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**Native Arabic-Speaking Graduate Students' Strategic  
Reading Activity with Advanced English Texts  
from Two Disciplines**

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**Abstract**

This research examined the English-learning backgrounds and text comprehension strategies of three native Arabic-speaking doctoral students in the field of education at a United States (US) university. Data sources included semi-structured interviews and a think-aloud activity with a text from their field of study (education) as well as from another field of study (statistics). Analyses involved qualitative coding of the interviews and think-aloud activity and cross-case comparisons. Participants' interviews regarding their English learning experiences included evidence of anxiety as well as cultural, family, school, and teacher influences. Ways in which learning environments and educational backgrounds affected their second language acquisition were also discussed. Analyses of the think-aloud revealed that there were similar patterns in the participants' interactions with the texts differentiated by disciplinary focus. Participants used more strategies overall, as well as higher-order strategies such as making inferences and paraphrasing with the education text than with the statistics text. Strategies used that have not been described in the ESL literature including the use of technological tools in particular ways and strategic skimming or skipping of words and, particularly, of cited names.

Key Words: ESL graduate students, reading strategies, academic language, native Arabic speakers

## Introduction

### Problem of Study

The interest in how to support non-native English speakers while completing their graduate studies in the United States institutions is increasing (Center for Adult English Language Acquisition, 2001). Some English as a Second Language (ESL) graduate students are able to be successful in their studies, while others struggle. Understanding the cause of the difficulties can be challenging as it is difficult for ESL students to self-monitor and determine whether their lack of understanding results from an inadequate vocabulary, a lack of prior knowledge, or some other language deficiencies (Mokhtari & Sheorey, 2002). Understanding ways in which particular students' linguistic and cultural backgrounds and use of comprehension-fostering strategies facilitate academic text comprehension could help

university faculty provide more effective supports for the non-native English speakers in their classes.

### **Purpose of Study**

In this paper, we describe the results of a study examined the reading strategies of three female native Arabic-speaking graduate students when reading academic texts in English that were about their own field of study (education), or about another field of study (statistics). The purpose of this study was to explore the way Arabic education graduate students at a US university understand English texts from two disciplines.

### **Significance of Study**

The findings of this study are significant for new Arabic education graduate students at a US university, English as a Second Language (ESL)/ English Foreign Language (EFL) teachers, and literacy researchers.

### **Research Question**

To address the aim of this study, the following primary question guided the research study for this study was: how do Arabic education graduate students at a US university process English texts from two disciplines?

The conceptual framework for this investigation includes a complex view of reading, in which text comprehension is impacted by a myriad of factors, including, but not limited to prior knowledge of the text ideas and vocabulary (Reading Study Group & Snow, 2002). Strategy use, including the use of metacognitive strategies is an essential aspect of readers' activity. Relatedly, readers' reflections, thoughts, experiences, and knowledge regarding their own ways of dealing with challenges academic texts play an important role in learning and reading comprehension. In addition to learner factors including background experiences, cognitive processing and affective responses, the characteristics of texts and reading tasks are also important, as is the sociocultural context in which a reading event takes place.

## **Literature Review**

### **Increasing Numbers of Adult ESL Students in the US Higher Education Programs**

According to federal statistics from the Center for Adult English Language Acquisition (2001), the number of adult learners in ESL programs has grown, particularly in the last decade. The Institute of International Education (2015) also reported that over the 2014-2015 academic year, the number of ESL international students in the US increased by approximately 974,926, a 10% increase from the previous year and, a 60% increase from 2000. The population of all ESL students at US universities is projected to jump from just under 5% to approximately 25% by the year 2025 (Kanno, 2015).

ESL students who come from Arabic-speaking countries, such as Saudi Arabia to US universities have been a part of this recent increase because of the number of those in US. According to Al-Hayat News (2016), the Director of the Saudi Arabian Cultural Mission to the US, Dr. Abdullah Al-Issa, noted that there are around 200,000 Saudi students in US universities and that he expected this number to increase in the next five years. Such statistics clearly demonstrate the importance of understanding more about Arabic-speaking students' use of reading strategies while navigating academic texts which have formal words. Yet, to date there have been only a handful of studies specifically examining native Arabic speakers' reading strategy use when they read in English (Alsheikh & Mokhtari, 2011).

### **Factors Impacting ESL Students' Academic Language Acquisition**

There are two types of factors: internal factors which includes reading anxiety and learners' own reading strategies, and contextual factors like the learning environment and teachers' influence.

Among the factors impacting ESL students' academic language acquisition, anxiety has been often examined as related to ESL adults' comprehension of text (Biglari & Farahiah, 2017; Hill & Wigfield, 1984; Krashen, 1981; Saito et al., 1999). While reading text, ESL students frequently encounter academic language that makes texts' information difficult to understand (Zin & Rafik-Galea, 2010). Consequently, students may feel disappointment and failure, particularly, when they use their reading strategies, which they are accustomed to using with their native language texts, and those strategies do not help them with college texts written in English. Usually, ESL students have expressed anxious of making mistakes while

reading English texts as well as distress at being perceived as lacking proficiency in teaching by their instructors) Genç, 2016). For example, instructors should be attention with using the way they correct students in class because that way can cause anxiety for some students. They should provide positive and useful feedback as much as possible as they can.

The evidence suggests that the affective aspects of reading and overall language anxiety can negatively impact the language learning process. Some scholars (Wu, 2010; Phillips, 1992; Tallon, 2009, and Nalliveetil, 2014) confirmed that academic language could make ESL students get anxious that is detrimental to their learning of the second language.

Mohd and Rafik-Galea (2010) and Lien (2016) have provided evidence that the more students feel confident and have experiences with a new language, the lower their anxiety. Researchers found that there was an important relationship between ESL learners' confidence and their successes in the comprehension of college reading, specifically vocabulary acquisition (Hueng & Newborn, 2012). Biglari and Farahiah (2017) also found that a reader-response approach, which gives students an opportunity to speak aloud about their experiences, thoughts, and feelings, contributed to reducing the students' test anxiety in the classroom. As discussed, students' anxiety plays an important role in reading comprehension levels as well as vocabulary acquisition, so such techniques to decrease anxiety can be valuable in ESL classrooms. With well-informed teachers skilled at meeting students' needs, learners' anxiety can be reduced, and their reading comprehension levels as well as vocabulary acquisition increased.

