in particular which is still followed in some educational institutions. The findings of this study showed that problem-solving skills are pivotal in learning English. Critical thinking is an integral part of problem-solving in instruction or learning as it set to identify, judge, and develop assumptions (Ennis, 2011). Tasks that are based on rational thinking and that allow learners to ask questions, identify, assess, and evaluate information will increase the learning outcomes. Adult learners tend to be rational in dealing with a new language, compared to children who are more emotional in their learning, and there are many learning activities that feed on and enhance problem-solving skills. Tasks such as those based on a jigsaw method where a fragmented assignment is assembled, working memory puzzles, role-taking tasks that resemble real situations, and other active and challenging tasks are of two-fold benefits for learners. They utilise the communicative approach to learning and provide authentic problem-solving training.

In general, perhaps the best way to teach the foreign language is to diversify the methods and tasks in order to develop all learners' skills and accommodate their needs. Employing as much as skills involved in aptitude and others in the form tasks whether the teaching approach is implicit, explicit or a mixture of the both, will benefit a class consisting individuals of various differences which is usually the norm.

The next chapter concludes this thesis by summarising the key findings. In addition, after the discussion of these findings in the current chapter, the next chapter will highlight the contributions of this research, the implications of the findings and the limitations that were encountered during the research. Moreover, it will suggest directions that further research might take.

Chapter Six

Conclusion

6.1 Introduction

This study set out to explore whether aptitude and print exposure in the first language (Arabic) can influence performance in learning a second language (English) while considering the moderating power of motivation and learning strategies within the proposed relationship. It also sought to examine the effectiveness of the General Aptitude Test and the Oriental Languages Aptitude Test to predict English language major students' success at university.

This chapter aims to present the following: a conclusion/summary in relation to the research's objectives, contribution to knowledge, implications, limitations of the study and possible directions for future research.

6.2 Conclusion in relation to the research's objectives

This section summarises what the study has concluded in order to achieve its objectives and answer the research three questions: Is there a relationship between aptitude in Arabic as a first language and performance in English as a foreign language? Is there a relationship between print exposure in Arabic as a first language and performance in English as a foreign language? To what extent are the Arabic General Aptitude Test and the Oriental Languages Aptitude Test effective in predicting the performance of L1 Arabic speakers in learning English as a foreign language?

6.2.1 The relationship between aptitude in Arabic and reading and grammar in English

Overall, the findings of the study show that there is a moderate relationship between aptitude in Arabic and reading and grammar in English and that aptitude in Arabic could predict English reading skills and knowledge of grammar. This confirms the claim that previously developed L1 ability affects and fosters competence in the L2 despite the apparent differences between the two languages according to the interdependence hypothesis proposed by Cummins (1979; 2000). While Cummins and early subsequent works considered the relationship between the L1 and L2 for bilingual children, the present study supports the hypothesis with regard to adult learners of English as a foreign language given that previous studies had conflicting findings. Moreover, most of the previous studies have examined this relationship between languages sharing alphabetic scripts, i.e. Latin within Indo-European languages. However, the present study has examined the relationship and influence between English and Arabic which use different scripts, with Arabic being from the Semitic family of languages.

Moreover, the present study has identified a baseline of proficiency required in the L2 which a learner should pass in order for the influence of the L1 to occur. This baseline is equivalent to the level between the foundation level and level two based on the context of the study. This supports the threshold hypothesis which developed from the interdependence hypothesis.

As second language learners actively utilise knowledge and experience gained from one language in learning another language, as stated by Kuo and Anderson (2008), and since aptitude has a complex of characteristics (Biedroń and Szczepaniak, 2009; Stansfield and Winke, 2008), this study has shown that

problem-solving abilities that were observed in Arabic (compared to relationship recognition, analysis, inference) are the most powerful construct of aptitude to predict performance in English. Hence, this has answered a question found in the literature pertaining to which aspect of skills/subskills is transferred from the L1 to L2 and which one has a greater effect.

This study has focused on L1 influence and transfer of reading-related skills exhibited in reading comprehension and knowledge of grammar as most studies on reading have examined it as a process and the behaviours involved rather than its product, such as comprehension for example. Moreover, it has considered exposure to print and writing activities as major contributors to the development of reading skills.

Therefore, this study's findings provide further support for the concept of metalinguistic knowledge which is universal across languages. Metalinguistics grasp the deep functioning of language structures and develop simultaneously with language aptitude. Once metalinguistics are well-developed, they regulate the linguistic input perception and interpretation, as well as being able to guide the process of learning to read (Kuo and Anderson, 2008). Thus, reading skills in the L2 benefit from aptitude and reading skills in the L1.

6.2.2 The relationship between print exposure in Arabic and reading and performance in English

The findings of the study have not shown a relationship between print exposure in Arabic and performance in English, nor have they shown a predictive relationship. Although no relationship was observed between the proposed factors, there was a low-to-moderate relationship between aptitude in Arabic and print exposure in Arabic. As Hurmuz (1987) and Kamal (1997) state, early literacy experience in Arabic enhances future achievements. The findings of the present study have shown the role of print exposure during the school years to enhance cognitive development. This, therefore, reveals an indirect relationship between print exposure in Arabic and performance in English as print exposure enhances language aptitude.

Furthermore, the findings reported somewhat moderate relationships between print exposure and intrinsic motivation for learning, and compensation learning strategies which, in turn, strengthen the relationship between L1 aptitude and English performance. This can also show the indirect relationship between the proposed factors. Moreover, the findings have revealed a relationship between print exposure and metacognitive, memory, cognitive learning strategies which could serve as a potential direction for future research.

6.2.3 The effectiveness of the General Aptitude Test performance in learning English as a foreign language

The findings of this study have shown a moderate relationship between the General Aptitude Test and performance in English skills and university studies. They have also shown a predictive relationship between them. Thus, this indicates that the test is effective in predicting performance in learning English. Moreover, the research gives further support to the GAT in terms of its ability as an admission requirement to predict students' success in English major at university. The main strength of this study in this regard, being in the examination of the GAT's breakdown verbal section scores as well as calibrating it to specific university courses and language skills. This method has allowed the present study to provide further evidence in terms of

the GAT's ability to explain performance variances up to 19% compared, for example, with Alanazi's (2014) study which found that the GAT explains 13% of variances. Similarly, the findings of the present study, which show a moderate relationship between the GAT and university performance, are in concordance with what Al Saud (2009) reports on the relationship between the GAT and GPA in the first year.

Therefore, this research supports the notion that high-stakes standardised tests and universities admission tests are good predictors of academic performance as proposed by Misanchuk (1977), supported by Crouse (1985) and College Board (2020) in the case of the Scholastic Aptitude Test in the United States.

6.2.4 The effectiveness of the Oriental Languages Aptitude Test in predicting performance in learning English as a foreign language

The findings of this research do not reveal a relationship between the Oriental Languages Aptitude Test and performance in English. Nevertheless, since the test has not been evaluated on a large scale previously (Dixon, 2017) and there are no published studies on it, this research serves as a first exploratory study of the OLAT. It is used primarily for English speaking learners of Arabic; therefore, it may be as useful for predicting the performance of Arabic speaking students in the learning of English, particularly considering that the current study found a relationship between the OLAT and the GAT.

6.2.5 The moderating effect of motivation and learning strategies for the relationship between aptitude in Arabic and performance in English

The study's findings reveal that intrinsic motivation and compensation learning strategy affect and strengthen the relationship between aptitude in Arabic and performance in English. Motivation and learning strategies are seen as influential factors in learning a foreign language and improving the outcomes and exhibiting differences among individual learners as confirmed by Gardner (1985) and Dornyei (2015). Given the importance of these factors in predicting performance in learning English as this study has shown, it goes behind that and could also affect the strength of the relationship between the L1 and the L2 which the current study has found. The role of motivation types is not consistent in the literature in terms of which motivation type plays the most significant role in predicting university performance (Newstead and Hoskins, 2003). This study has shown that intrinsic motivation is more influential than extrinsic motivation in strengthening L1 influence. In addition, in terms of the relationship between motivation and using learning strategies, the findings have also shown high and moderate relationships between intrinsic motivation with all of the learning strategies (cognitive, metacognitive, memory, compensation, affective and social) while the relationship between extrinsic motivation and learning strategies varies from none to low and moderate. This supports the claim that self-desire drives people to achieve their goals more than encouragement from others does. This indicates that having the internal motivation to learn the language makes the learner utilise as many as learning strategies as possible which will, in turn, improve the learning outcomes.

In terms of the findings of the role of compensation strategy in strengthening the L1 influence on the L2, this strategy, which employs problem-solving skills, is also supported by the

findings of the type of aptitude that plays the most effective role in predicting success in learning English as a foreign language.

6.2.6 A cognitive and non-cognitive factors model that can predict students' performance in the English language at university

After conducting this study, a novel model was revealed by the findings that can predict students' performance in English at the university in Saudi context as well as being able to account for the factors affecting the occurrence of cross-linguistic influence between the L1 and the L2. During the literature review, a conceptual framework of cross-linguistic influence was developed based on cognitive and non-cognitive factors as academic success can be predicted from such factors as stated by Pentages and Creedon (1978) and Alshumrani (2007). This framework was also formulated to find an answer to the question found in the literature pertaining to the conditions in which transfer of skills from the L1 to the L2 occurs and in which skills or tasks. Hence, the present study has shown that aptitude skills in the L1 and reading skills in Arabic are transferred to the English (L2) reading skills, provided that that intrinsic motivation and problem-solving strategies are in place. Thus, performance in English at university can be partially predicted from aptitude in Arabic, maintaining an intrinsic motivation for learning a foreign language and employing problem-solving strategies during the learning process.

Overall, the present research creates this model that breaks down and integrates some of the complex elements inherent in SLA exhibited in the cross-linguistic phenomenon. It also gives an explanation of what creates variances in learning English as a foreign language and performance at university. While this study, in its exploratory nature, has examined many more factors, including exposure to print, motivation types and different learning strategies, it actually refines the effective factors for the proposed relationship, as diagrammed in figure 6.1 below.

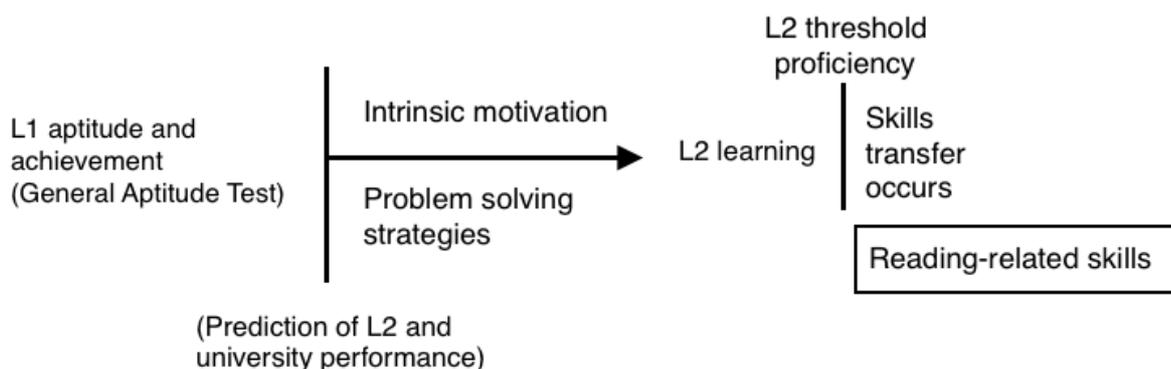


Figure 6.1: The model of the study

6.3 Contribution to knowledge

The present study contributes to knowledge methodologically, theoretically and practically. The following highlights what it adds to knowledge:

- It provides further, even stronger support for the GAT in terms of its ability as an admission requirement to predict students' success at university, but in a specific major course, that is English as a foreign language.

- It has provided the breakdown score from the GAT's verbal section can predict better than the total score.
- It has examined different constructs of language aptitude and revealed that problem-solving capacity can predict better than other constructs can. This is also supported by the findings of learning strategies where the problem-solving strategy was the most effective in strengthening L1's influence on L2.
- It has evaluated the OLAT for the first time, revealing a relationship between OLAT and aptitude in Arabic. This creates a potential for further investigation regarding its ability to predict performance in English.
- It provides supporting evidence for the interdependence hypothesis concerning EFL adult learners about which there are conflicting findings in the literature.
- It defines a baseline of L2 proficiency needed for influence to occur (between foundation level and level two in the context of this study). This supports the threshold hypothesis, which was hitherto unknown in the context of the present study.
- It provides a new theoretical perspective in terms of CLI outside Indo-European languages – in this case, between Arabic and English - for reading skills and reading comprehension as a product of reading, rather than as a behaviour of reading as espoused in most literature.
- It considers the role of motivation and learning strategies within the influential relationship and gives further support for the role of intrinsic motivation in the inconsistent findings of the literature.
- It has analysed print exposure in Arabic, revealing its relationship with Arabic aptitude. It has also devised a new index of measurement that reflects the context's cultural aspects. This can be used for further studies, particularly considering the lack of research into print exposure's effect in Arabic for both young and adult learners.
- It presents a novel model of CLI components, using it for predicting performance in the English language at a Saudi university using cognitive and non-cognitive factors.

6.4 Implications and recommendations

The study has many implications, both theoretical and practical. These implications are presented in the following points:

- The GAT, as a high-stakes test, has a huge impact on people's lives and careers. It is sat by more than 350,000 each year. These people are competing to fill an annual average of 310,000 higher education places in Saudi Arabia. Admission decisions are based partially on this test, with the weight given to it varying from 30% to 40% depending on the institute. Therefore, the test has an impact on applicants on two levels: One is whether the applicant will be offered a place and the other is whether he or she will be able to go their institute of choice. Understanding this impact makes it vital to consider the continuous assessment of the test in terms of its validity, reliability and development. The effect of the GAT does not only affect students in Saudi Arabia; it is also used in Oman and Bahrain. There are other countries using the test's developer plans to extend its application (NCA, 2020).
- This study has shown that GAT is a strong indicator of success in English language courses and therefore makes it a valid assessment for admission onto university English

language programmes in Saudi Arabia. It is, thus, recommended to continue as an admission requirement, particularly in the case of applicants with little or no prior knowledge of English.

