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THE EFFECTS OF EXTENDED TIME ON READING COMPREHENSION PERFORMANCE FOR ENGLISH AS A SECOND LANGUAGE COLLEGE STUDENTS: IS THERE A NEED FOR ACCOMMODATIONS?

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Abstract

American colleges and universities are enrolling an increasing number of students for whom English is a second language (ESL). These students face literacy challenges that may impact their academic performance as well as create disadvantages on tests, particularly reading intensive tests under time constraints. This study examined the effects of extended time as a test accommodation on a timed reading comprehension test for ESL students compared to non-ESL peers under standard time, time and one half, and double time conditions. Results revealed that under standard time conditions ESL students with low Cognitive Academic Language Proficiency (CALP) in English access significantly fewer test items and answer significantly fewer items correctly than non-ESL peers. ESL students with high CALP levels have access to the same amount of the test as non-ESL peers and have comparable levels of accuracy. All three groups improved reading comprehension performance under extended time conditions, especially those with higher levels of English language proficiency. Low proficiency students are able to surpass the performance of non-ESL peers at standard time when allotted 50% to 100% extra time. These results suggest extended time, in allocations less than 50%, may be appropriate for some ESL students.

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PERFORMANCE FOR ENGLISH AS A SECOND LANGUAGE COLLEGE STUDENTS: IS
THERE A NEED FOR ACCOMMODATIONS?

by

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The Effects of Extended Time on Reading Comprehension Performance for English as a Second Language College Students: Is There a Need for Accommodations?

Colleges and universities around the United States have seen a dramatic increase in the enrollment of students for whom English is a second language (ESL) and English Language Learners (ELLs). An ELL can be defined as “a national-origin minority student who is limited-English proficient” (U.S. Department of Education, 2012). Language minority students are composed of foreign-born United States citizens, second-generation United States immigrants, and individuals who are citizens from countries spanning the globe (Curry, 2004). As mentioned above, ELL and ESL students at the college level in the United States are not only comprised of international students. Many other ESL college students attended elementary and secondary school within the United States while speaking a language other than English at home (Callahan, Wilkinson, & Muller, 2010). As a result, ESL and ELL students encompass a diverse group of individuals that vary in factors such as English language exposure, skill in receptive versus expressive language, and formal English schooling. In addition to ESL and ELL, Limited English Proficiency (LEP), is another term used to describe this population of students. For simplicity, this literature review will utilize ESL throughout the paper to refer to all students for whom English is a second language, regardless of birthplace and level of English language proficiency.

Immigration into the United States has been climbing steadily over the past thirty years. It is estimated that foreign-born individuals comprise upwards of 13% of the total United States population (U.S. Census Bureau, 2010). Whether international or born in the United States, ESL students are enrolling in institutions of higher education in increasing numbers. In fact, the number of international students seeking educational opportunities in the United States has been

climbing steadily since 1989 (Institute of International Education, 2010). During the 2010-2011 academic year there was a reported five percent increase in the number of international students studying within the United States. This increase led to a total of 723, 277 international students enrolled in college level courses during the 2010 – 2011 academic year (Institute of International Education, 2012). In the past eight years alone, Syracuse University has reported an increase in international students from 2 to 7 percent (Senate Committee on Budget and Fiscal Affairs, 2011). An increase in an international population at a university presents unique concerns to university administration, faculty, and staff.

While many international students seeking educational opportunities within the United States are fluent or proficient in the English language, many others have limited exposure and competence with the language. It can be a challenge for a student who has learned English as a Second Language (ESL) to be successful in the classroom. Frequently, the minimum English language requirements for ESL students to gain entry into a university are not stringent enough for that student to be competent in the completion of readings and assignments necessary to be successful in the classroom (Baik & Greig, 2009). To be successful as an ESL student at the post-secondary level requires more than basic language skills. A college-level ESL student must develop strong competencies in academic reading, writing, and speaking (Curry, 2004). In order to aid ESL student success, many post-secondary institutions offer academic resources and support to students working to gain a command of the English language. In particular many universities provide remedial English instruction, first year writing programs, and/or accommodations to students learning English as a second language (Horner & Trimbur, 2002; Kanno & Varghese, 2010; Matsuda, 2006). Additionally, universities frequently utilize ESL

student support strategies such as clear communication about academic practices and standards and creation of cooperative learning environments.

Prior to gaining admittance into a university, most students, including ESL students, are required to complete a timed college entrance exam such as the American College Test (ACT) or the Scholastic Abilities Test (SAT). Measures that are used for determination of admission decisions or gaining licensure are often referred to as high stakes tests. These high stakes exams typically include a reading comprehension subtest that is administered in English. Timed measures that include reading comprehension can present a challenge to ESL students. Research has found that students read more slowly in a second language than in their native language (Fraser, 2007). The slower reading rate may not allow ESL students to access the same amount of the test as their native English speaking peers. This disadvantage may result in lower test scores, which play an important role in university admission decisions. In fact, high stakes test scores are frequently used to make scholarship decisions. It is also important to note that high stakes tests administered in English to ESL students may lead to difficulties with test interpretation (Coltrane, 2002). In other words, does the score earned by an ESL student carry the same meaning as a score earned by a typical English-speaking peer when given the same measure under the same circumstances?

The difficulties confronting ESL students do not stop after the completion of a high stakes entrance examination. Once students gain admittance into a university, challenges with reading in English only increase for ESL students. It is expected that students will complete all assigned readings in order to be prepared for class discussions and class examinations. Furthermore, the required course examinations often will require large quantities of reading in order to effectively answer questions. There are currently no clear guidelines to aid

administrators on how to best support ESL students in testing situations. Little empirical research has been conducted to examine the effectiveness and validity of utilizing test accommodations, such as extended time, with an ESL population (Abedi, 2004). Research focusing on ESL students at the post-secondary level has predominately been focused on college level writing and has overlooked other important areas of academic life (Kanno & Varghese, 2010). It is no wonder that with growing populations of international and other ESL students, university administrators and policy makers are struggling to find the necessary and appropriate resources to create a supportive learning environment for these students.

This literature review and research study aims to provide a better understanding of the diversity of ESL students, difficulties this population faces at the post-secondary level, and possible test accommodations that may be appropriate for postsecondary ESL students.

Characteristics of English as Second Language (ESL) Students

Demographics. College-aged students from around the world seek educational opportunities within the United States. It is estimated that the United States educates approximately one quarter of all international students seeking post-secondary educational experiences in a foreign country. Approximately half of the 723, 277 international students studying in the U.S. at American Universities during the 2010-2011 academic year report China, India, South Korea, Canada or Taiwan as their country of origin (Open Doors, IIE, 2011). Of those students, approximately 21.8% or 157, 558 are coming from China. Enrollment of international students at U.S. institutions of higher education is beneficial to the institution itself and the surrounding areas. At the institutional level, international students enhance diversity at the university, and the students serve as integral components of research projects and teaching experiences. At the greater community level, international students provide a significant

economic impact in the United States. More specifically, it is estimated that international students contribute more than 13 billion dollars a year to the U.S. economy (Obst & Forster, 2005). With such a substantial economic impact, it is no wonder American universities are actively recruiting international students.

The increase in international students at American post-secondary institutions calls into question the level of accountability universities should have for the educational and cultural experiences of the students they actively recruit. In order to meet the learning needs of ESL students, universities offer varying degrees of resources to help ESL students to succeed academically and socially. Many universities in the United States offer remedial English language courses or place students in first-level writing courses; however, in many institutions the resources end there. A common practice of placing ESL students in separate courses has been criticized to isolate ESL students rather than provide necessary academic skills (Kanno & Varghese, 2010). Some universities offer programs in which ESL students are paired with a non-ESL student who helps the ESL student navigate through college life. While this type of support is beneficial for the social adjustment of the ESL student, there is little evidence to suggest it enhances their academic success (Andrade, 2006).

Academic Characteristics. Research has found that ESL students may experience some overlapping academic difficulties with students with a disability (Crago & Paradis, 2002; Ortiz & Dynda, 2008; Paradis, 2005; Paradis & Crago, 2000; Salameh, Hakansson, & Nettelbladt, 2004). To demonstrate the academic similarities between ESL students and students with specific language impairments (SLI), Paradis and Crago (2000) conducted a study comparing the morphosyntax of ESL students ($n = 15$), students with Speech and Language Impairment (SLI; $n = 10$), and typical peers ($n = 10$). Morphosyntax refers to the correct use of grammar and verb

tenses such as past, present, and future. All three groups completed individual interview sessions with an experimenter. During the individual interviews the participants were asked questions relating to past and future events to elicit different tense structures. Verb usage was coded according to finiteness/tense, subject-verb agreement, and distributional contingencies. The SLI and ESL groups showed significantly more errors in the use of the past and future tenses when compared to typical peers. Interestingly, the SLI group and the ESL group did not differ from each other. These results support the claim that there are similarities in learning between ESL students and students with disabilities. Paradis (2005) and Salameh et al. (2004) also examined between groups differences between ESL students and students with SLI. Both studies found similar findings, reporting similarities between ESL and SLI students at the primary and secondary level in terms of grammar and morphosyntax.

It appears that both ESL and students with disabilities have verbal learning difficulties relative to typical peers. Research has found that ESL students may struggle with “the linguistically complex structure of questions, may not recognize vocabulary terms, or may mistakenly interpret an item literally” (Abedi, Courtney, & Leon, 2003, p. 8). This is particularly concerning because if a student is not able to understand the question being asked due to its linguistic structure, it will be extremely difficult for that student to demonstrate the true knowledge they may possess on that content matter. Mestre (1988) reported that ESL students might struggle on timed tests due to low reading speed. ESL students have reported that they are capable of reading and comprehending a passage at a faster speed in their native language than in a language learned later on in life (Mestre, 1988). This suggests that ESL students may spend more time on an exam reading the question than a typical English-speaking peer might on the same exam.

Hendricks, Lewandowski, Berger, and Garcia (2010) conducted an exploratory study to examine if there were differences in reading comprehension skills and strategies between ESL college students compared to native English speaking peers. ESL students were not preselected, but were included based on self-report of ESL status. All participants completed TestTracker, a computerized testing software package designed to assess reading skills and strategies that are utilized during a mock high stakes testing scenario. The high stakes testing scenario is created by a comparable testing format to measures such as the SAT and ACT and instructing participants to take the test as though it were a high stakes measure. The results of the analysis revealed that ESL students differed on several domains. ESL students performed significantly worse than peers on a time –sensitive reading comprehension measure. They also found that scores on brief measures of IQ and vocabulary approached significant differences. In a more recent study conducted by Hendricks (2013) specific variables such as reading speed, vocabulary, word recognition, and self-efficacy were examined. Participants included in this study completed TestTracker, the same software utilized by Hendricks and colleagues (2010). The software is capable of examining reading decoding, reading fluency, test-taking strategy, and effort. Additionally, participants in the study completed the Woodcock-Munoz Language Survey – Revised to assess English language proficiency and the Author Recognition Test to measure English language exposure. Preliminary analyses comparing ESL students to typical peers found significantly slower reading speed and lower overall reading comprehension scores for the ESL group. Additionally, they found that students who have had less exposure to the English language as measured by the Author Recognition Test, also demonstrated weaker vocabulary scores than those who have had more English language exposure. While the research has yet to be finalized, the preliminary results have important implications for future work and

research with ESL students. Specifically, it confirms previous research that ESL students read at a slower pace than peers and perform more poorly than peers on measures of reading comprehension. Additionally, it sheds light on the diversity within an ESL group and that the amount of English that an ESL student is exposed to can have important implications for academic success. Several research studies have been conducted that examine the academic and adjustment issues that exist when comparing native English speaking students to ESL peers. For example, a study conducted by Ramburuth (2001) examined the percentage of students at an Australian university that needed intensive English language support based on a writing sample. This study found that 76% of the ESL students needed this additional support compared to only 20% of native English speaking peers. In addition to writing difficulties, other studies found that ESL students have trouble understanding lectures. Specifically, ESL students reported that the vocabulary utilized in lectures was difficult and the speeds at which their professors spoke were too fast (Ramsay, Barker, & Jones, 1999).

The relationship between English proficiency of ESL students and academic achievement has also been investigated. These studies have yielded mixed results (Andrade, 2006). “Although over 2,500 colleges and universities in the United States and Canada require applicants from non-English-speaking countries to take the Test Of English as a Foreign Language (TOEFL), the test has been criticized both as a measure of language proficiency and as a predictor of academic success across the great diversity of campuses at which it is used” (Light, Xu, & Mossop, 1987, p. 253). The TOEFL’s predictive power has been examined across several studies and outcomes have revealed conflicting results. Light and Colleagues (1987) examined the role of the TOEFL in predicting academic success for graduate students at a state university. The authors analyzed the relationship between TOEFL score and Grade Point

Average (GPA) for 387 international students. The university's registrar provided TOEFL scores and GPAs. The study found a significant correlation between TOEFL score and GPA for students studying the humanities ($r = .24, p < .01$); however, they did not find a significant correlation between TOEFL and GPA for students in the sciences and mathematics ($r = .04, p > .05$). These results suggest that the TOEFL may be useful for determining academic success for students in some academic disciplines, but not in others. In contrast, other studies have found a link between the score earned on the TOEFL and measures of undergraduate achievement such as GPA, credits completed, and withdrawals from courses during the semester. In general, higher scores on the TOEFL predicted better academic outcomes (Johnson, 1988; Messner & Liu, 1995; Stoyhoff, 1997). Johnson (1988) conducted a similar study to Light et al. (1987), but examined the academic performance of 196 undergraduate international students. The researcher found that the subtests of Structure and Written Expression ($r = .43, p < .01$) and Vocabulary and Reading Comprehension ($r = .36, p < .01$) of the TOEFL significantly correlated with GPA, whereas the correlations between Listening Comprehension subtest and GPA was not significant. The confounding data described above makes it difficult to identify a clear relationship between English proficiency and academic performance. It is important to note that the studies varied greatly in the academic disciplines of the students examined, the degree sought after, and the subtests of the TOEFL examined. These factors have the potential to offer explanations towards the differences seen between studies.

There is limited research that delves into academic characteristics of ESL students at the post-secondary level. Due to a lack of empirical evidence examining important academic features of ESL college students, this literature review includes research based on ESL students in elementary and secondary schools. One study examining ESL students who attended public

schools within the United States conducted by Kim and Herman (2008) reviewed content-area (math, reading, and science) state test data from three states during the 2005 – 06 academic year. The data that was used for analyses came from students in grades 4, 5, 7 or 8. In the 4th grade group a total of 132,853 students were included, 10,316 ESL and 117,978 non-ESL. The 5th grade group included 33,242 total students, 5,008 ELL and 24,380 non-ESL. In the 7th grade group 80,129 total students were included, 2,565 ESL and 75,404 non-ESL. Finally, the largest sample size came from the 8th grade where 180,070 total students were included, 9897 ESL students and 161,435 non-ESL students. They compared the ESL and non-ESL students on a host of academic and demographic variables. More specifically, the researchers were interested in examining the presence or absence of achievement gaps across content areas, grades, and states. The researchers found that a significantly higher percentage of ESL students received Free or Reduced Lunch (FRL) when compared to English proficient peers. This suggests that more ESL students are coming from low socio-economic status (SES) families. Additionally, the authors found that there was a significant achievement gap between ESL students and non-ESL peers, such that non-ESL students were significantly outperforming ESL students in reading, science, and mathematics. Prior to conducting this study, the authors recognized that previous research examining the same constructs had overlooked the diversity within an ESL population and the difference across states in ESL policies and practice. This study began to address those concerns by subdividing the ESL group into three categories: current ESL students, reclassified ESL students (within the last two years), and former ESL students (reclassified over two years ago). These subdivisions were important to examine outcomes of former ESL students who have exited ESL programming. To examine the important variables for predicting ESL group designation the authors followed a logistic regression model that included the predictors of FRL,

Individualized Education Plan (IEP) status, 504 status, Title 1 assistance, identification as a migratory student, identification as student from an immigrant family, gifted or talented, and ethnicity. These variables were able to place students into one of the three groups. These analyses served as a step in the direction of beginning to include differentiating variables into research examining ESL students, achievement, and test taking. The other important step the researchers took to ensure integrity of the study was that they converted state tests into standard deviation units. The large sample size of approximately 5,000 ESL students per grade level and the inclusion of data spanning three states add to the external validity of this study. Studies such as the one described above, help to shine light on the uniqueness of individuals who identify as part of a group.

The academic achievement challenges facing ESL students persist from elementary school to middle school and high school. Beal, Adams, and Cohen (2010) conducted a study examining reading proficiency and math problem solving in a group of high school ESL students compared to non-ESL peers. Specifically, the researchers included over 400 9th grade students who were currently enrolled in an Algebra 1 course at one of four high schools sampled for this study. Students were then assessed on math skills according to the California Standards Test in Mathematics. The California English Language Development Test (CELDT) was used to determine English language proficiency. A one-way ANOVA found a main effect of English proficiency ($p < .001$) on mathematics performance. Post-hoc analyses suggest that the ESL high school students included in this study are performing worse than non-ESL peers on measures assessing mathematics achievement. Studies such as this one demonstrate that ESL students continue to struggle in core academic areas into high school. If ESL students continue to experience inferior academic performance compared to peers in high school, then there is

every reason to believe that these ESL students may be entering college with less developed academic skills than peers, on average.

While there are some mixed results as to the relationship between English language proficiency and academic achievement across elementary school, middle school, high school, and most likely college, it is known that each ESL student enters college with differing amounts of English proficiency and exposure. In particular, students can vary in the amount of formal English education they have had, how proficient they are in the English language, and even how much time they have previously spent in the United States or another English speaking nation. The ways in which ESL students vary in English language proficiency and exposure and reading comprehension development can have important implications for studying the efficacy and validity of test accommodations on reading comprehension measures in an ESL population.

ESL Students Language and Reading Development

It has been well documented that the processes, skills, and predictors involved in reading and reading comprehension by ESL students may not mirror the same developmental process as typical peers (Gottardo & Mueller, 2009; Mancilla-Martinez, Kieffer, Biancarosa, Christodoulou, & Snow, 2009; Quirk & Beem, 2012; Proctor, Carlo, August, & Snow, 2005; Zadeh, Farnia, & Geva 2010). Reading comprehension measures are often given to ESL students under the false assumption that ESL students will utilize the same processes and possess the same reading skills as typical native English speaking peers. In order to gain insight into how an ESL population may perform on a reading comprehension test, it is important to understand the following key factors: Second Language Acquisition (SLA), reading comprehension in ESL students, reading fluency, and perceptions of reading ability and test taking skill.