In addition to the affective aspects of ESL learners' experiences, researchers have examined the cognitive aspects. In particular, the strategies learners' employ when reading have been examined in various ways. Advanced graduate student ESL learners use specific types of strategies, such as cognitive strategies, support strategies, and metacognitive strategies, while reading, however, some of the reading strategies become successful with certain kinds of texts that provide much information. Mihara (2011) found that vocabulary pre-teaching is less effective for ESL graduate students than providing comprehension questions. Sporer and Brunstein (2009) demonstrated that using peer-assisted learning

strategies (PALS) significantly improved students' comprehension of texts, their effective use of reading strategies, and their understanding of self-regulated reading. Bang and Zhao (2007) also concluded that ESL students usually use some strategies, such as translating into their first language (L1), note-taking, talking with colleagues, etc., more than others because these specific strategies help them to reflect their relative background knowledge of using strategies which can impact their level of confidence while reading English academic texts. All these studies indicate there are relationships among ESL adult students' strategy knowledge, strategy use, and their task performance thereby affecting ESL graduate students' text comprehension.

Contextual factors have been found to be important for students' learning. Classroom learning environments can impact ESL learners' language and reading comprehension. Work by Tallon (2009), and Merriam and Brockett (2007) demonstrated that the social environment influences individuals' reading comprehension outcomes. They found even though students have basic level of the new language, they experience high anxiety that impacts their performances in classes. Therefore, researches suggested it is necessary to develop classes that are designed with special learning environments for those students in order to support the learning process. Al-Amir (2010), Johnson and Owen (2013), and Harklau (1994) confirmed that a supportive learning environment for ESL adult students can facilitate learners' risk taking and practice of the new language. Affective aspects of a learning environment are important. Researchers' results showed, in supportive learning environments, every student is empowered to take linguistic risks and to monitor and correct their own language errors without feeling embarrassment or anxiety. Students in supportive environments can learn better and comprehend new concepts, words, and language structures because they feel secure and confident.

The broader context outside the classroom is also important for students' academic acquisition. Iwai (2008) and Taguchi (2008) have suggested that learning English was more effective if ESL learners studied in a predominantly English-speaking environment. Work done by these researchers as well as by Roever (2012) found a positive relationship between the length of stay of the ESL learners in the target language country and the learners' English

proficiency high level. For example, if those students are able to live in an English country for years, they easily learn English through interacting with native speakers in daily life.

The impact of teachers' pedagogical methods has been a common theme in research related to ESL learning in higher education settings. Teachers should know and understand ESL students' capabilities if they want to meet those students' needs. To encourage teachers to become effective ESL educators, researchers have examined particular teaching approaches. For example Coxhead and Byrd (2007) suggested teachers prepare themselves to teach academic vocabulary and grammar by increasing their awareness of and attention to academic vocabulary. As well, teachers should consider the effect of the first language on how a learner processes the second language and understand that learning new academic vocabulary means more than finding dictionary definitions. Harklau (1994) illustrated how explicitly modeled comprehension strategy use helped ESL students learn how to apply strategies while working with academic texts.

Teachers' backgrounds and language knowledge have been shown to be of critical importance for learning strategies. Teachers' English background knowledge, cultural beliefs, and educational levels can impact ESL students' learning. Ajayi (2011), Dytynshyn and Collins (2012), Reeves and Medgyes (1994), Moussu (2010), and Ellis (2013) examined if there were effects of teachers' social, linguistic, cultural, and educational backgrounds on their roles as ESL educators in classrooms. They found ESL teachers' backgrounds, and ethnic and cultural identities informed their pedagogical practices in classrooms, and those ESL teachers' sociocultural identities significantly shaped their teaching styles. For example, ESL teachers usually face different challenges including linguistic problems and culture knowledge, and these type of challenges could negatively affect non-English speakers' capabilities in learning new language.

All these factors, reading anxiety and learners' reading strategies use, learning environment and teachers' effectiveness, are associated with ESL students' processes while reading academic texts. However, native Arabic-speaking students have rarely been focused in studies related to ESL students' learning processes. Additionally, most researchers have not specifically examined how learners' text processing may differ when working to



comprehend texts from different fields of study. Thus, this study helps fill a gap in the existing literature.

## Methods

### Participants

This study was conducted with three female native-Arabic speaking students from Saudi Arabia who had either just completed (**Leila**) or were still enrolled (**Nada and Sarah**) in a doctoral education program at an urban research university in the Midwest of the US. The age of women are older than thirty. They were all instructors at colleges of education at different Saudi universities and they came to the US because their jobs required them to obtain a doctorate. Their length of stay in the US ranged from three to seven years at the time of this study. These participants had all successfully passed an intensive English language program with a view towards entering a US university at its completion. For the purpose of this study, more information about each of them below are important in order to get an idea of women's' historical language proficiency levels. All the names are pseudonyms and all participants gave their informed consent per institutional review board research protocol review prior to their participation in the study.

**Nada.** Nada's university gave her a choice to study inside her country or overseas. She decided to complete her graduate studies abroad in order to gain new experiences, learn about other cultures, and learn English from native speakers. Upon receiving a scholarship to complete her master's and doctoral degrees, she came to the US in 2010 and studied at an ESL center for more than a year. In 2013, Nada started her master's program at a US university. After graduating, she returned to Saudi Arabia for one year in order to wait for an acceptance letter from a US university for her doctoral work. In 2014, she returned to the US and again studied at an ESL center prior to taking the Graduate Record Exam. She started her doctoral program in 2016.

**Leila.** Leila had been an assistant professor at a college of education at a Saudi university since the fall of 2003. She finished her master's in Saudi Arabia and received the university's scholarship to complete her doctorate in the US. In 2011, she travelled to the US



and began studying English at an ESL center; she then studied in a doctoral program at a US university in the Northwest. At the beginning of 2015, she transferred to a Midwest university to complete her PhD program, graduating in the spring of 2018.

**Sarah.** After finishing her master's degree in Saudi Arabia, Sarah was offered a full scholarship from the university where she works to pursue her doctorate. In July of 2013, she came to the US and began studying in the ESL centers in two different cities and states as she and her husband applied to universities that would be near one another. Her major is educational technology, and her husband is in a medical field, so it took some time to find an appropriate university for both of them. As a result, she started her doctoral program at a US university in 2016. Overall, she has studied almost five years in the US.

### **Procedure**

Data collection for this study described in more detail below was conducted between May and September of 2018.

**Questionnaire about academic background.** Participants completed a brief written questionnaire about their academic backgrounds, particularly where they completed their studies and how long they had been studying English.