- The findings of this study will inform policymakers in Saudi Arabia regarding the effectiveness of the GAT. At the same time, they will assure other stakeholders, such as parents and applicants, by ensuring a foundation of equality among them. In addition, the present study will inform the media, including journalists and columnists, with the test being a topic of debate whenever it is conducted.
- By applying such admission methods, dropout and failure rates at the university are expected to decrease since the test can contribute a realistic prediction of future outcomes. Thus, priority can be given to those who are likely to succeed. Hence, universities will benefit from the GAT as it can contribute to the quality of admission, in turn, improving the outcomes of graduates, particularly in majors where there is a competition between applicants. This will improve admission efficacy and will mean that each institute will not need to design its own test unless the target skills of that institute are different from the constructs intended in the GAT.
- Ethical issues should be carefully addressed to minimise side effects and biases against those with special needs, particularly in these tests account for only a small proportion of university success. It is essential to consider alternatives for those less fortunate in terms of skills in order to avoid any direct negative impact on them as well as any indirect negative impact on the country as a whole in terms of prosperity in general and the number of higher educated graduates in particular.
- It is believed that the GAT has a washback effect⁵ on state education in that it will prompt schools, teachers and even parents to prepare students and teach them skills targeted at the test, such as problem-solving, analysing and inferencing strategies and critical thinking.
- In addition, this study draws attention to the importance of intrinsic motivation for learning, the role of print exposure and the role of aptitude in the first language in promoting learning another. It is therefore hoped that it will have a reflexive impact to raise awareness among learners and teachers of such effects and work towards improving them. A good foundation in early education lays the foundation for future language learning that takes into consideration increasing the level of inner motivation among learners.
- The present study contributes to the knowledge body of SLA research into the inherent complexity of learning L2 deriving from the components modelled in this research, namely cross-linguistic influence, aptitude, motivation and learning strategies. However, ethical issues should always be handled carefully when measuring aptitude to minimise side effects on those with low aptitude levels as it is a controversy factor for learning success when it comes to innate capacity, rather than being a skill that can be taught or learned.

⁵ Washback effect is the consequences resulting from something on many aspects of education such as teaching, curriculum design, and teaching practices.

The questions, thus, remain: Is aptitude coachable? How much of it is innate and how much is environmentally enhanced? To what extent can one's perseverance in learning overcome a lack of aptitude?

6.5 Limitations of the study

Several limitations and shortcomings should be acknowledged in terms of the methodology and unavailability of resources. These limitations are:

- The present study did not track participants in the foundation level for a longer period. It would be necessary to monitor the progress that they make in learning English so that the relationship from the L1 and L2 can exhibit from such development.
- The study did not recruit participants from level one to fill the gap between the foundation and level two for a more thorough comparison of language learners to inform the threshold hypothesis more accurately.
- Administering the OLAT required time and effort for training students on how to complete it. Therefore, their understanding of the test could not be fully ensured during the test administration.
- The participants responding to the questionnaire might be affected by the self-reporting bias whereby a participant will choose a socially desirable answer rather than giving a true reflection on behaviour in terms of print exposure.
- The study features a small female sample compared to the male sample. Therefore, the generalisability of the findings from the female group needs to be addressed.
- The data were obtained from only one university in the capital city of Saudi Arabia. Therefore, there can be no certainty that the findings represent all students learning English from different economic backgrounds across the country.

Overall, despite these limitations and the complex nature of studying second language acquisition, the study has attempted to add to our understanding of some of the crucial components of SLA and cross-linguistic influence.

6.6 Directions for further research

The present study's findings suggest new directions and raise a number of issues and questions requiring future investigation. These are as follows:

- First, further investigations are suggested to address the present study's limitations. These include tracking foundation students until level one, reviewing the administration of the OLAT, improving the print exposure index, examining the use of learning strategies per task, rather than how frequently each is used, and including bigger female sample.
- Further research is suggested to cover different Saudi universities in terms of the GAT prediction for English performance to see whether the present findings represent the whole Saudi student population. Research should also be conducted in other countries that use the test, such as Oman and Bahrain.
- For the future direction of research, it is important to examine cross-linguistic influence between Arabic and English for Arabic speakers in different countries to establish the generalisability of the findings.

- Further investigation is recommended to compare the degree and manner of influence between Arabic and English to that between other L1 languages with English.
- This study focuses on reading-related skills. Thus, the question arises as to whether cross-linguistic influence exists in other skills such as writing and speaking.
- Future research is needed to expand on and evaluate the work on print exposure for the L1 taking into consideration the relationship found between print exposure and metacognitive, memory and cognitive learning strategies, and the nature of the relationship between them.
- It is also advisable that the proposed relationship be tested between Arabic and other foreign languages, whether with the same or different scripts, such as French, Chinese, Urdu, etc.
- The model designed can be expanded to cover other non-cognitive factors, such as anxiety and perseverance, and cognitive factors, such as explicit examination of working memory.
- While the present study has surveyed strategies for learning a foreign language, it is vital to compare learners' adaptation of certain strategies in both L1 and L2 development and to explore whether skills can be transferred when using similar strategies.
- It would also be insightful to adopt self-regulatory behaviour as a general concept, rather than learning strategies, for future research in similar contexts to feed into the current debate concerning abandoning the latter in favour of the former in researching second language acquisition and use.
- Further investigations may be useful for rearranging the effective variables of the study's model utilising statistical factor analysis and confirmatory factor analysis to better understand the nature of the factors examined.
- It is advisable to conduct a similar study utilising a qualitative tool that can elicit the nature of language aptitude from interviewing the learners – for example, as the phenomenon of cross-linguistic influence is too complex to be researched using a quantitative approach alone.
- A longitudinal study is suggested to track the effects of print exposure on the long term for both L1 achievement and L2 learning.
- As this study was exploratory regarding the OLAT, it would be worthwhile continuing to investigate this test and its ability to predict performance in learning languages.

6.7 Conclusion

In conclusion, the present study provides support for a wide range of the literature and hypotheses that first language acquisition and second language acquisition are fundamentally similar due to general cognitive skills, according to the connectionism and universal grammar views of SLA. However, it also supports the importance of conscious learning of the input from the foreign language and adoption of certain learning strategies that serve problem-solving skills in order to trigger aptitude gained and developed in the L1. Acquisition of a second language is a matter of activation of patterns that have already been stored; only the addition of certain experience is needed to foster the development of L2.

The study also considers that intrinsic motivation is crucial in implementing L2 development to benefit from previously acquired skills. The study thus supports, in particular, the

interdependence hypothesis that knowledge of L1 is strengthened by achievement in the same language and hence skills can be transferred to a new language once sufficient proficiency is achieved in the L2, as explained by the threshold hypothesis. In essence, once biological factors are driven by proper environmental and personal factors, this will help a learner foster learning a new language regardless of how different one language is from the other.

This study has addressed the key issues and problems expressed in the first chapter. It serves the following purposes:

- The study provides further evidence for the effectiveness of the GAT.
- It provides further support for the interdependence hypothesis, particularly considering the conflicting findings in the literature.
- It contributes evidence for the existence of cross-linguistic influence outside Indo-European languages that use Latin script.
- It combines cognitive and non-cognitive factors in the prediction relationship. Therefore, it introduces a comprehensive new model and offers a more accurate prediction of SLA.
- It highlights the importance of intrinsic motivation and problem-solving strategies for language learning performance.
- It shows that print exposure can affect language aptitude in the same language in the context of the Arabic language.
- It paves the way as an exploratory study to investigate the OLAT and print exposure.

References

- Abu-Rabia, S., & Siegel, L. S. (2003) Reading skills in three orthographies: The case of trilingual Arabic–Hebrew–English-speaking Arab children. *Reading and writing*, 16(7), 611-634.
- Acheson, D. J., Wells, J. B., & MacDonald, M. C. (2008) New and updated tests of print exposure and reading abilities in college students. *Behavior Research Methods*, 40(1), 278–89.
- Akhbar (2013) Ekhtebarat alqiyas tahtaj taqueem [Qiyas tests need evaluation] *Akhbar* [online], 15th August 2013
Available at: <https://akhbaar24.argaam.com/>
[Accessed: 25th January 2020]
- Adjemian, C. (1976) On the nature of interlanguage systems. *Language learning*, 26(2), 297-320.
- Alanazi, N. K. J. (2014) *The validity of the General Aptitude Test (GAT) to predict male Saudi students' academic performance in first semester*. Ph.D. thesis, University of Northern Colorado.
- Al-Alshaikh, H. (1972) Tareekh alharaka alta'limia fi Elmamlaka Alrabia Alsaudia [The history of educational movement in Kingdom of Saudi Arabia]. *Qafelat elzaiet*, 20(7), 3-10.
- Albilad, (2019) Ekhtebarat qiyas tahta mejhar almujtam' [Qiyas tests under the community scope] *Albilad* [online], 21st September 2019
Available at: <https://albiladdaily.com/>
[Accessed: 25th January 2020]
- Alderson, J. C. (1984) Reading in a foreign language: A reading problem or a language problem? In Alderson, J. C., & Urquhart, A. H. (1984). *Reading in a foreign language*. Longman Pub Group.
- Alhaisoni, E. (2012) Language learning strategy use of Saudi EFL students in an intensive English learning context. *Asian Social Science*, 8(13), 115.
- Aliaga, M. and Gunderson, B. (1999) *Interactive statistics*. Prentice Hall.
- AlQataee, A. (n.d.) *Differential validity of the GAT admission test in Saudi Arabia*
Available at: <http://www.iaea.info/>. Accessed: 12th November 2017
- Alnahdi, G. H. (2015) Aptitude tests and successful college students: The predictive validity of the General Aptitude Test (GAT) in Saudi Arabia. *International Education Studies*, 8(4), 1-6.
- Alnasser, A (2017) Conversation with Abdulrahman Alnasser. 25/2/2017
- Alriyad (2011) Ekhtebarat alqias [Qiyas tests] *Alriyad*[online], 12th June 2011
Available at: <http://www.alriyadh.com/>
[Accessed: 25th January 2020]
- Alriyadh Government*. (2020) Saudi Arabia.
<https://www.alriyadh.gov.sa/ar/riyadh/popudev>
- Al Saud, F. B. A. M. (2009) Development of Student Admission Criteria in Saudi Universities: the Experience of the National Center for Assessment in Higher Education. *Proceeding of Towards an Arab Higher Education Space: International Challenges and Societal Responsibilities*, 727.
- Al-Seghayer, K. (2011) *English teaching in Saudi Arabia: Status, issues, and challenges*. Hala.
- Al-Seghayer, K. (2014) The four most common constraints affecting English

teaching in Saudi Arabia. *International Journal of English Linguistics*, 4(5), 17.

- Al-Seghayer, K. (2017) Reality and challenges of TEFL in 21st-Century Saudi Arabia. *Riyadh: Hala Print CO*.
- Alshumrani, S.A. (2007) *Predictive validity of the General Aptitude Test and High School Percentage for Saudi undergraduate students*. Ph.D. thesis, University of Kansas.
- Aoun, J. E., Benmamoun, E., & Choueiri, L. (2009) *The syntax of Arabic*. Cambridge University Press.
- Anderson, N. (2003) Reading. In D. Nunan (Ed.), *Practical English language teaching* (pp. 67- 86). Singapore: McGraw-Hill.
- Artieda, G., & Muñoz, C. (2013) The role of age and literacy in adult foreign language learning. *Fremdsprachen in der perspektive lebenslangen lernens*. Frankfurt: Peter Lang.
- Artieda, G. (2017) The role of L1 literacy and reading habits on the L2 achievement of adult learners of English as a foreign language. *System*, 66, 168-176.
- Bernhardt, E. B., & Kamil, M. L. (1995) Interpreting relationships between L1 and L2 reading: Consolidating the linguistic threshold and the linguistic interdependence hypotheses. *Applied linguistics*, 16(1), 15-34.
- Bialystok, E. (1981) The role of conscious strategies in second language proficiency. *The Modern Language Journal*, 65(1), 24-35.
- Bley-Vroman, R. (1989) What is the logical problem of foreign language learning? In Gass, S. & Schachter J. (Eds), *Linguistic Perspectives on Second Language Acquisition*. Cambridge: Cambridge University Press.
- Bolton, K., & Kachru, B. B. (Eds.). (2006) *World Englishes: Critical concepts in linguistics* (Vol. 2). Taylor & Francis.
- Biedroń, A., & Szczepaniak, A. (2009) The cognitive profile of a talented foreign language learner: A case study. *Psychology of Language and Communication*, 13, 53-71.
- Bylund, E., Abrahamsson, N., & Hyltenstam, K. (2010). The role of language aptitude in first language attrition: The case of pre-pubescent attriters. *Applied linguistics*, 31(3), 443-464.
- Cambridge Assessment. (2019) <https://www.admissionstesting.org/for-test-takers/olat/about-olat/>
- Carroll, J., & Sapon, S. (1959) *Modern language aptitude test, Form A, 2002 ed*. Bethesda, MD: Second Language Testing, Inc.
- Carrell, P. L. (1991) Second language reading: Reading ability or language proficiency?. *Applied linguistics*, 12(2), 159-179.
- Cattell, R. B. (1943) The measurement of adult intelligence. *Psychological bulletin*, 40(3), 153.
- Chomsky, N. A. (1959) *Review of B.F. Skinner's Verbal Behavior*.
- Chomsky, N. (1975) *Reflections on Language*. New York: Pantheon.
- Chomsky, N. (1986) *Knowledge of language: Its nature, origin, and use*. Greenwood Publishing Group.
- Chomsky, N. (1988) Language and problems of knowledge: The Managua