Second Language Acquisition (SLA)

Researchers and linguistic experts have been interested in the processes involved in language development and second language acquisition dating as far back as 1875 (Whitney, 1875). The term Second Language Acquisition (SLA) is used to describe the overall process an individual goes through while learning a language other than his or her native language. In the SLA literature, the first language that is fluently acquired is referred to as L1. Not surprisingly, the second language an individual learns is expressed as L2. Language skills and development can be subdivided into two major components: Basic Interpersonal Communication Skills (BICS) and Cognitive Academic Language Proficiency (CALP). According to Cummins (1991), BICS can be roughly described as consisting of context specific communication and shared experiences. CALP encompasses language skills that serve cognitive and academic purposes, in particular, academic vocabulary and reading comprehension skills (Taboada, 2009). The importance of CALP in SLA should not be underestimated. Academic vocabulary and reading can serve as important predictors in determining classroom success for an ESL student. Research has found that SLA is a complex process. In fact, there are so many factors involved in SLA that it typically takes L2 students five to seven years to develop CALP (Cummings, 1979). These factors include age on arrival to an English-speaking nation and English language exposure. Within these two major factors the following variables can also be examined: English proficiency level on arrival to that English speaking nation, basic literacy and math skills in the native language upon arrive, and the number of years of formal schooling in English. With the high potential for variability among these factors, it is logical that SLA is acquired to varying degrees of proficiency across individuals (Collier, 1987).

Age on Arrival. Age on arrival refers to a student's chronological age when he or she first enters an English-speaking nation. This variable can influence the development of ESL students' CALP abilities. In order to further explore the relationship between CALP abilities and ESL students originally proposed by Cummins (1991), Collier (1987) conducted a study examining data collected over a nine year time period from a diverse group of 1,548 ESL students in a large public school district in grades 4, 6, 8, and 11. The sample included students from over 100 different countries who spoke more than 75 languages. The analyses were conducted to answer two main research questions: (1) how many years of English language instruction are necessary to reach non-ESL student averages in reading, language arts, social studies, science, and mathematics and (2) how strongly does age on arrival to the United States correlate with the rate of English language acquisition. These questions were answered by examining data patterns according to length of residence, age on arrival, grade-level achievement, and subject-area achievement. The answer to the first question came out to be dependent on several factors, including age on arrival. Students arriving between the ages of 8 and 11 required the least amount of time to achieve comparably to peers. More specifically, students beginning English language instruction between the ages of 8 and 11 required up to three less years to develop CALP than five and six year olds. This study provides important insight into the diversity of ESL students and the implications that can have in terms of academic learning; however the measures utilized for the study failed to assess important skills such as listening comprehension and writing abilities. Additionally, this study does not address SLA in high school or post-secondary students. Perhaps, the greatest concern with this study is that it provides important qualitative information, it failed to conduct quantitative analyses to determine if findings were statistically significant.

Other researchers have examined the influence that age of arrival can have on achievement. For example, Roessingh (2008) researched the influence that age on arrival can have on achievement at the high school level. To determine if age on arrival serves as a significant predictor of academic achievement, the authors looked at data from the Grade 13 English language arts examination for 55 ESL students. This Canadian measure is designed to assess written expression and reading comprehension. Age on arrival was categorized into five groups: elementary (6-11), junior high (12-14), Senior High (15-17), or native Canadian-born speakers. Using Pearson correlations, the authors found that there was a significant correlation between performance on the thought and detail subtest of the English language arts examination and elementary arrivals ($r = .711, p < .01$), junior high arrivals ($r = .691, p < .01$), and senior high arrivals ($r = .795, p < .01$). The conclusions of this study suggest that age of arrival can play an important role in student success. As with the majority of the research examining ESL students, this study did not include college-aged students in their study.

To determine if these patterns persist into college, Roessingh and Douglas (2012) compared cohorts of ESL students stratified by age on arrival to native English speakers. The ESL group was divided into two subgroups: ESL students arriving at age 14 or older and ESL student arriving at age 13 and younger. The researchers then examined the relationship between age of arrival and grade point average. A simple ANOVA demonstrated a significant main effect for age of arrival ($p < .05$). Post-Hoc analysis determined that GPA was significantly lower for older arrivals compared to native speakers ($p < .05$); however, there was no significant difference between younger arrivals and native speakers ($p = .32$). The results imply that age of arrival can play an important role in future academic success. The small sample size of this study ($n = 45$) leads to questions concerning the external validity of these results. There are few other studies

available that examine the relationship of age of arrival and academic performance at the post-secondary level. So although these results have questionable generalization, they are important to include.

English Language Exposure. ESL students as a whole form a heterogeneous group composed of individuals varying in ethnicity, native language, culture, and religion. Another area of diversity within the group that can vary considerably is the amount of exposure individuals have had to the English language. English language exposure can be conceptualized as either informal or formal contact with English language materials or experiences. Informal English language exposure can be thought of as experiencing language outside of a school setting. For example, an ESL child may hear English by watching a television program or through overhearing adults conversing. Formal English language exposure occurs when that same ESL child takes formal English language classes in a structured setting such as a classroom. The Level of English language exposure an ESL child experiences, whether informal or formal is different across individuals. Students in some countries may be required to take English as a foreign language requirement. Others may attend English-speaking schools within their home countries. Additionally, in some countries English language media is more present. For example, a student from South America may have grown up watching English language television or movies, whereas a student from Iran may not have had access to English language media. The overall picture is that ESL students receive English language exposure to varying degrees and in varying settings (Magno, 2010).

Some studies have found a direct link between the amount of formal English language exposure and reading comprehension and reading fluency abilities (Gradman & Hanania, 1991; Magno 2010). Magno (2010) was interested in predicting English language proficiency in

Korean students based on the Strategy Inventory for Language Learning (SILL) as well as the number of months a student had in formal English training. The SILL is designed to measure the frequency with which ESL students use learning strategies such as acquisition, retention, and retrieval of new knowledge in learning a second language (Oxford, 1986). The researcher examined 302 Korean students studying in the Philippines. Participants ranged in age from 14 to 18 years old and varied by grade level (sixth grade, high school, or college level of education). All students included in the study were L1 Korean and L2 English. All participants were then administered the English Proficiency test followed by the Korean version of the SILL. Formal English language exposure varied across participants from 1-144 months (12 years). Multiple regression revealed that compensation strategy (behaviors such as guessing intelligently and overcoming limitations in speaking and writing) and number of months studying English were the only significant predictors of English language proficiency. This has important implications for SLA. Most importantly it demonstrates that one of the necessary components to develop proficiency in a second language is to have formal education in that language over a relatively long period of time.

In a study conducted by Gradman and Hanania (1991), the researchers were interested in examining the relationship between language achievement and language learning background variables. The variables examined fell into one of four major categories: formal learning, exposure and use in class, extracurricular exposure and use, and attitudes and motivation. The sample included in the study contained 101 students from diverse backgrounds, all of who spoke English as second language. Students varied on formal English training as well as the score earned on the TOEFL. All students submitted TOEFL scores and completed a questionnaire assessing background characteristics. The researchers obtained correlations between all pairs of

background variables and TOEFL scores. The variables that most highly correlated with the TOEFL score included: extracurricular reading ($r = .53$), extent of exposure to teachers who are native speakers of English ($r = .39$), use of English as the language of instruction ($r = .36$), and months of previous intensive language instruction ($r = .26$). Factors such as outside reading and native English speaking teachers can impact SLA in ESL students.

Models of Reading Comprehension in ESL Students

Reading comprehension in a typical population is thought to consist of the following cognitive processes: phonological processing, syntactic awareness, and working memory (Lesaux & Sigel, 2003). Additionally, other factors such as motivation, oral language (vocabulary and syntax), organization, planning, and self-monitoring have been found to influence reading comprehension abilities (Cutting, Materek, Cole, Levine, & Mahone, 2009). Reading comprehension is thought to be “the process of simultaneously extracting and constructing meaning through interaction and involvement with written language” (RAND Reading Group, 2002, p.11). Little is known about these cognitive precursors in an ESL population. It is difficult to develop a comprehensive model of reading and reading comprehension for a population as diverse as ESL students. ESL students differ in a variety of domains including: native language, English language exposure, cultural experiences, formal English education, etc. The simple view of reading (SVR) framework is often used as a guide to examine important components of reading in a typical population. Under the SVR there are two main factors or predictors of reading comprehension: decoding and linguistic comprehension (Hoover & Gough, 1990). Decoding can be defined as being able to both recognize written words and to pronounce them. There is little research to suggest that the SVR model takes into account the effect that second language acquisition can have on reading comprehension

development in an ESL population (Gottardo & Mueller, 2009). The existing research examining the SVR in ESL students is limited to K-12 students. This literature will be reviewed under the assumption that some of the results may be extrapolated to a post-secondary ESL population.

To investigate the SVR in an ESL population, Proctor et al. (2005) included 135 Spanish-English bilingual fourth grade students in a research study. Students were administered the Computer-Based Academic Assessment system in order to measure decoding skills and the Woodcock Language Proficiency Battery to assess vocabulary knowledge, listening comprehension, and reading comprehension. Additionally, participants' alphabetic knowledge was assessed by the use of a computer-based pseudoword recognition test and fluency was determined by a response time measure for real-word recognition. Initial between group t-tests revealed significant differences in listening comprehension, $t(129) = 4.72, p < .05$, vocabulary knowledge, $t(129) = 8.28, p < .05$, and reading comprehension, $t(129) = 6.00, p < .05$, where the students who received instruction in English outperformed their Spanish instruction peers. Correlations generated from Structural Equation Modeling indicated that the two major components of the SVR, decoding and linguistic comprehension, are also correlated to the reading comprehension of ESL students. There was strong relationship between alphabetic knowledge and reading comprehension ($r = .48$) and listening comprehension and reading comprehension ($r = .76$). In the structural equation model used by the authors, listening comprehension explained 44% of the variance, vocabulary knowledge explained 30% of the variance, and alphabetic knowledge accounted for 18% of the variance. Overall, the model proved to have appropriate goodness of fit, $\chi^2(2, n = 135) = 2.59, p = .27$. It is also important to note that fluency did not serve as a significant predictor. This study provides important insight

into understanding reading development in this population; however, this study failed to include a comparison group and as a result, while it can be said that these components hold true in an ESL group, it is unknown if the extent to which effects were seen are comparable to English speaking peers. Consistent with previously discussed ESL literature, this study only examined a model of reading comprehension in an elementary-age population. It is unknown if the results of this study would hold true with a post-secondary ESL group as there is no research available.

Gottardo and Mueller (2009) were also interested in predicting second language reading comprehension. They conducted a study testing the SVR using oral language skills and word reading as predictors. One hundred and thirty-one Spanish speaking English learners were included in this study. All students received measures in English and Spanish assessing reading, oral language, and phonological awareness in the fall of first grade and in the winter of second grade. The reading measures consisted of subtests of the Woodcock Reading Master Test – Revised to look at decoding and the Woodcock Language Proficiency Battery – Revised was used to assess reading comprehension. Oral language measures included the Peabody Picture Vocabulary Test – III to assess receptive vocabulary and an oral cloze task to assess syntactic processing. Finally, all participants completed three different measures to assess phonological awareness. The researchers utilized structural equation modeling to examine the variables. They found that the constructs assessed may look different in English when compared to Spanish; however, when English language measures were used, the SVC model applied to this ESL population. The researchers also found that the constructs underlying reading comprehension may have different qualitative features across languages. In other words, a construct such as phonological awareness may look differently in L1 than L2. There were a few limitations to this study. A major limitation was that the Spanish language measures were presented to students

with English language directions. As discussed previously in this literature review, ESL students often struggle to follow instructions in L2 and as a result are slow to initiate a task and slow to finish a task. Additionally, similar to Proctor et al. (2005), this study also failed to include a comparison group of native English speaking students to determine if significant differences emerge between ESL students and typical English speaking peers.

To address the concerns of no comparison group, Martinez et al. (2011) investigated reading comprehension growth in an ESL population in order to add some insight into reading comprehension models applied towards this group. In this study, the researchers examined the same group of school-aged students across four time points: fall of 5th grade ($n = 55$), fall of 6th grade ($n = 48$), spring of 6th grade ($n = 48$), and fall of 7th grade ($n = 43$). Approximately 46% of all students had the classification of Limited English Proficient (LEP). At each time point students completed a word reading assessment (Test of Word Reading Efficiency; TOWRE) and a listening and reading comprehension measure (Group Reading Assessment and Diagnostic Evaluation; GRADE). The authors utilized multilevel modeling in order to examine the trajectory of reading comprehension growth over the time span of the study. The authors found that the speed of growth decreased over time. This finding was expected as this pattern has been seen with native English speakers (Catts, Bridges, Little, & Tomblin, 2008) and elementary school ESL students (Kieffer, 2008; Nakamoto, Lindsey, & Manis, 2008). Additionally, the authors examined the results in a SVR framework. It was found that differences could be explained by the components of the SVR (listening comprehension and word reading skills); however, in a typical population listening comprehension serves as a stronger predictor of reading comprehension than word reading skills, and with LEP students included in this study, word reading skills proved more important than linguistic comprehension skills. This study,

along with the others discussed, have shown a slowing in reading comprehension development in school-aged children; however, with the increasing rates of ESL students at a post-secondary level it is important that research begins to examine this unique group in order to understand if models of reading comprehension in ESL students hold true in a college-aged population.

Zadeh, Farnia, and Geva (2012) also examined the SVR framework with an ESL school-aged population. This study followed an expanded version of the SVR that included the variable of reading fluency as an important predictor. The researchers examined longitudinal data from 308 ESL individuals in first, second, and third grade. In first grade, students were administered two measures of phonological awareness: an auditory analysis task and an oddity task. Additionally, they completed two naming speed tasks: letter naming and object naming. Finally first graders completed a listening comprehension measure. Second grade students completed two measures of word-level reading skills: word identification subtest of the Wide Range Achievement Test – Revised and the Word Attack subtest of the Woodcock Reading Mastery Test – Revised. In grade three students completed a reading comprehension measure and two reading fluency subtests. Six latent variables were included in the measurement model: phonological awareness, rapid naming, listening comprehension, word-level reading skills, reading comprehension, and reading fluency. Confirmatory factor analysis was then used to test the latent variables in the described model. This study found that reading fluency is an important component of higher-level reading, but it should be considered distinct from reading comprehension. When both reading comprehension and reading fluency were entered into the mediation and direct-effect models utilized by the researchers, no significant associations were found between the two constructs. In other words, the authors believe that the SVR should be expanded to include reading fluency as a separate component of the model because the construct

of reading fluency can be operationalized differently when applied to L2 students. While this study provides some insight into the relationship between reading fluency and reading comprehension for ESL students, there are some limitations. This study, like many others, has focused on the development of reading in elementary school students. It is important to determine if the significant factors contribution to reading achievement continue to serve as important predictors for students at the post-secondary level. The proposed study is based on the premise that ESL college students have decreased reading fluency abilities compared to non-ESL peers and as a result obtain lower scores of reading comprehension achievement. In order to justify this premise, it is important to further explore the relationship between reading speed and fluency and reading comprehension.

Reading Speed and Fluency. Research stating that there is a direct relationship between reading fluency and reading comprehension dates back as far as 1974 when LaBerge and Samuels' proposed their automaticity model of reading. This model suggests that "skilled reading involves the reallocation of attentional capacity from lower level word identification processing to more demanding higher order reading skills, including comprehension functions" (Quirk & Beem, 2012, p. 539). In other words as fluency in reading is gained, cognitive processes are freed up and can refocus on other components of reading. Fluency refers to how quickly and accurately words are read, whereas reading speed refers solely to the rate at which words are read without taking into account whether or not errors were committed. Research has found that there is a clear relationship between reading fluency and reading comprehension in a typical population.

As demonstrated by Gottardo and Mueller (2009), Martinez et al. (2011), Proctor et al. (2005), and Zadeh, Farnia, and Geva (2012), the relationship between reading fluency and

reading comprehension in an ESL population may not be as strongly correlated as it is a native English speaking group; however it is important to note that there is limited research that has examined this relationship with an ESL group of students (Quirk & Beem, 2012). Additionally, the research that has been done has been met with mixed results. Wiley and Deno (2005) conducted a study that resulted in support of the relationship between reading fluency and reading comprehension. The researchers studied 36 third-grade and 33 fifth-grade students. Of those students, 15 third graders and 14 fifth graders were ESL students. All students participating in the study were administered the General Outcome Measures (GOM) maze task, a measure used to identify the lowest 50% of readers in a given classroom. This measure was administered in the fall, winter, and spring of an academic year. Students also completed the GOM Oral Reading measures throughout the academic year to monitor progress. Finally, the authors examined the results of the Minnesota Comprehensive Assessment (MCA), a measure that all third and fifth grade students were required to take in March of that year. The researchers found moderate correlations between oral reading fluency and MCA outcomes for ESL students ($r = .61$) and non-ESL ($r = .71$), suggesting that oral reading fluency served as a predictor of reading comprehension. Similar results were found for the fifth grade ESL students ($r = .69$) and non-ESL students ($r = .57$). The outcome of this study suggests that oral reading fluency plays a meaningful role in predicting reading comprehension performance. This study utilized a small sample size of only 36 students. It is important to include these results in a review in order to demonstrate the conflicting data in regards to utilizing reading fluency as a tool to predict reading comprehension abilities in ESL students; however, the small sample size causes one to interpret the results and validity of this study with caution.

Other studies have not concluded that reading fluency is an appropriate means to assess reading comprehension in an ESL population. A research question posited by Klein and Jimerson (2005) asked whether or not oral reading probes serve as an unbiased indicator of reading proficiency in regards to home language. The authors defined bias based on the definition provided by Cleary (1968) which states that “the test is biased if the criterion score predicted from the common regression line is consistently too high or too low for members of the subgroup” (p. 115). In this study, the researchers were examining the potential for test bias on a subgroup of students who speak Spanish at home. The researchers looked across grade levels to determine how many students identified Spanish as their primary language. Out of the 398 students included in the study, approximately 56% reported Spanish as their home language. All students were administered the Oral Reading Assessment Level which purports to measure letter identification, letter sound pronunciation, and oral reading passages. Students also completed the Stanford Achievement Test – Ninth Edition (SAT-9) in the spring of that academic year. In particular, the researchers were interested in the Reading Vocabulary subtest and the Reading comprehension subtest, which together comprise a Total Reading scale. To test the hypothesis, bias was examined by determining how much additional variance could be explained by adding oral reading fluency into the prediction model. After conducting multiple regression analyses it was determined that explained variance did not increase, suggesting the presence of intercept bias. Intercept bias in this study resulted in scores of oral reading fluency significantly over predicting actual reading comprehension and proficiency in an ESL group of students. To examine the intercept bias, the researchers utilized a multiple regression of concurrent SAT-9 Total Reading on oral reading fluency words per minute. Oral reading fluency was entered into the equation prior to the main effect dummy variables for the groups being examined, followed

by the interaction variables. The authors determined that intercept bias existed because the proportion of explained variance was not significantly increased by the interaction variables, but was increased by the main effect dummy variables. Interestingly, the authors found the same score under predicted achievement for students who speak English at home using the same analyses. There are several implications of this study that are relevant to the proposed study. The first of which is that it provides additional evidence that ESL students may not have the same variables that contribute to reading as typical peers. Additionally, as a result of these differences, test bias can result in the measures we give to subgroups of students. Finally, if this is the case, then it is important proper steps are taken to reduce bias and measures and provide equal access to learning and tests for all students regardless of language background.