**Semi-structured interviews.** The participants were individually interviewed by the Arabic and English bilingual first author individually at a place and time that was convenient for each of them. The interviews lasted about twenty minutes. In addition to taking field notes, the interviews were audio-taped and transcribed. The participants had a chance to read the interview questions. The questions (see Figure 1) were open-ended and relatively few in number as recommended by Creswell (2013). During the interviews, the researcher probed with additional questions in English following Stake's recommendations for case study interviews (2010).

#### **Semi-Structured Interview Questions**

1. How did you learn to read?
2. Why do you read?
3. How did you become interested in learning English?
4. How did you decide you wanted to do your advanced graduate work in English?
5. What do you think are some of the most difficult challenges about completing your graduate coursework in the United States?
6. What do you find challenging about reading texts for your coursework?
7. What makes a text easier or harder for you to understand?
8. What reading strategies do you use to help you understand your course texts?
9. How does reading English textbooks and reading textbooks in Arabic compare for you? What, if any differences are there for you in the way you read?
10. Thinking about vocabulary, what do you do when you come to a word in an English textbook that is unfamiliar to you?
11. How do you decide which strategy to use to help you understand a new word in an academic text?

**Figure 1. Interview Questions.**

**Think-aloud protocol.** The participants were asked to read and think aloud about two graduate level college texts written in English that were from two fields of study (education and statistics). The first passage about education was from the participants' field of study. The purpose of asking participants to read texts from different fields was to see whether the participants' strategy use with English academic texts differed across disciplines.

After completing an initial written questionnaire and engaging in the semi-structured interview described above, participants were orally introduced to the think-aloud technique and provided the same instructions in written form. They were told that thinking aloud about

the text meant that they should pause at the end of each paragraph, and whenever they find themselves needing to stop and think about the text, and explain out loud to me what they are thinking at that time. They were also told to feel free to circle or underline information you find is important, to use typographical features like boldface or italics if it is helpful, to use reference materials if you need, and to write notes or questions if you have them.

Participants read and thought aloud about the education text prior to completing the think-aloud with the statistics text. The first author observed the participants during this process in a non-interruptive manner and took notes regarding the participants' actions and utterances. The think-aloud protocols were also audio-taped and the participants' copies of the texts kept (to be able to analyze notations and markings participants may have made on them).

**Think-aloud materials.** The excerpts were chosen to have what we hoped would be a manageable level of challenge. According to a battery of seven readability formulas (as calculated at readabilityformulas.com), both of the texts used for the think-alouds showed that were very difficult and at the college or graduate school level. So, those texts were appropriate for the PhD students level. See Table 1 below for a comparison of the two texts on the basis of these readability formulas.

*Education text.* The excerpted text related to the field of education that the participants read was from an edited volume titled *Everyday cognition: Its development in social context*, (Rogoff & Lave, 1984) and the passage selected was from chapter 7, "The Creation of Context in Joint Problem-Solving" (Wertsch, Minick & Arns, 1984). The excerpt was from the very beginning of this chapter and focused on how theories of cognitive development often fundamentally different in terms of how prominent role social forces vs. individual level factors are thought to play in driving cognitive development. The passage has reference to Chomsky's "innate structures" and Piaget's notions of "equilibration" and "egocentrism." Some words in the passage that were likely to be relatively less familiar to the participants included "ontogenesis," "milieu," and "subsumed." The excerpt was 500 words long.

*Statistics Text.* The statistics text the participants read was from a book called *Design and Analysis of Experiments* (Montgomery, 2013). The excerpt came from the introductory chapter of this text. More specifically, the excerpt came from section five in this chapter, “A Brief History of Statistical Design” in which the author traced several major milestones in the emergence of modern statistical approaches from their roots in agricultural and industrial applications in the 1920s and 30s. The excerpt included some technical ideas such as “response surface methodology,” and “robust parameter design” as well as many words likely to be unfamiliar to the participants such as “optimality,” “fractionated,” and “orthogonal.” The excerpt the participants read for the think-aloud was 685 words long.

**Table 1. Readability results for think-aloud texts.**

Readability Formulas	Statistics Text	Education Text
Flesch Reading Ease Score	24.2 Very difficult to read.	16.1 Very difficult to read.
Gunning Fog	17.6 Difficult to read.	18.9 Difficult to read.
Flesch-Kincaid Grade Level	15 College.	16.4 College graduate and above.
The Coleman-Liau Index	14 College.	16 Graduate college.
The SMOG Index	13.1 College.	13.9 College
Automated Readability Index	14.5 College graduate	16.1 College graduate.
Linsear Write Formula	15.5 College Graduate and above.	16.7 College Graduate and above.

### Analyses

**Thematic coding of semi-structured interviews.** Interview responses were examined to discern the participants’ English learning motivation and interest, language

learning anxiety, learning environments, and teaching styles experienced. When woven together this information allowed the creation of a narrative to describe the English learning background of each participant.

**Coding of think-aloud protocols.** Several different aspects of the think-aloud were coded. First, the language(s) the participants used while doing the think-aloud, both orally and in notations they made on the text excerpts, was recorded. Second, the participants' affective comments were coded as being primarily positive or negative. The intent of examining participants' affective comments was to glean some insights regarding the participants' comfort level with the texts and the task. Additionally, the participants' explanations of their thoughts while interacting with the texts were analyzed and coded in terms of reading strategies. Table 2 details the codes used and provides examples. This coding scheme was adapted from a coding scheme used by Cheng (1999) for which he used both the "general reading strategies" from the literature (Block, 1985) and "local strategies" Cheng added in response to the think-aloud data he analyzed. By "local strategies" Cheng (and Block before him) referred to strategies his participants exhibited to address particular linguistic units. During the analyses of the data for this study, we identified eight additional "local" strategies that are also described in Table 2.

**Interrater reliability for think-aloud reading strategy coding.** Two doctoral students who had not been involved in data collection, independently coded 20% of the participants' think-aloud responses using the coding scheme of 25 reading strategies as described in Table 2. After comparing the doctoral students' coding with the first author's coding, there was 90.9% agreement. Coding differences were resolved through discussion.

**Table 2. Think-Aloud Reading Strategy Coding Scheme.**

<u>Name of Strategy</u>	<u>Description</u>	<u>Sample Responses</u>
<b>General Strategies</b> (adapted from Block, 1985)		
1. Corrective behavior.	The reader notices that an assumption, interpretation, paraphrase, spelling, or grammar is incorrect and changes that statement.	"There is a typo error here." (Leila, E/S text).