- lectures (Vol. 16). MIT press.
- Chomsky, N. (2000) *The architecture of language*. Oxford University Press.
- Clark, E. V. (2009) *First language acquisition*. Cambridge University Press.
- Cochran, J.L., McCallum, R.S. and Bell, S.M. (2010) Three A's: How do attributions, attitudes, and aptitude contribute to foreign language learning *Foreign Language Annals*, 43(4), pp.566-582.
- Cohen, Jacob (1988) *Statistical Power Analysis for the Behavioral Sciences*. Routledge. ISBN 978-1-134-74270-7.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003) *Applied multiple regression/correlation analysis for the behavioral sciences*, 3rd edn. Mahwah, NJ: Erlbaum.
- Cohen, A. D. (2011) *Strategies in learning and using a second language*. Routledge.
- Cook, V., & Bassetti, B. (Eds.) (2005) *Second language writing systems*. Multilingual Matters.
- Cook, V. (2016) *Second language learning and language teaching*. Routledge.
- College Board. (2020) USA. <https://www.collegeboard.org/>
- Corder, S. P. (1967) The significance of learner's errors. *IRAL-International Review of Applied Linguistics in Language Teaching*, 5(1-4), 161-170.
- Council of Europe. (2019) <https://www.coe.int/en/web/common-european-framework-reference-languages/home>
- Crombie, M. A. (1997) The effects of specific learning difficulties (dyslexia) on the learning of a foreign language in school. *Dyslexia*, 3, 27-47.
- Crouse, J. (1985) Does the SAT help colleges make better selection decisions?. *Harvard Educational Review*, 55(2), 195-220.
- Cummins, J. (1979) Linguistic Interdependence and the Educational Development of Bilingual Children. *Review of Educational Research*, 49(2), 222-251.
- Cummins, J. (2000) *Language, Power and Pedagogy: Bilingual Children in the Crossfire*. Multilingual Matters Ltd.
- Dabrowska, E., & Street, J. (2006) Individual differences in language attainment: Comprehension of passive sentences by native and non-native English speakers. *Language Sciences*, 28(6), 604-615.
- Dąbrowska, E. (2009) Constructing a Second Language Some final thoughts. *Annual Review of Cognitive Linguistics*, 7(1), 277-290.
- Dąbrowska, E. (2012) Different speakers, different grammars: Individual differences in native language attainment. *Linguistic Approaches to Bilingualism*, 2(3), 219-253.
- de Bot, K. (2006) The plastic bilingual brain: Synaptic pruning or growth? Commentary on Green et al. In M. Gullberg & P. Indefrey (Eds.), *The cognitive neuroscience of second language acquisition* (pp. 127-132). Oxford: Blackwell.
- Dixon, A (undergraduate@classics.ox.ac.uk) 20/12/2017 A query about the OLAT. Email to Abdulhameed Aldurayheem (A.A.Aldurayheem@2015.ljmu.ac.uk)

- Dörnyei, Z., & Skehan, P. (2003) 18 Individual Differences in Second Language Learning. *The handbook of second language acquisition*, 589.
- Dörnyei, Z. (2007) *Research methods in applied linguistics*. Oxford University Press
- Dörnyei, Z., & Ryan, S. (2015) *The psychology of the language learner revisited*. Routledge.
- Doughty, C. J. (2019) Cognitive language aptitude. *Language learning*, 69, 101-126.
- Dulay, H. C., & Burt, M. K. (1974) Natural sequences in child second language acquisition. *Language learning*, 24(1), 37-53.
- Dulay, H. (1982) *Language two*. Oxford University Press, 200 Madison Ave., New York, NY 10016.
- Eckman, F. (1996) On evaluating arguments for special nativism in second language acquisition theory. *Second Language Research*, 12, 398–419.
- Eckman, F. R., Mileham, J., Weber, R. R., Highland, D., & Lee, P. W. (2013) *Second language acquisition theory and pedagogy*. Routledge.
- Ellis, N. C. (2003) Constructions, chunking, and connectionism: The emergence of second language structure. In C. J. Doughty & M. Long (Eds.), *The handbook of second language acquisition* (pp. 63-103). Malden, MA: Blackwell Publishing.
- Ellis, R. (2012) *Language teaching research and language pedagogy*. John Wiley & Sons.
- Ellis, R. (2015) *Understanding second language acquisition 2nd Edition-Oxford applied linguistics*. Oxford university press.
- Ellis, R., & Shintani, N. (2013) *Exploring language pedagogy through second language acquisition research*. Routledge.
- Ennis, Robert (2011) Critical Thinking. *Inquiry: Critical Thinking Across the Disciplines* 26 (1):4-18.
- Evans, N., & Levinson, S. C. (2009) The myth of language universals: Language diversity and its importance for cognitive science. *Behavioral and brain sciences*, 32(5), 429-448.
- Evans, V. (2014) *The language myth: Why language is not an instinct*. Cambridge University Press.
- Fraenkel, J. R., & Wallen, N. E. (2003) *How to design and evaluate in education*. The McGraw-Hill Companies, Inc.
- Gass, Susan M., E., & Selinker, Larry, E. (1983) *Language transfer in language learning*. Rowley MA: Newbury House.
- Gass, S., & Selinker, R. (2008) *Second language acquisition: An introductory course*. New York: Routledge.
- Genesee, F., Geva, E., Dressler, C., & Kamil, M. (2006) Synthesis: Cross-linguistic relationships. *Developing literacy in second-language learners: Report of the National Literacy Panel on Language-Minority Children and Youth*, 153-174.
- Geva, E. (2014) The cross-language transfer journey—a guide to the perplexed. *Written language and literacy*, 17(1), pp.1-15.
- Goodman, K. S. (1973) Psycholinguistic universals in the reading process. In F. Smith (Ed.), *Psycholinguistics and reading* (pp. 21-28). New York: Holt, Rinehart and Winston.
- Gough, P.B. and Tunmer, W.E. (1986) Decoding, reading, and reading

- disability. *Remedial and special education*, 7(1), pp.6-10.
- Grabe, W. (2009) *Reading in a second language: Moving from theory to practice*. Ernst Klett Sprachen.
- Griffiths, C. (Ed.). (2008) *Lessons from good language learners*. Cambridge University Press.
- Griffiths, C. (2015) What have we learnt from 'good language learners'?. *Elt Journal*, 69(4), 425-433.
- Griffiths, C. (2018) *The strategy factor in successful language learning: The tornado effect*. Multilingual Matters.
- Guba, E. L., & Lincoln, Y. (1994) Competing paradigms in qualitative research. In Guba, E. G., Lincoln, Y. S., & Denzin, N. K (Eds.), *Handbook of qualitative research*. California: Sage, 105-117.
- Guthrie, J. T., & Knowles, K. T. (2001) Promoting reading motivation. In *Literacy and motivation* (pp. 153-168). Routledge.
- Fender, M. (2008) Arabic literacy development and cross-linguistic effects in subsequent L2 literacy development. In *Learning to read across languages* (pp. 113-136). Routledge.
- Fry, H., Ketteridge, S., & Marshall, S. (2008) *A handbook for teaching and learning in higher education: Enhancing academic practice*. Routledge
- Hamdan, Amani & Al-Hattami, Abdulghani. (2016) The accuracy of predicting university students' academic success. *Journal of Saudi Educational and Psychological Association*, 54, 173-182.
- Han, F. (2015) Word recognition research in foreign language reading: A systematic review. *University of Sydney Papers in TESOL*, 10.
- Hashem, H. (2009) Jeel mahmom be ekhtebarat alqudurat [A generation concerning the Aptitude Test] *Alriyadh*[online], 11th March 2009
Available at: <http://www.alriyadh.com/>
[Accessed: 25th January 2020]
- Hawkins, R. (2008) Can innate linguistic knowledge be eliminated from theories of SLA? *Lingua*, 118, 613-619.
- Hayes, D., & Grether, J. (1983) The school year and vacations: When do students learn? *Cornell Journal of Social Relations*, 17, 56-71.
- Hu, X., & Reiterer, S. (2009) Personality and pronunciation talent in second language acquisition. *Language talent and brain activity*, 97-130.
- Hughes, A. (2007) *Testing for language teachers*. Ernst Klett Sprachen.
- Hurmuz, S. H. (1987) Altharwa Alugauia lilatfal alarab wa rea'itha [Linguistic repertoire for Arab children and how to maintain it]
- Imam Muhammed bin Saud University*. (2016) Saudi Arabia. www.imamu.edu.sa
- Jarvis, S. (2012) Crosslinguistic influence and multilingualism. *The encyclopedia of applied linguistics*.
- Jiang, X. (2011) The role of first language literacy and second language proficiency in second language reading comprehension. *Reading Matrix: An International Online Journal*, 11(2).
- Kachru, Y., & Nelson, C. (2006) World Englishes in Asian contexts. Hong Kong:

Hong Kong University Press.

- Kamal, J. A. A. (1997) Alest'edad lilqera'a wa elaqatu' betadi'em alusari wa elmusharka alwalidea wa afkar wa edrak tefel arrowuda lilqera'a [Preparation for reading and its relationship with family support and parental sharing and the ideas and realisation of preschool child]
- Katz, L., & Frost, L. (1992) Reading in different orthographies: The orthographic depth hypothesis. In R. Frost & L. Katz (Eds.), *Orthography, phonology morphology, and meaning* (pp. 67–84). Amsterdam: Elsevier.
- King Saud University. (2020) Saudi Arabia. <https://ksu.edu.sa/ar/about-ksu>
- Koda, K. (2005) *Insights into second language reading: A cross-linguistic approach*. Cambridge University Press.
- Koda, K., & Zahlfer, A. M. (2008) *Learning to read across languages: Cross-linguistic relationships in first-and second-language literacy development*. New York: Routledge.
- Kormos, J. (2013) New conceptualizations of language aptitude in second language attainment. In Granena, G., & Long, M. (Eds.), *Sensitive periods, language aptitude, and ultimate L2 attainment*, 35(131). John Benjamins Publishing.
- Krashen, S. (1982) *Principles and practice in second language acquisition*.
- Krashen, S. (1994) The input hypothesis and its rivals. *Implicit and explicit learning of languages*, 45-77.
- Kuo, L. J., & Anderson, R. C. (2008) Conceptual and methodological issues in comparing metalinguistic awareness across languages. *Learning to read across languages*, 39-67.
- Lado, R. (1964) *Language teaching, a scientific approach*.
- Laplante, D. P., Barr, R. G., Brunet, A., Du Fort, G. G., Meaney, M. L., Saucier, J. F., & King, S. (2004) Stress during pregnancy affects general intellectual and language functioning in human toddlers. *Pediatric research*, 56(3), 400.
- Laufer, B. (1992) How much lexis is necessary for reading comprehension?. In *Vocabulary and applied linguistics* (pp. 126-132). Palgrave Macmillan, London.
- Laufer, B., & Ravenhorst-Kalovski, G. C. (2010) Lexical Threshold Revisited: Lexical Text Coverage, Learners' Vocabulary Size and Reading Comprehension. *Reading in a foreign language*, 22(1), 15-30.
- Legarreta, D. (1979) The effects of program models on language acquisition by Spanish speaking children. *TESOL Quarterly*, 521-534.
- Lenneberg, E. H. (1967) The biological foundations of language. *Hospital Practice*, 2(12), 59-67.
- Li, S. (2016) The construct validity of language aptitude: A meta-analysis. *Studies in Second Language Acquisition*, 38(4), 801-842.
- Lincoln, Y. S., Lynham, S. A., & Guba, E. G. (2011) Paradigmatic controversies, contradictions, and emerging confluences, revisited. In Denzin, N. K. & Lincoln, Y. S., & (Eds.), *The Sage handbook of qualitative research*, 4, 97-128.
- Liu, H., & Cao, F. (2016) L1 and L2 processing in the bilingual brain: A meta-analysis of neuroimaging studies. *Brain and language*, 159, 60-73.

- Lundberg, I. (2002) Second language learning and reading with the additional load of dyslexia. *Annals of Dyslexia*, 52, 165–187.
- Lust, B., & Foley, C. (Eds.). (2004) *First language acquisition: The essential readings*. Wiley-Blackwell.
- O'Grady, W. (2008) The emergentist program. *Lingua*, 118(4), 447-464.
- Okaz, H. (2009) Hai'at taqeeem alteleem takshef haqiqat eqaf ekhtebar alqudurat [Education Evaluation Commission unveiled the truth behind abolishing the Aptitude Test] Okaz[online], 11th September 2019
Available at: <https://www.okaz.com.sa/>
[Accessed: 25th January 2020]
- Ortega, L.(2014) *Understanding second language acquisition*. Routledge.
- Oxford, R., & Crookall, D. (1989) Research on language learning strategies: Methods, findings, and instructional issues. *The Modern Language Journal*, 73(4), 404-419.
- Oxford, R. L. (1989) Strategy inventory for language learning. *Alexandria, VA: Oxford Associates*.
- Oxford, R. L. (1990) *Language Learning Strategies: What Every Teacher Should Know*. Newburg House/Harper & Row, New York. Now Boston: Heinle & Heinle.
- Oxford, R. L. (2016) *Teaching and researching language learning strategies: Self-regulation in context*. Routledge.
- Oxford, R. (2012) Strategy Inventory for Language Learning (SILL). Version 7.0 (ESL/EFL).
- Marler, P., & Gould, J. L. (1987) Learning by instinct. In: Lust, B., & Foley, C. (Eds.). (2004) *First language acquisition: The essential readings*. Wiley-Blackwell.
- Masrai, A., & Milton, J. (2015) The impact of L1 lexical organisation on L2 vocabulary acquisition. *Language in Focus*, 1(1), 15-34.
- Masrai, A., & Milton, J. (2017) Recognition vocabulary knowledge and intelligence as predictors of academic achievement in EFL context. *TESOL International Journal*, 12(1), 128-142.
- Masrai, A. (2018) The Impact of Preschool Education on L1 Vocabulary Development and Sequential Bilingualism: The Case of Arab Schoolchildren. *International Journal of Applied Linguistics and English Literature*, 7(4), 121-128.
- Mei, L., Xue, G., Lu, Z. L., Chen, C., Zhang, M., He, Q., ... & Dong, Q. (2014). Learning to read words in a new language shapes the neural organization of the prior languages. *Neuropsychologia*, 65, 156-168
- Mendivil-Giró, J. L. (2018) Is Universal Grammar ready for retirement? A short review of a longstanding misinterpretation. *Journal of Linguistics*, 54(4), 859-888.
- McGrew, K. S., & Wendling, B. J. (2010) Cattell–Horn–Carroll cognitive-achievement relations: What we have learned from the past 20 years of research. *Psychology in the Schools*, 47(7), 651-675.
- McMurray, B., & Wasserman, E. (2009) Variability in languages, variability in learning?. *Behavioral and Brain Sciences*, 32(5), 459-460.
- Mikulecky, B.S. (2008) Teaching reading in a second language. *ELT*

Journal, 65(1), pp.99-101.

Miller, G. A. (1973) Some preliminaries to psycholinguistics. In F. Smith (Ed.), *Psycholinguistics and reading* (pp. 21-28). New York: Holt, Rinehart and Winston.

Ministry of Education. (2016) Saudi Arabia. www.moe.gov.sa

Misanchuk, E. L. (1977) A model- based prediction of Scholastic Achievement.

Journal of Educational Research, 71, 30- 35.

Muljani, D., Koda, K., & Moates, D. R. (1998) The development of word recognition in a second language. *Applied Psycholinguistics*, 19(1), 99-113.

Mushait, S. A. (2004) *The relationship of L1 reading and L2 language proficiency with the L2 reading comprehension and strategies of Saudi EFL university students* (Doctoral dissertation, University of Essex).

National Centre for Assessment. (2016) Saudi Arabia. <http://www.qiyas.sa>.

Newstead, S. E., & Hoskins, S. (2003) Encouraging student motivation. In H. Fry, H., S., Ketteridge, & S. Marshall, (Eds.), *Handbook for teaching & learning in higher education: Enhancing academic practice*, (pp.62-74.)