Other researchers also found a different relationship between reading fluency and reading comprehension in an ESL population. Quirk and Beam (2012) conducted a study examining the relationship between reading fluency and reading comprehension. They determined what percentage of students demonstrated significant differences between scores earned on measures of reading fluency compared to scores earned on measures assessing reading comprehension by examining students who demonstrated psychometrically normal reading fluency scores (z -score $> -.33$) and below-average reading comprehension scores ($z < -1.0$). 171 students in second through fourth grade were included in the study. Spanish was the primary language spoken at home for all the students included in the study. All participants were administered the Test of Word Reading Efficiency to measure word-level reading fluency. Additionally, students were given AIMS web Reading – Curriculum Based Measurement probes to assess passage-level reading fluency. To examine reading comprehension the students were administered the Gates-MacGinitie Reading Test. Lastly, all students completed the California English Language

Development Test to assess English language proficiency. The study found that just over half of the sample demonstrated a significant gap between the score earned on a reading fluency probe and the reading comprehension measure. This calls the validity of using oral reading fluency measures as a means to determine the reading comprehension skills of ESL students into question. These findings suggest that in an ESL population, reading fluency may not serve as a significant predictor of reading comprehension. This is relevant to the proposed study because it has implications for reading comprehension test taking. A student's speed may not be the only factor limiting access to test questions.

It is well established that reading fluency serves as an important predictor of reading comprehension for native English speakers; however, the studies described above cast doubt upon utilizing the same reading model for ESL students. The significant difference in reading comprehension models across languages may have important implications for developing reading strategies, interventions, and accommodations in an ESL population. Additionally, the studies above provide insight into the differences that may be seen in reading fluency abilities between ESL students and native English speaking peers. The question remains, is reading fluency a meaningful component of reading comprehension for ESL students? Even with the inconclusive findings, it is clear that there is a place for reading fluency in a reading comprehension model; however, researchers and educators should be aware that fluency does not effect comprehension for ESL students in the same way that it might for native English speaking individuals.

Perception of Reading Ability and Test Taking

A final important factor to take into consideration when administering reading comprehension measures to an ESL population is an individual's perception of reading ability

and testing taking skills. How a person feels about his or her reading skills has the potential to influence scores on measures of reading comprehension. Self-efficacy refers to “beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situation.” (Bandura, 1997, p.2). For example, someone who has high self-efficacy in reading might feel like he or she is confident that they can read a passage and take the necessary steps to answer the questions that follow. The link between self-efficacy and actual academic achievement has been met with mixed results. Some studies have found that students high in self-efficacy do better on academic reading tasks (Schunk, 1999), while others have found that high self-efficacy actually has the potential to negatively affect student performances (Stevenson, Chen, Lee, 1993). The general consensus is that affective factors can and do play a role as predictors of language achievement and test anxiety (Ghonsooly & Elahi, 2010).

In one study, specifically examining the connection between self-perception of reading, anxiety, comfort in reading, value placed on reading, and English language proficiency, Yamashita (2004) found that more positive perceptions of reading and ability were associated with better performance in extensive reading. Extensive reading in this study was operationalized as programs in which “students read a relatively large amount of texts compared with what is called intensive reading, which usually involves a slower reading of a relatively small amount of materials” (p. 2). In order to come to these conclusions, the researcher examined 59 Japanese university students who were enrolled in ESL extensive reading classes. All participants were native speakers of Japanese and had at least seven years of formal English language training. All students completed the Test of English for International Communication as a measure of English language proficiency. Additionally, all participants completed an attitude questionnaire that had students rank their L1 and L2 reading abilities on several domains

on a Likert type scale. Finally, the average number of pages read per week was used to operationalize performance in the extensive reading class. Not surprisingly, they found significantly higher levels of anxiety when reading in L2. The authors also conducted correlations between positive and negative attitudes of reading and reading performance. It was found that the most significant predictor of reading performance was having a positive attitude toward reading in general and reading capabilities in both the L1 and L2. These variables explained 27.82% of the variance. This relationship produced a moderately significant correlation coefficient. This study suggests that ESL students experience more anxiety about their reading capabilities than L1 peers. It appears that one's perception of reading skill could be a relevant variable for study in the ESL population.

Self-perception was also utilized as an independent variable in a study by Ghonsooly and Elahi (2010) that explored: a) the relationship between ESL student's self-efficacy in reading comprehension and their reading anxiety, and b) the relationship between ESL student's self-efficacy in reading comprehension and actual reading achievement. The latter is of more relevance to this literature review. The sample used in this study consisted of 150 sophomore college students at Iranian Universities. All participants included in the study were majoring in English literature. Additionally, all participants were between the ages of 19 and 24, had at least seven years of formal English language training, and spoke Persian Farsi as their first language. The authors of the study developed a scale to assess self-efficacy in reading comprehension based upon three standardized measures: The Persian Adaptation of General Self-efficacy, Morgan-Links Student Efficacy Scale, and Beliefs about Language Learning. In addition to completing the self-efficacy questionnaire, all participants also completed the Foreign Language Reading Anxiety Scale. Information about current grade point average (GPA) was also collected

from all students. The researchers utilized the Pearson-product moment formula to analyze the collected data. Results demonstrated that participants who were high in self-efficacy for reading comprehension reported experiencing less anxiety than peers who reported lower self-efficacy in reading comprehension ($r = -.824, p < .01$). A positive relationship was found between self-efficacy in reading comprehension and reading achievement. This was found by using the Pearson-product moment formula ($r = .765, p < .01$). In accordance with the hypotheses proposed by the researchers, students who reported high self-efficacy in reading comprehension achieved higher GPAs in English literature courses. Similar to Yamashita (2004), this study emphasizes the important role that internalizing factors such as self-perception, anxiety, and self-efficacy can have on the reading performance of ESL students. While the implications are important, it is also necessary to consider the limitations to this study. As previously described in this review, ESL students differ from L1s and from one another on a number of English learning variables. For example, they can differ on factors such as amount of English experience, age of initial exposure, length of formal English instruction, skill levels, English self-efficacy, etc. The authors in this study put all ESL students in one group and did not account for individual differences. Future research should take into account the variables that make an ESL group heterogeneous.

High Stakes Testing and ESL Students: Reading Comprehension

The emphasis on high stakes testing has been steadily increasing over the years. Schools around the country utilize these measures as one way to ensure accountability. Additionally, high stakes tests, such as the SAT or ACT, are required by many colleges and universities as a component of student applications. In general, the purpose of high stakes tests falls into one of three categories: student placement, student promotion, and student graduation (Solórzano,

2008). Aside from these categories high stakes test scores can also have important implications for scholarships, licensing in a profession, job placement, and other life achievement factors. Until the enactment of No Child Left Behind (NCLB) in 2001, ESL students were not required to take high stakes state tests (Abedi, Hofstetter, & Lord, 2004). This change in mandates for an ESL population was fundamental in the inclusion of test adaptations or accommodations for this specialized group of students. High stakes testing has been gaining importance across public schools in the United States. The government has enacted legislation to include high stakes and standardized testing into the curriculum in an effort to increase accountability of school districts, administrators, and teachers. Little research has been conducted that examines the performance of ESL students compared to native English speaking peers on high stakes or standardized measures.

In 2004, Stricker from the Educational Testing Service (ETS), the organization responsible for the production, administration, and scoring of many high stakes examinations conducted a study to examine the performance of ESL students on a computerized version of the TOEFL compared with scores earned on the Graduate Record Exam (GRE). The TOEFL is composed of three subtests: listening, structure/writing, and reading. The three tests combine to produce an overall total score. The GRE General Test also contains three separately scored subtests: Verbal, Quantitative, and Analytical. The study sampled 168 native born speakers of English and 3,489 ESL test-takers. Both groups completed the TOEFL and the GRE within a period of 15 days. The study found that scores on the TOEFL were highly correlated with scores earned on the Verbal (.64) and Analytical (.53) subtests of the GRE and moderately correlated with the quantitative subtest (.34). This study is important for several reasons. The first of which is that it demonstrates that the TOEFL has strong construct validity and that higher scores

on the TOEFL correlated with higher scores on the language loaded subtests of the GRE. Additionally, it demonstrated that students who are not proficient in English (as measured by the TOEFL) produce lower scores on a high stakes standardized test measure administered in English. This study is in agreement with statistics released by the National Center for Education Statistics (NCES, 2009) that report ESL students are being outperformed by English speaking peers on high stakes English language measures assessing reading and mathematics.

In addition to finding significant correlations between level of English proficiency and GRE scores, Stricker directly compared the Total GRE score, GRE Verbal, and GRE Quantitative scores earned by ESL students to scores earned by non-ESL peers. The results were startling. In terms of overall GRE scores, Stricker reported that ESL students are performing significantly worse than peers, . Furthermore, the results demonstrated that ESL students were performing significantly lower on the verbal subtest compared to peers. Adding further evidence to the role that language plays, this study also found that ESL students earning lower scores on the TOEFL compared to ESL students earning higher scores on the TOEFL performed significantly worse on the Verbal subtest of the GRE. While this study addresses some important issues in high stakes testing and ESL students, it did not provide sufficient data about test performance. For example, are ESL students performing worse than peers because they are answering questions incorrectly, or is it because they are accessing less of the test than peers? In order to develop the most appropriate guidelines for testing and ESL students, it is first important to understand where in the testing process the ESL students are struggling. Aside from some limitations, this study has important implications for the current study. It is clear from this research that ESL students are experiencing a weakness in the verbal subtest of the GRE. Accordingly, the current study focuses on reading comprehension, a skill that encompasses a

large portion of the verbal domain in order to address the academic area that appears to have the greatest effect on ESL students.

The study described above is not the only research that demonstrates that ESL students are at a disadvantage on high stakes measures such as the GRE or the Scholastic Aptitude Test (SAT). It has been reported that ESL students score lower on standardized tests of mathematics achievement across grade levels, the SAT, and GRE (Abedi, Hofstetter, Baker, & Lord, 2004). High stakes tests have the ability to greatly affect the life of a student who is required to take them. It is typical for high stakes tests (SAT, GRE, Law School Admission Test (LSAT), ACT, etc.) to have a reading comprehension component. The quantitative portions of some tests also require a high level of reading ability to understand the directions and solve the mathematical problems. Without strong reading comprehension skills, ESL students may not have the opportunity to access the same amount of the test as their native English-speaking peers. In other words, ESL students may not have the opportunity to demonstrate their true knowledge in a high stakes testing condition.

Reading outcomes. The NCES is the organization responsible for the National Assessment of Educational Progress (NAEP). NAEP is a nationwide assessment that aims to gain insight into the knowledge possessed by American students in the content areas of mathematics, reading, science, writing, the arts, civics, economics, geography, and U.S. history. Of interest to this literature review are the NAEP reports on ESL student performance on measures of reading. In particular, the most recent NAEP data available to the public from 2011 indicated stark differences in reading proficiency between ESL students and English speaking peers. More specifically, fourth grade results indicated that 93% of fourth grade ESL students were below proficiency level as compared to non-ESL peers with only 63% below proficiency.

The NAEP data also revealed that the reading difficulties ESL students in elementary school face do not disappear at the secondary level. Twelfth grade data shows that 98% of ESL students were below proficiency in reading as compared to 61% of English speaking peers. It is therefore important to understand the development and predictors of reading comprehension, reading speed and fluency, and how these variables may differ in an ESL population and affect overall high stakes test scores. There is no clear-cut model of reading development in an ESL population; however, some research has examined the development of literacy and fluency in school-aged ESL students.

The academic and achievement characteristics associated with ESL students lead to a presumption that these students may be at a disadvantage on high stakes time tests. Specifically, the identified weaknesses in reading, including lower reading speed and comprehension, as well as slower test taking performance and decreased confidence, collectively suggest a potential need to accommodate ESL students on high stakes testing measures. Students with a documented disability such as a learning disability present with a similar profile and these students are able to apply for and receive test accommodations to mitigate any testing disadvantages. Current laws and standard practice do not afford these same options to ESL students, even though they are still expected to take high stakes measures such as statewide assessment and post-secondary admission exams.

Test Accommodations

According to the New York State Office of Vocational and Educational Services for Individuals with Disabilities (VESID), test accommodations are defined as “changes in the standard administration of a test including testing procedures or formats that enables students with disabilities to participate in assessment programs on an equal basis with their non-disabled

peers” (NYS VESID, 2006). Testing accommodations typically fall into one of four main headings: presentation format, response format, test setting, and timing. If an individual had a visual impairment, he or she might utilize presentation format accommodations. Included in this category is access to large print forms, standard paper and pencil forms converted to Braille, or the use of a reader to have directions read aloud. Some students with disabilities have a right to use accommodations that alter the way that student records responses to an examination. This type of accommodation is known as a response format accommodation and examples include computer administrations in lieu of standard paper and pencil. Test setting accommodations are when changes to the location of test administration are made and include a separate room or a small group administration. The final category of test timing is defined as an alteration in the amount of response time allowed for the test and may also include the use of frequent breaks between test sections. Equal access to a test is the primary goal when test accommodations are granted.

Test accommodation eligibility.

Test accommodations may be mandated by laws in the United States for students who may have a disability, language impairment, or a low level of English language proficiency in order to provide equal access to test questions. While the majority of these laws have provisions for students with documented disabilities, very few address the barriers to testing for ESL students. Until the addition of No Child Left Behind in 2001 (NCLB, 2008), ESL students were not required to take part in statewide and national testing and were therefore never considered for eligibility to receive testing accommodations. Most colleges and universities have an office of disabilities services that evaluates and approves applications for test accommodations for students taking examinations at their institution; however, even these offices do not have clear

guidelines on whether or not to approve test accommodation requests from ESL students. While the difficulties experienced by the ESL population, as described previously, may look nearly identical to students with disabilities that are afforded access to resources and accommodations under educational laws, ESL students are often overlooked. Laws that oversee the use of test accommodations with an ESL population will be discussed.

There is not one specific law that affords ESL college students the rights to test accommodations; however, there are several laws that contribute to decisions regarding assessment of ESL students. These laws include Title VI of the Civil Rights Act of 1964; the Equal Educational Opportunities Act of 1975, federal court cases, the Improving America's Schools Act of 1994; and No Child Left Behind Act of 2001. Title VI of the Civil Rights Act of 1964 began to set things in motion for ESL children to receive access to an appropriate education. In particular, Title VI prohibits discrimination on the basis of race, color, or national origin. This law affects any agency that receives federal funding. Under this domain, schools and universities that receive funding are required by this law to provide equal educational opportunities to ESL students. This typically comes in the form of classes aimed at teaching English or classes that are taught in a student's native language. The next important governmental action affecting students who speak English as a second language was the Equal Educational Opportunities Act of 1975 (EEOA). This statute mandates that states cannot deny equal educational opportunities due to one's race, color, sex, or national origin. This act was particularly important for ensuring that ESL students were given appropriate resources to overcome language barriers.

Two important federal court cases produced results based on Title VI and the EEOA; *Lau v. Nichols* (1974) and *Castaneda v. Pickard* (1981). In *Lau v. Nichols* (1974), the parents of an

ESL Chinese student filed a claim against the San Francisco Unified School District stating that identical education is not the same as equal education. The verdict left the district responsible to take affirmative steps ensuring access to education for non-English speaking students and opened the door for ESL students around the country. In *Castañeda v. Pickard* (1981), the court ruled that there was a need for accountability in ESL programming and put three main safeguards in place to ensure adequacy of a districts programming: (1) the program must be based on empirically validated educational theory, (2) the appropriate resources and personnel need to be provided to follow the educational theory with integrity, (3) evaluations by the district should be in place to ensure language barriers are being overcome and adjustments are made when necessary. These two major court cases set the stage for access to test accommodations for ESL students, however, the extent to which an ESL population has rights to test accommodations under the laws remains questionable. In fact, decisions regarding ESL access to test accommodations are made on the state level. In 1999, only 40 of the 50 states had existing policies in regards to ESL and test accommodation practices (Young & King, 2008).

Validity of test accommodations. Validity, in regards to a test, refers to the extent to which a test actually measures the construct it claims to be assessing. There is a general debate regarding the validity of test accommodations, even concerning individuals with disabilities who are commonly afforded the right to accommodations. This discussion, by extension, translates to the adult ESL population, where there is no legal protection or guidelines for the use of test accommodations. The debate centers on whether the provision of a test accommodation provides solely equal access to a test without creating an advantage or disadvantage for some students. Phillips (1994) outlined several suggestions for determining whether or not a specific test accommodation would be valid for a particular group of students. These recommendations can

and should be applied to an ESL population. In particular, Phillips posits several important questions for consideration by professionals before granting accommodations to test takers. These questions include: (1) Will format change or alterations in testing conditions change the skill being measured? (2) Will the scores earned on the measure have different meaning for examinees with testing accommodation versus those without the accommodation? (3) Would examinees without a disability benefit if given the same accommodation? (4) Does the examinee receiving the accommodation have the capacity to take the test under standard administration conditions? (5) Was the disability diagnosis or tests accommodations policy based on procedures or measurements that do not have strong validity and reliability? Phillips suggests that if any of the previous questions can be answered yes, then a test accommodation may not be considered valid for a particular group or individual. These questions are important to determine the validity of extended time and can be used to determine the effects a test accommodation may have on score interpretation and speededness (amount of items attempted and accuracy in a set amount of time; Lovett, 2010).

The first of Phillips questions concerns the accuracy of skill measurement on a test. Any time the standard administration of a test is changed, the risk of altering the precision of accurate measurement and interpretation increases. In other words, does the accommodation produce results that no longer accurately measure the construct being assessed? An accommodation that has the potential to reduce measurement accuracy has the potential to significantly reduce the validity of the measure and confound test interpretation. For example, there could be a student with a disability that has average potential yet tends to test in the low average range. This student is then given 50% extra time and now is performing in the average range. The same student then receives 100% extended time and is now performing in the above average range.

Which score would now be considered closest to his true score? Which time allotment, if any, is most valid for this student? Accommodations, such as the example described above, have the potential to cause Construct Irrelevant Variance (CIV). CIV occurs when extraneous or uncontrolled variables are introduced that have the potential to affect the assessment outcome. If the use of extended time changes the student's outcome beyond his or her potential it may also be introducing a measurement error into the equation.

It is important that when a test is administered to a diverse group of students, the outcome score has the same underlying meaning across individuals. In other words, do the scores earned on an exam, accommodated or not, measure the same construct. This idea can be summarized by Phillips' second question. The logic frequently employed by an extended time accommodation is that it allows students with slow processing and/or reading speed to access the same amount of the test as peers; however, if the construct being measure by that test is processing speed or reading speed, the use of an extended time accommodation interferes with the validity of the test as a measure of the construct being examined. The purpose behind a given test can vary. If a test is concerned with how much knowledge an individual has of a particular topic, then that test is more concerned with power. On the other hand if the test is interested in how quickly a student can answer questions, then the test is focused on speed. Let's say a test intends to compare how many test items individuals can complete in a given time period. If one student is provided with an extended time accommodation and the other student is not, the accommodated student may answer considerably more test items than a peer. Conversely, if a test is based on power (knowledge) rather than speed, extended time should not affect the validity of the test. The use of extended time for the wrong reason or in the wrong situation has the potential to produce inaccurate comparisons to other examinees.