<p>2. Monitor comprehension.</p>	<p>The reader indicates that he/she is assessing his/her degree of understanding of the text by questioning his/herself and clarifying information.</p>	<p>“From the first sentence in the introduction, I understood that it is talking about different things of the intelligences. That is why I told you I usually read the first sentence because it helps me to understand the main idea. So, through the first sentence from the introduction, I understood the main idea or it talks about seven different things.” (Nada, E/E text).</p> <p>“Most of the words in this passage I know. There are some words that I did not know specifically what they mean. But, I understand the whole passage, the meaning you know. This is why I did not use the translation because most of the words are not new for me.” (Leila, E/S text).</p>
<p>3. Question information in the text.</p>	<p>The reader questions the significance or veracity of information in the text.</p>	<p>“Why do you choose this passage about the history and the Arabic one is not?” (Sarah, E/S text).</p>
<p>4. Use background knowledge.</p>	<p>The reader uses background knowledge or experience to understand the text, to evaluate the veracity of information, and to react to the information.</p>	<p>“It is ... um ... some of the words are related in my area, I understand them. For example, experimental design, principle, you know ... ah ... design of experiment. I understand the word that I usually read them in my area.” (Leila, E/S text).</p>
<p>5. Make an inference.</p>	<p>The reader makes an inference, draws a conclusion, or makes a hypothesis about the content.</p>	<p>“I like actually the explanation of the social theory and individualistic theory because I am interested actually in this area.” (Leila, E/E text).</p>
<p>6. Acknowledge lack of background knowledge.</p>	<p>The reader indicates that he/she does not have knowledge about a topic.</p>	<p>“So, it’s ... um ... it’s almost a new thing for me because it is more historical than statistical or mathematical.” (Nada, E/S text).</p> <p>“The information is hard for me because I did not know about it ... ha .... But, I understand what the passage talks about ...”( Leila, E/S text).</p>

7. React emotionally.	The reader reacts emotionally to information in the text.	<p>“It is hard for me, but when I read the it again, it was be easier for me.” (Nada, E/S text).</p> <p>“It’s very easy to understand and very interesting.” (Leila, E/E text).</p>
8. Comment on behavior or process.	The reader describes strategy use, indicates awareness of the components of the process, or expresses a sense of accomplishment or frustration.	<p>“Now, when I done reading. The new words from me I will write them in my notebook. Then try to find their definitions, and put them in the new sentences ... see if there is ... uh ... in order to use them in a different way and remember them. Also, see if they have any suffix or prefix in the words and if the words are too difficult for me to pronounce them, I try to divide them into several parts depending on the words.” (Nada, E/E text).</p>
9. Comment on text structure.	The reader distinguishes between main points and supporting details or makes comments on the purpose of information.	<p>“The individual’s psychological development, this is an important.” (Leila, E/E text).</p>
10. Integrate information.	The reader connects new information with previously stated content.	<p>“Ah-hah, Kiefer is the third one, so the first one is Fisher, and the second is George Box, okay.” (Nada, E/S text).</p>
11. Anticipate content.	The reader predicts what content will occur in succeeding portions of text.	<p>“From reading the sub-title and the first sentence in the second and third paragraphs. I learned that this passage is almost about compare and contrast between individual and social phenomena. So, I ... ah ... this is maybe the main idea. Now, I will read it again to understand more.” (Nada, E/E text).</p> <p>“Maybe, the passage talks about the history of statistics and about the person and his method or the methodology.” (Leila, E/S text).</p>
<b>Local Strategies</b> (Block, 1986 with additions from Cheng, 1999*)		



1. Question meaning of a letter, word, or a phrase.	The reader does not understand a particular word.	<p>“Now this is the first word ‘governed’ that I did not know. So, I will use Google translation. I need to know what does this word mean?” (Nada, E/E text).</p> <p>“The word, scientists, I did not know what it means.” (Leila, E/S text).</p>
2. Use knowledge of grammar.*	The reader uses knowledge of grammar to understand a portion of the text.	“I want to see the meaning of this word ‘arose’, ah ... arose is the past of arise. I think it is the past of the word arise. Um, yup it is a past of arise.” (Sarah, E/S text).
3. Reread.	The reader rereads a portion of the text either aloud or silently.	“In this case, I have to read it [Arabic statistic text] more in order to understand it.” (Nada, A/S text).
4. Question meaning of a clause or sentence.	The reader does not understand the meaning of a portion of the text.	“Now, in the third paragraph, I found a word that I didn’t understand, which is ‘optimal design.’ I am not sure what it is even when I read the whole sentence.” (Nada, E/S text).
5. Word-solving behavior.	The reader use context clues, a synonym, or some other means to understand a particular word or phrase.	“It talks about the historical development of the idea of ... uh ... social phenomenon. This is what I am guessing.” (Nada, E/E text).
6. Paraphrase.	The reader rephrases content using different words, but with the same sense.	“I heard about it because I taught that when I taught students. You know each student has like ... uh ... different intelligences. For example, I have two girls, second grade and first grade), one of them has a linguistic intelligence; the other one has a logical-mathematical intelligence; other one has like a bodily-kinesthetic intelligence. So, if you know what the intelligence ... ah ... that your students or children have it, then you can communicate with her in the right way.” (Sarah, E/E text).
<b>Additional “Local” Strategies Exhibited in this Study</b>		
1. Electronic dictionary.	The reader uses electronic translation to know the new words.	“Now this is the first word ‘governed’ that I did not know. So, I will use Google

		translation. I need to know what does this word mean?" (Nada, E/E text).  "I will try to use Google Translator, can I use it?" (Leila, E/S text).
2. Using Google or other websites.	The reader uses website to understand unfamiliar words.	"In paragraph three, it talks about 'Marxian theory.' This theory is a new theory for me. So, I will use Google to search to understand what is this theory?" (Nada, E/E text).
3. Scanning/ skimming reading sentences.	The reader reads the text quickly, silently, or aloud to comprehend the main ideas.	"I have a general idea about this passage even though I didn't read the whole. I read just the introduction and the bold in the sub-titles, which are about intelligences." (Sarah, E/E text).
4. Skipping unknown words or sentences.	The reader marks the words without trying to translate it or does not read words.	"Al-um, I think this is not important to read."(Sarah, E/S text).
5. Breaking a word into meaningful parts.	The reader tries to figure out the meaning without using reference materials.	"I see if they have any suffix or prefix in the words and if the words are too difficult for me to pronounce them, I try to divide them into several parts depending on the words." (Nada, E/E text).
6. Think aloud about the sentence or passage using L1.	The reader thinks and expresses ideas about the meaning of the sentence in Arabic.	"طيب. عندنا هنا ٧ أنواع من الذكاءات ... اها ... والنوع الثامن هو تحت اسم الذكاء الطبيعي." " Okay, we have seven types of intelligences... ah ... and the eighth one is under the normal intelligence." (Sarah, E/E text).
7. Mixed orally or written between Language 1 and Language 2.	The reader expresses the meaning of words in Arabic and English.	"I write the meaning of the new [English] words in Arabic." (Nada, E/E text).