Parry, T., & Child, J. (1990) Preliminary investigation of the relationship between VORD, MLAT and language proficiency. In T. Parry & C.

Stansfield (Eds.), *Language aptitude reconsidered* (pp. 30–66).

Englewood Cliffs, NJ: Prentice-Hall Regents.

Phakiti, A (2014) *Experimental research methods in languages learning*. Bloomsbury.

Perera, K. (1986) Language acquisition and writing. In P. Fletcher & M. Garman (Eds.), *Language Acquisition. Studies in First Language Development* (pp. 494-618). Cambridge: Cambridge University Press.

Perfetti, C. A. (1985) *Reading Ability*. New York, NY, US: Oxford University Press.

Perfetti, C. A. (2001) Reading Skills. In *International Encyclopedia of the Social & Behavioral Sciences* (Vol. 10, pp. 12800–12805).

Perfetti, C. (2007) Reading Ability: Lexical Quality to Comprehension. *Scientific Studies of Reading*, 11(4), 357–383.

Perfetti, C.A. and Dunlap, S. (2008) Learning to read: General principles and writing system variations. *Learning to read across languages*, pp.13-38.

Porte, G. (1988) Poor language learners and their strategies for dealing with new vocabulary. *ELT Journal* 42(3), 167–71.

Proctor, C. P., Harring, J. R., & Silverman, R. D. (2017). Linguistic interdependence between Spanish language and English language and reading: A longitudinal exploration from second through fifth grade. *Bilingual Research Journal*, 40(4), 372-391.

Rayner, K., Foorman, B.R., Perfetti, C.A., Pesetsky, D. and Seidenberg, M.S. (2002) How should reading be taught. *SCIENTIFIC AMERICAN-AMERICAN EDITION*, 286(3), pp.70-77.

Richards, K. (2003) *Qualitative inquiry in TESOL*. Springer.

- Robbins T. (2020) 'Our mysterious frontal lobes: How they control behaviour in health and disease' [PowerPoint presentation] *The Manchester Literary and Philosophical Society*, Manchester.
- Robert, R. (2019) 'Using your head: What neuroscience can teach us about learning' [PowerPoint presentation] *IATEFL conference*, Liverpool.
- Robinson, P. (2005) Aptitude and second language acquisition. In: De Bot, K., Lowie, W., Verspoor, M., & Verspoor, M. H. (2005) *Second language acquisition: An advanced resource book*. Psychology Press.
- Robinson, P. (2007) Aptitude, abilities, context and practice. In: DeKeyser, R. (Ed.). (2007) *Practice in a second language: Perspectives from applied linguistics and cognitive psychology*. Cambridge University Press.
- Robinson, P. (2012) Individual differences, aptitude complexes, SLA processes, and aptitude test development. In *New perspectives on individual differences in language learning and teaching* (pp. 57-75). Springer, Berlin, Heidelberg.
- Robson, C. (1993) *Real world research: A resource for social scientists and practitioner-researchers*. Oxford: Blackwell.
- Rubin, A. D. (1978) A theoretical taxonomy of the difference between oral and written language. *Theoretical Issues in Reading Comprehension*.
- Salkind, N. J. (2011) *Statistics for people who (think they) hate statistics*. Sage Publications.
- Saville-Troike, M., & Barto, K. (2016) *Introducing second language acquisition*. Cambridge University Press.
- Sears, C. R., Siakaluk, P. D., Chow, V. C., & Buchanan, L. (2008) Is there an Effect of Print Exposure on the Word Frequency Effect and the Neighbourhood Size Effect? *Journal of Psycholinguistic Research*, 37(4), 269–291.
- Sierens, S., Slembrouck, S., Van Gorp, K., Agirdag, O., & Van Avermaet, P. (2019) Linguistic interdependence of receptive vocabulary skills in emergent bilingual preschool children: Exploring a factor-dependent approach. *Applied Psycholinguistics*, 40(5), 1269-1297.
- Seliger, H. W., Seliger, H., Shohamy, E., & Shohamy, E. G. (1989) *Second language research methods*. Oxford University Press.
- Selinker, L. (1972) Interlanguage. *IRAL-International Review of Applied Linguistics in Language Teaching*, 10(1-4), 209-232.
- Siegel, L. S., & Ryan, E. B. (1988) Development of grammatical-sensitivity, phonological, and short-term memory skills in normally achieving and learning disabled children. *Developmental psychology*, 24(1), 28.
- Singleton, D. (2003) Critical Period or General Age. *Age and the acquisition of English as a foreign language*, 4, 1-22.
- Skehan, P. (1989) *Individual differences in second language acquisition*. London: Edward Arnold.
- Skehan, P. (2002) Theorising and updating aptitude. *Individual differences and instructed language learning*, 2, 69-94.
- Skehan, P. (2008) Interlanguage and language transfer. In: Spolsky, B, Hult, FM (eds) *The Handbook of Educational Linguistics*, Malden, MA; Oxford: Blackwell, pp. 411-423.

- Skehan, P. (2014) *Individual differences in second language learning*. Routledge.
- Skinner, B. F. (1957) *Verbal Behavior*.
- Skinner, B. F. (2014) *Verbal Behavior*. BF Skinner Foundation.
- Sobel, M. E. (1982) Asymptotic intervals for indirect effects in structural equations models. In S. Leinhardt (Ed.), *Sociological methodology 1982* (pp.290-312). San Francisco: Jossey-Bass.
- Smith, F. (1973) *Psycholinguistics and reading*. Holt, Rinehart & Winston.
- Sparks, R., & Ganschow, L. (1991) Foreign language-learning differences: Affective or native language aptitude differences? *Modern Language Journal*, 77, 58–74.
- Sparks, R. L., Artzer, M., Ganschow, L., Siebenhar, D., Plageman, M., & Patton, J. (1998) Differences in native-language skills, foreign- language aptitude, and foreign-language grades among high-, average-, and low-proficiency foreign-language learners: two studies. *Language Testing*, 15(2), 181–216.
- Sparks, R., Patton, J., Ganschow, L. and Humbach, N. (2009) Long-term crosslinguistic transfer of skills from L1 to L2. *Language Learning*, 59(1), pp.203-243.
- Sparks, Patton, J., Ganschow, L., & Humbach, N. (2012) Do L1 Reading Achievement and L1 Print Exposure Contribute to the Prediction of L2 Proficiency? *Language Learning*, 62(2), 473–505.
- Stanovich, K. E., & West, R. F. (1989) Exposure to Print and Orthographic Processing. *Reading Research Quarterly*, 24(4), 402–433.
- Stanovich, K. E. (2000) *Progress in Understanding Reading: Scientific Foundations and New Frontiers*. New York: Guilford Press.
- Stansfield, C., & Winke, P. (2008) Testing aptitude for second language learning. In E. Shohamy & N. Hornberger (Eds.), *Encyclopedia of language and education*, vol 7 (pp. 81-94).
- Sullivan, A. and Brown, M. (2013) Social inequalities in cognitive scores at age 16: The role of reading. *CLS Working Papers*, 2013(13/10).
- Tarone, E. (2012) Interlanguage. In C. Chapelle (Ed.), *The encyclopedia of applied linguistics*, 1-7. John Wiley & Sons, Ltd. Retrieved from DOI: 10.1002/9781405198431.wbeal0561.pub2
- Tomasello, M. (2009) Universal grammar is dead. *Behavioral and Brain Sciences*, 32(5), 470-471.
- Toyoda, E., & Scrimgeour, A. (2009) Common and script-specific awareness in relation to word recognition in English and Chinese. *Language Awareness*, 18(1), 61-73.
- Tunmer, W., Pratt, C. and Herriman, M. (eds.) (1984) *Metalinguistic awareness in children: Theory, research, and implications*. New York: Springer-Verlag.
- University of Oxford. (2016) <http://www.ox.ac.uk/>.
- Van Gelderen, A., Schoonen, R., Stoel, R. D., De Glopper, K., & Hulstijn, J. (2007) Development of adolescent reading comprehension in language 1 and language 2: A longitudinal analysis of constituent components. *Journal of Educational Psychology*, 99(3), 477.
- VanPatten, B., & Benati, A. G. (2015) *Key terms in second language acquisition*. Bloomsbury Publishing.
- Verhoeven, L.T. (1994) Transfer in bilingual development: The linguistic

- interdependence hypothesis revisited. *Language learning*, 44(3), pp.381-415.
- Wen, Z. E., Biedroń, A., & Skehan, P. (2017) Foreign language aptitude theory: Yesterday, today and tomorrow. *Language Teaching*, 50(1), 1-31.
- White, L. (2012) Universal Grammar, crosslinguistic variation and second language acquisition. *Language Teaching*, 45(3), 309-328.
- Woodrow, L. (2014) *Writing about quantitative research in applied linguistics*. Springer.
- Wolfe, R. N., & Johnson S. D. (1995) Personality as a predictor of college performance. *Educational and Psychological Measurement*, 55(2), 177–185.
- Whong, M., Gil, K. H., & Marsden, H. (2013) Introduction: Generative second language acquisition and language pedagogy. In *Universal grammar and the second language classroom* (pp. 1-13). Springer, Dordrecht.
- Yamane, T. (1967) *Statistics: An introductory analysis*.
- Young-Scholten, M. (2013) Great Expectations in Phonology? Second Language Acquisition Research and Its Relation to the Teaching of Older and Younger Learners. In *Universal Grammar and the Second Language Classroom* (pp. 207-229). Springer, Dordrecht.
- Zubairi, A. M., & Sarudin, I. (2009) Motivation to learn a foreign language in Malaysia. *GEMA Online Journal of Language Studies*, 9(2), 73-87.

Appendices

Appendix 1



Reading Habit Self-Reports

1. (Reading time estimates) How much time do you spend reading in a typical week for each of the types of material listed below?
 - a) Textbooks (Never read, 1-3, 4-6, 7-10, 10 or more) hours
 - b) Academic materials other than textbooks (Never read, 1-3, 4-6, 7-10, 10 or more) hours
 - c) Magazines (Never read, 1-3, 4-6, 7-10, 10 or more) hours
 - d) Newspaper/ online news (Never read, 1-3, 4-6, 7-10, 10 or more) hours
 - e) Internet media (all subjects not including e-mail) (Never read, 1-3, 4-6, 7-10, 10 or more) hours
 - f) Fiction books (Never read, 1-3, 4-6, 7-10, 10 or more) hours
 - g) Nonfiction/special interest books (Never read, 1-3, 4-6, 7-10, 10 or more) hours
 - h) Other categories (Never read, 1-3, 4-6, 7-10, 10 or more) hours

2. (Writing time estimates) How much time do you spend writing in a typical week for each of material listed below?
 - a) All forms of writing assignment required for class (Never write, 1-3, 4-6, 7-10, 10 or more) hours
 - b) Newspaper articles or internet media not required for (Never write, 1-3, 4-6, 7-10, 10 or more) hours
 - c) Personal materials (e.g. diaries, journals, letters) (Never write, 1-3, 4-6, 7-10, 10 or more) hours
 - d) E-mail (Never write, 1-3, 4-6, 7-10, 10 or more) hours
 - e) Creative writing not required for classes (e.g. fiction, poetry, plays) (Never write, 1-3, 4-6, 7-10, 10 or more) hours
 - f) Job-related materials not including e-mail (e.g. memos, reports, transcripts, etc.) (Never write, 1-3, 4-6, 7-10, 10 or more) hours
 - g) Other categories (Never write, 1-3, 4-6, 7-10, 10 or more) hours

3. (Comparative reading habits) Please choose from 1 to 7 to indicate what number in the scale best describes you roughly in comparison with your colleagues. (Number 7 is the highest rate in the scale)
 - a) Time spent in reading all types of materials (Never read, 1-3, 4-6, 7-10, 10 or more) hours
 - b) The complexity of your reading materials (simple, average, complex)
 - c) Reading enjoyment (not enjoyed, neutral, enjoyed)
 - d) Reading speed (slow, average, fast)
 - e) Reading comprehension (at your normal reading speed) (easy, average, difficult)

Arabic Print Exposure Survey

1. Have you ever lived in an English-speaking country for one year or more?
No – Yes, at what age (1-6 , 7-12 , 13-16 , over 17)
For how long (1-2, 3-4, 4+)
2. What is your level at the college?
Intensive course – 1 – 2 – 3 – 4 – 5- 6 – 7 – 8
3. Gender
Male – Female
4. What was your major in high school?
Sharia - Quranic - Literature – Science – International School Other:.....
5. Did you attend preschool?
Preschool - Kindergarten - Both?
6. Number of memorized chapters (or have been memorized) of the Quran (out of 30)
.....
7. When did you start reading Arabic books?
At age of 4-6, 6-8, 9-10, +10 can't remember
8. Did anyone used to read stories to you when you were a child? (approximately)
Never – Once a month - Once a week - Most days
9. Did you have a bookshelf for non-school Arabic books at home before entering university?
No – Yes
10. Does your family have a home library?
No - Yes
11. Did you use to visit a public library regularly for Arabic reading purposes?
Never – Once a month - Once a week - Most days
Which one?.....
12. Have you been an active member of any reading club?
No – Yes, please specify which one
13. Are you surrounded by avid readers? (close friends, family members)
No – Yes
14. During your holidays, are you involved in reading activities or any other learning activities (e.g. personal development courses) in Arabic?
Never – Once a month - Once a week - Most days
15. Do you used to receive books as present?
Never – Once every two months - Most gifts are books
16. Do you use any device for reading?
Never – Once a week - Twice a week - Most days
Please specify which one: (Mobile, tablet (e.g. iPad), Kindle, PC or laptop,
Other:.....)

Thank you for your cooperation!

If you would like the researcher to share the results of the study with you, you can contact him by
email: a.a.aldurayheem@2015.ljmu.ac.uk

Motivation to Learning English as a Foreign Language

What do you think of the following statements? Choose what best describes you.

*Strongly agrees/disagree means that you are truly convinced of.

*Agree/disagree = your belief about it is less stronger.

*Neutral = You do not favour one over another – you do not have an opinion about it.

Item No.	Statement	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	Learning the language was a personal decision.					
2	Learning the language is a main goal for me.					
3	Learning the language is not a goal for me; rather, it is a mean for another goals.					
4	I will need it for my future career.					
5	I think that it will make me a more knowledgeable person.					
6	I think that it will someday be useful in getting a job.					
7	Other people will respect me more if I have knowledge of this language.					
8	My family/friend/lecturer(s) encouraged me to learn it.					
9	It will allow me to meet and converse with a variety of people.					
10	I will be able to participate in the activities of other cultural groups.					
11	I enjoy meeting and listening to people who speak the language.					
12	Learning the language is an enjoyable experience					
13	If I were visiting an English-					

	speaking country, I would like to be able to speak the language of the people.					
14	It is important for everyone to learn the language.					
15	I believe that I will learn the language very well.					
16	I love English language					
17	I want to read the literature and culture of the language.					