The third validity question has to do with the “specificity” of the test accommodation to only those with a disability or others eligible to receive it. According to Phillips and many others (Fuchs et al, 2001; Sireci, Scarpati & Li, 2005; Zuriff, 2000), in order for a test accommodation to be valid, it should benefit only the individuals with disabilities, or at least benefit them significantly more than nondisabled peers. For any given test accommodation, it is important to rule out the possibility that everyone might benefit from the use of extended time. For example, an exam in Braille for a blind student is a specific accommodation. It allows that student better access to the exam without providing an unfair advantage and it would be of no benefit to students without that disability. The specificity issue has received considerable attention in past research studies and these studies have shown mixed results. Several hypotheses have been developed around the specificity notion, such as the interaction hypothesis (Sireci et al., 2005), differential boost hypothesis (Fuchs & Fuchs, 2001), and maximum potential thesis (Zuriff, 2000). Each of these hypotheses offers a variation of the same theme, mainly, that those with a disability will tend to perform below their peers in a standard timed test, but will improve more than peers when given extended time. It is expected that the extra time will benefit only those with disabilities, or at least provide them with a greater boost in performance. If disabled and nondisabled students benefit equally from extended time, or no one benefits from extended time, then according to Phillips and these other researchers the test accommodation is not valid.

The final question of Phillips’ asks if the examinee is able to demonstrate that he or she has the skills(s) necessary to access the exam under standard test administration. If that examinee can demonstrate the skill being measured without the test accommodation, then the accommodation should not be granted.

All of the questions proposed by Phillips have important implications for the use of extended time as a valid test accommodation, regardless of a person's disability or perceived needs. The use of test accommodations with an ESL population has recently come into question. With the growing number of ESL students seeking out educational opportunities in the US, educational institutions need to provide valid and appropriate ways to support them, and that could include test accommodations. As previously noted, ESL students share some of the same literacy problems as students with disabilities, and these problems certainly can influence various test performances, including speeded tests. Currently there are no laws or policies that mandate or govern the use of test accommodations with the ESL population nor is there research showing the potential utility and validity of test accommodations for this group. Surely there is a need for test accommodation research with this group of students.

Test Accommodation Findings for ESL Students

While there is no legal mandate to provide ESL post-secondary students with test accommodations, the rationale behind the use for this population is relatively clear. According to Abedi, Hofstetter, and Baker (2003), "student performance on assessments may be particularly affected by background factors (e.g. English language proficiency, number of years in the U.S.), the linguistic complexity of the text (e.g., passive voice constructions, difficult terminology), and other threats to validity" (p.3). In other words an ESL student's past experiences in combination with English language exposure can limit the student's ability to access the same amount of material on a test as a native English speaking peer. Thus, test accommodations may be a way to allow the student to access the same amount of test items as peers. Many districts have begun to provide changes to the test format when it seems appropriate. Little research is available regarding test accommodation practices for ESL students in testing agencies and post-secondary

institutions. Some research has supported that under standard test administration the content knowledge of many ESL students is frequently underestimated (Castellon-Wellington, 2000). This section will review the current literature on the effectiveness and validity of the use of test accommodations with an ESL population. It is important to note that nearly all of the research examining the utility of test accommodation with ESL students is conducted in a K-12 setting and little research has examined this unique population in a setting of higher education. Therefore the following literature review addresses the existing research, but make note of the gap for college-aged ESL students. It is important to keep in mind that the ESL study body at the primary and secondary level may look very different from the ESL student body at the college level. Accordingly, the utility of the following being applied to the college setting should be interpreted with caution.

Several different types of test accommodations have been utilized and researched with an ESL population. Examples of some of the more popular accommodations include: use of a computer (with or without a popup dictionary), extended time, use of a dictionary, use of a translator, and small group testing. Limited research examining the efficacy and validity of these accommodations has yielded mixed results. Abedi, Courtney, and Leon (2003) examined the effectiveness, validity, and feasibility of three different types of accommodations: computer testing with pop-up glossary, extra time, and customized dictionaries. The glossary and dictionary were included to ameliorate difficulties with comprehending word problems due to language barriers. They provided all three of the accommodations to 278 ESL and 328 non-ESL fourth grade students who were asked to take math tests assembled from a combination of public release items from NAEP (1996) and Trends in International Mathematics and Science Study. The investigators found that ELL students were able to increase their performance under all three

accommodated conditions. Specifically, the most improvement was seen under the computer accommodation, followed by the extra time accommodation. The study also found that non-ESL students did not improve their scores under any of the accommodated conditions suggesting that the use of the described accommodations benefitted the ESL group only.

Hafner (2000) also researched the effects of test accommodations for ESL students on math test performance. In particular, this researcher was curious if scores from accommodated tests could be interpreted in the same manner as scores from non-accommodated tests. This study examined the effects of extended time and extended oral presentation (EOP). EOP included simplified test directions, repeated directions, additional examples, or directions read in native language. Fourth grade students were separated into three groups: ESL students, English proficient students, and ESL students identified with a disability according to an individualized education plan (IEP). The study found that all groups significantly benefited from the extended time condition, including the English proficient students, where all groups demonstrated higher mean scores in this condition. In the EOP condition, both groups benefited from the accommodation, with higher means under EOP than no accommodations; however, extended time alone resulted in the greatest gain in test performance. The results of this study demonstrated that extended time accommodations with this sample violated the specificity concern raised by Phillips. The author concluded that since the accommodation aided ESL student access to the test, but also improved the performance of non-ESL students that extended time accommodations should be universal and provided to everyone. Once again, this study failed to address concerns relating to ceiling effects that might have been present. Additionally, the author did not make note of how much time was granted for the extended time condition or how the researchers determined what an appropriate amount of extended time might be for this

population of students. Variables such as these have the potential to change the outcomes of the study.

In another study examining test accommodations and test accommodation preference, Castellon-Wellington (2000) gave a preference questionnaire to 106 seventh grade ESL students in a California school district. The students were given the multiple-choice item, “what would help you do better on this test?” They then had to choose between the options of extended time or directions and questions read aloud. In the following weeks the students were given tests under the two accommodated conditions. The testing instruments included parallel forms of the Iowa Tests of Basic Skills Social Studies Test for 7th grade and the Language Assessment Scales Reading Component Form 3A. The social studies assessment consisted of 44 multiple-choice items examining history, geography, political science, economics, sociology, and anthropology. The reading measure consisted of 55 multiple-choice items designed to assess synonyms, fluency, antonyms, mechanics, and reading for information. The results indicated that the ESL students in this sample did not demonstrate improvement when provided with extended time accommodations or directions and questions read aloud. Additionally, the researchers looked to see if there were any differences seen for a student when that student was given their preferred accommodation. Once again, scores were no better even when the preferred accommodation was provided to the student. This is another study that did not demonstrate specificity. As in other studies that examine test accommodations and extended time, this study did not clarify the conditions of extended time, such as amount of time and length of test. Additionally, this study failed to include important variables such as test taking perception, reading speed, and level of English language proficiency.

Pennock-Roman (2011) performed a meta-analysis that examined the results of 14 studies (1990 to 2007) conducted within the United States that examined the use of different test accommodations for ESL students (grades K-12) on content-based material. In particular, the research was interested in determining if an accommodation was effective for ESL students, which accommodations were most effective for ESL students, and if the accommodation provided changed the meaning of the score produced. Accommodations included in the studies were: pop-up English glossary, English dictionary, picture dictionary, plain English, read aloud, dual language, pop-up bilingual dictionary, bilingual glossary, and extra time. The meta-analysis revealed that instructions read in a native language produced the largest effect size. In one study the ESL students in the group with native language testing produced an effect size of .95 whereas the English version yielded an effect size of .13. Across the studies included in this meta-analysis, the authors found that with restricted time limits the pop-up English dictionary (effect size = .285) produced a small effect, whereas under little or no time constraint conditions English dictionary continued to be significant. Overall, this meta-analysis provides important insight into the use of testing accommodations with ESL students; however, several of the studies included in the meta-analysis did not provide information regarding how many items the measure contained and/or did not explicitly express how much extra time students were given for task completion. Unaccounted variables such as the exact length of the extended time accommodation or how many items the test contained can have an impact on test results. By not knowing the length of the time allotment allowed, the authors may not have been comparing equivalent variables. Additionally, the lack of specification of the ceiling can have important implications as was learned in other studies, that the exclusion of a ceiling might change the outcome for participants in a study (Lewandowski, Cohen & Lovett, 2013). The authors did note

that studies examining the efficacy and validity of test accommodation use with an ESL population is lacking. As evidenced by Abedi, Courtney, and Leon (2003), Castellon-Wellington (2000), Hafner (2000), and Pennock-Roman (2011) demonstrated that there might be a need for test accommodations for ESL students. While it may not be immediately clear whether the test content and the type of accommodation provided contributes to the mixed results described in this section, it is apparent that additional research in the area of ESL students and test accommodations is needed. These researchers examined test accommodations at the K-12 level and did not address whether test concerns persist into the post-secondary level.

Test Accommodation Findings for Students with Learning Disabilities and ADHD

There has been limited research investigating the valid use of test accommodations in an ESL population; however, research has been conducted in this area for students with disabilities. This next section focuses on these studies of test accommodation use and validity in order to gain a greater understanding of how this may apply to an ESL population. As previously mentioned, several studies have investigated the use of extended time accommodations for students with disabilities at the post-secondary level. The Law School Admission Council (LSAC) examined the predictive validity of earned LSAT scores under accommodated situations for assessing First Year Average (FYA). FYA is the average grade earned by students in their first year of law school. This score is reported by individual law institutions to the LSAC correlations study service. The results of two studies demonstrated that extended time accommodations produced an over prediction of FYA (Amodeo, Marcus, Thornton, & Pashley, 2009; Thornton, Reese, Pashley, & Delassandro, 2001). Amodeo, Marcus, Thornton, & Pashley (2009), replicated the study by Thornton, Reese, Pashley, & Delassandro (2001) except utilized data from LSAT scores for the entering law school classes between the years of 2002 and 2006. This study included test

scores from 896 accommodated students under extended time allotments, 162 accommodated students under standard time conditions, and 118, 594 non-accommodated students under standard time conditions. Students in the accommodated groups had one of the following classifications: ADHD, hearing impairment, learning disorder, neurological impairment, physical disability, psychological disability, visual impairment, or other medical condition. All participants completed the four 35-min sections of the LSAT. The accommodated students receiving extended time were typically allotted time-and-a-half or double time. All scores, including the LSAT score, undergraduate GPA and the estimated FYA were all converted to Z-scores in order to compare the relative magnitude of all variables. The results of this study found that accommodated test scores over predicted FYA. In other words, when a test was accommodated, the predicted FYA was significantly higher than the actual FYA earned by the accommodated student. Over prediction was determined by the use of residual analysis for FYA estimation models. While the results have important implications it is necessary to note the limitations to this study. For example, the total sample size was large, however; the number of participants in each accommodated group was significantly smaller and varied over entering class.

Cahalan, Mandinach, and Camara (2002), conducted a similar study for the College Board. In this study, the researchers examined accommodated test takers on SAT in regards to predictive validity for first year grade point average (FGPA). Students included in the study provided data including their respective FGPA. They found that SAT scores earned by male students with disabilities under extended time conditions over predicted FGPA. The two studies described above were both conducted by high stakes testing agencies and are examples of

decreases in efficacy of measurement that can lead to inaccurate predication. This inaccurate prediction is possibly due to the use of the extended time accommodation.

Several research studies have been conducted that examine the notion of “specificity” of a test accommodation for students with various disabilities and needs. To determine whether extended time was specific for use with students with learning disabilities, Lewandowski, Cohen, and Lovett (2013) investigated the efficacy of extended time accommodations for students with and without learning disabilities. 107 students were administered a modified version of the Nelson-Denny Reading Test (NDRT) using three time allotments; standard time, time-and-one-half, and double time. Out of those students 26 students were included in the Learning Disability (LD) group and 50 students were included in the typical peer group for final analyses. Based on the Interaction hypothesis, one would posit, “non-LD students should outperform LD students at standard time, but the groups will perform comparably when they both receive extended time” (Lewandowski et al., 2013, p.6). A mixed-model ANOVA revealed a significant interaction between group and time in the opposite direction. In other words, typical students demonstrated greater gains from extended time than the students with LD. These results question the use of extended time as a valid accommodation, because it was not specific to those with a learning disability. Notably, the study did find that typical students attempted more items and answered more items correctly than students with LD at standard time. Another result of the study found that when comparing students with LD at double time to typical peers at standard time, the LD group had a distinct advantage. More specifically, the LD group had access to 26% more test content when given double time. This result suggests that allotting double time to students with LD may give those students an unfair advantage over their typical peers. These important and

surprising findings seem to have implications for making test accommodation decisions for students with LD.

Miller, Lewandowski, and Antshel (2013) replicated the above study applied to college students with and without ADHD. This study included 38 students with ADHD and 38 typical peers matched on age, grade point average, ethnicity, and year in school. All participants completed a modified version of the Nelson-Denny Reading Test. A mixed model ANOVA revealed no significant differences between groups under standard time conditions. Furthermore, the use of 50% and 100% extended time provided the ADHD students with the opportunity to attempt many more test items than their peers. While this study had several limitations such as relatively small sample size, and no information regarding whether individuals had taken stimulation medication the day of the examination, it has important implications for the rule of specificity. The results of the previous two studies violated the assumptions of valid test accommodation and question the original purpose of their use as a means of equal access for persons with disabilities.

The College Board has conducted several research studies to examine the effects of extended time on the performance of scores earned on the SAT. Cahalan-Laitusus, King, Cline, and Bridgeman (2006) administered several subtests of the SAT to high school juniors and seniors with and without a learning disability (LD) and/or Attention Deficit/Hyperactivity Disorder (ADHD). The examiners informed participants that they would be receiving 50% extended time to complete the Critical Reading, Mathematics, and/or Writing subtests of the SAT. Standard time for each subtest was reported to be 30 min and under time-and-one-half conditions, participants received 45 min to complete each subtest. Time for completion was

recorded for each participant. The data collected from this study were then compared to data collected by Bridgeman, Cahalan, and Cline (2003).

The data from the 2003 study focused the time typical learners required to complete each subtest of the SAT. On the Critical Reading subtest, comparisons found that students with disabilities took 8% longer than students without disabilities. On the Mathematics subtest, students with disabilities utilized 14% more time to complete the test than students without disabilities. Finally, on the Writing subtest, students with disabilities averaged 4% longer than students without disabilities. Overall, these comparisons demonstrated that students with disabilities required more time than typical peers to access the same information; however, it is important to note that only a few of the participants needed more than time-and-one-half to complete the subtest, and the majority were able to finish the subtests well under the 50% time allotment.

In a study conducted by Elliot and Marquart (2004), 97 middle school students were separated into three groups: students with disabilities, students educationally at risk in math, and students without disabilities. Each group was administered a mathematics test under standard time or extended time conditions. The math test was generated from alternate short forms of standardized mathematics tests developed from the TerraNova Level 19 mathematics test. The extended time condition allowed students to use as much time as necessary (up to 40 min) to complete the examination. The researchers utilized a repeated measures multivariate analysis of variance (MANOVA) to compare performance differences for students with and without disabilities across testing conditions. Results did not find evidence in support of an interaction between extended time and disability status, $F(1, 95) = .007, p = .93$. The two studies described above exemplify the mixed results generated from extended time studies looking at students with

disabilities. Some researchers have found that students with disabilities need more time than peers to access the same amount of information. Other researchers have not found an interaction between the use of extended time and disability status (Lewandowski, Lovett, & Rogers, 2008). This suggests that extended time may not always be an appropriate and empirically valid test accommodation for students with disabilities who are seeking its use (Phillips, 1994; Sharp & Earle, 2000; Zuriff, 2000). Additional research is needed to determine the validity of extended time as a test accommodation for individuals with various disabilities, as well as the specific amount of extra time that would be appropriate to provide equal access to a test. Furthermore, the extended time literature has focused on students with disabilities and often times overlooks other individuals, such as ESL students who may also be eligible to receive extended time accommodations.

Extended Time as a Test Accommodation for ESL Students

Extended time is the most commonly requested and granted test accommodation (Thurlow & Bolt, 2001), yet there is minimal empirically based support to validate its use, and even less to support its use in an ESL population. The utility of extra time as an accommodation is based on the premise that individuals who require its use have slower processing and/or reading speed and take longer when completing timed examinations. Extended time is also granted under the assumption that individuals with certain disabilities lose time during examinations due to distractibility or mental interference (such as mentally translating the language of the test into the students' native language) and extended time will provide those individuals additional time to make up for the time that is lost. According to anti-discrimination law, the intended use of extended time is to ensure equal access to a test and assure the best measurement of an individual's true abilities.

Commonly, extended time is provided to students in varying amounts ranging from 25% to 100% extra time. In some rare instances, extended time is offered in the form of unlimited time to complete an examination. According to Ofiesh et al. (2004), “there is not a precise scientific system to determine how much time” students with qualified needs should receive on tests. High stakes testing agencies, as well as many university offices of disability services make decisions about length of time based solely on what the student has requested or received on examinations in the past. This practice is questionable, as past allocations may have simply been based on a request or standard convention. Ofiesh et al. (2004) recommend allotting time-and-one-half (50%) as a baseline for determining appropriate amounts of extended time allocations; however there is no scientific, empirically based, basis for making this decision.

As previously mentioned, there is little empirical evidence to support the commonly granted extended time allotments. For example, 50% and 100% extra time are most commonly used, and are the only time amounts a student with a disability can request for extended time on the Scholastic Aptitude Test (SAT; Cahalan-Laitusis, King, Cline, & Bridgeman, 2006). However, there is no research in support of time-and-one-half and double time as any more appropriate and valid amounts of time than, for example, 25% or 75% additional time. The arbitrariness of extended time use suggests that time accommodations are allotted based on convention rather than an evidence-based procedure. Granting extended time under these conventional assumptions has the potential to invalidate the test or make interpretation and direct comparison to un-accommodated students problematic. As there are currently no clear guidelines in place for granting extended time to ESL students, it is important that when guidelines are developed, they are informed by evidence-based practices.

Purpose of the Present Study

The evidence indicates that ESL students are seeking educational opportunities in American colleges in record numbers, yet many do not have the English literacy skills of their L1 peers. This puts them at a disadvantage when taking tests that involve verbal material (e.g., reading comprehension), which includes most classroom and high stakes tests. Colleges should provide English learning resources to those ESL students with skill weaknesses, and also need to find ways to assess their learning in the classroom. This may involve the use of test accommodations (e.g., extended time, use of a dictionary) that attempt to mitigate any deficiencies these students have as a result of insufficient English proficiency. Most studies of test accommodations for the ESL population have been conducted on children, have had methodological weaknesses, and have reported mixed results. Even less is known about the efficacy of test accommodation on the performance of ESL students at the post-secondary level.

The goal of the present study was to evaluate the utility and validity of extended time (50% and 100%) as a potential test accommodation for ESL college students asked to take a reading comprehension test. ESL students were compared with native English language speakers on the number of items attempted, percent correct, and number of items answered correctly on a reading comprehension measure administered under standard time conditions, time and one half, and double time conditions.

The primary questions for this research study were generated in accordance with the “interaction hypothesis,” which states that students who need an extended time accommodation will perform less well than peers at standard time and will perform comparably to the peer group when provided with the extended time accommodations. A secondary goal of the study was to determine if there is a significant relationship between English proficiency (as measured by an

English language proficiency test battery) and the variables of comprehension items attempted, items correct, and percent correct. The primary hypotheses for this study were:

1. ESL students will perform significantly worse than L1 peers on items attempted, items correct, and accuracy under standard time conditions.
2. ESL students will perform worse than L1 peers at standard time, but comparably to L1 peers when allotted time and a half and/or double time on items attempted, items correct, and accuracy.

In addition to addressing the primary hypotheses, this study sought to determine if there is a relationship between the independent variables and performance on the reading comprehension measure. Accordingly, the following exploratory question was posed:

Do any of the following independent variables serve as a moderate to strong predictor of reading comprehension performance: amount of English language exposure, English language proficiency score, GPA, test-taking perceptions, or group? If so, which are the strongest predictors?

Method

Participants

Approval from the participating university's Institutional Review Board (IRB) was obtained prior to data collection. An *a priori* Power Analysis was performed using the G* Power 3.0 program (Faul, Lang, & Buchner, 2007). The power analysis was run for a mixed-model ANOVA with the parameters set to calculate sample size with a medium effect size (partial eta squared = .05). Results indicated that a total participant pool of 86 participants would be necessary for the primary analyses. Students were recruited through an Introduction to Psychology subject pool at a large, private, northeastern university. These students received one

and half hours of course credit for their participation. Additional students were recruited directly from psychology undergraduate courses with the permission of the classroom instructor and received course credit. A total of 229 participants were recruited for this study. Out of the 229 students, 88 participants identified as ESL students and 141 students were L1 peers. L1 peers were oversampled in order to match ESL students according to age, year in school, and gender. Participants were included in the ESL group if they self-reported speaking English as a Second language, earned an English proficiency level within two standard deviations of the standardized mean on an English language proficiency test, and did not endorse any psychiatric diagnosis such as ADHD, LD, anxiety, or depression. Individuals endorsing the presence of a psychiatric diagnosis were not included, because many of these diagnoses allow a student to receive extended time accommodations through the Office of Disability Services. This would have had the potential to skew the current data. Based on these inclusion criteria, out of the 88 participants with a self-report of English as a Second language, 9 participants were excluded for earning an English language proficiency below 70 and 4 participants were excluded from analysis for endorsing a psychiatric diagnosis (2 ADHD, 1 LD, 1 anxiety), leaving a total of 76 participants in the ESL group. Those 76 participants were then matched to an L1 peer based on age, gender, and year in school. No one in the peer group endorsed a psychiatric diagnosis. Demographic characteristics of participants are presented in Table 1.

Materials

Nelson-Denny Reading Test (NDRT) - Modified. This study utilized a modified version of the reading comprehension subtest of the NDRT (Brown, Fischo, & Hanna, 1993). Forms G and H were included. These forms measure reading rate, vocabulary and comprehension. For this study, only the reading comprehension subtest was administered. Each

form of the reading comprehension subtest is made up of seven reading passages selected from college level sources. Following each passage are 4-6 multiple-choice questions (total of 38 questions per form). Standard administration guidelines allow for 20 minutes to complete the subtest. The NDRT technical manual indicates that the reading comprehension subtest has alternative forms reliability of .81 and internal consistency of .88 for forms G and H. The current study combined Forms G and H to create a longer test in order to reduce the likelihood of ceiling effects. Several previous studies examining the validity of extended time accommodations utilized measures that did not take into account potential ceiling effects (Hill, 1984; Runyan, 1991). Additionally, the standard test time was reduced from 20 to 15 minutes. This ensured that few, if any, students completed all test items, even with extended time. Internal consistency on the combined form was assessed by Lewandowski, Cohen, and Lovett (2013) and it was found that the correlation between odd items and even items was .82, suggesting that the combined form maintains the reliability from the original NDRT subtests. This measure yielded three types of scores. Items attempted referred to the total number of questions that participants answered, whether right or wrong. Items correct referred to the number of questions the student answers correctly. Finally, percent correct (accuracy) was calculated by dividing the number correct by the number attempted.

Woodcock-Munoz Language Survey Revised (WMLS-R). This study employed a language proficiency measure to screen ESL students with at least a minimum level of proficiency for the study. The 25-minute screener of the Woodcock-Munoz Language Survey-Revised (WMLS-R; Woodcock & Munoz-Sandoval, 2011) was utilized for this study. The WMLS-R was normed on more than 8,800 individuals representing over 100 geographically diverse communities. The norming sample was stratified across census regions (Northeast,

Midwest, South, and West), community size, sex, race, ethnicity, and type of college/university. This measure demonstrates strong psychometric properties. In terms of reliability, the manual provides data indicating good internal consistency reliability (.81 - .93), split-half reliability (.76 - .97), and cluster reliability (.88 - .98). The test manual indicates evidence of concurrent validity based on moderate correlations with other measures that assess broad English ability, oral language, and reading-writing skills.

The screener consists of four sub-tests: Picture Vocabulary, Verbal Analogies, Letter-Word Identification, and Dictation. The Picture Vocabulary subtest required participants to provide the appropriate name for pictures of familiar and unfamiliar items that assess a broad range of school-related knowledge. The Verbal Analogies subtest consists of several oral analogies that participants were asked to complete. In the Letter-Word Identification subtest, the participants were instructed to read familiar and unfamiliar letters and words. Finally, for the Dictation subtest, participants were asked to respond in writing to questions that require a range of written skill. Overall, these four subtests combine to provide an overall rating of broad English ability.

The Broad English Ability cluster has a median reliability (internal consistency) of .98 for college-aged individuals. This cluster score can be reported as a standard score, which has a mean of 100 and a standard deviation of 15. It can also be reported as a Cognitive Academic Language Proficiency index (CALP) that has five levels for evaluating competence in English language abilities. A CALP level of 1 indicates a negligible amount of English proficiency. A CALP score of 2 indicates “very limited” English language proficiency and indicates that a student with this level of proficiency would find corresponding grade level academic work to be extremely difficult. Those earning a CALP score of 3 are described as having “limited”

language proficiency and the demands of learning in English are expected to be difficult. A CALP score of 4 is described as “fluent” and individuals at this level are expected to find academic learning in English to be manageable. Finally, CALP scores of 5 are described as “advanced” and it is expected these individuals will not have any learning difficulties associated with language proficiency in the classroom. Means and standard deviations for Broad Language Ability scores and CALP scores are reported in table 2.

Demographics and English Language Exposure Questionnaire. A demographics questionnaire was created to obtain participant information including age, year in school, ethnicity/race, GPA, psychiatric diagnosis, and current medications. This information was used to match participants and ensure that differences seen between the groups were not due to any demographic differences except for ESL status. Additionally, this questionnaire included several questions that document the number of hours per week a participant has been exposed to written English language materials. It also contained questions about other important components of second language acquisition such as age of acquisition and number of years of English language instruction. This questionnaire is a paper and pencil measure and took participants approximately 5-10 minutes to complete (see Appendix A).

Self-Evaluation of Performance on Timed Academic Reading (SEPTAR; Kleinmann & Lewandowski, 2005). The SEPTAR is designed as a self-report measure of students’ perceptions of reading speed and potential need for extended time on timed reading measures. The measure consists of nine Likert type questions where students were asked to respond to statements examining the above constructs on a scale of 1 (strongly disagree) to 5 (strongly agree). Examples of the statements on the SEPTAR include “I am a slow reader,” “I have trouble finishing timed tests,” and “I could do better on my exams if I had additional time.”

Psychometrically, the SEPTAR has good reliability ($\alpha = .89$; Kleinmann & Lewandowski, 2005). This measure took participants approximately 2 to 5 minutes to complete (see Appendix B). This measure was administered to use as a possible predictor of reading comprehension performance in the regression model.

Author Recognition Test (ART). To assess exposure to English language written material, this study utilized the Author Recognition Test (ART; Cunningham & Stanovich, 1997). Exposure to English language is an important factor to include due to the role it plays in SLA. This study explored the way English language exposure may impact outcome on an English proficiency measure as well as examining the role it might play in accessing items on a reading comprehension measure. The ART consists of a list of 42 names of popular English language authors. Respondents are instructed to place a check mark next to any author name with which they are familiar. They also are instructed that their score would be penalized for placing a checkmark next to a name that is not a real author. This measure took approximately five minutes for participants to complete. English language exposure, as determined by the ART total score, was entered into the regression model to determine the extent to which it predicts reading comprehension performance.

Procedure

Participants were administered measures in a classroom in small groups of no more than five individuals at a time. Administration groups consisted of a mix of typical students (peer group) and students reporting English as a second language (ESL group). Students began by reading and signing an informed consent form that covered the purpose of the study and what participation entails. All questions participants had about the study were answered prior to their participation. Following consent, participants were provided with a packet of testing materials in

a folder and one colored pencil. Prior to the start of the test, students were instructed that they would be receiving extra time to complete the reading comprehension exam. Additionally, they were asked to exert effort in a manner consistent with how they would for a reading comprehension subtest on a high stakes testing examination, such as the SAT. They had an opportunity to ask questions before the task began.

Participants began working on their test using a red pencil and received 15 minutes to read and answer questions (standard time). Once 15 minutes had elapsed, participants were asked to stop working and their red pencils were exchanged for blue pencils. The students received instructions to not begin working again until told to do so. They then received 7 minutes and 30 seconds additional time to continue working on the exam (50% extended time). After 22 minutes and 30 seconds had elapsed, the examiner stopped the students briefly, the blue pencils were collected, and green pencils were distributed to all participants. Students then continued the exam for the final session for an additional 7 minutes and 30 seconds (100% extended time). At the end of thirty minutes, participants were told to stop and asked to place the reading comprehension measure in the folder. Participants were then asked to complete a demographics form and the SEPTAR measure of perceived reading speed and performance. Next, a trained experimenter individually administered the four subtests of the Woodcock-Munoz Language Survey – Revised and the Author Recognition Test in a private testing location.

Results

Distribution of Data

The data were first inspected for outliers and/or data points that did not meet inclusion criteria. Based on these inclusion criteria, 9 participants were excluded for earning an English language proficiency score below 70 and 4 participants were excluded from analysis for endorsing a psychiatric diagnosis (2 ADHD, 1 LD, 1 anxiety), leaving a total of 76 participants in the ESL group. Following data inspection, distribution of the data was checked for normality, skew, kurtosis, and homogeneity of variance. The assumptions of repeated measures ANOVA are normal distribution, homogeneity of variance, and sphericity. As indicated above, examining the skew and kurtosis of the distribution assessed normality. The data for all three dependent variables (items attempted, items correct, percent correct) were normally distributed according to examination of Q/Q plots. Kurtosis and skew were calculated using SPSS version 22 for the dependent variables. All measures were less than 1, adding further evidence that the data was normally distributed. Homogeneity of variance was evaluated by Levene's Test for Equality of Variances. Across all time conditions, Levene's Test resulted in nonsignificant values indicating equal variance. Sphericity was calculated by utilizing Mauchly's Test of Sphericity. This test yielded a significant result, indicating that the condition of sphericity was not met. When sphericity is violated, *F* values will be positively biased. To correct for this, degrees of freedom were lowered in accordance with the Greenhouse-Geisser correction to make the *F*-ratio more conservative.

Descriptive Data

Descriptive data were analyzed to determine means and standard deviations for both groups on continuous variables (see Table 1). T-tests were utilized to check for group differences on the continuous variables of age and grade point average (GPA). There were no group differences for age $t(148) = 1.841, p = .068$, or for GPA $t(148) = -1.147, p = .253$.

Similarly, there were no group differences for sex distribution (see Table 1). An independent samples t-test was conducted to determine if the groups differed significantly on the mean Broad English Language Ability score as determined by Woodcock-Muñoz Language Survey – Revised (see Table 2). As expected, there were significant differences on the Broad English Language Ability standard score, $t(148) = -7.533, p < .001, d = -1.23$, such that the ESL group ($M = 93.89$) demonstrated significantly lower scores than the peer group ($M = 106.28$) in terms of English language proficiency. Additionally, a t-test was conducted to determine if groups differed significantly on the ART. Results revealed a significant difference, $t(148) = 4.291, p = .001, d = -.70$, with the ESL group ($M = 5.85$) reporting significantly fewer authors than the peer group ($M = 9.73$).

Research Question One

Analyses were conducted to address each research question noted earlier. First, the interaction hypothesis predicted that ESL students would perform less well than native English speaking peers on the reading comprehension variables (items attempted, items correct, and percent correct) under standard time conditions. A t-test was conducted on each variable to compare the ESL and the peer groups.

Items attempted. The two-group comparison on items attempted revealed a significant difference, $t(148) = -2.506, p = .013, d = -0.41$ such that the ESL group ($M = 24.31$) attempted significantly fewer items under standard time conditions than the peer group ($M = 27.59$; see Table 3).

Items correct. For the variable of items correct, t-test revealed a significant group difference, $t(148) = -3.05, p = .003, d = -.50$ with the peer group, $M = 24.53$ answering significantly more items correct under standard time conditions than the ESL group, $M = 20.64$.

Percent correct. With regard to percent correct, a significant difference at standard time between the ESL group and peer group was found, $t(148) = -2.878, p = .005, d = -.47$, with the peer group ($M = 88.21$) demonstrating a significantly more accurate performance than the ESL group ($M = 84.05$).

Primary Research Questions Two and Three

The next analyses addressed further predictions from the interaction hypothesis. Specifically, this hypothesis predicts an interaction between group (ESL v. peers) and time (standard time v. 50% v. 100%) on the dependent variables of items correct, items attempted, and percent correct, such that groups will differ at standard time but not at extended time. A mixed model ANOVA utilizing a 2 X 3 (Group [ESL, peer group] x Time conditions [15, 22.5, 30 minutes]) design was conducted.

Items attempted. The 2 group x 3 time condition ANOVA on items attempted was run in SPSS. Mauchly's Test of Sphericity yielded a significant result, indicating that the condition of sphericity was not met. To correct for this, degrees of freedom were lowered in accordance with the Greenhouse-Geisser correction to make the F -ratio more conservative. With the correction, there was a significant interaction, $F(1.34, 148) = 6.055, p = .008, \eta_p^2 = .039$, indicating the ESL group differed significantly from the peer group on items attempted across the time conditions (standard time, time and one half, double time). More specifically, a divergent interaction was found, opposing the convergent relationship that was initially hypothesized. The peer group benefitted significantly more than the ESL group.

Additional post-hoc tests were conducted to determine if the groups differed significantly on items attempted when comparing the peer group at standard time to the ESL group at time and one half and double time. Scheffe post-hoc comparisons of the groups indicated that the

peer group at time 1, $M = 27.59$ $SD = 7.48$, attempted significantly less items than the ESL group at time 2, $M = 38.05$, $SD = 10.94$, $p < .001$. The ESL group continued to significantly outperform the peer group at standard time when allotted double time, $M = 51.36$, $SD = 13.27$, $p = .002$.

Items correct. The 2 group x 3 time condition ANOVA on items correct was run in SPSS. Mauchly's Test of Sphericity, once again, yielded a significant result. The Greenhouse-Geisser correction was again utilized for a more conservative F -ratio. With the correction, there was a significant interaction, $F(1.37, 148) = 12.23$, $p = .000$, $\eta_p^2 = .076$, indicating the ESL group differed significantly from the peer group on items correct across the time conditions (standard time, time and one half, double time). Once again the interaction found was divergent and opposite of the expected convergent relationship suggested in the original hypotheses of the study. This is in contrast with the interaction hypothesis as the groups both significantly improved and the ESL group did not "catch up" to the peer group over the extended time conditions.

Although, not part of the original hypotheses, additional post-hoc tests were conducted to determine if the groups differed significantly on items correct when comparing the peer group at standard time to the ESL group at time and one half and double time. Scheffe post-hoc comparisons of the groups indicated that the peer group at time 1, $M = 24.53$ $SD = 7.45$, correctly answered significantly less items than the ESL group at time 2, $M = 32.28$, $SD = 10.14$, $p < .001$. The ESL group continued to significantly outperform the peer group at standard time when allotted double time, $M = 43.33$, $SD = 12.19$, $p < .001$.

Percent correct. As previously noted, there was not a gap under standard time conditions, so it was not expected an interaction effect would be found for percent correct. Regardless of this, 2 group x 3-time condition ANOVA on percent correct was conducted. With

the Greenhouse-Geisser correction, there was not a significant interaction, $F(1.37, 148) = .284, p = .668, \eta_p^2 = .002$, indicating the ESL group did not significantly differ from the peer group in terms of accuracy across the time conditions (standard time, time and one half, double time; see Table 3).

Exploratory Analyses

Additional analyses investigated potential effects of independent variables of interest (amount of English language exposure, Broad English Language Ability score, GPA, test-taking perceptions, or group) on reading comprehension performance. Multiple regression analysis was conducted after determining that variables were normally distributed and the relationships between variables were linear. The following independent variables were entered into the model: Broad English Language Ability score, SEPTAR score, ART score, and GPA. The dependent variable for the model was number of items attempted at standard time in order to examine test access for all students under standard time conditions.

As can be seen in Table 7, the independent variables of Broad English Language Ability score and ART Score both positively and significantly correlated with the dependent variable, indicating that those with higher scores on these variables tend to attempt more items on the reading comprehension measure. SEPTAR score was negatively, yet significantly correlated with items attempted under standard time conditions, indicating that students reporting a more positive perception of their test taking skills accessed a greater number of test items. GPA was not significantly correlated with items attempted.

Entering the variables of Broad English Language Ability Score, ART, and SEPTAR into the multiple regression model, the model produced $R^2 = .27, F(3, 146) = 18.15, p < .001$. Broad English Language Ability score produced significant positive regression weights, $B = .36$,

indicating participants with higher English language proficiency were expected to attempt more item. The SEPTAR score had a significant negative weight, $B = -.17$. This indicates that after accounting for Broad English Language Ability score, those students reporting a more positive perception of test taking skills accessed significantly more items under standard time conditions. The ART score did not significantly contribute to the multiple regression model (see Table 7).

The results from this exploratory analysis indicate that the regression model accounted for 27% of the variance in the outcome. Broad English Language Ability scores presented as the strongest variable playing a role in the model. The results of the multiple regression analyses along with group differences on the WMLS-R suggest that English language proficiency level is playing an imperative role in test access. The WMLS-R manual provides CALP scores that are generated from the Broad English Language ability scores. CALP scores can be viewed under a categorical lens. Specifically, it provides the reader with information regarding fluency level and predications related to academic success in the classroom. Scores of 2 and 3 are described as being earned by students with limited English language proficiency who will most likely experience difficulty keeping up with the English language demands in the classroom. CALP scores of 4 and 5 are described as fluent and suggest that individuals with these scores should be capable to hand the English language requirements in the classroom. In consideration of CALP differences and to further examine the impact of language proficiency on items attempted, the ESL group was split into two groups based on each student's CALP level. Those earning a CALP level of 2 or 3 (very limited to limited fluency) were placed in the low proficiency (LP) ESL group ($n = 34$) and those individuals earning a CALP level of 4 or 5 (fluency to advanced) were placed in the high proficiency (HP) ESL group ($n = 41$). The same analyses run to answer the original questions were then re-run as a three group model with the groups operationalized as

native English speaking peers, High Proficiency ESL (HPESL), and Low Proficiency ESL (LPESL). Based on this three-group model, the peer groups average CALP remained at 4.35. The high proficiency ESL group mean CALP level was 4.13 ($SD = .30$). The low proficiency ESL group earned a mean CALP level of 2.99 ($SD = .55$). A statistically significant difference does not exist between the English language proficiency of the high proficiency ESL group compared to the peer group; however, a statistically significant difference emerges between the low proficiency ESL group compared to both the high proficiency ESL group and the peer group. As would be expected with this information, no significant differences were found under standard time conditions between the high proficiency ESL group and the peer group. The low proficiency ESL group differed significantly from both the low proficiency ESL group and the peer group adding further support to the claim that English language proficiency plays an important role in terms of academic achievement.

Following the calculation of mean CALP scores across the groups, a one-way ANOVA was utilized to compare these three groups on the dependent variables. For the dependent variable of items attempted, a significant difference was found across these groups, $F(2, 147) = 9.48, p < .001$. Tukey HSD post-hoc comparisons of the three groups indicated that the peer group, $M = 27.59, SD = 7.48$, attempted significantly more items than the LP ESL group, $M = 20.88, SD = 7.47, p < .001, d = -.89$. The HP ESL group, $M = 27.15, SD = 8.37, p = .002, d = -0.78$, also attempted significantly more items than the LP ESL group. However, the peer group and the HP ESL group did not significantly differ, $p = .954$.

For items correct, the ANOVA revealed significant differences, $F(2,147) = 13.57, p < .001$. Tukey HSD was again utilized for post-hoc comparisons. The Tukey HSD demonstrated that the peer group, $M = 24.53, SD = 7.44$, correctly answered significantly more items than the

LP ESL group, $M = 16.76$, $SD = 7.11$ $p < .001$, $d = -1.07$. The HP ESL group, $M = 23.85$, $SD = 7.68$, also correctly answered significantly more items than the LP ESL group, $p < .001$, $d = -.96$. However, once again, the peer group and the HP ESL group did not differ significantly, $p = .885$.

When examining percent correct, the one-way ANOVA revealed a significant difference, $F(2,147) = 11.41$, $p < .001$. A Tukey HSD post-hoc comparison indicated that the peer group, $M = 88.21$, $SD = 7.31$, had significantly higher accuracy than the LP ESL group, $M = 80.04$, $SD = 12.12$, $p < .001$, $d = -.82$. The HP ESL group, $M = 87.37$, $SD = 6.76$, also was significantly more accurate than the LP ESL group, $p = .001$, $d = -.75$. However, for a third time, the peer group and the HP ESL group did not differ significantly, $p = .867$.

A 3 X 3 mixed model ANOVA (Group [LP ESL, HP ESL, peer group] x Time [15, 22.5, 30 minutes]) design was utilized to further examine the impact of English language proficiency as related to the interaction hypothesis. Results for items attempted revealed a significant interaction between group and time, $F(2.70, 148) = 3.984$, $p = .011$, $\eta_p^2 = .051$. An additional one-way ANOVA was conducted to assess for significant differences on items attempted when comparing the LP ESL group at time and one half, the HP ESL group at time and one half, and the peer group at standard time. These comparisons were made in order to mirror actual test conditions in which only a target group, in this case ESL students, receive an accommodation. There was no interaction; however, the main effect of the one-way ANOVA was significant, $F = 31.51$, $p < .001$ (see Table 7). Tukey HSD post-hoc comparisons of the three groups indicated that the peer group under standard time conditions, $M = 27.59$, $SD = 7.48$, attempted significantly less items than the LP ESL group at time and one half, $M = 34.00$, $SD = 10.71$. The peer group also attempted significantly less items at standard time than the HP ESL group at time and one

half, $M = 41.42$, $SD = 10.06$. Finally, the LP ESL at time and one half attempted significantly fewer items than the HP ESL group at time and one half.

A one-way ANOVA on items attempted was then run to compare the peer group at standard time to the LP ESL group and HP ESL at double time. Not surprisingly, there was a significant group difference, $F(2, 147) = 103.98$, $p < .001$. Tukey HSD post-hoc comparisons indicated the HP ESL group attempted significantly more items at double time, $M = 55.12$, $SD = 12.38$, than the peer group at standard time, $M = 27.59$, $SD = 7.48$. Additionally, the LP ESL group at double time, $M = 46.82$, $SD = 13.05$, attempted significantly more items than the peer group at standard time. Lastly, the HP ESL group accessed significantly more items than the LP ESL group comparing both groups at double time.

A 3 group x 3 time condition ANOVA on items correct was run. Results revealed a significant interaction, $F(2.75, 148) = 8.13$, $p = .000$, $\eta_p^2 = .100$. An additional one-way ANOVA was conducted to assess for significant differences on items attempted when comparing the LP ESL group at time and one half, the HP ESL group at time and one half, and the peer group at standard time. Again, significant differences were revealed, $F(2, 147) = 25.40$, $p < .001$. Tukey HSD post-hoc comparisons highlighted some interesting results. For example, when comparing the LP ESL group on items correct at time and one half, $M = 27.64$, $SD = 9.53$, to the peer group at standard time, $M = 24.53$, $SD = 7.45$, the difference was not statistically significant, $p = .18$. In contrast, the peer group at standard time correctly answered significantly fewer items correctly than the HP ESL group at time and one half, $M = 36.12$, $SD = 9.04$. The LP ESL group also answered significantly fewer items correct at time and one half when compared to the HP ESL group at time and one half. When comparing the LP ESL group and HP ESL group at double time to the peer group at standard time, a significant difference once again

emerged, $F(2, 147) = 86.26, p < .001$ (see Table 5). Tukey HSD post-hoc comparisons revealed that both the LP ESL group at double time, $M = 37.59, SD = 11.19$, and the HP ESL group at double time, $M = 48.10, SD = 10.96$, answered significantly more items correct than the peer group at standard time, $M = 24.53, SD = 7.45$, indicating a distinct advantage to ESL groups when given double time.

A 3 group x 3-time condition ANOVA on percent correct was conducted (see Table 5). Results remained consistent with the 2-group model on this dependent variable and no significant interaction was found for percent correct across the three groups, $F(2.73, 148) = .303, p = .804, \eta_p^2 = .004$ (see Table 6). Throughout the study, accuracy did not change as a result of times condition.

Finally, several comparisons were made to gain a greater understanding of the role of extended time in test access and outcomes. Specifically, a comparison was made to examine the number of items attempted at double time for both ESL groups (HP and LP) and standard time for the peer group. At double time, the LP ESL group accessed a mean of 46.82 items and the HP ESL group accessed a mean of 55.12 test items. The HP ESL group had accessed twice as many items as the typical group under standard test administration procedures and the LP ESL group accessed 19.32 more items than the typical peer group.

In order to gain a greater understanding of the compositions of the ESL groups, additional descriptive analyses were run. Specifically, the following variables were examined for both the LP ESL group and the HP ESL group: age of arrival to the United States, age began learning English, country of origin, number of languages spoken. The peer group was not included in the following analyses. A t-test was run to determine if group differences exist on the age at which participants reported beginning to learn English. The HP ESL group began

learning English as a second language a significantly younger age ($M = 6.56, SD = 4.36$) when compared to the LP ESL group ($M = 9.76, SD = 3.78$). For number of languages spoken, no group differences emerged between the LP ESL ($M = 2.50$) and the HP ESL group ($M = 2.53$), suggesting the reported number of languages spoken is not a differentiating factor between the HP ESL group and the LP ESL group. Additionally, no significant group differences between countries of origin emerged.

Discussion

Summary of Findings

This study produced several interesting findings in regards to ESL student performance on a timed reading comprehension task. Since the groups were matched on age, gender, and year in school, no differences in these areas emerged between the two groups. Interestingly, the groups also did not differ on GPA, despite the premise of the study being that ESL students may be at an academic disadvantage compared to L1 peers. It is important to recognize that most participants in this study were freshman in the second semester and had only accrued one semester of coursework to contribute to GPA. Additionally, GPA was collected in the form of self-report, which may not be accurate.

In terms of the main research hypotheses, the ESL students performed less well than L1 peers on all reading comprehension variables included in the study (items attempted, items correct, and percent correct) under standard time conditions. Additionally, access to a reading comprehension test was best predicted by language proficiency as measured by CALP score. Within the ESL group, there was much variation in regards to English language proficiency, leading me to split this group into Low Proficiency ESL and High Proficiency ESL subgroups. Group comparisons demonstrated significant differences between the LP ESL subgroup when compared to both the HP ESL group and L1 peers in terms of test access. The HP ESL subgroup

did not significantly differ from peers, suggesting that language proficiency may have been accounting for the differences seen in the original ESL group. With regard to extended time, all groups significantly improved their scores with the allotments of time and one half and double time. In fact, the L1 peer group not only improved their score with extended time, but they improved at a greater rate than the LP ESL group. The LP group surpassed the performance of peers under the 50% and 100% extended time conditions, suggesting that time and one half is more than sufficient to ensure equal access to the test in this sample.

Review of Hypotheses

The ESL group was first compared to L1 peers to determine if ESL students demonstrate a weaker performance than the L1 peers on a reading comprehension task under standard time conditions. As hypothesized, the ESL students, did in fact, perform significantly worse than L1 peers on the task. The ESL group attempted fewer items and answered significantly fewer items correctly than L1 peers under standard time conditions. This group difference is necessary in order to test the “interaction hypothesis,” which predicts that a target group (ESL) will initially perform below a control group at standard time but perform comparably with extended time.

The interaction hypothesis was tested across two time conditions, time and one-half and double time, on both items attempted and items correct. Results revealed a significant interaction between group and time for items attempted and items correct; however, the interaction was not in the direction predicted by the interaction hypothesis. Interestingly, both groups improved when given 50% and 100% extra time; however, the L1 peer group improved significantly more than the ESL group, contrary to the hypothesized direction.

Since a difference between the ESL group and L1 peer group on comprehension performance was found, variables that might predict this difference were examined. To no

surprise, English proficiency served as the strongest predictor of reading comprehension performance (for both number attempted and correct). The other factor that played an important role in the regression model was SEPTAR score, an indication of one's self-perception of test taking. More specifically, there was a negative relationship indicating that the better one perceived test taking abilities, they better they actually performed. This is in agreement of findings in similar studies (Lewandowski, Cohen, & Lovett, 2013). The participants in this study who reported higher levels of positive self-perception of test taking skills accessed more items on the test than those participants who reported less confidence in their self-perception of test taking skills.

Results from the regression analysis provided further evidence of the important role CALP score seems to play in regards to test access. This led to the decision to split the ESL group based on CALP score and rerun the analysis on the interaction hypothesis. What changed with this manipulation is that LP ESL group performance remained below that of L1 peers, whereas the HP ESL performance was comparable to L1 peers. With extended time all three groups improved performance, and the interaction again was in the opposite direction predicted, indicating that both the L1 peer group and HP ESL group improved performance with extended time more than the LP ESL group. Once again the interaction hypothesis was rejected, and again the extended time accommodation failed to demonstrate specificity. In other words, extended time failed to help only the target group, LP ESL participants.

Standard Time Findings.

In the original two-group model (ESL vs. L1 peers), the groups differed significantly by level of English language proficiency as measure by CALP score. The L1 peer group earned an average CALP score significantly higher than the ESL group. The L1 group also significantly

outperformed the ESL group under standard time conditions on the reading comprehension measure (items attempted, items correct, and accuracy). These data are consistent with previous studies that have found that individuals with lower levels of language proficiency perform less well on related academic tasks (Gradman & Hanania, 1991; Magno, 2010). This finding also corroborates research showing that that ESL students generally are not performing as well as peers on measures of academic achievement (Beal, Adams, & Cohen, 2010; Kim & Herman, 2008). Other studies have found ESL students to be at a distinct disadvantage on timed high stakes tests (Stricker, 2004; Abedi et. al., 2004). The group difference in this study confirms previous findings and suggests that this ESL sample likely shares characteristics with previously studied ESL groups, adding merit to the external validity of the current study.

Despite the group differences, which resulted in moderate effect sizes for both items attempted and items correct, the group effect seemed to obscure the variation in performance within the ESL group. As previously described, the ESL group seemed to consist of the “haves” and “have nots,” those who had reasonably good language proficiency and those still struggling to acquire language proficiency. In the primary and secondary setting ESL students with limited English ability that require additional support are referred to as English Language Learners. The LP ESL group appears to be comparable to ELL’s. The HP ESL students performed comparably to L1 peers, whereas the LP ESL group performed well below L1 peers and HPs, as noted by a large effect size. The take home message from this finding is that not all ESL students are the same in their English ability and therefore in their capacity to access timed verbal tests. Those with lower language proficiency (CALP score of 2-3) show deficits on a timed reading comprehension test and are at a clear disadvantage on such tests. This is in line with previous research that has found that language proficiency plays a vital role in academic assessment,

particularly on verbally loaded material such as reading comprehension (Abedi, 2002; Abedi & Gándara, 2006).

The designation of ESL status alone does not provide us with enough information to determine appropriateness of interventions and accommodations. The current findings suggest that students in the low proficiency ESL group need to be the focus for possible accommodations and/or interventions at the post-secondary level. Many post-secondary schools require ESL students to take the TOEFL exam prior to gaining admission. It can be assumed that the ESL students in this study earned scores above the necessary threshold to gain admittance to the university; however, this study demonstrated that many of these students do not possess the amount of English language proficiency necessary to access the same amount of test content as English proficient/fluent peers.

Extended Time Findings

Aside from the findings based on the analyses run under standard time conditions, interesting results regarding the interaction hypothesis were also found. Focusing on the three-group model, it was clear that all groups benefitted from extended time. Scores for each group consistently improved at each time extension (50% and 100%). This same finding has been reported on college students with learning disabilities (Lewandowski, Lovett, & Cohen, 2013) and ADHD (Miller, Lewandowski, & Antshel, 2013), as well as high school students with reading disabilities (Lewandowski, Lovett, & Rogers, 2009). It appears that students with good reading and test taking skills benefit more from extended time than students with deficiencies in those areas. This finding not only refutes the interaction hypothesis, it also violates the validity assumptions of test accommodations proposed by Phillips (1994), Zuriff (2000) and others. A test accommodation is supposed to specifically help those with impairment (from disability or

language weakness), and not significantly benefit those without impairment. However, most research on extended time has not found the accommodation of extended time to demonstrate specificity (see Lovett, 2010 and Sireci, Scarpati, & Li, 2005 for reviews).

Although extended time did not demonstrate specificity, and may not be considered by some to be a valid test accommodation, this study did examine what would happen if a target group (e.g., ESL) only received extended time. That is, how would ESL students receiving extended time compare to peers getting no extra time. These findings are most interesting and relevant when examining them across three groups. Since the HP ESL and L1 peer groups performed similarly, the contrast of interest is LP ESL versus L1 peers. Here we see that when given 50% extended time, the LPs outperform peers in both item access and total number of items correct. In other words, 50% extended time tended to overcompensate for their deficiencies. An amount of extended time between standard and 50% would have equated the groups in terms of item access. Interestingly, Lewandowski, Lovett, and Cohen (2013) obtained the same finding with a group of college students diagnosed with learning disabilities. In both studies, 25% extended time seemed sufficient, 50% was a bit too much, and 100% gave a large advantage to the target group. Lewandowski and colleagues have argued that 100% extended time does not seem to be an appropriate accommodation for college students who show little or no impairment. Based on the current study, a time accommodation might be suggested for only those with LP and conservatively no more than 50% extra time. Of course, the score results from these studies are derived from a particular test under specific conditions. These results cannot and should not be generalized to other test situations. Ideally, each exam (e.g., ACT, SAT, LSAT, MCAT, etc.) should be able to match an appropriate amount of extended time to a given level of impairment (i.e., slow reading speed). The reading comprehension measure

utilized for this study may not accurately reflect a real world high stakes exam or what the students are expected to do in the classroom. This measure does allow for a clear picture that when a test requires a significant amount of reading and reading comprehension, LP ESL students may be confronted with a time challenge.

An accommodation such as extended time may be a potential way to allow low proficiency ESL students to gain equal test access in a way that is fair and reasonable. Suggestions such as the one proposed of course come with limitations. While this study indicates that the current group would benefit from such an accommodation, other considerations must be taken into account. For example, it is unclear where to draw the line on CALP score in terms of who may be eligible to receive accommodations. Additionally, CALP is a fluid score that is most likely changing for ESL students as they are exposed to English language throughout the academic year. A student, who may enter the year with a CALP level indicative of a need for extended time, may improve proficiency and earn a CALP score suggestive of no need for extended time by the end of the academic year. As noted above, each test is different in terms of its content, task demands, and speededness. These factors will also affect the need for an accommodation and play a role in determining how much extra time is may be necessary. Not lost in this discussion is the issue of whether or not extended time is a valid accommodation. In some respects this is a philosophical or policy issue more than a scientific one. Researchers have strongly suggested that a valid accommodation must be specific, lead to the best assessment of the skill in question, and not alter the meaning of test scores or threaten the integrity of the test (see Phillips, 1994). The results of this study do not meet these validity assumptions, and join a growing body of similar research findings that question the validity of extended time as a test

accommodation (Lewandowski, Cohen, & Lovett, 2013; Lovett, 2010; Miller, Lewandowski, & Antshel, 2013).

Exploratory Findings

While the main analyses sought to specifically address Phillips assumptions of test accommodation validity as discussed above, exploratory analyses were also conducted to examine possible predictors of tests access on a reading comprehension measure. For an ESL sample, language proficiency appears to be one of the most important predictors for test access as measured by items attempted. More specifically, lower CALP scores predicted lower scores for items attempted on a reading comprehension measure. CALP is clearly important when it comes to test access. The factors that differentiate the low CALP group from the high CALP group could provide valuable information to educators. This study did not specifically address the factors that go into language proficiency; however, several variables were included that research has shown go into second language acquisition. These factors include English language exposure and age of arrival to an English-speaking nation. This study utilized the author recognition test to assess English language exposure. Not surprisingly, ESL students with low English language proficiency are able to identify significantly fewer famous English language authors than both high proficiency ESL students and typical peers. This finding indicates the LP ESL has significantly less exposure to English language reading materials than the HP group and L1 peers. Furthermore, this study found that students in the LP ESL group were exposed to English at a significantly later age than HP ESL participants. This finding supports previous literature that has found a direct link between English language exposure and reading comprehension performance (Gradman & Hanania, 1991; Magno, 2010). It is unclear whether the results from this study would apply to other types of exams requiring other skills (e.g.,

science, social studies, math, etc.). Future research might examine how low proficiency students perform on these other types of exams to determine if they are disadvantaged only on highly verbal tests or a wider array of tests.

It is clear that some ESL students are at a distinct disadvantage when it comes to taking timed tests compared to their native English-speaking peers. Results from this study demonstrate that students with low English language proficiency access fewer test items and answer fewer items correctly than peers. ESL students with low levels of English language proficiency are able to successfully earn TOEFL scores that allow for admittance into a university setting, yet these scores are not high enough to allow these students equal access to test content. This information allows us to begin to understand some of the difficulties individuals with low English proficiency may face in a university setting. More specifically, we know that universities wishing to address these concerns might reconsider their policies related to English language proficiency of admitted students.

Universities may wish to reexamine English proficiency cut-offs for students to gain admittance. Alternatively, universities could enhance the language assessment procedures such that they are better able to determine language deficiencies. Once individuals with language deficiencies are appropriately identified, the university would be in a better position to provide interventions or accommodations to those with a certain deficiency. The process, however, should not end there. The university would need to monitor student language proficiency over time, as this tends to improve with experience. Progress monitoring may help to determine if a student no longer requires an intervention or accommodation. If universities wish to continue recruiting international students with limited English ability, it might then fall onto the university to provide appropriate accommodations or interventions for this population as long as they need

them. This study determined that 50% extended time appears to be too much for LP ESL students and standard time conditions are not enough. While native English-speaking peers also benefit from the use of extended time, violating the principle of specificity, universities may still wish to grant ESL students with low English language proficiency access to extended time allotments equalize test access. Of note, is that extended time does not appear to increase accuracy of responding, it simply allows for access to test items that without it an examinee may not have the chance to answer. This is why extended time alone does not solve all concerns and other factors discussed throughout this document need to be considered.

Limitations

As with all studies, the findings of this study are tempered by research limitations. Any research on the ESL population is complicated by the fact that a sample from one university is unlikely to be representative of the population, particularly since the ESL population in the United States is constantly changing. This study was conducted at a large private, competitive university in the northeast. Accordingly, the students included in this study are likely not a representative sample of all ESL students in the U.S. Students pursue academics in a variety of postsecondary settings including community colleges, public universities and online coursework. Consequently, the ESL sample in this study is not likely to match one from another study, nor would it be easy to replicate. Obviously, this phenomenon limits the external validity of such research. Adding even more complexity is the fact that ESL status alone does not denote a certain level of English language proficiency, nor does it account for variation in ethnicity, culture, or language system. The ESL population is quite heterogeneous. It is constantly changing and varies by geographic location. Thus, it is a difficult group to describe or represent.

An additional threat to the validity of this study is the type and length of the reading comprehension measure. The measure used in this study was a brief thirty-minute reading comprehension measure. A limitation may have been that the measure did not require students to maintain vigilance for a lengthy enough period of time. Frequently, high stakes tests require students to sustain focus for several hours. The demands of this research study may not have been intense enough to bring out performance differences between all of the groups. Perhaps thirty minutes was not long enough to allow for differences in reading speed to significantly impact test outcomes.

Additionally, students were told to act as though this was a high stakes examination; however, it is difficult to actually achieve an analogue to a high stakes environment. Participants received course credit regardless of their effort throughout the test. While it appeared that most students performed reasonably well based on few outlying scores, participants were not given any measures to assess the level of effort they were putting into taking the test. For example, students were not asked to rate their level of motivation to perform their best on the reading comprehension measure.

While there are threats to both the internal and external validity of the study, some steps were taken in the development and implementation of the study to minimize threats. Students were administered the comprehension measure in small groups proctored by a research assistant to make sure participants were engaged in the task for 30 minutes. Language proficiency measures and questionnaires were administered individually in accordance with standardized administration procedures to increase reliability of the language measurement. It is likely that the assessment of language proficiency in this study is more reliable than TOEFL scores collected in large group settings in other countries. The fact that comprehension performance

varied as a function of language proficiency, which in turn was related to English exposure, and that study findings are consistent with previous research, add confidence that the findings of this study do reflect the test taking dilemma for some ESL students.

Future Research

The results of this study leave me interested in learning more about LP ESL students. For example, what are the factors that delineate LP ESL students from HP ESL students other than language proficiency? Development of a better predictive model may be useful for universities when they are making decisions about language proficiency cut-offs. With the development of this type of model, the university may be in a position to develop more targeted and appropriate interventions and accommodations. This study only examined one test accommodation, extended time. Within extended time alone there is still much to learn. Future research could take a closer look at extended time and begin to tackle questions such as under what conditions should extended time be considered and what amount of time is sufficient for a given test and given level of English language proficiency? As proficiency is constantly changing, it would also be useful to gain insight into progress monitoring of English language development at the postsecondary level, and how to fade test accommodations as proficiency improves.

Extended time is only one type of test accommodation. Other accommodations, such as use of a dictionary, tests read aloud, and use of a computer may be worth examining in the postsecondary ESL population. Many of these accommodations have already been researched in the K-12 setting with ESL students. There is very little research on postsecondary ESL students and their use of a variety of test accommodations. Use of an English dictionary would be a natural accommodation to study.

Another area of interest is the possibility of different performances and accommodation responses from different types of ESL students. For example, some schools have a high percentage of Chinese students, whereas other schools may have primarily Spanish speaking students. There might be differences in proficiency, ease of learning English, and need for accommodations between various groups of ESL students.

An area I would pursue in future research pertains to students with very low language proficiency (CALP level 1). I studied a college population of students who were at least screened for some language proficiency. However, in K-12 classrooms across this country there are students who barely speak any English. What interventions and test accommodations can be used to assist these students? How proficient must one be to take advantage of certain accommodations? Can we preserve the integrity and validity of our tests and still test the academic skills of these students? Clearly there are more research questions to tackle in this relatively untapped area.

Conclusion

Unlike students with disabilities who are allotted accommodations according to federal regulations, no such laws exist to protect students seeking an educational opportunity in a nonnative language. The laws that protect students with disabilities help to ensure that these students are granted the same level of access to academic life, including tests, as their peers without disabilities. Should the same protection be afforded to students that universities are actively recruiting who do not speak English as a native language? This study does not directly answer this question, but it does begin to provide some insight into the ESL population at the college level and what accommodations may be appropriate to help certain students access the same amount of academic content as native English speaking peers.

Based on findings of this study, it is clear that language proficiency is variable across and within individuals and it matters in regards to test access. This study found students ranged from very low to very high levels of English proficiency, despite all students earning TOEFL scores high enough to gain admittance to the university. Within this sample, two subgroups of students emerged: low proficiency and high proficiency. The high group appears to not be at a disadvantage when it comes to a timed reading comprehension measure; however, low proficiency peers are struggling to keep up with the language demands on this type of measure. Universities are not currently differentiating the groups and formal accommodations are not currently being offered.

Low language proficiency creates a disadvantage on speeded verbal tasks. Students with low English language proficiency have restricted access to the exam. This study found that 50% and 100% extended time overcompensates for the disadvantage. Extra time in allotments less than 50% may make sense for students similar to the low proficiency group in this study and on a similar test of reading comprehension. Unlike students with disabilities who are allotted accommodations according to federal regulations, no such laws exist to protect students seeking an educational opportunity in a nonnative language. Laws that protect students with disabilities are in place to help protect students who are at high risk for experiencing difficulties. Some ESL students fall into a similar high-risk situation. ESL students are most often thousands of miles away from home, experiencing a new culture, and the language demands may be far beyond their capability. All of these factors may go into explaining why ESL students in the post-secondary setting have a higher rate of attrition (Andrade, 2006; Behroozi-Bagherpour, 2010; Johnson, 2008). Universities clearly need to provide additional support.

As a result of these important findings, it seems that universities are left with a few basic options if they wish to support all students. One option would be to increase the standards for English language proficiency criteria for students wishing to gain admittance to the university. Admitting only HP ESLs would seem to solve the problem. For LP ESLs, universities might consider English training programs that raise language proficiency to more functional levels, perhaps prior to taking English-based courses. Another option would be to allot extended time accommodations for those individuals whose language weakness hampers equal access to a test. Perhaps, universities may wish to utilize universal designs for all tests so that students have equal access. Tests and assessments created under a universal design model allow for the largest amount of test takers to have fair access to the test (Thompson, Johnstone, & Thurlow, 2002). Universal design in this case would have to take into account that individuals take tests at various rates, and accordingly the time component would be removed. One thing that should not be an option is to admit LP ESL students and ignore their plight. That seems to be irresponsible, and potentially harmful, to students seeking “higher” education.

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Table 1

Demographic Characteristics of Participants (n = 150)

Characteristics	Typical group		ESL		Total	
	%	(n)	%	(n)	%	(n)
Sex						
Female	54.7	(41)	54.7	(41)	54.7	(82)
Male	45.3	(34)	45.3	(34)	45.3	(68)
Ethnicity/ethnicity/race						
White	62.7	(47)	17.3	(13)	40.0	(60)
Hispanic	10.7	(8)	19.9	(15)	15.4	(23)
Black/African American	14.7	(11)	1.3	(1)	8.0	(12)
Asian/Pacific Islander	9.3	(7)	53.3	(40)	31.4	(47)
Other and Multiracial	1.3	(1)	8.0	(6)	4.7	(7)
Year in School						
Freshman	52.0	(39)	52.0	(39)	52.0	(78)
Sophomore	20.0	(15)	20.0	(15)	20.0	(30)
Junior	13.3	(10)	14.7	(11)	14.0	(21)
Senior	13.3	(10)	13.3	(10)	13.3	(20)
Other	1.30	(1)	0	(0)	0.7	(1)

Table 2

Woodcock-Muñoz Language Survey – Revised edition (n = 150)

Score Domain	Typical group		ESL	
	<i>M</i>	(<i>SD</i>)	<i>M</i>	(<i>SD</i>)
Broad English Language Ability	106.28	(8.25)	93.89	(11.61)
CALP	4.35	(0.44)	3.61	(0.72)

Table 3

Descriptive Statistics

Conditions	Typical group		ESL	
	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>
Standard Time (15 minutes)				
Items Correct	24.53	(7.45)	20.64	(8.19)
Items Attempted	27.59	(7.48)	24.31	(8.52)
% Accuracy (correct/attempted)	88.21	(7.31)	84.05	(10.19)
Time and a half (22.5 minutes)				
Items Correct	38.49	(10.05)	32.28	(10.14)
Items Attempted	43.05	(10.16)	38.05	(10.94)
% Accuracy (correct/attempted)	88.97	(5.64)	84.20	(8.38)
Double Time (30 minutes)				
Items Correct	51.61	(13.28)	43.33	(12.19)
Items Attempted	57.17	(10.68)	51.36	(13.27)
% Accuracy (correct/attempted)	88.51	(5.94)	84.08	(8.46)

Table 4

Summary of Repeated Measures Analysis of Variance for 2 Group and 3 Time Conditions

Source	<i>df</i>	<i>MSE</i>	<i>F</i>	<i>p</i>	η_p^2
Time					
Items Correct	1.39	33555.27	1573.44.000	.914	
Items Attempted	1.36	44202.09	2903.72 .000	.952	
Percent Correct	1.39	11.37	.647	.471	.004
Group X Time					
Items Correct	1.39	260.86	12.23	.000	.076
Items Attempted	1.36	92.17	6.06	.008	.039
Percent Correct	1.39	4.99	.284	.671	.002
Between-Subjects Error					
Items Correct	148	296.12			
Items Attempted	148	305.97			
Percent Correct	148	158.61			
Within-Subjects Error					
Items Correct	204.93	21.33			
Items Attempted	201.47	15.22			
Percent Correct	205.47	17.58			

Table 5

Descriptive Statistics

Conditions	Typical group	HP ESL	LP ESL
	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)	<i>M</i> (<i>SD</i>)
<hr/>			
Standard Time (15 minutes)			
Items Correct	24.53 (7.45)	23.85 (7.68)	16.76 (7.11)
Items Attempted	27.59 (7.48)	27.15 (8.37)	20.88 (7.47)
% Accuracy (correct/attempted)	88.21 (7.31)	87.37 (6.76)	80.04 (12.12)
Time and a half (22.5 minutes)			
Items Correct	38.49 (10.05)	36.12 (9.04)	27.64 (9.53)
Items Attempted	43.05 (10.16)	41.42 (10.06)	34.00 (10.70)
% Accuracy (correct/attempted)	88.97 (5.64)	87.19 (6.39)	80.59 (9.13)
Double Time (30 minutes)			
Items Correct	51.61 (13.28)	48.10 (10.96)	37.59 (11.19)
Items Attempted	57.17 (11.22)	55.12 (12.38)	46.82 (13.05)
% Accuracy (correct/attempted)	88.51 (5.94)	87.47 (6.60)	80.00 (8.73)

Table 6

Summary of Repeated Measures Analysis of Variance for 3 Group and 3 Time Conditions

Source	<i>df</i>	<i>MSE</i>	<i>F</i>	<i>p</i>	η_p^2
Time					
Items Correct	1.37	28163.03	1337.97	<.001	.901
Items Attempted	1.35	38504.57	2521.50	<.001	.945
Percent Correct	1.37	7.21	.401	.591	.003
Group X Time					
Items Correct	2.75	171.12	8.13	<.001	.100
Items Attempted	2.70	60.84	3.98	.011	.051
Percent Correct	2.732	5.45	.303	.804	.004
Between-Subjects Error					
Items Correct	202.40	21.05			
Items Attempted	198.30	15.27			
Percent Correct	200.78	17.95			
Within-Subjects Error					
Items Correct	147	23.45			
Items Attempted	147	17.45			
Percent Correct	147	19.18			

Table 7

Correlation Matrix

	Items Attempted	Broad English Language Ability Score	SEPTAR	ART	GPA
Items Attempted	--				
Broad English Language Ability Score	.49**	--			
SEPTAR	-.32**	-.34**	--		
ART	.37**	.61**	-.23*	--	
GPA	.08	-.02	-.16	-.18*	--

Note. * $p < .05$, ** $p < .001$, $n = 150$ for Items Attempted, Broad English Language Ability Score, SEPTAR, and ART. $n = 147$ for GPA.

Table 8

Regression Table

	B	SE B	β
Broad English Language Ability Score	.25**	.06**	.36**
SEPTAR	-.24*	.11*	-.17*
GPA	.15	.13	.11

Note. * $p < .05$, ** $p < .001$

Figure 1. Items attempted across 3 groups and 3 time conditions

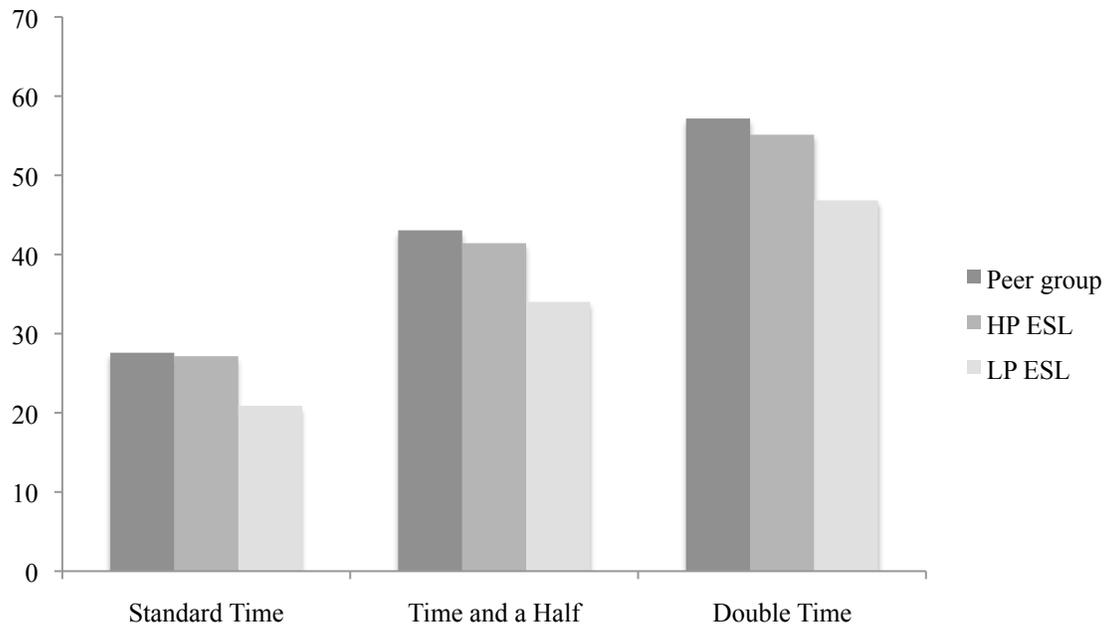
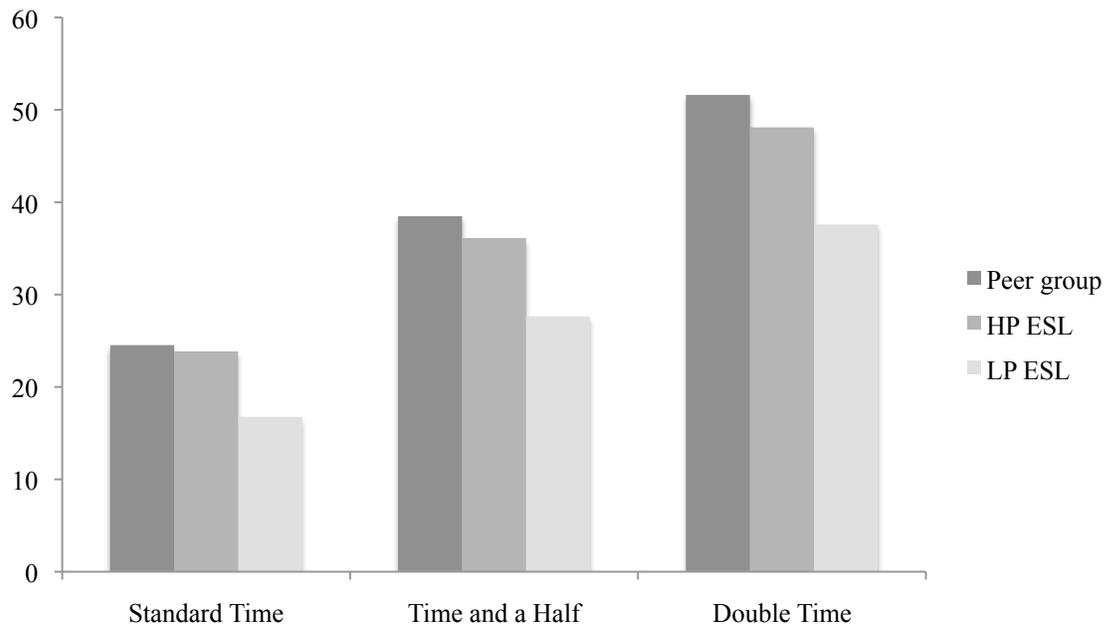


Figure 2. Items correct across 3 groups and 3 time conditions



Appendix A
Demographics Form

Please answer the following questions as they apply to you:

Sex: ____ Male ____ Female **Age:** _____

If you wish to identify yourself as a member of an ethnic or racial group please indicate:

- American Indian/Alaskan Native
- Asian American
- Black/African American
- Hispanic/Latino
- Mexican American
- Native Hawaiian/Pacific Islander
- Puerto Rican
- White/Caucasian
- Other ethnicity/races/ethnicities, including multiracial

Native Language: ____ English ____ Other (please specify): _____

Year at Syracuse University:

____ Freshman ____ Sophomore
____ Junior ____ Senior ____ Other (please specify): _____

Current GPA (High School GPA if SU GPA is not available): _____

Combined SAT Score: _____

Please check if you have been professionally diagnosed with any of the following disorders:

- Dyslexia or a learning disability in reading
- Dyscalculia or a learning disability in mathematics
- Attention Deficit/Hyperactivity Disorder
- Depression
- Anxiety
- Traumatic Brain Injury
- Other (please specify):

Please list any medications you are currently taking: _____

Are you currently receiving accommodations through the Syracuse University Office of Disability Services?

_____ Yes _____ No

If yes, please briefly list the accommodations you typically receive: _____

Appendix B

Self-Evaluation of Performance on Timed Academic Reading, Revised Version (SEPTAR)

Please rate the following items using the five-point scale described below:

#	Item	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I am a slow reader.	1	2	3	4	5
2	I have trouble finishing timed tests.	1	2	3	4	5
3	My reading speed negatively affects my ability to do well on exams.	1	2	3	4	5
4	I finish exams early.	1	2	3	4	5
5	I am able to pace myself appropriately on timed exams.	1	2	3	4	5
6	I could do better on my exams if I had extra time.	1	2	3	4	5
7	I need to read things over and over again to be able to understand them.	1	2	3	4	5
8	I would do better on exams if I were faster.	1	2	3	4	5
9	My reading speed is adequate for exams.	1	2	3	4	5

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EDUCATION

Doctor of Philosophy, School Psychology, *Syracuse University* (APA and NASP Full Accreditation), Syracuse, NY, August 2009 – August 2014

Master of Science, Psychology, *Syracuse University*, Syracuse, NY, May 2012.

Bachelor of Arts, *Vanderbilt University*, Nashville, TN, May 2006

Major(s): Psychology, Spanish

TEACHING EXPERIENCE

Foundations of Human Behavior, *Primary Instructor*, Syracuse University
Summer Session 1 (May 2012 – July 2012)

- Lectured four times a week and instructed 30 students in six-week undergraduate summer session course.
- Constructed all lectures, tests, and quizzes.
- Created interactive activities and class discussion.
- Supervisor: Lawrence Lewandowski, Ph.D.

Athletic Department, *Tutor*, Syracuse University
May 2011 – May 2012.

- Provided tutoring for undergraduate athletes in psychology and Spanish.
- Helped students identify methods of studying that increased their retention, trained study skills, and provided feedback to athletic coaches.
- Supervisor: Judy Kopp

Foundations of Human Behavior, *Teaching Assistant*, Syracuse University
May 2011 – June 2011.

- Primary responsibilities included creating and delivering independent lectures on psychological disorders and treatment for a summer session course.
- Held weekly office hours and graded exams.
- Supervisor: Lawrence Lewandowski, Ph.D.

Foundations of Human Behavior, Teaching Assistant, Syracuse University
August 2009 – May 2010.

- Lectured and facilitated discussions for five recitation sections per week, each with approximately 20 students.
- Created lectures, provided interactive group activities, and led discussions. Graded quizzes and papers and maintained students' grades.
- Held weekly office hours and proctored exams.
- Supervisor: Tibor Palfai, Ph.D.

CLINICAL TRAINING AND EXPERIENCE

Virginia Beach City Public School District, Pediatric Neuropsychology Track (APA accredited predoctoral internship site)

Doctoral Intern in Professional Psychology, Virginia Beach, VA. July 2013 – June 2014.

- Conducted comprehensive neuropsychology evaluations for students with neurological conditions including neurocognitive late effects, neurofibromatosis, epilepsy, and traumatic brain injury.
- Observed students in a school setting, interviewed parents, and administered the ADOS-2 as part of the Autism Consultation Team.
- Assessed preschool-aged children for special education eligibility as part of a multidisciplinary team through the preschool assessment center.
- Functioned as the school psychologist for an elementary school building by serving on the special education committee and providing assessment, intervention, counseling, and consultation services.
- Supervisor(s): Clifford Hatt, Ed.D., ABPP (Licensed Psychologist), Nancy Como-Lesko, Ph.D. (Licensed Psychologist), and Ellen Kveton, Psy.D. (Licensed Psychologist)

Homer Central School District

Psychology Extern, Homer, NY. September 2012 – June 2013.

- Primary responsibilities included administering psychoeducational assessments, generating reports, providing crisis-counseling and counseling services, consulting with teachers and administrators, and designing behavioral and academic interventions.
- Supervisor: Seth Aldrich, PhD (Licensed Psychologist)

Gebbie Speech, Language, and Hearing Clinic

Student Clinician, Syracuse University, Syracuse, NY. September 2012 – June 2013.

- Conduct cognitive assessments with preschool aged children to rule out cognitive impairment as a factor for difficulties with speech and language.
- Responsible for report writing and conducting feedback sessions with parents.
- Supervisors: Larry Lewandowski, Ph.D. (Licensed Psychologist), Megan Leece, M.A., CCC-SLP

Office of Disability Services Adult Psychoeducational Clinic

Student Clinician, Syracuse University, Syracuse, NY. August 2011 – August 2012.

- Interviewed university students who have been previously diagnosed with a learning disability and required updated documentation or who suspected a learning disability.
- Conducted comprehensive psychoeducational evaluations with university students.
- Responsible for report writing and conducting feedback sessions with students.
- Supervisor: Karen Grella, M.A., C.A.S.

SUNY Upstate Medical University Center for Children's Cancer and Blood Disorders

Student Clinician, Syracuse, NY, August 2010 – August 2011.

- Provided neuropsychological assessments for children exposed to radiation and central nervous system chemotherapy to screen for or monitor cognitive late effects.
- Coordinated educational supports for patients of the Center for Children's Cancer and Blood Disorders.
- Responsible for school re-entry presentations for teachers and administrators of schools with children with cancer or blood disorders.
- Consulted with medical staff, families, and schools.
- Supervisor: Brian Rieger, Ph.D. (Licensed Psychologist)

SUNY Upstate Concussion Management Clinic

Student Clinician and Research Assistant, Syracuse, NY, August 2010 – August 2011.

- Observed concussion management office visits and administered the ImPACT.
- Obtained IRB approval, recruited participants, and ran participants through a concussion outcome protocol consisting of the ImPACT, MSVT, TRAILS, and an EEG paradigm.
- Analyzed data and contributed to a publication generated from a research project examining concussion outcome in children.
- Supervisor: Brian Rieger, Ph.D. (Licensed Psychologist)

SUNY Upstate Medical University Department of Psychiatry

Social Skills Group Assistant, Syracuse, NY, September 2009 – August 2012.

- Assisted with a ten-week, group-based intervention designed to improve social functioning in children experiencing social difficulties (e.g., children with autism spectrum disorders, ADHD, and anxiety).
- Primary duties included direct instruction and modeling of appropriate communication and social problem-solving skills, facilitation of dyad-based skill practice, and conducting of parent informational and support sessions.
- Supervisor: Kevin Antshel, Ph.D. (Licensed Psychologist)

Panama School Psychology Summer Immersion Program, Graduate Student Participant, Boquete, Panama. July 2010 – August 2010.

- Consulted with school personnel to aid in the transition to full inclusion for students belonging to the native tribe, the Ngobe.
 - Supervisor: Carlos Dejud, Ph.D.
-

PRACTICUM EXPERIENCE

Direct Academic Assessment Practicum, *Homer Intermediate School*, Homer, NY
January 2013 – June 2013.

- Administered curriculum based academic assessments, implemented academic interventions, progress monitored data, and generated academic reports.
- Supervisor: Seth Aldrich, Ph.D. (Licensed Psychologist)

Consultation Practicum, *Salem Hyde Elementary School*, Syracuse, NY.
January 2012 – May 2012.

- Provided consultation services to elementary school teachers working with students in kindergarten through fifth grade to provide guidance and intervention protocols for students with behavioral and academic concerns.
- Supervisor: Brian Martens, Ph.D.

Practicum in Psychoeducational Evaluation and Planning for Exceptional Children, *Syracuse University*, Syracuse, NY
July 2011 – August 2011.

- As part of a multidisciplinary evaluation team, conducted comprehensive psychoeducational evaluations for two students with learning, behavioral, and emotional difficulties.
- Completed home and school visits to interview parents and teachers.
- Created and implemented trial teaching lessons to evaluate the effectiveness of recommended interventions.
- Prepared comprehensive reports including extensive recommendations to address individual strengths and weaknesses at home and school.
- Supervisor: Michelle Storie, Ph.D.

Behavior Therapy Practicum, *Dr. Weeks Elementary School*, Syracuse, NY
January 2011 – May 2011.

- Provided behavior therapy services for two cases involving behavioral difficulties in school-age children.
- Utilized both indirect and direct assessment methods including teacher interviews, functional behavior assessments, and brief experimental analyses.
- Developed behavior plans to address the target behavior, provided teacher training on the interventions, and monitored integrity of the intervention.

- Presented outcome data to teachers and administrators in addition to recommendations for continuation of the interventions.
- Supervisor: Brian Martens, Ph.D.

RESEARCH EXPERIENCE

English as a Second Language Post-Secondary Students and Extended Time: Is there a need for accommodations? (Dissertation Project).

Primary Investigator, Syracuse University, Syracuse, NY. January 2013 – January 2104.

- Designed a between-group comparison study to investigate the role of extended time on the reading comprehension performance of post-secondary students ESL Students.
- Faculty Advisor: Lawrence Lewandowski, Ph.D.

Effects of Extended Time for College Students with and without ADHD (Thesis Project),

Primary Investigator, Syracuse University, Syracuse, NY. December 2010 – December 2011.

- Prepared a between-group comparison study to investigate the role of extended time on the reading comprehension performance of college students with and without ADHD.
- Faculty Advisor: Lawrence Lewandowski, Ph.D.

Formative Assessment and Instrumentation Procedure for Reading (FAIP-R), *Research*

Assistant, Syracuse University, Syracuse, NY. October 2010 – May 2012.

- Assisted with a US Department of Education, IES-funded (\$1,600,000) project to develop, evaluate, and improve formative assessment procedures for reading.
- Conducted field-testing of students in grades 1 – 5 across sites using project designed curriculum-based reading passages.
- Principal Investigators: Theodore Christ, Ph.D., Scott Ardoin, Ph.D., and Tanya Eckert, Ph.D.

Prevalence and Duration of Post-Concussion Symptoms in Children After Mild Traumatic

Brain Injury, *Research Assistant*, SUNY Upstate Medical University, Syracuse, NY. September 2010 – September 2012.

- Examined the symptoms experienced by children, ages 8-17, with a mild traumatic brain injury (concussion) for one year post-injury to explore the duration and prevalence of common post-concussion symptoms.
- Responsible for data analysis and presenting results.
- Principal Investigators: Brian Rieger, Ph.D. and Lawrence Lewandowski, Ph.D.

Social Competence and Physiological Stress Outcomes, *Research Assistant*, Syracuse University, Syracuse, NY. March 2010 – December 2010.

- Examined the link between individuals' social competence and physiological responses to stressful situations.
- Coded adolescent and adult participants' responses to an interview process designed to elicit discussion about chronically stressful experiences.
- Received training in social competence interview procedures.
- Principal Investigator: Craig Ewart, Ph.D.

Olin Neuropsychiatry Research Center, *Research Assistant*, Yale University/Institute of Living, Hartford, CT. September 2006 – July 2009.

- Employed as a research assistant for several NIMH R01 grant funded research studies investigating neural deficits in ADHD, Conduct Disorder, Oppositional Defiant Disorder, Autism Spectrum Disorders, and Schizophrenia.
- Primary duties included administering neurocognitive assessments including WAIS-IV, WISC-IV and WASI, performing clinical interviews including SCID, K-SADS-PL, ADI-R and ADOS, operating the MRI for fMRI data collection and structural scans, recruiting participants for studies, and analyzing fMRI data using SPM2 and behavioral data using SPSS.
- Assisted with grant writing, manuscript submission, and presentations at national conferences.
- Principal Investigators: Godfrey Pearlson, M.D. Michael Stevens, Ph.D., and Michal Assaf Ph.D.

Walker Research Laboratory, *Research Assistant*, Vanderbilt University, Nashville, TN. September 2005 – May 2006.

- Primary responsibilities included developing a recruitment database, consenting participants, making recruitment calls, and performing data entries in Excel and SPSS for a study investigating recurrent abdominal pain in children.
- Principal Investigator: Lynn Walker, Ph.D.

PUBLICATIONS

Miller, L.A., Lewandowski, L.J., and Antshel, K. (2013). Effects of Extended Time for College Students with and Without ADHD. *Journal of Attention Disorders*, DOI: 10.1177/1087054713483308

Rieger, B. P., Lewandowski, L. J., Callahan, J., Spenceley, L., Truckenmiller, A., Gathje, R., & **Miller, L. A.** (2013). A Prospective Study of Symptoms and Neurocognitive Outcomes in Youth with Concussion vs. Orthopedic Injuries. *Brain Injury*. 27(2), 169 – 178.

- Antshel, K.M., Polacek, C., McMahon, M., Dygert, K., Spenceley, L., Dygert, L., **Miller, L.**, & Faisal, F. (2011). Comorbid ADHD and anxiety affect social skills group intervention treatment efficacy in children with autism spectrum disorders. *Journal of Developmental & Behavioral Pediatrics*, 32, 439-446.
- Lovett, B., Lewandowski, L., **Miller, L.** (2010). Auditory Processing Disorder and ADHD: What's the Relationship? *The ADHD Report*, 18(3), 7-11.
- Assaf, M., Jagannathan, K., Calhoun, V., **Miller, L.**, Stevens, M., Sahl, R., O'Boyle, J., Schultz, R., Pearlson, G. (2010). Impaired Functional Connectivity of Default Mode Sub-Networks in Autism Spectrum Disorder Patients. *Neuroimage*, 53(1), 247-256.
-

PRESENTATIONS

- Miller, L.A.**, Lewandowski, L., Kim, Y., Gardineer, S., Spielberger, S., Hier, B., & Malandrino, R. (2014, February). *Extended Time and English Language Proficiency for Post-Secondary Students*. Poster presented at the National Association of School Psychologists annual conference, Washington, D.C.
- Hier, B. O., Eckert, T. L., **Miller, L. A.**, Morley, A. J., Spielberger, S. L., & Malandrino, R. D. (2014, February). *Programming generality into a performance feedback writing intervention*. Poster presented at the National Association of School Psychologists annual conference, Washington, D.C.
- Miller, L.A.**, Hendricks, K., Kim, Y., & Lewandowski, L. (2013, February). Effects of Extended Time for College English Language Learners. Poster presentation at the 45th Annual Convention of the National Association of School Psychologists, Seattle, WA.
- Miller, L.A.**, Kim, Y., & Lewandowski, L. (2012, February). Effects of Extended Time for College Students with and without ADHD. Poster presentation at the 44th Annual Convention of the National Association of School Psychologists, Philadelphia, PA.
- Hier, B. O., Eckert, T. L., Koenig, E. A., Magnuson, J., Hendricks, K., **Miller, L. A.**, Spenceley, L. M., & Lambert, T. (2012, February). Evaluating students' ability to generalize and maintain writing intervention gains. Poster presentation at the 44th Annual Convention of the National Association of School Psychologists, Philadelphia, PA.
- Spenceley, L. M., & **Miller, L.** (2011, October). Symptom Validity Testing and Implications for School Psychologists. Presentation at the 2011 Annual Conference of the New York Association of School Psychologists, Verona, NY.

Spenceley, L. M., Truckenmiller, A. J., Lewandowski, L. J., Rieger, B., & **Miller, L.** (2010, March). Prevalence and Duration of Post-concussion Symptoms in Children after Mild Traumatic Brain Injury. Poster presentation at the 42nd Annual Convention of the National Association of School Psychologists, Chicago, IL.

Miller L, Jagannathan K, O'Boyle J, Stevens M, Sahl R, Pearlson G, Assaf M. (2009). Default Mode Network in Patients with High Functioning Autism Spectrum Disorders During Resting State fMRI. International Meeting for Autism Research 2009 Annual Meeting Proceedings.

Miller L, Assaf M, Book G and Pearlson G. (2008) Face Building: An fMRI investigation of brain activation of faces versus houses, objects and patterns in individuals with high functioning Autism. Poster Presentation at the Cognitive Neuroscience Society annual meeting.

Assaf, M, Jagannathan K, **Miller L,** Sahl R, Schultz R and Pearlson G. (2008) Mentalization Network of Gray Matter Volume Abnormalities in Autism Spectrum Disorders. International Meeting for Autism Research 2008 Annual Meeting Proceedings.

AWARDS AND HONORS

Ted Bernstein Award, New York Association of School Psychologists (NYASP), 2013
Graduate Travel Award, NASP Conference, Syracuse University, 2009, 2011, 2012, 2014
Graduate Research Award, Syracuse University, 2009, 2013
Graduate Tuition Scholarship, Syracuse University, 2009 – 2014
Dean's List, Vanderbilt University, 2005-2006
Division 1 Varsity Track and Field, Vanderbilt University, 2002-2005
South Eastern Conference All Academic Team, Vanderbilt University, 2003-2004

PROFESSIONAL AFFILIATIONS

New York Association of School Psychologists, *Member,* 2011 – current
National Association of School Psychologists, *Member,* 2009 – current
American Psychological Association, Division 16, *Member,* 2009 – current
American Psychological Association, Division 40, *Member,* 2013 - current

PROFESSIONAL AND COMMUNITY SERVICE

Syracuse University Psychology Action Committee, *Friday Forum Coordinator*, 2012 – present, *member*, 2009 – 2012.

Syracuse University Senate, *Senator*, 2011 – 2012.

Syracuse University Senate Instruction Committee, *Member*, 2011 – 2012.

Syracuse University Graduate Student Organization, *Psychology Department Representative and Senator*, 2011 – 2012.

RELEVANT GRADUATE COURSEWORK

COU 644	Counseling Pre-Practicum
PSY 600	Life-Span Developmental Psychology
PSY 600	Emotion and Cognition in Children & Youth
PSY 653	Psychological Measurement
PSY 655 & 765	Statistical Methods II & III
PSY 696	Neuropsychology
PSY 762	Cognitive Intellectual Assessment
PSY 763	Direct Academic Assessment
PSY 764	Socio-Emotional Assessment
PSY 765 & 866	Principles of Behavior Modification & Behavior Therapy
PSY 853	Experimental Designs and Statistical Tests
PSY 860	Diversity & Cultural Issues in Assessment & Psychotherapy
PSY 860	Theories of Health & Behavior
PSY 861	Consultation
PSY 863	Developmental Psychopathology
PSY 894	History & Systems of Psychology
SPE 705	Psychoeducational Evaluation

LANGUAGES

Spanish. Proficient in written and oral Spanish.