8. Shortcutting the words.	The reader makes up a simple way to remember the words later.	“I face a problem to pronounce the names. I just save the first letter for the names. If the name is long or I don’t know how to pronounce it, I used this strategy instead of using a laptop to translate it or to read it because it is not important to know it.” (Sarah, E/S text).
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## Results

### Participant narratives.

First we describe the English language learning backgrounds of the three participants from the information they shared during semi-structured interviews.

**Nada.** Nada explained her English learning background during the interview in depth. She mentioned that the only person that encouraged her to be interested in learning English was one of her teachers. She started officially learning English in the seventh grade as is typical for Saudi students. Her teachers’ teaching styles helped her to love English. For example, she recalled one of her teachers having the students create concept cubes for learning new vocabulary. In this activity, students were given paper cut in a way so that it could be folded into a cube. On each side of the cube the students wrote some aspect of a new vocabulary word, such as antonyms, synonyms, parts of speech, root words and an example sentence using the new word. Then the students rolled the cubes and explained how the information on the side that lands up related to the word. Nada reported that this instructional strategy helped her understand how word parts can be meaningful and facilitate acquiring English vocabulary. After finishing her schooling, she was accepted to major in English at a university in Saudi Arabia, but found it was very hard to study English in depth and transferred into the Arabic language field. She stated that the learning environment was not conducive to successfully majoring in English, so she decided to change her major at that time.

Although she said she enjoyed reading novels in English, Nada said she experienced reading anxiety when reading academic texts, because these texts often have complex

sentence structures and unfamiliar vocabulary. Even for texts about various branches of her own field, not directly about her own subfield of educational technology, she said she found the materials to be difficult. To cope, she reported that she often tried to find summaries or reviews for assigned texts via Google searches in order to find written notes that could help her get the main ideas. Nada clearly stated that she preferred to read just the academic texts that are related to her, because the words and ideas in these texts are more familiar to her. Also, she finds the language of the texts in her major to be more understandable compared to other branches of education.

**Leila.** Leila had been studying English since middle school though she had not found English enjoyable to learn. Too often she said her teachers focused on explaining grammar structures more than teaching how to read sentences correctly or how to pronounce the words. That caused Leila to develop reading anxiety toward learning English, although one of her dreams in life was to learn it. Thus, when her employer offered her a scholarship to learn English abroad she seized the opportunity despite her anxiety. One reason was that she had noticed while writing her master's thesis that it was difficult to find scholarly articles written in Arabic. Most sources were in English, but she could not read English. Knowing this pushed Leila toward learning English and addressing her anxiety. Therefore, she decided to learn advanced English at an English language institute in the US. Being immersed in an English-speaking environment facilitated her language acquisition and, eventually, enabled her to complete her doctorate at a US institution.

Leila described feeling anxious while reading texts in English from another field, but also when reading within her field. She mentioned her awareness of how the way texts were written could make texts easier or more difficult for her to understand. For example, some texts could be hard even for American students because of the words, sentence structure, and writing styles. She explained how it could take her two days to read a chapter of an academic text that might take native English speakers just an hour to read. Leila also expressed another anxiety, which was facing new vocabulary in other fields. She recalled the intimidating number of words that she did not know when she read a text in one of her courses in

statistics. Leila was emphatic that she was not interested in reading English texts from other fields.

**Sarah.** Sarah's extended family supported her English language development. Since Sarah lived in a different city that was not close to her parents' city, Sarah's uncle played a role in teaching her English by bringing videotapes of movies home for her. Thus, Sarah had a chance to learn English through watching those movies. In fact, Sarah said that she loved watching movies more than reading books. Her uncle also provided her with books, newspapers, picture dictionaries, and regular dictionaries when she asked him about words that she heard in the movies. She felt those tools enhanced her learning ability. But, she recognized that just watching movies was neglecting her reading and writing skills. She decided to study in the US in order to pursue a better learning environment, to become familiar with a new culture, to learn a new language, and to provide a good education for her children. Upon arriving in the US Sarah explained how the anxiety continued in learning a second language. As she emphasized, her listening skills were very good; however, that initially caused a problem in developing her reading ability. However, her teacher's teaching methods helped her to learn English faster. Sarah said that she learned how to use different reading strategies from her teacher at the English program. She also expressed her belief that being in an English-speaking learning environment sped up her acquisition of the new language.

Like Leila, Sarah specifically mentioned feeling anxious when she read a text from another field and found new academic words and philosophical concepts that made the text hard for her to comprehend. She recognized that translation did not help her understand the meaning of philosophical concepts in Arabic or in English. She felt that it took a long time to understand those concepts compared with native speakers. Additionally, Sarah said that the texts' level or the language of the texts played an important role in comprehending what the texts discuss. As an example, she compared books written in the past with those written more recently. She described an experience of reading about the field of curriculum studies that was written in the past and finding the books easy to understand. When she asked her professor about it, he said this was because the books from that era were written for non-

specialists and therefore the ideas were explained more thoroughly. In contrast, Sarah's professor said that most books today are written at an advanced level and with academic words for an audience of professionals in the field.

### **Thematic results from semi-structured interviews**

**The importance of the learning environment.** Nada, Leila and Sarah all seized the opportunity to study in the US to experience a different kind of learning environment as well as to learn about a new culture. Their statements during the interviews show how the participants valued having an immersive English-language learning environment and credited it with enabling them to more readily and speedily acquire more proficient English. In this the participants' interview responses echoed previous work by Roever (2012), Iwai (2008), and Taguchi (2008) regarding how being in an English-speaking country like the US positively impacts learners' language learning.

**Cross-cultural aspects can be challenging.** The participants also discussed some of the cultural learning they needed to do in order to fully function in the new environment. For example, Leila explained what she faced when she arrived in the US:

"I remember the first question I asked, " Can I have a water please?" and no one give a water, why? Because instead of saying "water" I should say "wader." So, the sound the 't' in water is "d." So, no one understands what I said. So, it was so hard for me. I was shy, and I had a dictionary and the accent is from UK. This is also a problem."

This story showed the importance of integrating into a new culture through involvement in the community. Knowing more about the new culture helped the participants learn English more quickly. The relates to what Ilieva (2012) found, which centered on the difficulty of learning English through textbooks without being familiar with the cultural information of the country. Neglecting to include this cultural information in ESL textbooks creates difficulty for those trying to comprehend English texts and interact with native speakers. Thus, those ESL learners feel unprepared and disappointed when they communicate with native speakers, such as what happened for Leila.

**How a language is taught is very important.** The results indicated that the ESL graduate Saudi students' educational experiences played a significant role in developing their language skills, their comprehension of varied texts, and their capacities to use reading strategies. During the interviews, the participants made comments relating to how being in a safe learning environment encouraged them to achieve learning English. For example, Sarah reported why she decided to learn English in US. She said, "I try to have a better place or environment; try to learn about a new culture; learning a new language; and better education for my children". This matched Tallon's (2009), Johnson and Owen (2013), and Harklau (1994) findings that if ESL learners are treated in the learning environments with equality, safety, and effective education, they can more readily learn a new language.

**Family & school experiences have a large impact on second language learning.** A child's family serves as the first significant teacher before a child ever sets foot in a school, and once in school, teachers can have a profound impact on a child's interest in learning a second language. In other words, both family and school develop a child's language skills. In their interviews, the participants confirmed that their past educational backgrounds influenced their learning of a new language as adults. This result concurred with Hellman's (2011) conclusions that a learner's proficiency level in reading during childhood is correlated with the learner's proficiency in understanding new words in college texts as an adult. All participants discussed the importance of their family and/or their teachers in school on learning how to read Arabic and English. Nada described how her parents taught her and her siblings how to read Arabic at home by reading them stories, specifically mentioning the role her father played in teaching her how to read Arabic when she was a little girl, saying "my father was helping me by bringing stories to the home. So, I started reading since first grade at home." Nada stated that she started learning English in the seventh grade at school. Her teacher helped her to learn the basics of English, which set the foundation for her more advanced learning in the US.

In contrast to the combination of family and school that Nada described, Sarah stated that she learned how to read Arabic and English from her family members. She explained how her relatives supported her learning how to read both Arabic and English: "I learned



Arabic from my aunt and my sister . . . I started learning English by watching. My uncle usually gave me a movie tape all the time in English.” Leila, on the other hand, reported no family role in learning languages: “I started to learn to read Arabic when I was a child in school. But, in English, I started to learn how to read during the time of learning English as a second language in the US.” These results were similar to those of other researchers regarding the importance of home and school experiences for L2 learning (Coxhead & Byrd, 2007; Fleming, Rene, Bangou, & Sarwar, 2015; Harklau, 1994; Politi, 2008).

**Language learning anxiety is pervasive.** Not surprisingly, all three of the participants expressed feeling anxious when working to learn and improve their English. Even as their proficiency increased, they continued to experience language anxiety. These findings echo those reported in numerous researchers’ work (c.f., Biglari & Farahiah, 2017; Nalliveetil, 2014).

### **Results of the Think-Aloud Analyses**

The data from a think-aloud protocol were analyzed and coded in a variety of ways. Below we describe the analyses and report the findings.

**Languages participants used during the think-aloud protocol.** Participants were free to use English and/or Arabic during the think-aloud, and many of them used both. All of the participants used both Arabic and English while orally explaining their thinking about the passages. When taking notes on the passages, two of the three (Nada and Sarah) mixed writing between Arabic and English. Leila did not write any notes in Arabic or English on her copy of the two texts. The results suggest that the difference in the text topic did not impact how the participants used L1 and L2 during the think-aloud protocol and that differences in this regard among participants were individual styles.

**Participants’ affect during the think-aloud protocol.** Comments that the participants made that were coded as “reacting emotionally” to the texts (strategy 7, Table 2) were further categorized as reflecting positive or negative affect. Table 3 below shows the frequency with which emotional reactions were expressed during the think-alouds with the two different texts. The participants’ positive expressions, which were only expressed for the

education text, were along the lines of statements such the passage being “interesting,” “easy,” or something “new” for them. The negative comments mainly focused on the language and writing of the texts. For example, one of the negative comments was, “Why the author used this words, that does not make sense!” There were more negative comments made about the statistics text than about the education text. More specifically, Nada thought the education text was easy for her, she said “I think it is okay, not difficult.” And, regarding the statistics text she said “it’s more statistical history that is different than I studied in my coursework at university.” Leila also responded positively about the education text, “Um, it is advanced, but it is okay. It is not that difficult.” And she clearly explained that she did not like reading a text from another field: “To be honest, I did not go to each word to understand. It is really hard or maybe I am not interested in it.” Sarah found both texts difficult: “These texts are so hard. There are many advanced words that I don’t know them.” But, she said she could understand the education text more since she knew most of the words in the passage.

**Table 3. Affective Comments.**

Participants	Positive		Negative	
	Ed Text	Stats Text	Ed Text	Stats Text
Nada	1	0	0	1
Leila	2	0	0	2
Sarah	1	0	1	2

**Language anxiety exhibited.** All three participants experienced feeling language anxiety in different ways during the think aloud protocol. Sarah mentioned that since both texts included a high density of academic vocabulary, she felt anxious about successfully understanding the texts. Even though Nada took some courses in statistics, she felt anxiety while reading the statistics text. She stated, “it’s ... um ... it’s almost a new thing for me

because it is more historical than statistical or mathematical . . . I found a word that I didn't understand, which is "optimal design." I am not sure what it is even when I read the whole sentence." Liela stated that she did not like to read any type of texts that were not related to her field of study because, as she said, she had worked hard to become familiar with vocabulary in her field and was not interested in learning new concepts or vocabulary from another field. She honestly said at the beginning of reading the statistics text that "the statistical vocabulary I did not go through it and did not get it." That all the participants expressed anxiety in some form was expected, given the extensive reports of language anxiety with academically challenging texts in the literature (Nalliveetil, 2014; Tallon, 2009; Wu, 2010; Phillips, 1992; Zin & Rafik-Galea, 2010).

**Reading strategies exhibited.** Information about which strategies participants' used and did not use while working with the education and statistics texts during the think-aloud protocols is reported in Table 4. An asterisk indicates that the participants' think-aloud was coded as having had at least one instance of the use of that strategy.

**Table 4. Strategies Used with Texts in Think-Aloud.**

Strategies Used in Think Aloud	Nada		Leila		Sarah	
	Ed text	Stats text	Ed text	Stats text	Ed text	Stats text
Corrective behavior.	*		*		*	
Monitor comprehension.	*		*		*	
Question information in the text.	*	*	*	*	*	*
Use background knowledge.	*	*	*	*	*	*
Make an inference.	*		*		*	

Acknowledge lack of background knowledge.	*	*		*	*	*
React emotionally.	*	*	*	*	*	*
Comment on behavior or process.	*	*	*	*	*	*
Comment on text structure.	*		*		*	
Integrate information.	*	*	*	*	*	*
Anticipate content.	*		*	*	*	
Question meaning of a letter, word, or a phrase.		*		*		*
Use knowledge of grammar.	*	*	*	*	*	*
Reread.	*		*		*	
Question meaning of a clause or sentence.	*		*		*	
Word-solving behavior.	*		*		*	
Paraphrase.	*		*		*	
Electronic dictionary.	*	*	*	*	*	*
Using Google or other websites.		*		*		*
Scanning/ skimming reading sentences.		*		*		*

Skipping unknown words or sentences.		*		*		*
Breaking a word into meaningful parts.	*	*	*	*	*	*
Think aloud about the sentence or passage using L1.	*		*		*	
Mixed orally or written between L1 and L2.	*	*			*	*
Shortcutting the words.	*	*	*	*	*	*

Overall, there were many similarities in the ways the participants engaged in strategic behavior with the two types of texts. The participants applied some strategies with both the texts from their own field (education) and the statistics texts. These included using background knowledge, reacting emotionally, commenting on behavior or process, questioning information in the text, integrating information, using knowledge of grammar, breaking words into meaningful parts, using an electronic dictionary, and shortcutting words (particularly names).

All of the participants also used electronic translations to understand unfamiliar vocabulary in both of the texts. In fact, the use of electronic translation arose as one of the participants' local reading strategies during the think-aloud activity confirming Huang and Nisbet's (2014) emphasis on the importance of support strategies for ESL learners. These findings also related to what Mokhtari and Sheorey (2002) stated, which was that a first step for ESL learners is utilizing outside reference materials, such as dictionaries and other support systems, taking written notes, and other practical strategies.

It is also evident from these analyses that all three participants used more strategic behaviors with texts from their own field, even though they mentioned they knew most of the vocabulary in the education text. When working with the statistics text, there were some strategies all the participants used that they did not use with the education texts, specifically,

using Google or other websites (to find additional explanations of the text ideas) and questioning the meaning of a letter, word or phrase in the texts. Additionally, they all exhibited scanning/skimming and skipping unknown words or sentences when working with the statistics text, though not with the education text. Additionally, there were also some strategies the participants only used with the education text, such as paraphrasing, making inferences, rereading, commenting on text structure and engaging in word-solving. They also thought out loud about the meaning of a whole sentence or passage (not just a word) in Arabic with only the education text, which may have indicated more immediate comprehension.

In addition to the use of electronic translation, mentioned above, another strategy we noted in these participants' engagement with the texts was a behavior we coded as "shortcutting the words." What this specifically referred to was how all of the participants dealt with embedded citations in the texts. Because they found it difficult to pronounce the names of authors in the embedded citations, they would just say the first syllable or sound of the name, or simply skip over them.

## Discussion

Findings from this study concur with many of the results from previous research examining adult ESL learners' experiences regarding the negative impact reading and language anxiety can have, the positive effect of productive use of reading comprehension strategies, the importance of cultural backgrounds and learning environments, and the critical nature of educators' teaching styles. The results of this study contribute to the discussion on how ESL graduate students engage with texts from across different disciplines. In this discussion we examine patterns in the participants' think-aloud activities. We also discuss strategies the participants exhibited that are not yet well described in the literature.

**The Effect of Anxiety on Participants' Understanding.** The participants all expressed anxiety about reading the academic texts, particularly the text from outside their major field of study, the statistics text. They also revealed their awareness that they did not comprehend the statistics text very well and struggled with particular words and concepts. These findings

simulate those, such as Nalliveettil's (2014), regarding how the combination of ESL learners' anxieties, such as a fear of failure, nervousness, and disappointment can negatively impact their comprehension levels while reading texts. Additionally, participants expressed feeling different types of anxiety from different sources, just as Tallon (2009) and Wu (2010) illustrated in their claims that there are differences between reading anxiety and language anxiety. Reading anxiety relates to each person's literacy skills while reading the texts in any language; language anxiety, meanwhile, is related to the difficulties of the language learning process. As an example of reading anxiety, the participants in this study read the statistics text less carefully and were observed to skip unfamiliar vocabulary instead of trying to figure out the meanings.

Participants also exhibited language anxiety when, for example, during an interview, Leila expressed feeling afraid of reading a text from other fields,

Sometimes, some courses are not the courses. I mean; for example; I am in education. We have a course in statistics. Most of the concepts are new for me. So, here is a difficulty. The area ... um ... you barely understand the words in your area. And then, in another course, you find a new area with new words. So, that is the difficulty for me also . . . so, I skip a lot of words.

Nada had a language anxiety experience when she started her first course at a US university. She said,

At the beginning, it was very difficult. Especially, I was the only international student and it was during, ah, discussion board. There was a specific time that we have to go to Black Board and participate in the discussion. So, it was difficult because I need more time to read the question and to type my answer compared with American students. They were so fast. So, that caused me so much problems and affected my grade in that semester during my master.

Sarah also explained how she felt anxiety when asked to read an advanced text about an unfamiliar subject. She stated,



ISSN: 2617-958X

I don't want to read something that I don't know about. You know when I learned the language before I started my program; I just learned the academic words in general. But, when I started my program, PhD, so, it more uses like philosophy words and academic words. Even my friends, ah, American students, and English is their native language. So, they have a hard time to understand these words. This is the big challenge for all of us, for any graduate students, international student like me or American students . . . Usually when I translate like this word; it gives me the wrong meaning in Arabic. Even in English when I try to find it, it gives me different meanings. In this case, I go to find what the meaning of this word is in YouTube.

Sarah expressed how she had worked hard to acquire a more specialized academic vocabulary during her doctoral studies which made her reluctant to tackle advanced text from another discipline that she did not know well.

**Participants' Reading Strategies During the Think-aloud Protocol.** Across the two texts and three participants, there was evidence of use of a wide range of “general” and “local” strategies that have been previously identified in the literature (Block, 1986; Cheng, 1999). The participants also used eight additional strategies during think-aloud activity. Some of the additional strategies, such as using an electronic dictionary, were used by all participants in the think-aloud activity across texts from both domains. The participants explained that they preferred using the Merriam-Webster dictionary application because it helped them to find the definition, synonyms, and examples for the words in English. This additional strategy was a creative method that helped participants learn the meanings of new words. Relatedly, the participants also made use of the search engine Google, although only when reading the statistics text. In these instances, the participants looked up unfamiliar concepts, not just words, in an attempt to better understand the ideas in the statistics text. The use of these strategies echoed Huang and Nisbet's findings that ESL students favor problem-solving strategies that are “focused techniques for use when problems develop in understanding textual information” (2014, p. 3)

**Discipline-specific Considerations.** Another important consideration is the disciplinary content of the text. It is well known that having more background knowledge of a

text's content aids comprehension (Makhtari, 2018). There were definite differences in how the participants processed the education and the statistics texts. The analyses of data from these three advanced graduate ESL students revealed that although they used some general and problem solving strategies with the statistics text (e.g., Googling unfamiliar words and concepts), overall, they used more top-down higher-order strategies (e.g. making inference, monitoring comprehension, and paraphrasing) with the education text. In all three cases, the participants skimmed and scanned extensively as well as skipped over unknown words just with the statistics texts. These findings add to the very small literature regarding discipline-specific aspects of advanced graduate-level ESL learners' challenges and experiences (Hartshorn, Evans, Egbert & Johnson, 2017; Jawing, 2016; Wette & Furneaux, 2018).

Overall, the participants used more strategies with the education text than with the statistics text. One might have expected that, given that the content of the statistics text was likely less familiar, the participants would need to use more strategies during their attempts to comprehend it. Such a result would have corresponded with other's findings that less advanced ESL learners used more strategies (Huang & Nisbet, 2014). However, quite the opposite occurred in the three cases described in this study. Perhaps this is not so surprising given findings such as in Anderson's work finding that readers with a greater comprehension of a text used more strategies (1991).

Another factor to consider was the relationship between the readers' background knowledge, types of strategies employed and the degree of "cohesion" of the texts (McNamara, 2010). "Cohesion" of a text refers to the degree of explicit overlap there is among the text ideas as presented in the text. Advanced academic texts, as both the education and statistics texts were, often have low cohesion, meaning that readers are expected to make a great number of inferences as the ideas are not explicitly linked throughout the text. The texts used for the think-aloud in this study also had frequent references to domain-specific ideas for which no embedded explanations were provided. Based on the Text Easability Assessor online tool (Cohmetrix, 2019) both texts had low word concreteness (education 2%; statistics 26%) and low referential cohesion (education 8%; statistics 35%). Thus, the texts had low cohesion. McNamara's work suggests that a reader with less background knowledge

(as was the case for the education students reading the statistics text) can be stymied by a text with low cohesion and be unable to make the inferences necessary for comprehension. In contrast, “low-cohesion text induces the high knowledge reader to generate inferences that connect the ideas in the text with prior knowledge” (McNamara, 2010, p. 342). This was born out in the findings that the education students, with high knowledge related to the ideas in the low-cohesion education text, engaged in making inferences (which they did not do with the statistics text) and overall used more strategic behaviors. An additional finding of note was how the participants only discussed the text ideas using Arabic when working with the education text. This perhaps reflects their greater interest in and engagement with the text for which they had greater background knowledge.

Familiarity with discipline specific concepts and ways of ideas being articulated can also impact the emotions of a reader and as we’ve seen for these participants whose interest in and motivation to work hard to comprehend a difficult text was more evident for the education text. As graduate students it is not surprising that they were developing specialized language that was particular to their field. It was interesting to note that with this specialization came differential strategy use.

**Implications for teachers of ESL students.** It is important to note that this study has limitations; nonetheless, some pedagogical implications can be drawn from the findings discussed above. Through exploring ESL native Arabic-speaking participants’ reading behaviors and strategy use with English texts from their own (education) and another field of study (statistics), we can see that the task of thinking aloud with texts can be useful for instructors of advanced ESL students to understand the kinds of strategies advanced adult learners’ use with different types of text. Teaching ESL students how to use text-based cues (such as connectives and transitions) can help them make inferences to better comprehend academic texts with low cohesion.

The adult learners in this study had limited interaction with English statistics texts and were somewhat anxious about being able to understand them, even though they had studied for both their masters’ and doctoral degrees in the US. The reading anxiety described by the participants in this study, and that has been described by other researchers, points out the

critical nature of creating a positive and effective learning environment for ESL students. Helping advanced learners acquire discipline-specific concepts and linguistic conventions can also be effective. As has been shown with nursing students (Hillege, Catterall, Beale & Steward, 2014) and economics students (Nguyen, Williams & Trimarchi, 2015) embedding discipline-specific tutorials for vocabulary acquisition and improving reading note taking skills and writing skills can increase ESL students' content knowledge and language proficiency. Even at the doctoral level, it could be beneficial to provide discipline-specific tutorials for ESL students. In addition, instructors could provide web-links and alternative texts to help ESL students build background knowledge for challenging concepts and relationships.

In regard to native Arabic speaking students in particular, teachers should also recognize that ESL Arabic students may need particular attention in developing language skills. This is due to linguistic differences that can lead to common errors for Arabic ESL learners, who have no experience in their mother language with modal verbs, gerund forms, infinitive forms, indefinite articles, or adjectives that precede nouns (Bassiouney, 2009).

### **Suggestions for Future Research**

**Areas for additional research.** As with any study, there were limitations and the results suggest avenues for further research. There were no comprehension measures in this study and this was in part to decrease the participants' anxiety about the think-aloud procedure, which was unfamiliar to all of them. But, in future work, it would be important to include a measure of comprehension of the text ideas and vocabulary. This study was also limited to a small number of participants. Additional research examining disciplinary-specific aspects of language processing among ESL learners is needed with more participants. Further research on participants' local reading strategies observed in this study – such as use of electronic dictionaries and using Google or other web-browser searches to acquire background knowledge would increase our understanding of how learners practice these strategies. Additionally, future studies could be conducted with English as a Foreign Language (EFL) adult learners who learn English in their own countries. EFL adult learners could be included in the study in order to examine whether and how their learning

environment or thinking processes are different than those of students studying at advanced levels abroad.

### **Recommendations**

Indeed, reviewing research related to the think-aloud technique helps to demonstrate how my study contributes to body of research on ESL learners. Additionally, my study will be useful for not only new adult ESL Arabic learners, but also people who are working with ESL adult learners, such as ESL teachers, literacy researchers, and linguistic analysts.

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