Learning Strategies:

NEVER OR ALMOST NEVER TRUE OF ME means that the statement is very rarely true of you.

USUALLY NOT TRUE OF ME means that the statement is true less than half the time.

SOMEWHAT TRUE OF ME means that the statement is true of you about half the time.

USUALLY TRUE OF ME means that the statement is true more than half the time.

ALWAYS OR ALMOST ALWAYS TRUE OF ME means that the statement is true of you almost always.

	Type	Statement	Never or almost never true of me	Usually not true of me	Somewhat true of me	Usually true of me	Always or almost always true of me
1	Metacognitive	I use different ways to improve my language					
2	Metacognitive	I use many resources for learning the language					
3	Metacognitive	I read and think about my reading strategies and how to develop them					
4	Metacognitive	I think about the progress I make in reading skills					
5	Memory	I put a lot of efforts on learning English beside school's requirements					
6	Memory	I memorise new phrases as I do with new vocabulary					
7	Memory	I think of what I already know and the new things I learn in English.					

8	Memory	I react with the new words in different ways so I can remember them.					
9	Memory	I have a quick and strong memory					
10	Cognitive	I practice the language a lot					
11	Cognitive	I dedicate my time for studying					
12	Cognitive	I read a lot for pleasure or to get knowledge in English (bedside school's reading)					
13	Cognitive	I try to summarise the main ideas of my reading and go back to some parts of the text for comprehension consolidation					
14	Cognitive	I say or write new English words several times.					
15	Cognitive	I use the English words I know in different ways.					
16	Cognitive	I try to find patterns in the language.					
17	Cognitive	I can understand grammar fast					
18	Social	I understand English jokes					
19	Social	My night dreams are in English					
20	Social	I speak the language easily and effortlessly					
21	Social	I can imitate native speakers in speaking					
22	Affective	I set a goal of each text I read					
23	Affective	I do not worry about making mistakes when I speak					
24	Compensation	I watch films/clips a lot without the need for subtitles translation					
25	Compensation	I find the meaning of an English word by dividing it into parts that I understand.					
26	Compensation	I try not to translate word for word.					

27	Compensation	I read English without looking up every new word					
28	Compensation	To understand unfamiliar English words, I make guesses					
29	Compensation	If I can't think of an English word, I use a word or phrase that means the same thing.					

Appendix 2

The following is examples excerpted and translated from an old General Aptitude Test and provided with some clarifications between these symbols{}

*According to the GAT manual, the verbal section of the test measures, in general, the analytical and deductive skills of the language of students. Therefore, it is not based on school curriculum nor it needs a special study for the test; rather, it is based on the student's cognitive ability that is developed throughout the years. It measures language abilities in comprehending, inferencing, information retention, and structure sensitivity all of which in a short of time.

*It is important to bear in mind that the questions are originally in Arabic; hence, some of them may not meet the description above of the test when comparing with English language. This is because of the functions and cultural aspects each language has.

Vocabulary Meaning

*The point of these word meaning questions is the trickery situation they may look like (has to do with Arabic); so, they are not direct achievement word meaning and students should be careful when choosing the right answer.

Instructions: the following is a group of words; some of them comes alone and some in sentences. The required word is underlined. There are four meaning; choose the correct one.

Question 1

He was undismayed⁶ even with the horror of the war:

- A courage B **heart** C patience D bold

Question 2

loose:

- A noise B space C **baggy** D rich

Question 3

ecstasy:

- A a step to progress forward B **a feeling of extreme happiness**
C a stage of childhood growth D deep cognitive capacity and thinking

Fragment Statement Completing

{According to the GAT's manual, students in this part should pay attention to what is before and after each space and make sure that the answer that they choose fits appropriately in both spaces of the same statement (i.e. one of the pair words from the choices may fit with a space but the other word does not go with the other space) in order to get an accurate and right answer.

These questions measure the student's ability to analyse structures and his/her structural sensitivity and sense of logic (2004). Some statements (not included here) have only one space}.

Instructions: every sentence below is followed by four choices, one of them complete the space or spaces in the sentence correctly. Choose the correct answer and then highlight the correct letter in your answer sheet.

⁶ has a solid heart

Question 1

A sane person should fight against and expose its falsity in order to save and rescue lost people from confusion.

- A temptation - poor B **myth - ignorant**
C theft - shoppers D unemployment - employees

Question 2

Cultural encyclopaedias projects are attempts to the gaps that started to appear in the Arabic cultural world during the great era of that attacked culture and thoughts.

- A widen - revolution B fill - awakening
C open - dominance D **close - retrogression**

Question 3

Seeing things as they are on reality is not always as simple as we imagine because our ability to ourselves has no limit. That is, everyone builds his own imagination within the of his world.

- A explore - depth B change - sky
C attract - real D **deceive - boundary**

Word Analogy

{These questions measure students' ability to induce and detect the relationship between words, for example, opposite relation, a part of a whole, place and time relation, etc., AAT's manual}.

Instructions: at the beginning of every question, there are two words that share a kind of relationship. They are followed by four pairs of words; one pair has a similar relationship of the pair in the head of the question. Choose the correct answer.

Question 1

a friend : an enemy

- A **horror : safety** B fat : overweight
C a thief : a criminal D disease : medication

Question 2

shoe : leather

- A wood : chair B **ring : gold**
C refrigerator : electricity C house : land

Question 3

coffee : staying up at night

- A **medication : cure** B river : sea
C insomnia : relaxation D comfort : sleeping

Reading comprehension

{The following is an excerpt from the reading passage. The length of the texts is the same in all of the three verbal portions of the AAT, 350 words}.

Instructions: the following questions are related to the preceded text; there are four choices after each question, one of which is true. What is required is to read the text carefully, and choose the correct answer.

(1) When we talk about the culture of the Internet, we talk at first glance about the technical aspects, which quickly disappear to highlight the social and cultural aspects. It was natural that the Internet is faster than other modern means of communication in disarming its technical mask to

reveal itself as a cultural arena in the first place; it is dealing with all the elements of the cultural system, whether it considers the culture a national or a creative and expressive heritage.

(2) In addition, this network contributes to the formation of social groups' awareness, and plays a vital role in the integration of culture system with the system of education, media and economy. And most of all is that this new informative structure provides, perhaps for the first time, an ideal environment for the dialogue of cultures.

(3) Human concern was the relationship between human development and the environment, and how to protect biodiversity from extinction due to the blind application of the technology of industry without taking into account its side effects. Our concern now is how to protect the cultural diversity from extinction due to misuse of information technology, and the domination of one culture and language over the languages and cultures of the world.....

Question 1

Paragraph (2) shows that the internet:

- A a neutral economic pillar
- B corrupts the media system
- C has a strong social impact
- D alternative means of education

Question 2

Paragraph (2) shows that the Internet is a field for:

- A harmony of cultures
- B gap of cultures
- C establishing cultures
- D protecting cultures

Question 3

According to paragraph (3) the misuse of industrial technology and information technology leads to:

- A encourage the search for alternatives
- B threaten diversity by vanish and dissolution
- C harm poor people
- D limit the industrial development

Appendix 3

The following are example questions excerpted from the Oriental Languages Aptitude Test followed by translated exercises into Arabic for training with answers.

Instructions: The questions in this test are all based on an invented language, called Pip. Read each group of examples carefully, paying particular attention to different forms of words, and working out what information they convey. Word order in Pip is not important. Note that **a** and **ã** are different vowels from each other. You are also advised to work through the questions in the order in which they are given, as the later ones presuppose some information or vocabulary supplied in earlier examples.

- | | |
|------------------------|------------------------------|
| (a) pit sak run | The dog chased the cat. |
| rin lup kat | The cat watched the mouse. |
| mup taw kid | The horse saw the teacher. |
| liip puut kat | The mice watched the dogs. |
| kid taw muuk | The horse saw the squirrels. |

Give the meaning of:
miip put kat _____

taw kud lip _____

Translate into Pip:
The mouse saw the cats. _____

- | | |
|--------------------------|---------------------------------|
| (b) mip put kakap | The teacher likes the dog. |
| sasãk rin | The cat chases him. |
| pit kãp | The dog liked her. |
| kakãt lip | The mouse watches him. |
| kiid tatãw | The horses see her. |
| mik yub tataw | The squirrel sees an apple pie. |
| pãs kid | The horse bit it. |
| pit pãp | The dog cut it. |
| sasãt rin | The cat steals it. |
| lip papãs | The mouse bites it. |
| rin kãt | The cat watched it. |
| rarãf mik | The squirrel takes it. |
| yub lip lam | The mouse got the apple pie. |

Give the meaning of:

kid yub papap. _____

kakãp miik. _____

Translate into Pip:

The dogs get it. _____

اختبار على قواعد لغة مصطنعة

الاسم:

الرقم الجامعي:

حدد مستواك الأقرب في اللغة الإنجليزية: ١ - ٢ - ٣

١: لديك حد أدنى من المهارات، تعرف تقرأ ولكن يعصب عليك فهم المقروء، تعرف بعض الكلمات، تفهم وتتحدث بشكل بسيط جداً كالتعريف بنفسك والطلب من المطعم، لا تكتب جمل.

٢: تعرف كلمات كثيرة وتفهم الكثير من الحديث العادي، تتركب جمل بسيطة إذا تحدثت كوصف الأشياء والطريق، تكتب جمل بسيطة، تقرأ وتفهم بعض المقروء والمقصود منه.

٣: تفهم أكثر الذي تقرأ، تتفاعل في الحديث وتتحدث بسهولة، تكتب جمل مركبة ومطولة.

تعليمات:

لديك جمل باللغة العربية يقابلها ترجمتها في هذه اللغة المصطنعة، حاول معرفة ما تعني كل كلمة في أي صيغة كانت. قراءتك لجميع الجمل في نفس السؤال تظهر لك التشابهات والاختلافات فتسهل عليك معرفة الكلمات بصيغها المختلفة. ملاحظات:

* ترتيب الكلمات ليس بالضرورة مهم في المعنى وليس بمتطابق بين اللغتين.

* التأنيث والتذكير موحد.

* عليك استنتاج صيغ بعض الكلمات التي ليست موجودة في الجمل المترجمة.

* ã مختلفة عن a.

A)

pit sak run	لحق الكلبُ القطُ
rin lup kat	شاهد القطُ الفأرُ
mup taw kid	رأى الخيلُ الأسدَ
liip puut kat	شاهدتُ الفئرانُ الكلابَ
kid kat muuk	شاهد الخيلُ السناجبَ

ما معنى الآتي:

miip put kat. شاهدت الأسود الكلب.

taw kud lip. رأى الفأر الخيل.

ترجم الآتي:

kat lip ruun. شاهد الفأر القطط.

sak kiid muk لحقت الخيول السناجب

B)

mip puut kakap	يحب الأسد الكلاب
sasāk rin	يلحقه القط
pit kāp	حيها الكلب
kakāt lip	يشاهدهه الفأر
rin tatāw	يراه القط
mik yub tataw	يرى السناجب فطيرة تفاح
pās kid	عضها الخيل
pit pāp	قطعها الكلب
sasāt rin	يسرقها القط
lip papās	يعضها الفأر
rin kāt	شاهدها القط

rarāf liip

تحصل عليها الفران

yub lip lam

أخذ الفأر فطيرة التفاح

ما معنى الآتي:

kid yub papap. يقطع الخيل فطيرة التفاح.

kakāp miik. تحبها السناجب.

muup tataw kid. يرى الخيل الأسود.

ترجم الآتي:

piit lalām. تأخذها الكلاب.

rāf lip حصل عليها الفأر

Appendix 4

The following are example tests of English language skills for level two followed by foundation level test.

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LIVERPOOL JOHN MOORES UNIVERSITY GATEKEEPER INFORMATION SHEET Imam University

An investigation into the Relationship between Achievement and Print Exposure in the First Language and Performance in Learning a Foreign Language

Name of Researcher and Faculty: Abulhameed Aldurayheem (Faculty of Arts, Professional and Social Studies)

You are being invited to be a gatekeeper for a study in your university. Prior to your decision to accept, it is important that you understand why the research is being done and what it involves. Please take time to read the following information. Ask us if there is anything that is not clear or if you like more information.

The aim of this study is to investigate potential relationships between ability and achievement in the first language (Arabic) of University students and their achievement in second language (English) reading comprehension. The potential relationship between print exposure and these factors will also be explored. This is part of a PhD study to develop strategies/ suggestions that will help to understand how to employ this relationship in language learning and assessment.

It is up to you to decide whether or not to provide access. If you do, you will be given this information sheet and asked to sign a consent form. You are still free to withdraw at any time and without giving a reason. A decision to withdraw will not affect your rights or any future treatment/service you receive. Your participation in this study will be kept confidential. All information provided will be used only in the manner allowed by you.

I understand that my consent for this project will involve the participation of students who are studying in the English Department at Imam University. Students will be given a questionnaire about their habits and experience of reading in Arabic, which will take approximately 15 minutes to complete. Then, the students' breakdown scores in the final examination for reading comprehension, Translation Courses Scores, and in the Entry/Placement English Test will be obtained. After that, the students' IDs will be sent to the National Centre for Assessment to obtain their breakdown scores in the Arabic Aptitude Test. Then, the results of these tests will be linked to the questionnaire results for the analysis. This procedure is intended to investigate the relationship between print exposure in Arabic and reading comprehension in English. The process should take no longer than one month to complete.

The information provided by participants will be kept confidential. The questionnaire sheets collected from them will be given by the class's teacher to the researcher in sealed envelopes right after finishing the class session. The questionnaire sheets will be coded and the participants' personal data (IDs) will be split on separated forms with a unique code for each ID and handed to the Test Centre at the College and to the National Centre for Assessment along with the gatekeeper's consent form and the participants consent forms. After receiving the data, linking the questionnaire and the tests results will be based on the coding generated previously so that the IDs numbers will be deleted permanently before making the linkage and analysis. Therefore, participants' data will be anonymous and therefore it will be impossible to trace this information back to them individually. All recorded data will be kept on the Liverpool John Moores University server for a maximum of 5 years after completion and the data will be deleted after that.

I understand that students' participation in this study is entirely voluntary and they can withdraw from the study during the data collection without giving a reason.

I understand that I am free to ask any questions at any time. I am also free to withdraw students from participation in this study and discuss my concerns with the college committee members at the English Department.

Lastly, I would like to assure you that this study has been reviewed and received ethical approval through the Office of Research Ethics at the Liverpool John Moores University (LJMU). However, the final decision about participation is yours. I would hope that the result of this study would benefit the University and its students. I look forward to your response and thank you in advance for your assistance in this project.

I, Dr. Mohammed Alahaydeb giving consent for students in to participate in the study conducted by Abdulhameed Aldurayheem faculty of arts, Liverpool John Moores University with the supervision of Dr Amanda Mason, Business School, Liverpool John Moores University.



**LIVERPOOL JOHN MOORES UNIVERSITY
GATEKEEPER CONSENT FORM
Imam University**

An investigation into the Relationship between Achievement and Print Exposure in the First Language and Performance in Learning a Foreign Language

Name of Researcher and Faculty: Abulhameed Aldurayheem (Faculty of Arts, Professional and Social Studies)

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	<input type="checkbox"/>
2. I understand that participation is voluntary and that I am free to withdraw at any time without giving any reason.	<input type="checkbox"/>
3. I consent to tests results being collected and analysed for the study above from the Testing Centre at the College of Languages and Translation and the National Testing Centre for Assessment.	<input type="checkbox"/>
4. I agree to take part in the above study.	<input type="checkbox"/>

Name of the gatekeeper: Dr. Mohammed Alahaydib

Date:

Signature:

Name of Researcher : Abulhameed Aldurayheem

Date:

Signature:

**Contact Details of Researcher:
Abulhameed Alduraheem,**

**Liverpool John Moores University,
a.a.aldurayheem@2015.ljmu.ac.uk**

**Contact Details of Academic Supervisor:
Amanda Mason,**

**Senior Lecturer PhD, MA, BSc, TEFL Diploma
Liverpool John Moores University,
A.Mason@ljmu.ac.uk**



LIVERPOOL JOHN MOORES UNIVERSITY PARTICIPANT INFORMATION SHEET

Liverpool Business School

Name of Researcher:

Abdulhameed Aldurayheem

Title of Research:

An investigation into the Relationship between Achievement and Print Exposure in the First Language and Performance in Learning a Foreign Language

Dear Participant,

You are being invited to take part in a research study into the relationship between achievement and print exposure in the first Language and performance in learning a foreign language. Before you decide to participate, it is important that you understand why the research is being done and what it involves. Please take time to read the following information. If there is anything that is not clear, or if you would like more information, please feel free to contact me or my supervisor. Our contact details are provided at the end of this form.

What is the purpose of the study?

The aim of this study is to investigate potential relationships between ability and achievement in the first language (Arabic) of University students and their achievement in second language (English) reading comprehension. The potential relationship between print exposure and these factors will also be explored. This is part of a PhD study to develop strategies/ suggestions that will help to understand how to employ this relationship in language learning and assessment.

Do I have to take part?

Your participation in this study is entirely voluntary so it is up to you to decide whether or not to take part in it. If you do, you will be asked to sign a consent form. However, even after signing the consent form you are still free to withdraw during the data collection and without giving a reason. For the purpose of this study, only students who have not spent significant time studying in an English-speaking country (one year and more) are invited to participate. Therefore, you will be asked in the consent form to state that.

What will happen to me if I take part?

First, you will be given a questionnaire that asks you about your habits and experience of reading in Arabic. After that, your breakdown scores in the reading comprehension exam or your scores in the Translation Courses and in the placement test that you have taken before enrolling to the Department will be obtained from the Testing Centre at the College by the researcher based on your consent to release your score using your school ID number to retrieve the results. After that, your national ID number along with your consent and the College' Dean consent will be handed by the researcher to the National Centre for Assessment to release the breakdown of your results in the Arabic Aptitude Test that you took before entering the university. The researcher will generate a unique code for your personal data and for your questionnaire so that after completing the data collection your IDs numbers will be deleted before making any analysis. The results of these tests and the questionnaire results will be linked and analysed. The reason for this linking is to see if there is a relationship between achievement in Arabic and in English.

You will be asked to include your national and school ID numbers in the questionnaire so that your tests breakdown scores can be retrieved by the Testing Centre at the College and at National Centre for Assessment.

Are there any risks / benefits involved?

There are no known or expected risks for involvement in this study and there are no direct benefits to you of taking part in this study. However, the results of the study could inform policy makers regarding the relevance of the Arabic Aptitude Test as a requirement for university admission.

Will my taking part in the study be kept confidential?

No personal information such as name, date of birth, etc., is required to be declared except your student and national IDs which will be taken by the researcher and handed to the Testing Centres to easily retrieve your breakdown tests results. However, once the results are back to the researcher,

your IDs will be deleted and unique codes will be used instead. All of the data held by the researcher then will remain anonymous and will be kept confidential on a Liverpool John Moores University computer that is protected with a user name and password known by the researcher only.

All information collected about you including survey and tests scores will be kept **strictly confidential**. Any information about you will not be disclosed to anyone.

Thank you for your valuable assistance and your co-operation is highly appreciated.

Contact details:

Name of Researcher: Abulhameed Aldurayheem
Email: a.a.aldurayheem@2015.ljmu.ac.uk
Phone: +966555180780

Name of Supervisor: Dr. Amanda Mason (Senior Lecturer PhD, MA, BSc, TEFL Diploma)
Email: A.Mason@ljmu.ac.uk
Phone: (0044) (0)151 231 3866

Address: Liverpool Business School, Faculty of Business and Law, Liverpool John Moores University, Redmonds Building, Clarence Street, Liverpool, United Kingdom, L3 5UG.

LIVERPOOL JOHN MOORES UNIVERSITY

بسم الله الرحمن الرحيم

جامعة ليفربول جون مورس

ورقة موافقة المشاركة/ المشاركة من جامعة الإمام محمد بن سعود على المشاركة في البحث

أخي المشارك/ أختي المشاركة
السلام عليكم ورحمة الله وبركاته
يسعدني مشاركتك في هذا البحث وتعمية هذا الاستبيان المتعلق ببحثي والمشاركة في إنشاء رسالة الدكتوراه
تهدف الدراسة إلى معرفة العلاقة بين اللغة الأم (العربية) للطلاب والطالبة واللغة الثانية (الإنجليزية) من قِياس هذه العلاقة باستخدام
استبيان وبالأستفادة من درجات الطلاب والطالبة في اختبار القدرات العامة واختبارات كلية اللغات والترجمة (كاختبار تحديد المستوى
ومادة مهارات القراءة والاستيعاب ومادة الترجمة).

سأطلب منك في الاستبيان الإجابة على أسئلة تتعلق بخلفيتك الدراسية وعلاقتك بالكتاب العربي والقراءة قبل دخولك الجامعة. كذلك
سأطلب منك تزويد الباحث برقم الجامعي وهويتك وذلك بهدف استخراج درجتك في مادة القراءة والاستيعاب أو الترجمة واختبار
تحديد المستوى في اللغة الإنجليزية من كلية اللغات والترجمة واستخراج درجتك التحصيلية في الجزء اللغوي من اختبار القدرات العامة
من المركز الوطني لقياس والتقييم لربط هذه الدرجات مع الاستبيان وتحليل النتائج إحصائياً. علماً أن التعامل مع هذه البيانات سيكون
إجمالياً لجميع المشاركين من دون تفصيل للأفراد وسيكون لكل مشارك رمز خاص لكي تحذف البيانات الشخصية وتضمن الروموز في
عملية ربط البيانات.

المشاركة في هذه الدراسة طوعية ويدون أي التزام لك أو عليك وقد تستغرق أقل من عشر دقائق ويحق لك الانسحاب في أي وقت
خلال مشاركتك وفي حال رغبتك بالاستفسار أو معرفة نتائج الدراسة بعد انتهاء البحث فيمكنك التواصل مع الباحث على العنوان
الإلكتروني.

الباحث سعيد بميثاق من جامعة الإمام وطلب دكتوراه في جامعة ليفربول جون مورس (بريطانيا) وتمت الموافقة على إجراء البحث/تقديم
الصيغة علماً أن البيانات ستكون في حساب محمي وخاص بالباحث وسوف تسمح بعد انتهاء الدراسة مما يجعل تنبؤاتها أكثر دقة

شاكراً ومقدر لكم تعاونكم

أخوكم: عبدالحميد الدريهم a.a.aldurayheem@2015.ljmu.ac.uk رابط الاستبيان:

موافقة صيد كلية اللغات والترجمة على إجراء الدراسة في الكلية: *عبدالحميد الدريهم*

موافقة الطالب/ الطالبة في المشاركة في الدراسة: (الرجاء وضع علامة ✓ في المربع إذا كنته لاتصاح بالمشاركة في البحث)

1. أطلع على معلومات الدراسة أعلاه وفهمتها

2. متأكد من أنني متطوع في الحق في الانسحاب متى شئت

3. أوافق أن توحي درجتني وكيفية بغرض الدراسة أعلاه وذلك لاختبار القدرات العامة
والاختبار تحديد المستوى واختبار المهارة

4. أوافق أن أزوّد الباحث برقمي الجامعي ورقم هويتي وذلك لغرض استخراج الدرجات
من كلية اللغات والترجمة ومن المركز الوطني للقياس والتقييم

5. أوافق على المشاركة في هذه الدراسة

الاسم: *عبدالحميد الدريهم*

رقم الهوية: *9903147231*

الرقم الجامعي: *9903147231*

الرمز الخاص: *9903147231*

(للاستخدام الخاص من الباحث بغرض
الاعتماد عليه بدلاً من الهوية)



Abdulhameed <thaqep@gmail.com>

طلب البيانات من المركز الوطني للقياس والتقييم

data <data@qiyas.org>
To: عبدالحميد الدريهم <thaqep@gmail.com>

Mon, Feb 15, 2016 at 11:25 AM

هلا اخوي عبدالحميد

السلام عليكم ورحمة الله وبركاته

أفيدكم بأنه ليس لدى المركز ممانعة في منحك البيانات حسب الصيغة التي كتبها في نموذج الطلب شريطة ما يأتي:

1-إكمال متطلبات المركز للحصول على البيانات (نموذج وتقرير خطة البحث و ملف اكمل لطبيعة البيانات المطلوبة.

2-تزويد المركز بخطاب من الجامعة بعدم الممانعة تزويدكم بدرجات الطلاب.

3-تزويدنا بالمجلات المدنية للطلاب ومعاها درجات الطلاب في اللغة الإنجليزية وسوف نقوم نحن برابطها بأداء الطلاب حسب مجالات القسم اللغوي
ومن لم تزويدكم بالبيانات دون هوية وطنية.



Abdulhameed <thaqep@gmail.com>

طلب بيانات من المركز

Fahad A. Al-Hozimi <F.Hozimi@qiyas.org>
To: عبدالحميد الدريهم <thaqep@gmail.com>

Mon, May 7, 2018 at 1:23 PM

الأستاذ عبدالحميد الدريهم

تحية طيبة

يوجد في المرفق ملف اكمل يحتوي على البيانات المرسل منكم مقرونة بدرجات اختبار القدرات.

وتقبّلوا وافر التحية والتقدير،،،
فهد الحزيمي

From: عبدالحميد الدريهم <thaqep@gmail.com>

Sent: Thursday, March 22, 2018 2:18 PM

To: Fahad A. Al-Hozimi <F.Hozimi@Qiyas.org>

Subject: Re: طلب بيانات من المركز



**LIVERPOOL JOHN MOORES UNIVERSITY
PARTICIPANTS CONSENT FORM
Imam University**

An investigation into the Relationship between Achievement and Print Exposure in the First Language and Performance in Learning a Foreign Language

Name of Researcher and Faculty: Abdulhameed Aldurayheem (Faculty of Arts, Professional and Social Studies)

1. I confirm that I have read and understand the information sheet for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	<input type="checkbox"/>
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.	<input type="checkbox"/>
3. I consent to my results being collected and analysed for the study above in the Arabica Aptitude Test, Final English Reading Comprehension Exam, the English Entry/placement Test, and Translation Courses Scores.	<input type="checkbox"/>
1. I consent to give my school and national IDs for the purpose of retrieving my tests results from the College Testing Centre and the National Centre for Assessment.	<input type="checkbox"/>
2. I have not studied in an English-speaking country for one year or more.	<input type="checkbox"/>
3. I agree to take part in the above study.	<input type="checkbox"/>

Name of Participants:

Date:

Signature:

Name of Researcher : Abulhameed Aldurayheem

Date:

Signature:

Appendix 9

Figures from findings: foundation students

Figure 1: Model 1

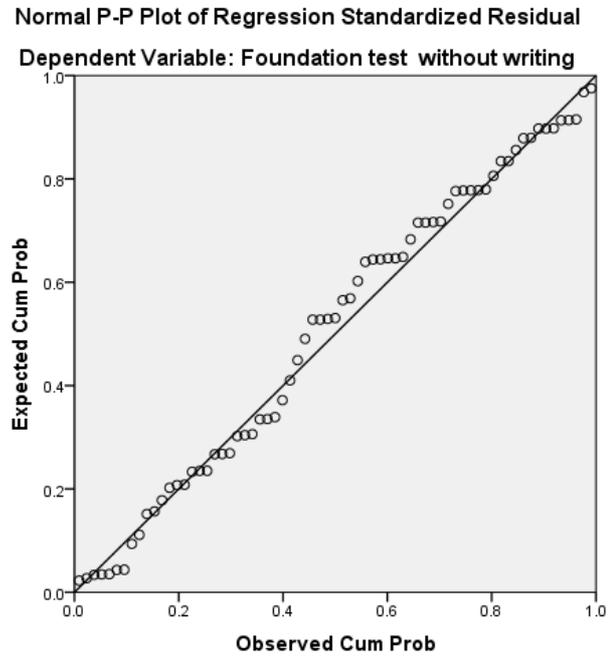


Figure 2: Model 1

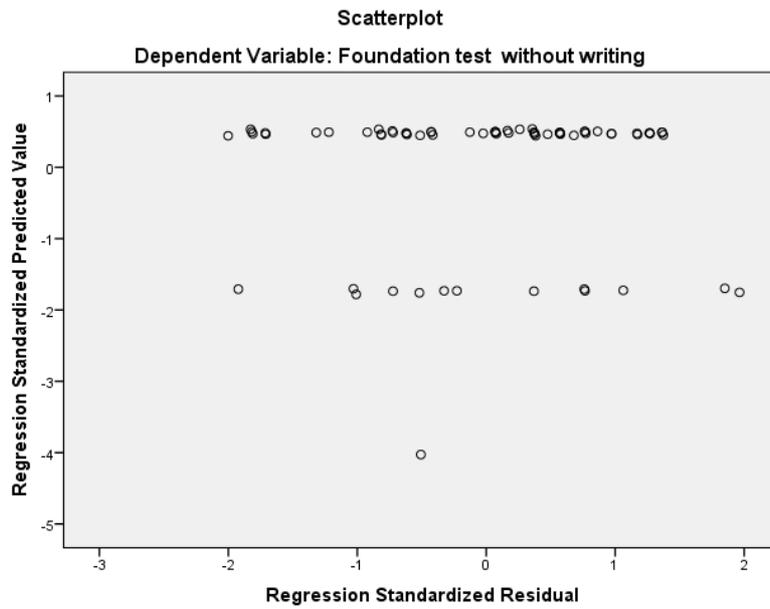


Figure 1: Model 2

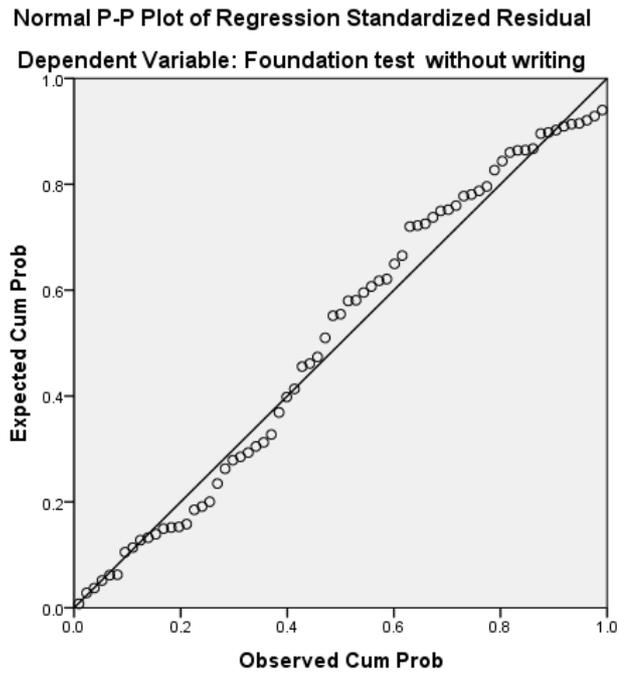


Figure 2: Model 2

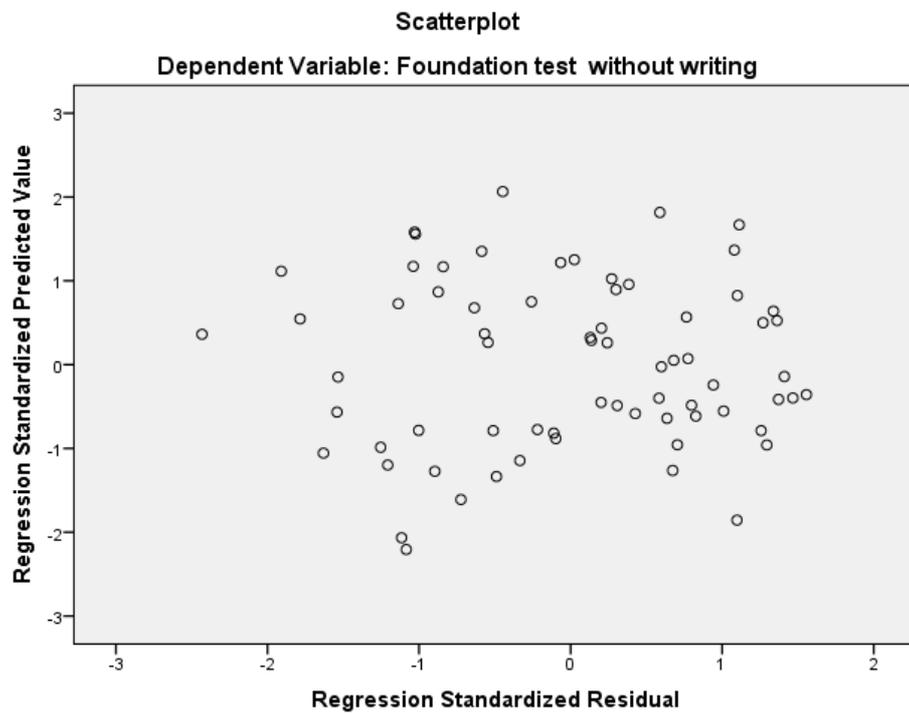
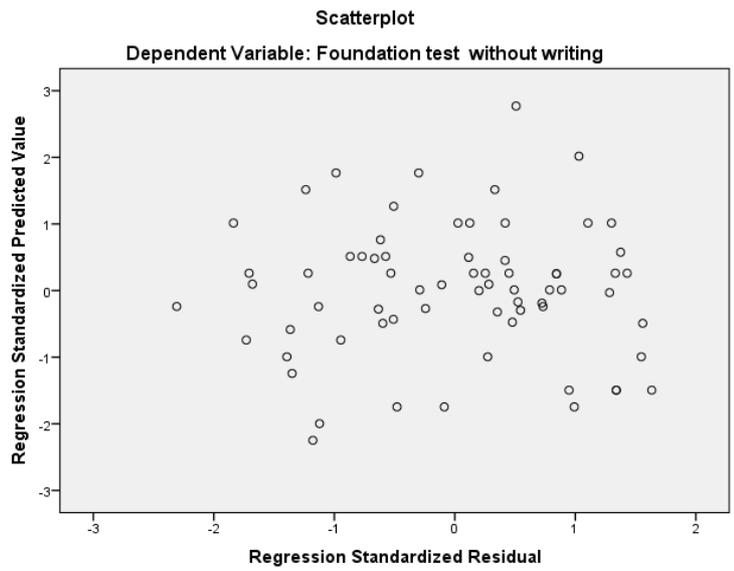


Figure 3: Model 2



Appendix 10
Figures from findings: Level two students

Table 1: Correlation matrix for variables of study

	Type of Exposure	Reading time score	GAT total	Quantitative section	Verbal section	Analogy breakdown	Context error	Sentence completion	Comprehension Reading	Reading Course	Reading Test	Grammar Course	Grammar Test	Intrinsic Motivation	Extrinsic Motivation	Metacognitive Strategies	Memory Strategies	Cognitive Strategies	Social Strategies	Affective Strategies	Compensation Strategies
R	.341**	-.091	-.298**	-.207*	-.245**	-.158	-.066	-.139	.020	-.008	-.033	-.031	-.039	-.003	-.042	.026	-.003	-.022	-.053	.055	-.100
Sig. (2-tailed)	.000	.315	.001	.021	.006	.081	.467	.123	.823	.934	.717	.730	.671	.978	.644	.774	.978	.805	.561	.542	.268
N	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124	124
R	-.341**	.298**	.298**	.105	.240**	.187*	.128	.291**	.154	.083	-.045	.127	.098	.113	.056	.081	.190*	.201*	-.013	.152	.231**
Sig. (2-tailed)	.000	.001	.001	.242	.007	.036	.154	.001	.086	.357	.613	.156	.273	.206	.534	.364	.033	.024	.886	.088	.009
N	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
R	-.091	.293**	-.000	.063	-.048	.023	-.061	.092	-.047	.038	.067	.020	.024	.223*	.169	.189*	.309**	.253**	.030	.102	.285**
Sig. (2-tailed)	.315	.001	.939	.481	.597	.795	.495	.307	.605	.669	.459	.828	.793	.012	.058	.034	.000	.004	.736	.257	.001
N	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
R	-.225	-.007	.845**	.05**	.719**	.474**	.641**	.574**	.458**	.459**	.375**	.419**	-.058	.039	.006	-.085	-.094	-.005	-.007	-.023	
N	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127	127

		Quantitative section		Verbal section		Analogy breakdown		Context error breakdown
		R	Sig. (2-tailed)	R	Sig. (2-tailed)	R	Sig. (2-tailed)	
OWN	98**	.000	.000	.000	.000	.000	.000	.000
	112	.011	.000	.240	.000	.187	.000	.128
	126	.939	.000	.048	.000	.023	.000	.061
	126	.825**	.000	.905**	.000	.719**	.000	.474**
	126	.541	.000	.814**	.000	.814**	.000	.578**
	126	.420**	.008	.578**	.000	.329**	.000	.329**
	126	.235**	.000	.726**	.000	.606**	.000	.354**
	126	.386**	.001	.709**	.000	.445**	.000	.267**
	126	.289**	.000	.420**	.000	.327**	.000	.327**
	126	.414**	.000	.436**	.000	.353**	.000	.304**
	126	.394**	.000	.344**	.000	.308**	.000	.244**
	126	.328**	.000	.403**	.000	.310**	.000	.350**
	126	.342**	.059	.056	.536	.150	.094	.137
	126	.068	.451	.012	.893	.236**	.008	.226*
	126	-.015	.872	.005	.953	.140	.118	-.029
	126	.110	.220	.046	.607	.107	.235	.163
	126	.093	.299	.084	.352	.073	.417	.124
	126	.025	.784	.029	.747	.097	.278	.003
	126	.056	.531	.029	.746	.116	.196	.117
	126	-.062	.487	-.007	.941	.165	.065	-.194*

Sentence completion breakdown	Sig. (2-tailed)	.467	.154	.495	.000	.000	.000	.000	.002	.000	.001	.006	.000	.125	.011	.749	.069	.168	.976	.190	.030	
	N	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
Comprehension Reading breakdown	R	-.139	.291**	-.092	.641**	.726**	.606**	.354**	1	.450**	.310**	.330**	.303**	.287**	-.045	.125	.073	.109	.071	.011	.070	
	Sig. (2-tailed)	.123	.001	.307	.000	.000	.000	.000	.000	.000	.000	.000	.001	.001	.619	.164	.415	.224	.427	.904	.434	.436
Reading Test	R	-.020	.154	-.047	.574**	.709**	.445**	.267**	.450**	1	.229*	.240**	.121	.204*	.034	-.003	-.014	.025	-.038	.109	.019	
	Sig. (2-tailed)	.823	.086	.605	.001	.000	.000	.002	.000	.000	.010	.007	.176	.022	.702	.969	.875	.783	.675	.223	.831	.834
Reading Course	R	-.008	-.083	-.038	.458**	.420**	.327**	.327**	.310**	.229*	1	.959**	.647**	.674**	.166	-.082	.218*	-.029	.053	.297**	.185*	.067
	Sig. (2-tailed)	.934	.357	.669	.000	.000	.000	.000	.000	.010	.000	.000	.000	.000	.063	.362	.014	.744	.556	.001	.038	.458
	N	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
	R	-.033	-.045	-.067	.459**	.436**	.353**	.304**	.330**	.240**	.959**	1	.604**	.631**	.183*	-.052	.278**	.072	.130	.339**	.263**	.178*
	p-value	.717	.613	.459	.000	.000	.000	.001	.000	.007	.000	.000	.000	.000	.040	.563	.002	.425	.148	.000	.003	.046

Grammar Test	N	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
	R	.127	.020	.375**	.328*	.344**	.308**	.244**	.303**	.121	.647**	.604**	1	.960**	.051	-	.142	.085	.007	.047	.150	.156
	P-value	.156	.828	.000	.000	.000	.006	.001	.176	.000	.000	.000	.000	.568	.112	.344	.934	.598	.095	.081	.697	
Grammar Course	N	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
	R	.098	.024	.419**	.342*	.403**	.310**	.350**	.287**	.204*	.674**	.631**	.960**	1	.098	-	.143	.133	.032	.096	.175	.217*
	P-value	.273	.793	.000	.000	.000	.000	.001	.022	.000	.000	.000	.000	.276	.111	.138	.719	.283	.050	.014	.499	
Intrinsic Motivation Mean	N	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
	R	.113	.223*	.058	-.059	-.056	.150	-.137	-.045	.034	.166	.183*	.051	.098	1	.599**	.555**	.480**	.554**	.416**	.531**	.427**
	P-value	.206	.012	.513	.536	.094	.125	.619	.702	.063	.040	.568	.276	.000	.000	.000	.000	.000	.000	.000	.000	.000
Extrinsic Motivation Mean	N	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
	R	.054	.169	.039	.068	-.012	.236**	.226*	.125	-.003	.082	.052	.142	.143	.599**	1	.244**	.278**	.321**	.148	.217*	.238**
	P-value	.534	.058	.663	.451	.893	.008	.011	.164	.969	.362	.563	.112	.111	.000	.006	.002	.000	.098	.015	.007	

MetaCognitive Strategies	R	.026	.081	.189*	.006	-.015	.005	.140	-.029	.073	-.014	.218*	.278**	.085	.133	.555**	.244**	1	.601**	.820**	.656**	.709**	.704**
	P-value	.774	.364	.034	.944	.872	.953	.118	.749	.415	.875	.014	.002	.344	.138	.000	.006	.000	.000	.000	.000	.000	.000
	N	124	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
	R	-.000	.190*	.309*	-.008	-.110	-.046	.107	-.163	.109	.025	-.029	.072	-.007	.032	.480**	.278**	.601**	1	.709**	.337**	.530**	.590**
Memory Strategies	P-value	.937	.033	.000	.342	.220	.607	.235	.069	.224	.783	.744	.425	.934	.719	.000	.002	.000	.000	.000	.000	.000	.000
	N	124	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
	R	-.022	.201*	.253**	-.009	-.093	-.084	.073	-.124	.071	-.038	.053	.130	.047	.096	.554**	.321**	.820**	.709**	1	.645**	.724**	.751**
	P-value	.805	.024	.004	.297	.352	.417	.168	.427	.675	.556	.148	.598	.283	.000	.000	.000	.000	.000	.000	.000	.000	.000
Cognitive Strategies	N	124	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
	R	-.055	-.013	.030	-.005	.025	-.029	.097	-.003	.011	-.109	.297**	.339**	.150	.175	.416**	.148	.656**	.337**	.645**	1	.612**	.582**
	P-value	.561	.886	.736	.952	.784	.747	.278	.976	.904	.223	.001	.000	.095	.050	.000	.098	.000	.000	.000	.000	.000	.000
	N	124	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
Social Strategies	R	-.055	-.013	.030	-.005	.025	-.029	.097	-.003	.011	-.109	.297**	.339**	.150	.175	.416**	.148	.656**	.337**	.645**	1	.612**	.582**
	P-value	.561	.886	.736	.952	.784	.747	.278	.976	.904	.223	.001	.000	.095	.050	.000	.098	.000	.000	.000	.000	.000	.000
	N	124	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
	R	-.055	.152	.102	-.000	-.056	-.029	.116	.117	.070	.019	.185*	.263**	.156	.217*	.531**	.217*	.709**	.530**	.724**	.612**	1	.592**
Affective Strategies	P-value	.561	.024	.004	.297	.352	.417	.168	.427	.675	.556	.148	.598	.283	.000	.000	.000	.000	.000	.000	.000	.000	.000
	N	124	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126

Compensation Strategies	P-value	.54	.088	.257	.94	.531	.746	.196	.190	.434	.831	.038	.003	.081	.014	.000	.015	.000	.000	.000	.000	.000	.000	
	N	21	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	
	R	.10	.231**	.285**	-.02	-.062	-.007	.165	.194*	.070	.019	.067	.178*	.035	.061	.427**	.238**	.704**	.590**	.751**	.582**	.592**	.1	
	P-value	.26	.009	.001	.79	.487	.941	.065	.030	.436	.834	.458	.046	.697	.499	.000	.007	.000	.000	.000	.000	.000	.000	.000
	N	12	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126	126
		4		6	6																			

** . Correlation is significant at the 0.01 level (2-tailed).

* . Correlation is significant at the 0.05 level (2-tailed).

Figure 1: Model 1

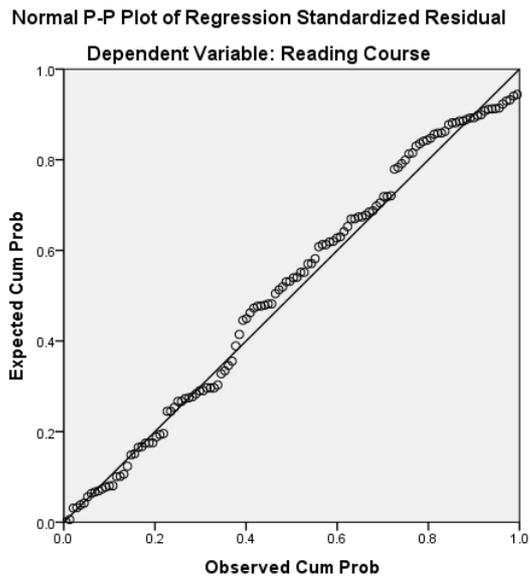


Figure 2: Model 1

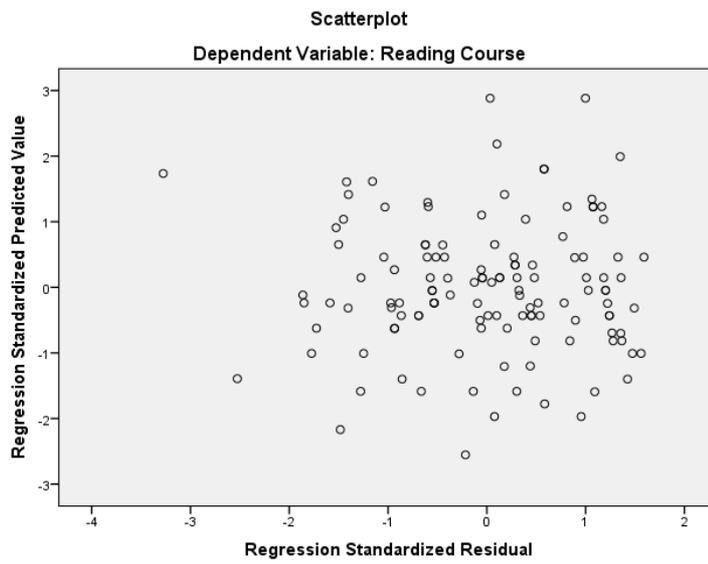


Figure 3: Model 1

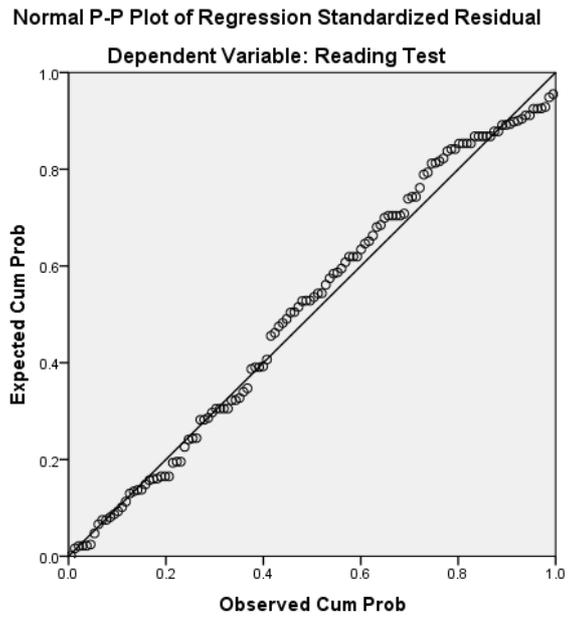


Figure 4: Model 1

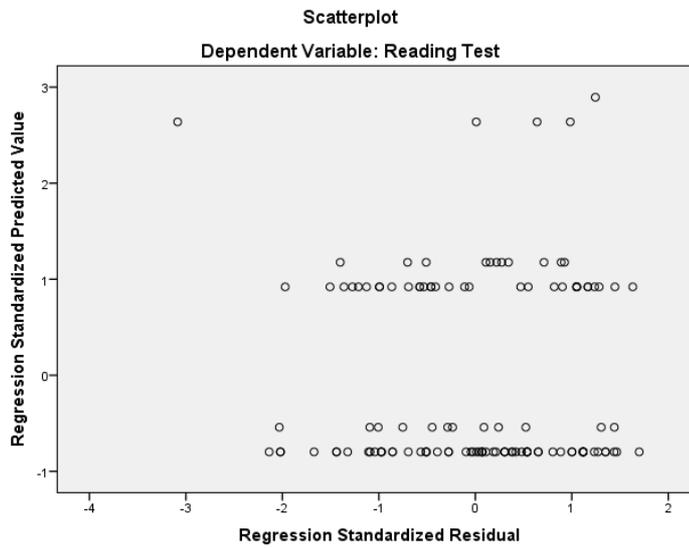


Figure 5: Model 1

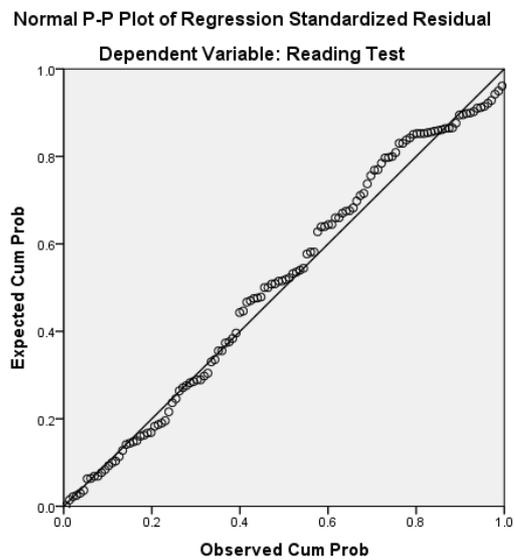


Figure 6: Model 1

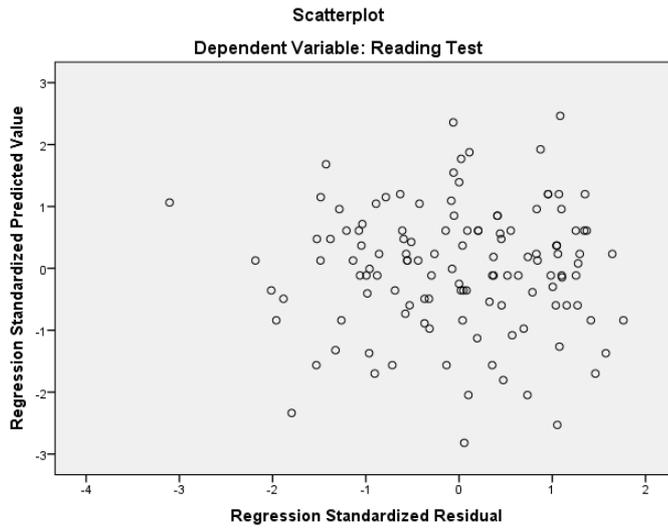


Figure 7: Reading Test Model

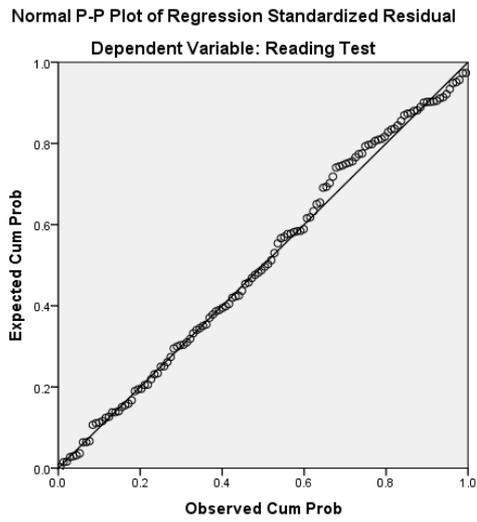


Figure 8: Reading Test Model

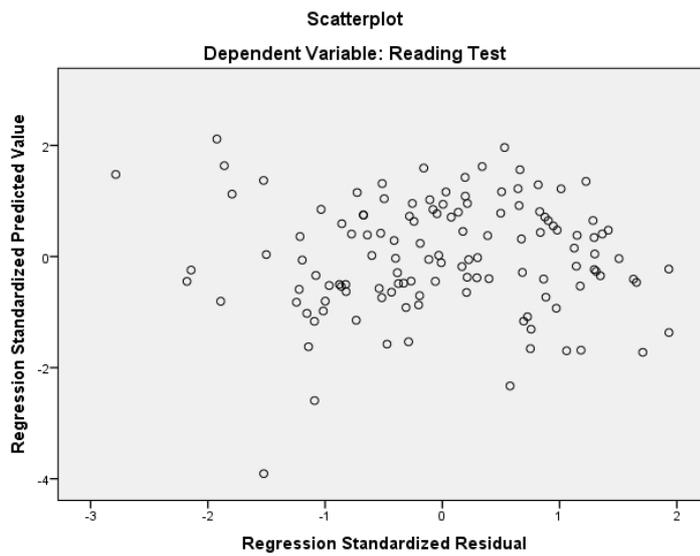


Figure 9: Grammar with interaction Model

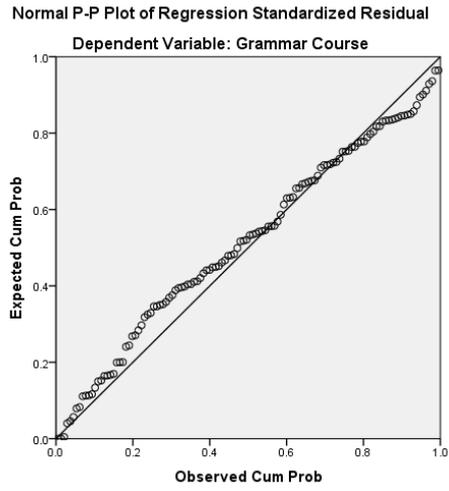


Figure 10: Grammar with interaction Model

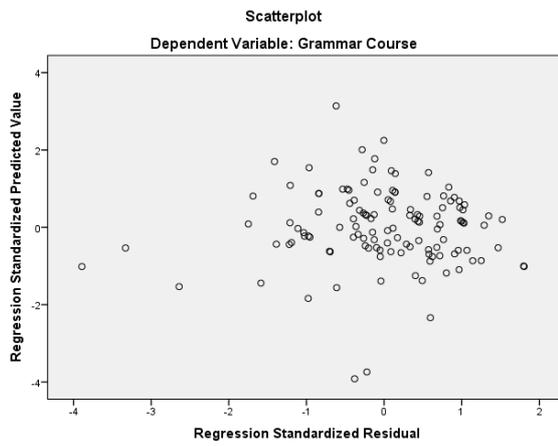


Figure 11: Model 7

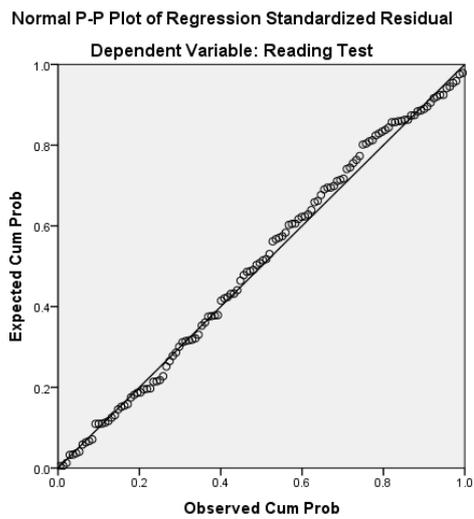


Figure 12: Model 7

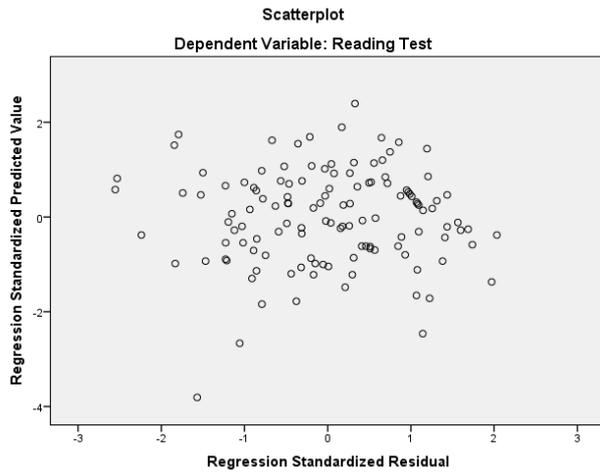


Figure 13: Model 8

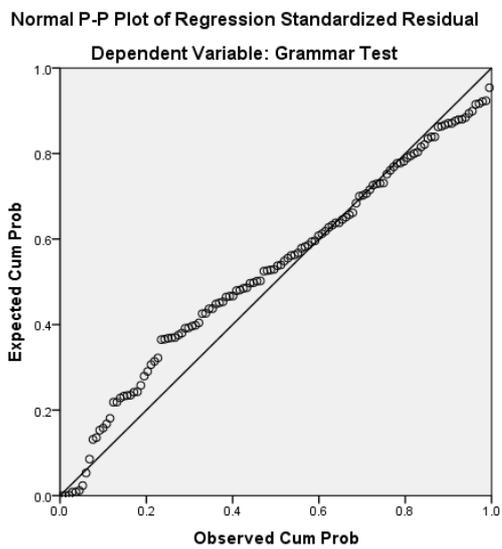


Figure 14:

