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Exploring Spanish Translation Accommodations for English Learning Students

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This is to certify that the doctoral study by

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has been found to be complete and satisfactory in all respects,
and that any and all revisions required by
the review committee have been made.

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Walden University
2024

Abstract

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MAT, Philippine Normal University, 2002

BS, Bicol University, 1984

Dissertation Submitted in Partial Fulfillment

of the Requirements for the Degree of

Doctor of Education

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Abstract

The problem is that translations of language in standardized mathematics tests are not provided, which reduces the achievement scores of native-Spanish-speaking English language learners (ELLs) in Grades 4 and 8. The purpose of this basic qualitative study was to explore teachers' perceptions of language translation for the National Assessment of Educational Progress (NAEP) to uncover strategies of language translation to support the math scores of Spanish-speaking ELLs in fourth and eighth grades in a northeastern state. Underpinned by Krashen's theory of comprehensible input, this study addressed the research question regarding how teachers of ELLs perceive language translation strategies for the NAEP standardized mathematics tests to foster the mathematics scores and academic achievement of fourth- and eighth-grade ELL students. Twelve teachers of ELLs who took the NAEP assessments, recruited via purposeful sampling, participated in semi structured interviews via Zoom. Findings revealed that translation strategies were considered a very valuable tool by the teachers towards the improvement of math scores and achievement in academics among ELL students enrolled at the fourth and eighth grade levels. Teachers emphasized the importance of culturally relevant translations and how language proficiency may be a key factor in the capacity of ELLs to perform better on tests. The findings of this study may facilitate positive social change through providing a foundation for targeted interventions to enhance academic outcomes for Spanish-speaking ELLs at the individual level and advocating for comprehensive strategies to address language-related issues in standardized testing at the organizational level.

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Dedication

This dissertation is lovingly dedicated to my family. To my husband, Dolo, my precious children, Shann, and Rocky, who have each, in their unique ways, contributed to making this dream a reality. Despite the distances that have separated us, our reunions--whether in our Maryland home or during our cherished holiday gatherings around the world—remind me of the unbreakable bond we share. This work is a testament to our collective journey from the humble beginnings in the Philippines to the fulfilled life we now enjoy together. Each page is infused with the love and perseverance that define our family.

Acknowledgments

First and foremost, I extend my deepest gratitude to my beloved husband, Teodolo, whose unwavering support and sacrifices have been the backbone of my journey. My dear husband, your resilience and adaptability in retiring and embracing a new life in the United States, finding solace in fishing has inspired me every day. Thank you for being my steadfast partner through every challenge and triumph.

I am immensely proud of my sons, Shann and Rocky, whose dedication and hard work have led them to prestigious roles in the medical field, in New York City and Honolulu, Hawaii respectively. Shann, your leadership as the eldest has been a guiding light, and Rocky, your perseverance as the youngest continues to make us proud. Your success is my joy, and I am thankful for both of your contributions to our family and the world.

I also would like to express my gratitude to my 21st Century Teach USA family, for the continued encouragements to move forward despite constraints and challenges. To my friends and family of the members of Unified New York for their untiring support in the completion of this dissertation.

My sincere appreciation to chair, my advisor, Dr. Ashraf Esmail and committee member, Dr. Heather Caldwell whose expertise were invaluable throughout this research process. Your patience, knowledge, and commitment not only guided this dissertation but also transformed it into a profound learning experience for me. Moreover, I am grateful to Walden University for providing me with the opportunity to pursue my academic goals in such a nurturing and rigorous academic environment. This dissertation stands as a milestone achieved through the collective efforts of everyone involved.

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Chapter 1: Introduction to the Study

The topic of this study was the mathematics standardized test scores of English language learners (ELLs). ELLs are those students who are learning English as a second language and using this language as a medium of instruction while learning academic content. The number of ELLs in the United States has doubled since 2015, with estimates suggesting that by 2025, 1 in 4 public school students will be an ELL (National Education Association Organization [NEA], 2018). In U.S. schools, 75% of the ELL populations consist of native Spanish speakers (Lam et al., 2020). Researchers have found a gap in mathematics standard test results between ELLs and non-ELLs in the United States (Alonso, 2017; Driver & Powell, 2017; Farah, 2017; Foster et al., 2019; Miley & Farmer, 2017; Norval, 2019a).

Supporting the ELL population has become a priority for educators, as ELLs fall behind native-speaking students on standardized math tests, which has prompted calls from researchers to improve pro-ELLs policies and practices to reduce this assessment gap (Polat et al., 2016). For example, language accommodations have been seen as means of improving students' scores by removing possible language barriers that greatly impact test results (Driver & Powell, 2017; Farah, 2017; Guzman-Orth et al., 2016). In the current research, focusing on the population of ELLs was relevant because of its significant portion in the entire population of U.S. school students.

The focus of the discussion in this chapter is the details of the topic of the study and the specific problem addressed in this research. To provide an in-depth discussion of the topic of the study, Chapter 1 includes information about the following: background,

problem statement, purpose of the study, research question, theoretical framework, nature of the study, definitions, assumptions, scope and delimitations, limitations, and significance. A summary of the key points in the chapter is provided at the end.

Background

Nonnative English-speaking students have been found to have several disadvantages in terms of performance measures in education (Alonso, 2017; Driver & Powell, 2017; Farah, 2017; Foster et al., 2019; Miley & Farmer, 2017; Norval, 2019a). Specifically, the linguistic capabilities of ELLs have an influence on ELLs' performance in school subjects, including mathematics (Driver & Powell, 2017; Foster et al., 2019; Norval, 2019a). Kopelman (2016) claimed that giving students assessments in their native language is a more accurate assessment of their skills. This claim is based on findings indicating that Spanish-speaking ELLs can perform well when tests are in Spanish.

The ELL population has increased across the different states of the United States (Guzman-Orth et al., 2016). The needs of the ELL population have been addressed in different programs and policies (Gonzalez, 2016; Parsi, 2016). Researchers have, however, found a gap in mathematics standardized test results between ELLs and non-ELLs in the United States (Alonso, 2017; Driver & Powell, 2017; Farah, 2017; Foster et al., 2019; Miley & Farmer, 2017; Norval, 2019b). Researchers have also shown that language proficiency is associated with students' standardized test scores (Alonso, 2017; Miley & Farmer, 2017). A significant gap exists in the test results of ELLs who had

achieved language proficiency when compared to those who had not achieved the required language proficiency level (Guzman-Orth et al., 2016; Miley & Farmer, 2017).

According to Guzman-Orth et al. (2016), test developers must create an assessment that is appropriate for assessing inclusive populations, while enabling the production of valid measurement of the rigorous standards. Language accommodations must be in place to ensure that assessments are effective and valid in measuring the proficiency of students, without having a language barrier as a factor in the performance of students (Driver & Powell, 2017; Farah, 2017; Guzman-Orth et al., 2016). Native Spanish-speaking students have the option of taking the Spanish translated version or the English version of the test (Peña et al., 2018). As practiced by the National Assessment of Educational Progress (NAEP; Appendix B) in the standardized math test, one of the accommodations to support the math scores of native Spanish ELLs in Grades 4 and 8 is the availability of the Spanish–English version of the mathematics assessment. Other forms of accommodations for ELLs include word-to-word translation dictionaries and qualified interpreters (Pennsylvania Department of Education, 2020). The topic of language use for mathematics standardized tests was the focus of this study.

Problem Statement

The problem is that translation of language in standardized mathematics tests is not provided, which reduces the achievement scores of Spanish-native ELLs in Grades 4 and 8 (Abedi et al., 2020; Foster et al., 2019; Newkirk-Turner & Johnson, 2018; Norval, 2019a). The results of national math standardized tests support the persistence of lower performance by ELLs (e.g., native Spanish) as compared to English-speaking students

(Newkirk-Turner & Johnson, 2018; Norval, 2019b). In a study conducted across all states, the scores in mathematics standardized tests for ELLs were at least 35 points lower than those for non-ELL counterparts from 2017 to 2019 (Nation's Report Card, 2019). Non-ELLs had average scores of 243 and 246 for 2017 and 2019, respectively, whereas ELLs only scored, on average, 203 and 207 for 2017 and 2019, respectively (Nation's Report Card, 2019). Therefore, the observation that mathematics scores for ELLs are lower compared to non-ELLs is true across states.

Regarding the reasons for the lowered standardized scores, some researchers posited that lack of language translation may be a central issue for ELL students (Abedi et al., 2020; Foster et al., 2019; Newkirk-Turner & Johnson, 2018; Norval, 2019b). Researchers established that ELLs perform poorly on standardized tests. Norval (2019b) claimed that ELLs in the United States often have poorer performance on the language used in the tests. Nation's Report Card (2019) showed that the ELLs' scores in mathematics for the NAEP in the United States were about 20 to 30 points lower than those for their non-ELL counterparts in Grades 4, 8, and 12. In line with the performance gap, Newkirk-Turner and Johnson (2018) agreed with Wijekumar et al. (2018) that poor performance on standardized tests among ELLs in U.S. schools is a critical problem in the United States (Newkirk-Turner & Johnson, 2018; Wijekumar et al., 2018).

Mathematics is perceived to be a universal language (Norval, 2019a). The scores of ELLs on mathematics tests, however, show that this subject may also be linguistically demanding (Abedi et al., 2020; Foster et al., 2019; Norval, 2019a). Norval (2019a) showed that modifying the language of mathematics tests is effective in reducing testing

bias against ELLs. Norval, however, did not show the actual language used for the linguistically translated tests. Abedi et al. (2020) further pointed out that preparedness for the language used in assessments plays a significant role in the success of students on a mathematics exam. The gap in practice is that it is not known how teachers perceive implementation of language translation of the NAEP standardized math tests to support achievement scores of Spanish-native ELLs in Grades 4 and 8.

Purpose of the Study

The purpose of this basic qualitative study was to explore teachers' perceptions of language translation for the NAEP to uncover strategies of language translation to support the math scores of Spanish-speaking ELLs in fourth and eighth grades in a northeastern state. I explored the perceptions of teachers of Spanish ELLs regarding language translations in standardized mathematics tests to support strategies that foster the achievement scores of Spanish-native ELLs in Grade 4 and 8 (Abedi et al., 2020; Foster et al., 2019; Newkirk-Turner & Johnson, 2018; Norval, 2019b). Through the exploration of the perceptions of these ELL teachers, I identified how strategies for translating language used in standardized mathematics tests may be designed to improve the performance of native Spanish ELLs and address the performance gap between ELLs and non-ELLs.

Research Question

I posed the following research question to address the purpose and problem statement: How do teachers of ELLs perceive language translation strategies for the

NAEP standardized math tests to foster the math scores and academic achievement of fourth and eighth grade ELL students in a northeastern state?

Conceptual Framework

The conceptual framework used in the current study was Krashen's theory of comprehensible input. Krashen's (1981) theory can be used to understand why native-Spanish-speaking ELLs experience difficulties when taking a standardized math test in English. Krashen theorized that a language acquirer (i.e., an ELL) needs comprehensible input as a precursor to acquiring secondary language. Humans acquire language by understanding messages or receiving comprehensible input in a logical order. Administering assessments in a nonnative language may not meet the comprehensible input criteria needed for ELLs to understand the questions and instructions on the exam correctly. Two possibilities may be true. ELLs may lack the knowledge of the English language, and this lack of English proficiency may limit their ability to understand the mathematics questions. Alternatively, ELLs may not understand the mathematics concepts, which limits their ability to use context to understand the test instructions or questions. Either way, the lack of comprehensible language input limits the ability of the test to measure ELLs' mathematics knowledge.

Krashen's (1981) theory of comprehensible input had a direct relationship to the topic of this study, as it is the basis for exploring language as a cause of the poor performance of ELLs in standardized tests. The theory of comprehensible input supports the claims that language barriers make comprehension difficult for students when answering tests (Newkirk-Turner & Johnson, 2018; Wijekumar et al., 2018). Therefore,

this theory was the lens used to view teachers' perceptions of the role of language translation in helping ELLs perform better in standardized math tests, which was the focus of the central research question of this study,

Nature of the Study

I implemented a basic qualitative research design for this study. Researchers have claimed that qualitative methodology is appropriate when the researcher is exploring a phenomenon within its natural environment (Carley Rizzuto, 2017; Silverman, 2019). Moreover, qualitative methodology is appropriate for studies that require in-depth gathering of thick and rich data to address the research questions (Carley Rizzuto, 2017).

The other two methodological options, specifically quantitative and mixed methodology, were both inappropriate for this study. Quantitative research methodology is often appropriate for studies that involve the collection and analysis of numerical data for statistical purposes (Goertzen, 2017). A quantitative methodology was not suitable for this research because I had no intention to establish relationships of variables using numerical data. The mixed-methods approach is mainly concerned with collecting and analyzing both quantitative and qualitative data to address all the research questions and completely fulfill the purpose of a study (Paull & Girardi, 2017). Using mixed methodology was not appropriate for the current research because the study did not involve establishing relationships of variables (i.e., no quantitative component).

When using a basic qualitative design, the focus of the researcher is on collecting data about participants' perceptions and experiences related to a phenomenon to address the purpose and research questions of the study (Percy et al., 2015). A basic qualitative

research design was appropriate for this study, as it allowed in-depth exploration of the phenomenon through exploring interview data gained from the participants' reflections (see Percy et al., 2015). I considered other research traditions but did not choose them for this study because of their misalignment with the purpose and research question. Based on the purpose and research question of this study, exploring the experiences and perceptions of ELL teachers was important to gain relevant information about the phenomenon of language format translations for standardized mathematics tests for ELLs.

Definitions

Test accommodations: Test accommodations refer to changes in the test process, in the test itself, or in the test response format to cater to the needs of ELLs (Abedi et al., 2020).

English language learners (ELLs): The term ELLs refers to individuals who are learning the English language as a second language (Wei, 2021).

Comprehensible input: This refers to the assumptions that students acquire language when they have been exposed to a language that is greater than their current proficiency level (Krashen, 1981).

Standardized testing: This refers to a testing method where learners answer the same set of questions under the same testing conditions (Banes et al., 2018).

Assumptions

Assumptions had to be made for the study to be completed. The first assumption was that the participants in the study would be truthful in their answers in the data

collection phase. This assumption was based on the discussions of Theofanidis and Fountouki (2018). I had to make this assumption because I could not be completely certain that the participants would be honest when answering the questions in the data collection phase. I reminded the participants to give complete and truthful responses, emphasizing that there were no right nor wrong answers. Another assumption was that teachers participating in this study had different opinions and perceptions that would be the basis of the data for this study. I had to make this assumption because individuals have different perceptions, experiences, and opinions. Nevertheless, I aimed to achieve data saturation to ensure that the data were valid, despite the differences in the perceptions and opinions of individuals.

Scope and Delimitations

I had to include and exclude specific aspects of the study based on the boundaries of the topic and the feasibility of the methodology. These exclusions defined the scope and delimitations of the study. The first delimitation was that the study would only be concerned with the phenomenon of translation of standardized mathematics tests to support the mathematics achievement of native Spanish ELLs. In the chosen school district, the standardized mathematics test exists in a standardized translated form for ELLs. I explored this phenomenon, which aligned with the problem, purpose, and research question of the study. Based on the phenomenon and the problem of the study, the theoretical lens used for viewing this study was Krashen's (1981) theory of comprehensible input because of its alignment with the problem and research question.

Another delimitation was that only scores of ELLs in Grades 4 and 8 in a school district of a northeastern state were considered. Other than the schools in this chosen district and county, I did not explore any other area within the context of this study. Another delimitation was that only teachers in the chosen area participated in this study. This study did not include minors or at-risk populations.

Limitations

The study had several limitations. One of the limitations was that I held personal biases in relation to the topic of the study. To minimize the influences of these biases, I acknowledged my experiences, expectations, and past knowledge related to the topic of the study. According to Kross and Giust (2019), because of the impossibility of perfectly objective qualitative research, reflexive journaling throughout the research process is an effective strategy to identify researcher bias. Through this process, I could validate interpretations related to my biases based on actual data before including them in the results and findings of the study. I also used an interview guide during data collection to avoid irrelevant and biased questions.

Significance

The population of ELLs in the United States is only expected to grow (NEA, 2018), making the current performance gap between ELLs and native English-speaking students wider, thus increasing the problems that teachers, administrators, and policy makers face (Polat et al., 2016). However, it is not known how teachers perceive the implementation of language translation of the NAEP standardized mathematics tests to support the achievement scores of Spanish-native ELLs in Grades 4 and 8. In this study,

the teachers used a translated version to support ELL students' success in the NAEP exam.

Empirically evaluating the strategy of using translated language formats in standardized mathematics tests for native Spanish-speaking ELLs makes contributions to academic research, educational practice, and positive social change. The findings of the study may provide information that could be used to address a gap in practice among teachers. Moreover, the findings and limitations of this study may be used as basis for future academic research. The findings may also contribute to educational practice by service as inputs for developing accommodations for Spanish ELLs when taking standardized math tests. Furthermore, ELL teachers can use the findings to advocate for appropriate language translations that may benefit society, as poor-performing students may be aided in achieving good scores on standardized tests.

Summary

The number of ELLs has been increasing in the U.S. student population (Lam et al., 2020; NEA, 2018). The specific needs of this population have been highlighted in the works of several researchers. Language proficiency has been found to have a significant influence on needs and outcomes for the ELL population. Hence, this population and topic were the focus of this study.

The problem investigated in this study was that the mathematics standardized test scores of ELL students have been persistently lower than those of non-ELL students in a northeastern state in the United States. The purpose of this basic qualitative study was to explore teachers' perceptions about how they implement a process of using a language

translation of standardized mathematics tests in one school district of a northeastern state to support the mathematics scores of native Spanish ELLs in Grades 4 and 8. This problem and purpose were the basis for the development and completion of this research. In Chapter 2, I review relevant literature for establishing the gap and research problem.

Chapter 2: Literature Review

The problem investigated in this study was that mathematics standardized test scores of ELL students have been persistently lower than for non-ELL students in a northeastern state in the United States. The purpose of this basic qualitative study was to explore teachers' perceptions about how they implement a process of using language translation of standardized math tests in one school district of a northeastern state to support the mathematics scores of native Spanish ELLs in Grades 4 and 8. Although mathematics is often regarded as a universal language, the mathematics test scores of ELLs have remained consistently lower than those of non-ELL students (Norval, 2019b). Prior research findings are mixed regarding why this performance pattern persists; however, the issue is quite multifaceted and complex.

Since the adoption of the Common Core State Standards in 2009, for instance, the performance gap between ELLs and non-ELLs has increased, and because of this increase in the performance gap, teachers have often been forced to shoulder the burden of enhancing ELL students' progress without being provided with the necessary resources to achieve such high learning outcome expectations (Maarouf, 2019). Additionally, as stated by Turkan and Oliveri (2014) in their study investigating testing accommodations for ELL students, "ELLs are a heterogeneous group with varied ethnic backgrounds, first languages, socioeconomic statuses, quality of prior schooling, and levels of English language proficiency" (p. 10). Unfortunately, teachers often instruct these students based on their own faulty assumptions about ELLs and their language capabilities, learning potential, and unique cultural insights—leading to a lack of equal opportunities for ELL

students to thrive alongside their non-ELL peers in mathematics and other subjects (de Araujo et al., 2018; Suh, 2020). A combination of factors such as resource disparities and biased teacher perceptions may at least partially account for the performance gap between ELLs and non-ELLS.

Not all teachers instruct ELL students under their own faulty assumptions. Rather, some teachers express genuinely good intentions and positive attitudes toward the ELL students they teach. These teachers, however, often also report feeling ill equipped to properly teach their ELL students or are unwilling to change their preferred teaching styles even for the benefit of ELLs' academic improvement (Carley Rizzuto, 2017). These teachers may be unconvinced that the time they invest in adopting new teaching methods with ELL students will produce any significant changes over time that would justify the effort they had expended prior.

Previous research has shown that teacher perceptions—both positive and negative—matter when it comes to teaching and supporting ELLs in their understanding of mathematics and other subjects. It may be that the whole ELL system currently in place in the United States needs to be reviewed and revamped to meet the needs and expectations of the growing ELL population (Bailey & Carroll, 2015). Executing revisions to current practices that limit teacher and student potential, such as demanding additional resources for ELLs and funding for schoolteachers, could help improve teacher perceptions of ELLs and their willingness to try out new teaching methods with them. Before that kind of school-wide change happens, though, it is imperative to better understand the views of the teachers who would be enacting any large-scale changes to

instruction in their classrooms so that any proposed changes would be backed by student educators. Therefore, the purpose of this basic qualitative study was to explore teachers' perceptions about how they implement a process of using language translation of standardized mathematics tests in one school district of a northeastern state to support the mathematics scores of native Spanish-native ELLs in Grades 4 and 8.

In Chapter 2, the focus of the discussion is the review of relevant literature for this study. The contents of the chapter are Literature Search Strategy, Conceptual Framework, and Literature Review Related to Key Concepts and Variable. A summary is presented at the end.

Literature Search Strategy

I used Google Scholar to find the reference material cited in this review. I set the search parameters so that most of the articles displayed in the results were from 2017 to 2021—in that way, I referenced the most up-to-date information in this literature review. I also cited some earlier seminal works in this review to ensure thoroughness and greater conceptual understanding. Types of sources found through the Google Scholar search included literature reviews, books related to the topic of effectively teaching ELL students, and published empirical research studies related to the topic of interest in the present study. Key phrases used in the Google Scholar literature search for this topic included the following: *Spanish ELL students' mathematics*, *teacher perceptions about test translation for ELLs*, *barriers to teaching mathematics to Spanish ELLs*, *math test adaptation for Spanish ELLs*, *math teacher perceptions of elementary ELL students*, and *mathematics standardized test scores of elementary ELLs*. For each phrase used in this

search, I reviewed the first 20 pages of links that Google Scholar populated into the results to find appropriate sources. In total, 77 sources are referenced throughout this chapter—with 87.01% of them published between the years 2017 and 2021, and the remaining 12.99% published before 2017.

In this literature review section, I elaborate on the background and problem of interest discussed in the previous chapter. My discussion first centers on the conceptual framework used for this study, namely Krashen's (1981) theory of comprehensible input, and then on the relevant literature. This discussion progresses from research on the gaps in ELL student performance to ELL students' perceptions of their own academic performance potential and then teacher perceptions of ELLs. The section concludes with possible avenues that educators can explore to help both students and teachers reduce the current performance gap among ELLs. Finally, the chapter ends with a summary and implications of the literature review.

Conceptual Framework

Krashen's (1981) theory of comprehensible input served as the conceptual framework and foundation for the present research. According to this theory, ELLs need sufficient exposure to comprehensible input before learning a secondary language. Comprehensible input includes those words and phrases that can be understood by listeners even if they are unable to fully understand all the surrounding words and context being communicated. Through regular receipt of this comprehensible input in a logical manner, people acquire new language. The responsibility falls on teachers to understand

the needs of their ELL students well enough to choose comprehensible input at the appropriate level for these students to really benefit from exposure to it.

According to Krashen's (1981) research, the influence of a person's first language can have a significant impact on the ease with which they learn other languages. For example, the influence of a person's first language is strongest in word-for-word translations, complex wordings, and in "acquisition poor" learning environments. In contrast, the influence of a person's first language is weaker when it comes to bound morphology—that is, in forms such as lack-of-subject-agreement, omission of nouns or plurals, and noun–adjective agreement. Thus, Krashen's theory of comprehensible input can be used to better understand why Spanish-speaking ELL students may have a more difficult time taking a standardized mathematics exam in English than their non-ELL peers.

Krashen's (1981) theory has been used in recent studies. Based on Krashen's theory, it seems logical that simply increasing the use of English in the classroom may not necessarily lead to stronger achievements in mathematics among ELL students (Morita-Mullaney et al., 2021). If ELL students are having to learn new English words and phrases while they are trying to learn new mathematical concepts, then these students are doubly burdened when trying to perform as well as their non-ELL peers who already have a solid grasp of the English language. Schools may benefit from instead taking both native language proficiency and current English language proficiency into account when determining the true mathematical ability level of ELLs (Foster et al., 2019). Based on these recent researchers involving Krashen's theory, it could be stated that using the

theory could be helpful to teachers in meeting the needs of each individual ELL student because these students' English proficiency levels would not have a great influence on their teachers' perceptions of their mathematical capabilities in general.

In addition to classroom adjustments for the benefit of students and teachers, test adjustments may be key. Test developers are advised to seriously consider incorporating input from ELL students of various language backgrounds during the development of standardized tests, as doing so could help mitigate the effects of biased language on ELL student performance outcomes (Solano-Flores, 2014). As Short and Boyson (2012) articulately stated in their report on newcomer ELL student success in schools, "Academic achievement is the currency of mobility and helps reduce racial, ethnic, and socioeconomic gaps [that ELL students often face]" (p. 79). This realization underscores the importance of exploring the perceptions and prior experiences of teachers of Spanish ELLs concerning the use of language translations in standardized mathematics tests. Such research may be able to reveal how the strategies used to translate the language used in standardized mathematics exams may be updated to improve the test scores of native-Spanish-speaking ELLs and address the current performance gap between ELLs and non-ELLs. Because the theory of comprehensible input (Krashen, 1981) addresses language acquisition and subsequent learning outcomes, it served as a useful framework for inquiry in the present study's exploration of teachers' perceptions regarding the implementation of a process that uses the translation of standardized mathematics tests to support mathematics achievement among native Spanish-speaking ELLs.

Literature Review Related to Key Concepts and Variable

As stated in the concluding paragraph of the previous section, Krashen's (1981) theory of comprehensible input guided the following sections of this literature review. I begin with general information on the ELL student performance gap and then narrow the focus of the review to reflect the purpose of the present study. This analysis entails a review of ELL students' perceptions of their academic performance potential and teacher perceptions of ELLs and their performance potential, followed by a review of possible avenues by which to close the performance gap between ELLs and non-ELLs. Possible avenues discussed are student interventions and accommodations in addition to teacher interventions and training programs. This literature review concludes with a summary section and my concluding thoughts leading into Chapter 3.

English Language Learner Student Performance Gaps

The exact reasons why Spanish-speaking ELL students continue to lag behind their non-ELL peers in terms of mathematics achievement are not yet fully understood. Previous research has, however, uncovered some nonrandom factors that appear to systematically affect these students' test performance across the school, state, and national levels (Acosta et al., 2020). These factors include students' current Spanish language proficiency levels and socioeconomic status (SES), which have been observed to influence the performance gap among these student groups beginning as early as kindergarten (Wilkinson, 2017). Instances where parents must work full time to provide for their family and struggle to grasp the intricacies of the English language themselves may, in turn, increase the difficulty that their Spanish-speaking ELL students have trying

to practice English with others outside of school (Wilkinson, 2017). In addition, lower SES students tend to be taught by more novice teachers than students of more advantaged backgrounds; as a result, lower SES students receive lower quality academic instruction than their wealthier peers (Hill et al., 2019). When faced with such environmental/familial circumstances that are outside of their control, ELL students must overcome these additional barriers to catch up with their non-ELL peers academically (Hill et al., 2019; Wilkinson, 2017). Systemic barriers to a fair education such as those mentioned above provide a few possible reasons why the performance gap between ELLs and non-ELLs persists.

Other factors may also contribute to the gap in performance between ELL and non-ELL students. For example, working memory and language may interact to some extent, and, as a result, influence ELL students' mathematical computation ability in English (Swanson et al., 2018). This view has been supported by previous researchers who found that complex language features in word problems and on tests in general often favored native English speakers over ELLs (Buono & Jang, 2021). Examples of these complex and problematic language features include those related to culture, syntax (e.g., how words are arranged to form sentences), and lexicon (e.g., the vocabulary of a particular language; Moschkovich & Scott, 2021). Although syntax may be a better proxy for assessing the language ability of children to solve mathematics problems than vocabulary (as suggested in a study by Chow & Ekholm, 2019), neither one may be a sufficient indicator of this ability on its own. Even when considered together, they may still not be sufficient indicators of ELL students' true computational capabilities.

This point relates back to Krashen's (1981) theory, which holds that a person's first language can impact their ability to learn and perform in a nonnative language. If, for example, the language used in math problems and throughout exams is too complicated for ELLs to understand at their current proficiency levels—and is also unrelated to the core meaning of the questions that they are being asked to solve—then these complex language features may be actually causing ELL students to underperform compared to their non-ELL peers, rather than any significant difference in math skills (Moschkovich & Scott, 2021). To counteract this possibility, testing accessibility concerns should be expanded to include those test takers who are nonnative English speakers and who may need additional supports to be able to perform on par with their native-English-speaking peers (Guzman-Orth et al., 2016). Language supports and similar strategies could be one way to help reduce the persisting ELL performance gap.

Language supports on their own may not be sufficient. Previous research data indicate that even with approved accommodations, ELL students continue to score significantly lower than their non-ELL peers on mathematics items included in country-wide assessments such as the NAEP (Norval, 2019b). For example, in one study, Polat et al. (2016) investigated student performance improvements on the NAEP over time and found that from Grade 4 to 8, non-ELLs improved their mathematics and reading scores fourfold whereas ELLs only improved their math and reading scores twofold (Polat et al., 2016). These findings are especially concerning when one considers that almost 75% of ELL students are typically second- or third-generation U.S.-born children (Polat et al.,

2016). What these findings mean is that various other factors, besides English language proficiency, most likely hinder these students' academic development and achievement.

In addition to factors such as complex language, SES, and current English–Spanish proficiency levels, anxiety may be a factor contributing to the performance gap between ELLs and non-ELLs. Gong and Gao (2018) provided evidence supporting this possibility by testing high school students' mathematical ability and assessing these students' opinions on their performance both on the test and during classroom learning in general. Specifically, Gong and Gao wanted to better understand ELL students' experiences interacting with their teachers and peers during classroom instruction. The anxiety factor evaluated in this study usually manifests in ELLs when these students are intimidated by the new language they are trying to learn and/or feel uneasy trying to express themselves in certain settings using their nonnative language (Gong & Gao, 2018). To help these students avoid succumbing to language-related anxiousness, teachers could use linguistic resources and language modes—such as dual-language assessments with "read aloud" options—to allow ELLs to use their knowledge of multiple languages and possibly increase their engagement and performance in the classroom (Lopez, 2020). Thus, creating inclusive classroom environments in which their ELL students feel safe practicing the English language without fear of ridicule or mistreatment if they happen to make any language errors during the learning process is important for teachers (Gong & Gao, 2018). Creating safe environments that foster merging the practice of the English language with mastering math concepts could prove to be a valuable approach for both teachers and ELLs.

This section included a general overview of the issue of ELL performance gap plaguing U.S. educational institutions. It included a discussion of possible factors contributing to the increasing gap and some possible ways to counteract these factors. The next section of this literature covers the perceptions of ELL students concerning what they believe their academic performance potential is and what may be preventing them from achieving their full performance potential in school.

English Language Learner Students' Perceptions of Their Academic Performance Potential

ELL students without a solid grasp of the English language are already at a disadvantage in schools compared to their native English-speaking peers. As such, it is important for researchers to try to understand ELL students' views regarding their experiences trying to learn in their nonnative language and what they believe the barriers to their successful learning and performance could be. Previous researchers have demonstrated that ELL students' perspectives on what they believe to be limiting factors to their successful learning tend to be sharply different from the views of their teachers, as evidenced by a study on ELL learning experiences conducted by Shim and Shur (2017). Mismatches in perceptions of instructional methods and learning experiences can be detrimental to student performance outcomes; hence, it was essential to examine the exiting research on this topic in detail.

In a study by Shim and Shur (2017), the consensus among ELL student participants was that their learning was heavily influenced by what their teachers did and did not do when conducting lessons in the classroom. These ELL student participants

viewed teachers who chose to adopt a student-centered approach to classroom instruction (e.g., they encouraged students to actively participate in class discussions and express their opinions openly with their peers without fear of judgment) as having a positive influence on their overall learning compared to teachers who did not. The teacher participants in this study, however, believed that either instructional approach would help their ELL students master the concepts and perform similarly to their non-ELL peers so long as the teachers were willing to put in effort to provide additional explanation and support to their ELL students who requested it (Shim & Shur, 2017). These research findings provide a glimpse into the inconsistencies between what ELL students and their teachers consider effective classroom teaching methods conducive to positive student learning outcomes.

Mismatches in teacher-student perceptions where learning is concerned could potentially lead to a drop in ELL students' confidence in their performance potential. For example, in a study on self-efficacy beliefs, Sandilos et al. (2020) found that ELL students categorized as "limited English proficient" possessed significantly less self-efficacy in science and mathematics compared to their classmates who were more proficient in English. Self-efficacy is commonly defined as one's belief in their competence to achieve a goal or respond effectively to a given situation (Sandilos et al., 2020). Attaining a greater grasp of the English language may lead to an increase in ELL students' confidence, enabling them to perform well on subjects that are taught and gain knowledge that is assessed in English—regardless of the instructional methods used by their teachers. Therefore, educators should remain cognizant of how English proficiency

levels can affect student motivations and ability to succeed in school alongside their more English proficient peers (Sandilos et al., 2020). This recognition could be vital in improving ELL students' perceptions of their potential and help close the current performance gap between ELLs and non-ELLs.

This section of the literature review covered factors that may affect ELL students' perceptions of their academic performance potential. These factors include differences in opinion between ELL students and their teachers concerning how to best teach novel concepts in English as well as ELL students' self-efficacy levels. ELL students need to believe that they *can learn* for any effortful initiatives meant to improve their self-efficacy and English skills to be truly effective (Sorto et al., 2019). After this review of past literature on ELL students' perceptions of their learning and performance potential, it is important to examine the perceptions of teachers concerning their ELL students' potential. This next section includes a review of previous research on teachers' implicit and explicit perceptions of the ELL students they teach.

Teacher Perceptions of English Language Learners

As examined in the previous section, there appears to be a clear disconnect between ELL students and their teachers regarding perceptions about learning potential and effective instructional methods to achieve desired test results. Even among preservice teachers (PSTs, i.e., students training to become full-fledged teachers), previous researchers have established that a lack of interconnectedness exists between their professional beliefs and experiences with the needs of the ELL students they interact with (E. Cho et al., 2020). For example, in a study of the language orientations of PST math

teachers, Fernandes (2020) found that PSTs tended to view ELL students' native languages as a "problem" that inhibited their English learning potential and mathematical performance. These teacher participants also believed that students should be challenged to express their answers to mathematics problems in English only to help ultimately promote their mathematical understanding (Fernandes, 2020). The research findings mentioned in the prior section—as well as Krashen's theory of comprehensible input (1981)—suggest that students' native language, when used properly to draw parallels and find similarities with the English language, could help ELLs master the English language faster and improve their school performance over time.

Fernandes's (2020) study on the language orientations of PST mathematics teachers was not the only one to provide insights into teachers' perceptions of ELLs. Harrison and Lakin (2018) demonstrated that some teachers possess negatively nuanced views of ELL students; an Implicit Associations Test revealed that mainstream teachers held more negative implicit beliefs about ELL students than non-ELL students. Implicit Associations Tests evaluate a person's subconscious associations between concepts (e.g., ELLs) and evaluations (e.g., intelligent or unintelligent), and may or may not coincide with similar explicit (e.g., conscious) beliefs (Harrison & Lakin, 2018). The results of these studies are important because they demonstrate that negative perceptions of ELL students can persist through PST training and be carried on into mainstream teachers' classroom practices if not noticed and addressed earlier in their careers.

Although past researchers have uncovered that some teachers really seem to possess negative views of their ELL students' learning and performance potential, other

researchers have started to investigate some potential factors that might be contributing to why some teachers come to form these negative opinions of ELLs in the first place. Teachers' attitudes and decision-making methods often appear to be influenced by factors such as student characteristics, specific task features, and professional knowledge and experiences they acquired throughout their formal teacher training (Turkan & de Jong, 2018). Kelly (2018) investigated this issue to better understand the developing attitudes of PSTs toward ELLs with a targeted ELL methods course that PSTs would complete as part of their teacher training. The methods course was meant to help PSTs understand the true capabilities of ELLs and learn to adapt their teaching methods accordingly to meet these students' unique needs. Kelly, however, found that even after participating in a targeted ELL methods course, PSTs still expressed the belief that they were simply instructing basic literacy skills to passive ELL students. This belief that ELL students are not active and competent participants in their learning of subjects taught in English suggests that these teachers may not fully understand their role and responsibility in engaging ELLs in the classroom (Kelly, 2018). More research is needed to understand what training methods could be successful in altering biased beliefs among PSTs for the long-term benefit of the ELL students they teach.

In addition to teacher beliefs that ELL students are passive and not as knowledgeable as their peers, researchers have found that native English-speaking teachers may just have an inherent preference for native English-speaking students and ELLs who already possess a strong grasp of the English language. For example, in two experimental studies, Vögelin et al. (2018) asked teacher participants to rate the quality of

four upper-intermediate ELL students' argumentative essays. Vögelin et al. had secretly manipulated all the essays beforehand so that they each contained varied amounts of vocabulary (Study 1) and spelling (Study 2) errors. Upon analysis of the data, Vögelin et al. found that teachers' perceptions of the strengths and weaknesses of students' essays—and their tendency towards exhibiting a halo effect (e.g., when positive impressions in one area positively influence impressions in another, sometimes unrelated, area)—reflected these teachers' general preference for more proficient English-speaking students over less proficient ones. This finding reflects the challenge ELLs who do not yet have the ability to address language-related problems face when taking standardized exams. If teachers retain such strong preferences for students who are more proficient in English over those who are less proficient, then they should be strongly encouraged to continuously demonstrate language acquisition strategies to their ELL students that would enhance their students' overall learning potential and academic achievement (Lawson, 2017). Such teaching tactics may serve to help close the performance gap between ELLs and non-ELLs in all school subjects, including mathematics.

What can be gleaned from these findings and other similar findings is that teacher perceptions of ELL students' achievement potential and their use (or lack thereof) of particular teaching methods to try to help these students succeed, are not uniform. Rather, varied levels of acceptance and hesitancy exist among teachers concerning the degree to which they support ELL students' use of their first language versus English in the classroom (Holdway & Hitchcock, 2018). Contributing to these differing perceptions of ELL student performance and language use could be the existence of resource constraints

such as limited class time, few technological languages support materials, and insufficient family involvement that many teachers must typically work around (Wassell et al., 2017). These possibilities are worth exploring in detail.

Teacher participants in a study by Rahman et al. (2017) about the use of a practice known as communicative language teaching (CLT) expressed contradictory opinions on the use of such a practice in the classroom. CLT is a practice focused on improving the communicative competence of learners in their nonnative language (Rahman et al., 2017). The participant teachers in this study believed that CLT should be student-centered, written and spoken errors should be addressed by teachers in sufficient depth so that students would be more likely to avoid repeating their mistakes, and using students' native language during instruction could be helpful in clarifying language differences such as new grammar structures or vocabulary. These teachers also expressed that time constraints often made these beliefs difficult to uphold when teaching in real time. As a result, classes often resorted back to being teacher-focused—with students more so just passively taking in information rather than attempting to actively practice what they learned in their nonnative language with their peers during class time (Rahman et al., 2017). The unfortunate outcome of situations such as this are that ELL students do not receive the same level of education as their non-ELL peers simply because they lack the same understanding of the nuances contained within the English language.

The passivity of ELLs as determined by their teachers can lead to other negative consequences. When teachers perceive that their ELL students are simply passive actors in the learning process who possess limited linguistic resources and would thus have

difficulty understanding more complex wordings found in available classroom textbooks, they tend to choose activities with limited vocabulary and very simple explanations for their ELL students to complete (de Araujo, 2017). Both PSTs and mainstream teachers have expressed how challenging it can be to master the art of tactfully explaining mathematical concepts such as word problems to ELL students while also maintaining a meaningful and adequate degree of cognitive demand appropriate to the students' current learning and language capabilities (Kurz et al., 2017). The failure to meet this challenge can be detrimental to the learning of ELL students who often rely heavily on the teaching they receive in school to help them succeed in mastering English and related life skills as they mature (de Araujo, 2017). Therefore, it was important in the current study to determine how to improve teachers' perceptions of their ELL students in addition to ELL students' own perceptions of themselves.

Not all teachers view ELL students in a negative light or are steadfastly unwilling to change their teaching methods. Teachers who do try to diversify their teaching methods to better instruct their ELL students have been shown to gain an increased critical awareness of how adapting instructional practices can help ELLs thrive while learning both in and out of the classroom (Villegas et al., 2018). Such research findings are promising because they indicate that the perceptions of ELLs and their performance outcomes could possibly be improved over time with enough attention and effort from all involved. Dedicating resources toward accomplishing this goal is crucial for the sake of ELLs' long-term learning and development. In the next section, I delve into ways that

previous research findings suggest could be useful in closing the performance gap between ELL and non-ELL students.

Possible Avenues to Close the Performance Gap

In the preceding sections, I reviewed relevant literature concerning the seeming gap in academic achievement between ELL and non-ELL students, ELL's perceptions of their performance potential and teachers' perceptions of their ELL students' learning and performance potential. What has yet to be discussed, though, is how students, teachers, and society can potentially work toward reducing the performance gap between ELLs and non-ELLs. For example, one such approach to stemming this issue could be to enact legislative policy changes (e.g., increased funding and/or school curriculum restructuring) backed by the support of the governing body and general population of the United States (Garcia-Felix, 2019). Nation-wide initiatives to improve school resource allocation or requiring PSTs to undergo rigorous fieldwork with ELL students before becoming certified teachers could be challenging to accomplish at first; however, doing so could also be greatly rewarding in terms of improving society's productivity over time (Garcia-Felix, 2019; Johnson & Wells, 2017). Thus, the choice to enact such a large-scale undertaking should not be discredited until additional input from future research studies has been obtained.

Another general approach that could be pursued in an attempt to reduce the performance gap between ELLs and non-ELLs include changes to test administration policies and reclassification criteria. The development of dual-language assessment systems, for example, could be beneficial when evaluating the school-readiness of

preschool-aged ELLs who are set to enter programs where English may be the predominant language of instruction (Guzman-Orth et al., 2017). Assessing ELLs in both English and their native language could help educators more accurately determine the appropriate "starting point" for these ELL students compared to their fellow ELL and non-ELL peers (Guzman-Orth et al., 2017). Such an assessment would possibly lead to better outcomes for ELLs than for educators, assuming that all ELL students are the same and that all of them start school already lagging behind non-ELL students academically.

Additionally, allowing more flexible reclassification criteria that enable teachers to use student work samples and their professional opinions to supplement state requirements for students to meet standardized English proficiency goals could help their ELL students reach similar performance levels with their non-ELL classmates much more quickly (Pilger Shur et al., 2021). The reason for such a conclusion is that tests are only able to capture a limited snippet of students' knowledge, skills, and abilities but they also allow students to demonstrate their understanding of material in various ways that may be better suited to their preferred learning style or current English proficiency level (e.g., drawings with captions, developing and performing themed skits with their peers, etc.; Pilger Shur et al., 2021). Thus, tests may provide a useful baseline for determining students' current ability levels, but they should not be used alone without other assessments.

Despite this caveat, tests are still the most used method to assess the learning and performance of both ELL and non-ELL students in school. Therefore, understanding how to improve testing conditions and scoring methods is imperative to fair assessment of the

capabilities of ELLs. For example, Kachchaf and Solano-Flores (2012) conducted a study on test raters' language background as a potential source of measurement error in the scoring of student exams and found that raters of different language backgrounds (e.g., English Spanish) were able to score ELL student responses to short-answer, open-ended test items with similar reliability. These results demonstrated that certified raters with proper training were able to adequately score the written responses of ELL test-takers with minimal bias—regardless of their own language background (Kachchaf & Solano-Flores, 2012). In the following subsections of this review, I present additional interventions and accommodations for ELLs as well as additional interventions and training for the teachers of ELL students that could also potentially help reduce the existing performance gap (particularly in mathematics achievement) between ELLs and non-ELLs.

Interventions for English Language Learner Students

Although researchers are still trying to establish why the academic performance gap between ELLs and non-ELLs persists, they have also been studying methods of instruction that may help close this gap in performance. One possible approach is to encourage teachers to engage their students in what has been termed, the "productive struggle" (Ewing et al., 2019). Engaging in the productive struggle essentially means that students are taught to grapple with difficult problems on a regular basis to facilitate higher-order thinking and problem-solving skills in mathematics (Ewing et al., 2019). Using this method, teachers try to connect mathematical concepts to students' personal lives in some befitting manner, resources are provided to teachers to help them facilitate

this process, and teachers express high expectations for all their students (Ewing et al., 2019). For this type of intervention to be effective, however, teachers must create and follow a plan that will expose students to this new learning process, and they must continuously encourage students to work through the process even during frustrating learning sessions (Ewing et al., 2019). This approach will ensure that teachers and their ELL students are able to notice significant improvements in learning outcomes.

In addition to engaging students in the productive struggle, other methods have been shown to help improve the academic performance of ELL students. For example, Banes et al. (2018) investigated how the use of focused mathematical classroom discussions with third- and fourth-grade students could improve their test scores compared to a set of control classrooms where this focused approach was not implemented. These mathematical classroom discussions emphasized conveying to students that there are multiple approaches to problem-solving, allowing students equitable opportunities to speak, clearly explaining concepts in-depth to facilitate deeper understanding of the topic among students, and making sure to connect ideas to one another while working together as a class to solve example problems. The results of this study showed that even after controlling for prior mathematics achievement and English proficiency levels, all students in the treatment groups (both ELLs and non-ELLs) outperformed those students in the control groups on a linguistically modified mathematics exam. These findings suggest that mathematical classroom discussions—when implemented appropriately—have the potential to help close the mathematical performance gap between ELLs and non-ELLs.

Another possible way that teachers could help their ELL students perform or score more similarly on tests to their non-ELL peers is using guided tutoring interventions. Specifically, guided tutoring interventions that combine schema instruction with linguistically and culturally responsive practices during instruction may present a fruitful approach to closing the gap in ELL mathematics performance (Driver & Powell, 2017). This process involves teachers explaining to their students how to identify word problem types, how to represent them correctly, and how to solve them effectively while also being cognizant of their students' current mathematical and linguistic ability levels (Driver & Powell, 2017). By guiding ELL students as they work through understanding tough concepts, teachers may also connect with these students on a deeper level that ultimately improves their overall perceptions of ELLs.

Schools implementing guided tutoring initiatives should consider incorporating the use of paraphrasing interventions into these guided tutoring sessions. Paraphrasing can take on many forms—from simply restating the question being asked to examining all the relevant information needed to find the correct solution and reviewing all the information to determine whether it is important to correctly solving the problem. Swanson et al. (2018), for example, demonstrated in their study on paraphrasing interventions and problem-solving accuracy that Grade 3 students who paraphrased relevant information from mathematics word problems (e.g., the main question to be solved and the numbers needed to correctly solve the problem; the 'Relevant condition') showed a significant posttest problem-solving advantage compared to students in the control conditions and the other treatment conditions (e.g., the 'Restate' and 'Complete'

conditions). This finding remained significant even after controlling for pretest reading and mathematics comprehension, suggesting that generative paraphrasing interventions could be helpful in improving the performance of many ELL students.

Linguistic modifications and web-based tools may greatly help with the process of guided tutoring and ELL learning. Linguistic modifications (e.g., language simplifications) reduce the amount of reading associated with test items while still maintaining the test items' integrity and core content (Norval, 2019a). Previous researchers have demonstrated that linguistic modifications can have a positive impact on the learning of ELLs, with ELLs in low- and average-level math classes benefitting the most (Norval, 2019a). In addition, web-based tools such as the Strategy Instruction on the Web for English Learners have shown promise in providing high-quality, supportive instruction to help Spanish-speaking ELLs improve their reading comprehension skills (Wijekumar et al., 2018). Teachers could use such adaptive, guided tutoring interventions to help support their instruction of ELL students alongside their non-ELL peers.

Prior researchers have published study results suggesting that targeted approaches and support could prove beneficial to the behavioral and academic outcomes of ELL students. In one such study, Castro-Olivo et al. (2018) sought to examine the effects of a culturally adapted, comprehensive intervention on Spanish-speaking ELL students' behavior and reading skills. This intervention was called the *First Steps to Success for Latino English Language Learners* program (FSS). The FSS was adapted to include a bilingual Spanish-speaking interventionist, incorporate language translations, add

culturally relevant metaphors, point out educational differences, and promote the use of methods and goals that reflect positive values of Latino culture.

Participants in the FSS pilot study were three kindergarten students (one female and two males) who had been categorized as high-risk based on their classroom behavior and academic engagement before the start of the study. Following these students' participation in the FSS intervention, the research findings revealed a functional relationship between implementation of the adapted FSS program and time that these three participants spent engaging with the academic material and a significant relationship between FSS program exposure and a decrease in disruptive behavior. Finally, Castro-Olivo et al. (2018) found a small-to-moderate relationship between FSS program exposure and improved reading skills. These findings reveal several novel insights into the literature on how culturally adapted interventions such as FSS can benefit young ELLs.

In addition to the interventions discussed already, several other methods have shown promise in improving the performance of ELL students. An example includes the Culturally Appropriate Problem-Solving Instruction (CAPSI) program, which incorporates ELLs' native language and culture into the teaching curriculum during schema instruction, vocabulary instruction, and video modelling (Luevano & Collins, 2020). Others, such as the school counselor-led Student Success Skills curriculum, emphasize the school-wide implementation of social-emotional learning interventions focused on improving ELL student learning and achievement outcomes over time (Urbina et al., 2017). Past research has shown that incorporating cultural and linguistic elements

more familiar to ELLs while they are trying to learn new skills in English can enhance these students' mathematics vocabulary acquisition and problem-solving skills, among other positive outcomes (Luevano & Collins, 2020). Therefore, such culturally translated interventions could help decrease the gap between Hispanic ELL students and their non-ELL peers.

Other methods such as the use of on-site, dual-language programs have demonstrated similar positive results to the interventions discussed above. For example, Cardoza and Brown (2019) investigated how instructing newly arrived Latinx students in their native language (i.e., Spanish) rather than English would impact their academic gains in mathematics. Cardoza and Brown found that on-site, dual-language programs led by high-quality bilingual teachers and culturally competent support staff could potentially reduce the achievement gap between ELL and non-ELL students in mathematics. Research findings from a study by Roncoroni et al. (2021) also support this notion. Roncoroni et al. found that the implementation of inclusive and immersive learning environments in schools (e.g., culturally relevant content fairs with diverse career professionals) elicited increased interest of Spanish-speaking ELL student participants in science, technology, engineering, and mathematics (STEM) subjects. By piquing and retaining these young ELL students' interest in STEM, such interventions could help them build social capital in the long-term by way of acquiring useful STEM knowledge and practical experience. These results are consistent with Krashen's (1981) theory on language acquisition and suggest that using ELL students' native language and culture

when teaching them new concepts in English could help them learn faster and make gains in performance on par with their non-ELL peers.

This subsection covered various different interventions that could be useful in reducing the performance gap that currently exists between ELL and non-ELL students. Engaging in the "productive struggle', mathematical classroom discussions, generative paraphrasing, linguistic modifications, guided tutoring, and culturally appropriate and responsive instructional interventions are some avenues to accomplish this goal. In the following subsection, I continue discussing ways that schools and test-makers could help ELL students attain similar performance outcomes to their non-ELL peers; that is, by way of ELL-specific language accommodations.

Accommodations for English Language Learner Students

As addressed in the preceding subsection, culturally and linguistically sensitive interventions can help ELL students acquire skills faster and start to perform more similarly to their non-ELL counterparts. Additionally, accommodating ELL students even further by normalizing the use of these students' first language regularly during everyday classroom instruction could also help them grasp new concepts more quickly compared to teaching them only in English (Méndez et al., 2019). Such dual-language approaches to instruction have already been shown to be useful in improving newly arrived ELLs adjustment to the English-based, American education system (Cardoza & Brown, 2020). Thus, incorporating smaller accommodations in addition to larger scale interventions is important to derive the greatest benefit from their use. This section includes details of

several different accommodations, which has been demonstrated in past research to be beneficial to ELL students' long-term development and performance.

The first type of accommodation that could be beneficial to ELL students' academic performance is intelligent tutoring systems. These are computer-based programs that are usually interactive and adapt the difficulty level of the questions being asked based on how many of the previous questions a participating student answered correctly (Allessio et al., 2018). Therefore, if the intelligent tutoring system receives input that a student has incorrectly answered the last two questions that were asked, then that system would be able to generate a new series of easier questions for the student to answer next. This process would be the opposite for a student who consistently answers questions correctly—that is, the intelligent tutoring system would be able to choose a new series of harder questions for the student to answer next. A high engagement environment and immediate adaptability capabilities promote the appeal of accommodations such as intelligent tutoring systems.

Furthermore, intelligent tutoring systems that use animated pedagogical avatars may enhance the interactive online environment and personalize the learning process for ELL students even more. These avatars are, however, often chosen by researchers rather than by the students who are expected to interact with the avatars most often (Allessio et al., 2018). The goal of a study by Allessio et al. (2018) was to examine how Hispanic ELL students rated the utility of, and related to, animated pedagogical avatars based on how similar they perceived the avatars to be to themselves. Of the 76 sixth- and seventh-grade students who participated in this study, 24 were ELL students whereas the rest were

non-ELL students. After designing their own avatars, the participants completed a set of Likert scale items about their perceptions of the avatars' similarity to themselves and usefulness to their performance. Analysis of the data revealed that ELL students viewed the avatars as significantly more useful than non-ELL students did, and that they felt the avatars were more like themselves than did non-ELL students (Allessio et al., 2018). These findings support the position that greater similarity between an avatar and the learner could increase learner engagement with course material and improve their overall learning experience.

Similar to intelligent tutoring systems are dynamic assessments. Dynamic assessment systems are able to automatically adjust upcoming test questions based on how a student is answering the current test questions in real-time (E. Cho et al., 2020). Researchers Koran and Kopriva (2017) discovered in their prior work that research-based accommodation taxonomy systems provided a significantly better fit to the needs of each individual ELL student than any randomly generated accommodations or either of two teacher-recommended accommodations they assessed. These findings support the assertions posed by Solano-Flores et al. (2014) who, in their study on structural (e.g., visual aids) and linguistic accommodations for ELL students, claimed that creating testing accommodations for ELLs is an iterative process that involves specification, development, design, evaluation, and revision of the test material—sometime multiple times—before such accommodations would truly be able to benefit ELL students' performance in mathematics or other subjects.

What can be gleaned from this review of possible ELL student testing accommodations is that a "one-size-fits-all" approach does not work. Abedi et al. (2020) posited that other factors (e.g., teacher-student relationships or teacher preparedness to teach ELLs) might be contributing to the achievement gap between ELL and non-ELL students. Therefore, it is important that researchers examine how teachers could work on improving themselves for the benefit of the ELL students they teach. To examine this situation further, the following subsections of this review include a discussion of interventions and training for teachers to assist in furthering their confidence and skills when working with ELL students.

Interventions for Teachers of English Language Learners

Although there are numerous interventions and accommodations currently available for ELL students—with new tactics and aids being developed and researched every year—not as many currently exist for the teachers who instruct these students. For example, in a study focusing specifically on STEM teacher preparedness, Besterman et al. (2018) found that most of the STEM teacher participants in their sample did not have ELL credentialing, and less than 25% of these teachers had ever participated in any professional development activities related to ELL student learning. If these statistics are generalizable to the broader population of U.S. teachers, then they should raise concerns regarding their preparedness to properly instruct ELLs in ways that help them succeed alongside their non-ELL peers.

Mathematics teachers continue to face increasing demands concerning how to facilitate mathematical discussions effectively during class time while also sufficiently

supporting the learning of ELL students so that they do not fall behind their non-ELL peers. Therefore, Banse et al. (2017) conducted a comparative case study to better understand how teachers enacting a Calendar Math curriculum in Grade 4 classrooms attempted to facilitate mathematical discussions. In this study, Calendar Math served as the context in which teachers facilitated classroom discussions and was used as a warm-up method meant to enhance ELL students' basic math skills. Two White female teachers who each taught 21 students (at least 50% of which were ELLs) participated in this case study due to their demographic similarities. Banse et al. videotaped these participants teaching mathematics lessons to their students and then wrote summaries of their observations that they later used to developed codes for analyzing the qualitative data. Upon analysis of the data, Banse et al. found that repetition and elaboration were the most used voice strategies by both teachers to solidify their students' understanding of the concepts being covered. Overall, both teachers demonstrated a lack of depth into the application of Calendar Math discussions (Banse et al., 2017). This lack of conversational depth on the part of teachers could be particularly harmful to ELLs who rely more heavily on discussions to understand what is being taught in their nonnative language.

One intervention that could help prepare teachers to instruct and interact with their ELL students on a more in-depth level is a culturally responsive pedagogy called instructional conversation. Instructional conversation is described as a regularly scheduled, teacher-led discussion session between small groups of students who are all working together to achieve a clear instructional goal (Mellom et al., 2018). In a longitudinal study base on instructional conversation, Mellom et al. (2018) discovered

that after teachers had started engaging in the instructional conversation method with their ELL students, their attitudes towards ELLs began to change. Before participating in the intervention, these teachers held predominantly negative views of their ELL students—believing that these students' use of their native language in the classroom would hinder their understanding of new concepts taught in English. After participating in the intervention, however, these teachers shared with the researchers that ELL students' participation in class had increased, their knowledge of their ELL students' background increased, and they had increased their linguistic awareness (Mellom et al., 2018). Studies such as this illustrate how interventions for teachers could mitigate prejudicial attitudes towards ELLs over time and lead to improvements in classroom instruction over time.

It is apparent that comprehensive and culturally sensitive interventions such as instructional conversation or the discussion-focused Calendar Math curriculum could be beneficial to ELL students' performance outcomes. Using such methods, teachers of ELLs could improve their ability to connect with this diverse student population and adapt their teaching styles to better suit each of their ELL student's needs. The last subsection of this review contains a discussion of teacher training initiatives that have also shown promise in closing the mathematics performance gap between ELLs and non-ELLs.

Training for Teachers of English Language Learners

Teacher attitudes toward ELLs and their knowledge (or lack thereof) on how to adequately teach ELLs can often greatly impact the quality of education that these

students receive. This relationship emphasizes why it is imperative that targeted trainings meant to instruct teachers on how to connect with and teach ELL students effectively continue to be developed and improved upon. Explicit coursework related to how to teach ELLs through cultural understanding and appreciation for differences is just one training tactic that can be used to help PSTs develop competent ELL teaching strategies during their years of preservice training (Wissink & Starks, 2019). Doing so could help correct biased perceptions of ELLs earlier on in teachers' careers to enable them begin their teaching journey with a more accepting, equitable outlook.

Past research has revealed that training exercises in various forms can be beneficial to teachers' professional development. For example, Otten et al. (2019) found that preservice teachers benefitted from uncomfortable learning situations in which an unfamiliar learning environment simulated for them what learning was often like for ELL students (e.g., trying to learn mathematical concepts using Mayan numbers and Spanish instructions only when neither of these languages were familiar to the PSTs who participated in the training simulation). Real-life simulation training and in-person training experiences could improve teachers' intercultural communication competence and help them develop a more positive perception of their ELL students in general (Zhang, 2017). Thus, more training opportunities such as those mentioned here should be made available to teachers of ELL students across the United States, and administrators should encourage teacher participation in such opportunities.

Other types of training experiences—such as in-service learning opportunities—could also benefit teachers and ELL students. In-service learning opportunities have been

shown to help participating teachers of all experience levels develop novel pedagogical knowledge, analyze and adapt their beliefs, and encourage themselves to deepen their professional student-teacher relationships in the classroom (Lucas et al., 2018). For example, Shea et al. (2018) conducted a longitudinal study to investigate whether implementing a professional development training program in schools would improve outcomes for the low-socioeconomic, high-minority student population. This program consisted of two separate components, namely, strategies to incorporate student-talk into grade-level lessons in mathematics and science, and school-level learning groups focused on discussions and literature of student-talk research. In total, 203 elementary teachers participated in professional development workshops before the study began to be better prepared to carry out the professional development initiatives with their students in the classroom after the start of the study.

Upon the start of the study, Shea et al. (2018) chose 17 schools as the treatment group and designated four other schools as the control group. Additionally, Shea et al. analyzed 2,000 second-grade students' state test scores at both the start of the study and after the study's 3-year duration to determine whether any significant improvements in their test scores had been achieved. Of the 2,000 students, 566 of them were considered ELL students. The results of this study supported the assertions by Shea et al. that ELL student achievement (and that of all students) would significantly increase for teachers who participated in the professional development training program. These results present another possible avenue for improving relationships between teachers and their ELL students and ELL students' academic achievement.

In general, interventions, accommodations, and trainings of various type and scope currently exist that may be used to improve the performance of both ELL students and their teachers. However, how exactly effective current methods such as these would have on the long-term development and achievement of ELL students has not been examined. Spanish-speaking ELL students may have their unique needs when it comes to connecting with their teachers and non-ELL peers and engaging with the subject material they learn in their classes. More research is needed to discover the best methods to close the performance gap between ELLs and non-ELLs as well as how to effectively implement such methods countrywide, across thousands of K-12 schools.

Summary and Conclusions

The previous sections of this literature review included a discussion of the persistent gap in mathematics performance between ELL and non-ELL students, ELL students' perceptions of their performance potential, and how their perceptions often clash with those of their teachers (S. Cho et al., 2020; Norval, 2019b; Shim & Shur, 2017). Also discussed was how students and teachers tend to act (or react) according to their perceptions (de Araujo, 2017; Fernandes, 2020; Harrison & Lakin, 2018). Finally, I reviewed possible interventions and accommodations for students that could help reduce the performance between ELLs and non-ELLs, as well as interventions and training for teachers that could help achieve the same thing in detail (S. Cho et al., 2020; Driver & Powell, 2017; Lucas et al., 2018). By examining these factors in-depth, my hope was to convey the importance of research on teacher perceptions of ELLs and mathematical testing accommodations successfully.

As was mentioned earlier on in this review, ELL students in the United States may experience systematic barriers and linguistic limitations that affect their ability to learn and perform as well as their non-ELL peers. Nation-wide legislative changes may be necessary to help counteract these barriers and limitations. For example, perhaps educators should grant ELL students some freedom to express themselves and build up their native language skills so that the push to acquire a second language is seen as a way to boost their academic potential rather than as an attack on their cultural identity (Lumbrears & Rupley, 2019). Alternatively, maybe English-only legislative policies should be removed in favor of educational guidelines that promote more culturally competent practices regarding the use of multiple languages in students' learning (Nelson & Davis-Wiley, 2017). These strategies are just a few high-level changes that could be made to improve the performance outcomes of ELL students.

Further still, changes to local, state, and national testing structures may help reduce the performance gap between ELLs and non-ELLs. For example, Newkirk-Turner and Johnson (2018) showed that standardized and teacher-created tests for assessing ELL students' math skills possess linguistic and content biases that often lead to inaccurate depictions of linguistically and culturally diverse students' math abilities. Therefore, more research is needed to investigate how to improve the efficacy of linguistic modifications for exam items so that ELL students can be assessed alongside their non-ELL peers under more equitable circumstances (J. W. Young et al., 2014). Focusing on the needs of each specific ELL demographic group (e.g., Hispanic) in terms of testing and

classroom support could assist educators in adequately instructing all types of students in school and preparing them to succeed after graduation.

Understanding teachers' differing perceptions is critical to successfully implementing any substantial changes to the way that ELL students are taught and how their academic performance assessed. This chapter focused on reviewing literature related to the present study's central purpose to explore teachers' perceptions regarding how they implement a process of using the translation of standardized mathematics tests to support mathematics achievement among native Spanish-speaking ELLs in Grades 4 and 8 in one school district of a northeastern state. In Chapter 3, I outline the research methods and data analysis plan used in the present study.

Chapter 3: Research Method

The purpose of this basic qualitative study was to explore teachers' perceptions regarding the implementation of the language-translation NAEP standardized mathematics tests in one school district of a northeastern state to support the mathematics scores of Spanish-native ELLs in Grades 4 and 8. The topic of the study was the NAEP standardized mathematics tests for ELLs in one school district of a northeastern state in the United States. The population of ELLs takes up a significant portion of the students in the United States (Gonzalez, 2016; Parsi, 2016). The gap in practice is that it is not known how teachers perceive implementation of language translation of the NAEP standardized mathematics tests to support achievement scores of Spanish-native ELLs in Grades 4 and 8.

Based on the practical gap, the problem investigated in this study was that mathematics standardized test scores of ELL students have been persistently lower than for non-ELL students in a northeastern state in the United States. The results of national math standardized tests support the persistence of lower performance by ELLs (e.g., native Spanish) compared to English-speaking students (Newkirk-Turner & Johnson, 2018; Norval, 2019a). The research question addressed was the following: What are teachers' perceptions regarding the implementation of the language translation for the NAEP standardized math tests in one school district of a northeastern state to support the math scores of Spanish-native ELLs in fourth and eighth grade?

In Chapter 3, I discuss the methodology and research design implemented in this study. Based on the purpose of the study, a basic qualitative inquiry was the appropriate

research design for this study. The different topics discussed in Chapter 3, in alignment with a qualitative design inquiry, are as follows: Research Design and Rationale, Role of the Researcher, Methodology, Trustworthiness, and Ethical Procedures. Chapter 3 concludes with a summary of key points and transition to the succeeding parts of the study.

Research Design and Rationale

A basic qualitative inquiry was the research design appropriate for this study. For this study, a basic qualitative inquiry was appropriate because this design allowed in-depth exploration of the phenomenon of using language translation of standardized math tests to support the math achievement of Spanish-native ELLs. In this manner, the purpose of the study and research question were addressed.

According to Percy et al. (2015), basic qualitative inquiry is the design often used when a researcher cannot fit the purpose of the study into one specific qualitative model or design. The basic qualitative research study typically entails data collection through interviews to gain the perceptions of participants as reported to the researcher (Percy et al., 2015). The rationale for using a basic qualitative research design is to describe the perceptions of individuals and to explore the importance of these relevant perceptions to the phenomenon being studied (Merriam & Tisdell, 2015).

The basic qualitative approach is also useful for addressing a problem that requires qualitative data to better understand how to provide practical and useful information to support social change (Percy et al., 2015). The basic qualitative design also requires that the researcher interpret the participants' perceptions through a thematic

approach, an analysis method employed within the current study. The researcher, in a basic qualitative study, will also focus on the social phenomenon through a naturalistic setting (Percy et al., 2015), which, in this study, included exploring teachers' perceptions within the school setting. For this study, I chose the basic qualitative inquiry design as it provided the opportunity to gain the perceptions of teachers based on their own perceptions as they described them during the data collection phase of this study.

Looking into the problem and purpose of the study, I considered that I could most appropriately accomplish the requirements of the study through a basic qualitative research design. Through a basic qualitative research design, I could address the purpose and research question by obtaining firsthand information from individuals' perceptions about the topic of interest. I did not choose a case study for this study, as the aim was not to explore the social phenomenon within a bounded social context but to understand how teachers' individual perceptions relate to their implementation of language translation for ELL students. Phenomenology was also inappropriate for this study because making sense of the lived experiences would not have been sufficient to fully explore the phenomenon of interest (see Moustakas, 1994). Narrative inquiry was also inappropriate because collecting data in a storied manner was not relevant to addressing the purpose and research question of this study.

Role of the Researcher

I, as the researcher, served as the main instrument of data collection for this study. As the main instrument of data collection, my role included recruitment of participants, facilitation of interviews, and analysis of data. In the recruitment phase, I was responsible

for inviting and selecting eligible participants for the study. In the data collection, I conducted interviews as the interviewer. During the data analysis, I transcribed all interviews and processed all data through thematic analysis.

During the recruitment phase, I was responsible for identifying and contacting potential participants for data collection for the study. Before I performed any step during the recruitment of participants, I ensured that I had all the necessary permissions and authorization from different authorizing bodies, such as the university's Institutional Review Board (IRB) and the schools where participating teachers worked. Obtaining IRB and site permission before conducting any procedures that required interactions with the participants was necessary. I used these procedures to ensure I adhered to the following criteria: minimize potential risks for the participants and address ethical issues in the study.

When recruiting participants, as the recruiter, I had to conduct procedures that would minimize conflicts of interest throughout the study. To address potential conflicts of interest, I did not recruit participants who had a personal or professional relationship with me, including my family members, friends, relatives, colleagues, or work subordinates. I also emailed copies of the informed consent forms to the participants before commencing the study. Performing the informed consent process enabled me to ensure that the teacher participants were aware of their rights and roles as respondents to the study before deciding and committing to be a part of this research.

During the data collection, my role was that of interviewer. I interviewed participants to collect relevant information that I needed to address the research question.

Besides being an interviewer, I acknowledged my personal biases that might influence the findings of the study. Failing to address these biases could have had negative impacts on the credibility of the study. Therefore, I acknowledged possible sources of bias, specifically, personal opinions, perceptions, and beliefs, including expected findings about the study, before conducting any data collection steps. I based my efforts to document or list personal assumptions, beliefs, and opinions that were related to the study to minimize influences of biases on steps that other researchers had taken in previous studies (Datta, 2018; Wadams & Park, 2018). I also kept a reflective journal of my personal experiences, observations, ideas, and feelings. According to Kross and Giust (2019), because of the impossibility of perfectly objective qualitative research, reflexive journaling throughout the research process is an effective strategy to identify researcher bias. The process of journaling helped me to detach my personal opinions and biases from my role as interviewer and analyst of data. This process helped me improve the credibility of the findings. I also used an interview protocol to ensure that the questions I asked during the interview sessions were relevant, properly structured, and unbiased.

During the data analysis, my role was that of an analyst. I performed thematic analysis procedures to process the data collected during the interviews. To improve the credibility of the study, I transcribed the interviews, generated initial interpretations for each interview session, and performed member checking of the initial interpretations. Member checking is an effective means of improving the credibility of qualitative research (Candela, 2019). I performed these tasks before processing of data through thematic analysis.

Methodology

The phenomenon explored in this study was using language translation (e.g., a standard NAEP translation for ELL students; Robinson, 2010; Turkan & Oliveri, 2014) in one school district of a northeastern state to support the mathematics scores of Spanish-native ELLs in Grades 4 and 8. To explore the phenomenon of interest, I ensured that methods I used were appropriate for addressing the purpose and research question of the study. I collected data from a relevant population with the characteristics I needed to gather data on the perceptions and events related to the topic of the study. The focus on the participants with characteristics aligned with the topic of my study was based on the concept of purposive sampling (see Etikan et al., 2016; Klar et al., 2020). I discuss this sampling technique in the succeeding subsections of this chapter. In the next subsection, I discuss the relevant information on the target population, sampling frame, sampling strategy, and sample size.

Target Population and Sample

The general population of interest was teachers of ELLs who took the NAEP assessments in one of the school districts of a northeastern state. The target population from which I collected data was composed of Grade 4 and 8 teachers of ELL students in one of the school districts of a northeastern state. The exact number of teachers in the target population could not be determined. Approximately, 15% of students enrolled in K–12 for the chosen state were from Grades 4 and 8 (Department of Education, 2021). There are approximately 12,000 teachers in the chosen northeastern state (Department of Education, 2021). The estimated number of teachers in Grades 4 and 8 based on student

population (15%) was about 18,000 teachers. About 10% of fourth and eighth graders in the United States participate in NAEP assessments (Department of Education, 2021). Based on this percentage, I inferred that the approximate population of teachers of students taking the NAEP assessments was also 10% or 1,800 within the chosen northeastern state.

I chose this target population because of its parallelism with the phenomenon of interest of the study, which was the use of language translation in standardized mathematics tests to support the mathematics achievement of Spanish-native ELLs. Exploring this phenomenon using data on the perceptions of ELL teachers enabled me to collect information directly related to the research question of the study. In the research question and the purpose of the study, ELL teachers are explicitly mentioned. Therefore, the chosen target population was aligned with and appropriate for this study.

Participant Selection

I selected a sample from the target population. The sample was composed of individuals who had specific traits or characteristics aligned with the problem of the current study. To select and recruit these individuals, I used purposive sampling. Purposive sampling is a technique that researchers use when selecting participants based on a set of criteria that are aligned with the objectives of a study (Etikan et al., 2016; Klar et al., 2020). Various qualitative researchers on this topic have also used purposive sampling technique in their respective research (Ames et al., 2019; Asmaningrum & Tsai, 2018; Shahdadi & Rahnama, 2018). Using purposive sampling was appropriate for selecting a specific group of participants to address the research question (see Etikan et

al., 2016; Klar et al., 2020). Therefore, purposive sampling was appropriate for this basic qualitative research.

To perform purposive sampling, I used a set of eligibility criteria that each interested teacher had to satisfy before being considered a valid participant in the current study. The criteria aligned with the requirements of providing relevant information to the study. The eligibility criteria for this study were as follows: (a) must be a teacher of 4th- and 8th-grade ELLs in one of the school districts of a northeastern state and (b) must have used an English-translated mathematics test for Spanish-native ELLs. I asked screening questions aligned with the eligibility criteria after individuals sent the signed copies of the informed consent form to ensure that participants were eligible to be part of this study.

The planned sample size was 10–12 participants from the chosen school district, but ultimately 12 teachers participated. I interviewed the 12 eligible participants who volunteered to be included in this study. Sample sizes for qualitative studies are based on the data saturation point (Tran et al., 2016). The data saturation point is the instance during data collection and analysis wherein no new codes or themes emerge from the addition of new data (Tran et al., 2016). Researchers have suggested different sample sizes to achieve data saturation for qualitative studies (Braun & Clarke, 2021; Shahdadi & Rahnama, 2018; Sim et al., 2018). Based on different studies, eight to 12 participants are needed to achieve data saturation (Hassankhani et al., 2017; Shahdadi & Rahnama, 2018). For this study, I recruited 12 eligible teachers. However, if data saturation had not been reached with the initial 12 participants, I planned to recruit more participants until

reaching data saturation. Moreover, had I recruited less than 10–12 participants from the chosen school districts, I planned to expand the geographical scope of participants to include other school districts in the chosen state. I asked screening questions based on the eligibility criteria through email or phone call. I conducted this screening step after each participant sent a signed copy of the consent form. Conducting this screening step helped me ensure that the participants had the needed background on language translations to provide relevant information for this study.

Instrumentation

The source of information collected for this study was semi structured interviews. Semi structured interviews are said to be effective in collecting in-depth data because of the follow-up questions that interviewers may ask (Kallio et al., 2016). I used an interview protocol to aid in conducting the interviews. Using an interview guide was helpful in ensuring that the questions that I asked during the interviews were valid, relevant, unbiased, and not leading questions (Chuang et al., 2020).

I personally developed the interview guide. I based the questions on relevant literature about the use of language translation in tests for ELLs or nonnative English-speaking students. I also used the concept of Krashen (1981) that a language acquirer (i.e., an ELL) needs comprehensible input as a precursor to acquiring secondary language when asking questions about the importance of language translation to ELL performance. I also investigated recent reports about the topic of the study to be able to include questions that would enable me to collect relevant questions about the phenomenon that using translated language formats in standardized tests has yet to be empirically explored

as an appropriate accommodation for ELLs, especially for Spanish-native students. The contents of the interview guide included questions aligned with the research question of the study (see Kallio et al., 2016; J. C. Young et al., 2018).

I subjected the interview guide to expert reviews to improve the credibility of the study. The panel was composed of three experts with at least 5 years of experience in their respective fields. The fields of interest were teaching of ELLs, language accommodations for nonnative English-speaking students, and qualitative research. The experts reviewed the contents of the interview guide based on the following criteria: (a) proper word use, (b) ease of understanding of sentences, and (c) completeness of the items in terms of addressing the research question. I asked for comments and feedback from each expert regarding the items in the interview guide. I made the necessary changes to the questions based on the prominent comments from the experts.

Procedures for Recruitment, Participation, and Data Collection

Recruitment Procedures

I began recruitment by obtaining the necessary permits and authorization from different authorizing organizations, including the university IRB and the school administration where the ELL teachers were working. The school administrators who gave me site authorization provided a list of possible participants with corresponding email addresses where I could contact and invite ELL teachers. I was the only person to contact and communicate with participants for recruitment. From the list, I sent emails to the teachers to invite them to participate in the study. In the invitation email, I included the purpose of the interview, the intent to recruit them into the study, the eligibility

criteria in the invitation email that I would send, and the scope of participation. Interested teachers contacted me through email or by phone. I replied to each interested participant with an email containing a copy of the informed consent form and a set of screening questions that corresponded with the eligibility criteria of the study. Each teacher had to read and sign the informed consent document if they agreed with its contents. The teachers then sent a signed copy of the consent form to me before I could contact them for interview scheduling. I then contacted each interested participant to schedule an interview on their preferred time and date.

Data Collection Procedures

I used semi structured interviews to collect data for the study. All interviews occurred online via Zoom to minimize my physical contact with the participants, especially with the Covid-19 pandemic. I expected each interview to last 60 minutes. For each participant, I assigned one unique virtual meeting room in Zoom to ensure that all interviews occurred securely and remained confidential. I sent an email to each interviewee to provide the links to their respective virtual meeting rooms, meeting ID, and password in Zoom.

On the day of the interview, I allowed access to the virtual meeting room 5 minutes before the scheduled time. After a participant requested entry to the room, I accepted the request and then began the session by welcoming the participant into the interview. I then provided a brief introduction about the topic of the research, purpose of the interview, and the outline of the interview that would be conducted. I asked the participants for any questions and clarifications before proceeding to the interview

proper. If there are comments and questions, I first addressed them before proceeding to the question-and-answer phase.

After the introduction, I began asking questions as listed in the interview guide. I also asked follow-up questions, as needed, depending on the participant's answers. Asking follow-up questions enabled me to clarify answers and explore the information that the participant provided for each question more deeply. After finishing all the questions in the interview guide, I informed the participant that the interview was over. I then asked the interviewee whether they had any questions or comments, which I addressed during this part. I finally thanked the participant for their time and effort as a respondent in the study.

After each interview, I transcribed the session and wrote an initial interpretation of the findings from each of the interviews. I then performed member checking of the initial interpretation of the data from each interview. Member checking ensured that the initial interpretations of the interview data were correct based on the intended meaning that the participants had in mind during the interviews (see Birt et al., 2016). I asked the participants to review the transcript and my initial interpretations of their interviews and provide feedback about the correctness and accuracy of the information found in the document. If a participant had to make changes, they had 7 days from receipt of the initial interpretations to contact the researcher and discuss the corrections. Where I received no response within this period, I contacted the participant to ask for the feedback on the member-checking process.

Data Analysis Plan

I used thematic analysis process to analyze the data for the study following Braun and Clarke's (2019) six-step guide. I used Nvivo coding to guide the data analysis procedure for this study. In inductive coding, the researcher develops initial codes based on the data rather than previous theory or literature (Braun & Clarke, 2019). To guide data analysis, I used Nvivo 12 as an organizational tool. NVivo 12 is used to store data as well as to organize the similarities in texts that are coded and grouped. For the current study, I used this tool only for organization, as I conducted all coding procedures manually. The following six steps of thematic analysis by Braun and Clarke (2019) guided the data analysis procedure for this study.

Phase 1: Gaining Familiarity With the Data

For the data familiarization step, I read the member checked interview data at least two times. After the first round of reading, I took note and highlighted descriptive texts, which were the relevant words and phrases in the interviews that addressed the research question of the study (see Braun & Clarke, 2019). The aim of this first step was to ensure familiarity with the transcripts in preparation for the proceeding phase (see Braun & Clarke, 2019).

Phase 2: Identifying Initial Codes

After identifying descriptive texts, I began data coding. In this second step, I focused upon creation of initial codes. I tagged each similarity in the textual evidence as a "code" in NVivo (see Braun & Clarke, 2019). For this purpose, I noted a similarity, highlighted this, and tagged it as a code using the organizational software NVivo.

Subsequently, I grouped the codes to create categories in the following phase (see Braun & Clarke, 2019).

Phase 3: Searching for Emergent Themes Through Categories

In this third phase, I started to search for themes by grouping the initial codes into categories (see Braun & Clarke, 2019). Braun and Clarke (2019) noted that researchers do not choose themes but instead group similar codes into categories, which leads to the emergent themes within the data. The development of themes depended on the previous steps in which key codes of meaning were identified from individual reflections of the participants. I subsequently grouped these codes into categories that demonstrated a collection of similarities between the previously identified unit of meaning (e.g., codes). The development of emergent themes involved identifying the similarities in categories that could be grouped together. Thus, the second step after initial coding identification was grouping of categories. I created categories by reviewing similarities between codes created in the previous step (see Braun & Clarke, 2019). I used the final categories to review and create themes in the proceeding phase (see Braun & Clarke, 2019).

Phase 4: Reviewing Themes

In the fourth phase, I reviewed the categories I developed to explore for potential emergent themes (see Braun & Clarke, 2019). I also created a table to demonstrate the relationship among the codes, categories, and themes. After coding all the data, I identified themes by grouping similar codes together. Each group formed a theme that was a direct answer to the research question of the study (see Braun & Clarke, 2019).

Phase 5: Defining and Naming Themes

I finalized the initial themes identified in Phase 4 and evaluated those that could be combined or decomposed to form more coherent groups or themes. I then re-labeled each theme and determined the final list of the themes. I provided descriptions for each of the finalized themes.

Phase 6: Generating a Report

I wrote a report of the findings by listing the final themes, describing each theme, and justifying the themes based on the answers of the participants. The report is presented as the main content of Chapter 4.

Trustworthiness

Trustworthiness refers to the extent to which a research account is believable and appropriate (Lincoln & Guba, 1985). Trustworthiness may be improved through four elements: (a) credibility, (b) transferability, (c) dependability, and (d) confirmability (Lincoln & Guba, 1985). Trustworthiness is used to ensure the rigor of qualitative methodology and research design employed by the researcher. A researcher reviews validated methods of trustworthiness in a qualitative study to ensure the quality of the methodologies used to collect and analyze data (Korstjens & Moser, 2018). Three methods are used to address these trustworthiness issues and mitigate threats that can reduce the trustworthiness of a proposed qualitative study (Grant & Lincoln, 2021; Nowell et al., 2017). In this section, I define each term and review the methods I employed to address threats to these issues of trustworthiness.

Credibility

Credibility refers to the reliability of the methods used by the researcher to demonstrate that the data accurately represents the participants' perceptions as collected through data collection and analysis methods (Korstjens & Moser, 2018). Threats to credibility include researcher bias, qualitative data collection method, and sampling strategies (Grant & Lincoln, 2021; Nowell et al., 2017). A key threat to credibility is misrepresentation of data (Grant & Lincoln, 2021), which I addressed through member checking, as discussed in the following paragraph.

Member checking is considered a valid methodology for addressing credibility, as it provides participants an opportunity to review their reflections (as provided during data collection methods) and provide clarification, if needed, regarding the information that is presented in the data analysis procedures. Member checking involves providing participants with a summary of the interview data used in the data analysis procedures. Member checking began with downloading transcripts of the qualitative data (see Koelsch, 2013). I then reviewed the transcripts for grammatical errors that may occur during transfer between procedures. Subsequently, I summarized the transcripts to the corresponding participant (see Koelsch, 2013). The participant had several days to review the summary of the individual transcript and provide notations to me. The member checking notes included clarifications or additional discussion regarding their perceptions as presented through the transcript. The process of member checking is considered a key element of addressing threats to credibility while ensuring that participants can reflect upon their perceptions of the researcher (Koelsch, 2013). Through member checking, I

determined the accuracy of interview data by asking the participants to review the initial interpretations of their respective interviews (see Smith & McGannon, 2018).

Transferability

Transferability refers to the degree to which the results of qualitative research can be transferred to other settings (Lincoln & Guba, 1985). In qualitative research, transferability is limited due to a specific focus on the participants' perceptions. Threats to transferability may include study design, data collection, and analysis, as well as sampling strategy (Nowell et al., 2017). Korstjens and Moser (2018) recommended addressing dependability through quotes, descriptions, and participants demographics in qualitative research. I improved transferability by collecting full and rich explanations and presenting detailed descriptive data and direct answers of the participants' strategies (see Grant & Lincoln, 2021). I provided complete and detailed descriptions of the participants' reflections in Chapter 4 for future researchers to evaluate the transferability of the findings of this study (see Nowell et al., 2017).

I also addressed researcher bias, a potential threat to the dependability of this qualitative study. One method to address researcher bias is through reflexive journaling (Korstjens & Moser, 2018). Researchers may employ differing methods to document bias and increase personal reflexivity such as employing an individual journal to document their opinions or perceptions that could influence the interpretation of findings (Korstjens & Moser, 2018). Reflexive journaling is used in qualitative approach that can improve the trustworthiness of a qualitative study (Stahl & King, 2020). I employed research journaling through documenting my personal reflections and concerns throughout the

entire data collection process in a personal journal. I deeply reflected on my opinions, biases, and perceptions regarding all elements of the study throughout the reflexive journaling process (see Stahl & King, 2020).

Dependability

Dependability refers to the consistency and reliability of the study (Lincoln & Guba, 1985). Threats to dependability include instrumentation, such as the interview protocol developed in this study (Nowell et al., 2017). A researcher should clearly identify whether the instrumentation used was employed by a previous researcher or developed by the researcher themselves (Nowell et al., 2017). In qualitative research, the researcher must delineate whether they chose instrumentation used by previous researchers and demonstrate appropriate approval to use previously developed instrumentation. If the researcher chooses to develop their instrumentation, such as the interview guide in this study, they should clearly discuss development procedures (Nowell et al., 2017).

To address the threat to dependability, I provided a detailed discussion of the methods used to create the interview protocol for this study in Chapter 3. I also reviewed the interview guide with an expert panel to address the threat of dependability to reduce the trustworthiness of this study (see Nowell et al., 2017). I provided a detailed copy of the interview guide created for this study in Appendix A for the purpose of review by future researchers. The instrumentation is clearly defined and detailed in Chapter 3 to further demonstrate the methods used to create the interview protocol for improved study dependability (see Nowell et al., 2017).

Confirmability

Confirmability refers to the objectivity of the study (Lincoln & Guba, 1985). A key threat to credibility is the misrepresentation of data, which refers to how the researcher will demonstrate the perceptions of the participants accurately (Grant & Lincoln, 2021). To address confirmability, I provided a detailed audit trail to clearly demonstrate the data collection and analysis employed used in this study. The audit trail contains details of how the researcher developed the findings based on the participants' perspectives (Nowell et al., 2017). In addition, I included a codebook in Chapter 4 with details of the codes, categories, and themes identified in data analysis procedures. I also kept accurate details of the coding process in spreadsheets using the NVivo 12 software. In Chapter 3, I provided complete descriptions and details of the procedures that would allow readers to have a proper understanding of the process undertaken and the findings of the study to contribute to the richness of the audit trail (see Grant & Lincoln, 2021).

Ethical Procedures

I considered and addressed all ethical issues related to the inclusion of human participants in this study. To fulfill this responsibility, I obtained IRB approval, performed informed consent process, ensured participant confidentiality and data security, and recruited volunteer participants. First, before conducting any form of data collection or recruitment process, I obtained IRB approval for the study # 09-09-22-0650479. This step ensured that the procedures I followed for the study were unbiased and protective of the rights of the participants as human beings. Second, I provided copies of the consent form to all participants during recruitment to provide details of their roles and rights, as well as

the scope of their participation. Only those who sent a signed copy of the consent form ultimately participated in the study. Third, I kept the identity of the participants confidential through pseudonyms. I did not use the names of the participants while conducting the study. I also avoided conflicts of interest and impact of power relationships by not recruiting my co-workers, subordinates, family members, relatives, and friends for this study. I will also keep all data and electronic files secured (e.g., audio recording files) by keeping all documents in a locked cabinet for 5 years. All electronic files were password-protected and stored in my personal external hard drive. After 5 years, I will destroy all the documents by shredding and burning and delete all electronic files permanently from my hard drive. Fourth, all the participants were volunteers. I did not force anyone to be a participant in this study nor give incentives to those who agreed to join in this study. Any participant could decide to terminate their participation without incurring penalties. In such a case, I would return all data collected from quitting participants, as this information could not be included in the analysis of data for the study.

Summary

The purpose of this basic qualitative study was to explore teachers' perceptions about how they implement a process of using language translation of standardized math tests in one school district of a northeastern state to support the math scores of Spanish-native ELLs in fourth and eighth grade. Based on the purpose, I conducted a basic qualitative study to accomplish this research. This chapter included the implementation of the methodology and design chosen for this study. The participants were teachers of

Spanish ELLs about language translations in standardized mathematics tests. I used purposive sampling to recruit 12 teachers who participated in this study. I collected data using semi structured interviews. I transcribed the interview data and performed member checking using an initial interpretation of the data from each interview. I analyzed the data using thematic analysis. The results of the analysis are presented in Chapter 4.

Chapter 4: Results

The purpose of this basic qualitative study was to explore teachers' perceptions of language translation for the NAEP to uncover strategies of language translation to support the math scores of Spanish-speaking ELLs in fourth and eighth grades in a northeastern state. I explored teachers' perceptions of Spanish ELLs regarding language translations in standardized mathematics tests to support strategies that foster the achievement scores of native Spanish ELLs in Grades 4 and 8. Through exploring the perceptions of these ELL teachers, I identified how strategies for translating language used in standardized mathematics tests might be designed to improve the performance of native Spanish ELLs and address the performance gap between ELLs and non-ELLs. I posed the following research question to address the purpose and problem statement: How do teachers of ELLs perceive language translation strategies for the NAEP standardized math tests to foster the math scores and academic achievement of fourth and eighth-grade ELL students in a northeastern state?

This chapter comprises the following sections: Setting, Demographics, Data Collection, Data Analysis, Evidence of Trustworthiness, Results, and Summary.

Setting

The study setting was in a northeastern state. For this study focusing on fourth- and eighth-grade ELL teachers, recruitment involved obtaining permit authorizations and compiling a participant list. I sent invitations via email, and interested teachers underwent a screening process. Data collection occurred via online semi structured interviews through Zoom to accommodate COVID-19 precautions. Each participant received unique

Zoom meeting details for confidentiality. Interviews lasted 60–90 minutes and involved an introduction, question-and-answer session, and participant feedback. After the interviews, I transcribed sessions, provided initial interpretations, and conducted member checking for data accuracy. The study's location, a northeastern state, and the method of online interviews via Zoom ensured efficient and secure data collection.

Demographics

The study involved teachers of ELLs who had participated in the NAEP assessments in a northeastern state. The focus was on Grade 4 and 8 teachers responsible for instructing ELL students in the chosen state. Although the exact number of teachers in this target population was uncertain, I derived an estimated figure of approximately 18,000 teachers based on the state's student population distribution. I selected the participants through purposive sampling, with eligibility criteria specifying that they had to be teachers of Grades 4 and 8 ELLs in the northeastern state and have experience using an English-translated mathematics test designed for Spanish-native ELLs. The goal was to initially recruit 10–12 participants, with the flexibility to expand the sample size if data saturation was not achieved. The recruitment process involved obtaining necessary permit authorizations and emailing potential participants.

Table 1

Demographic Data

Demographic information	Details
Study location	Northeastern state
Grade levels focus	4th and 8th grades
Target population	ELL teachers who participated in NAEP assessments
Estimated teacher population	Approximately 18,000 teachers (estimated)
Eligibility criteria	- Teachers of 4th- and 8th-grade ELLs - Experience using English-translated math tests for Spanish-native ELLs

Data Collection

The data collection process involved semi structured interviews conducted online through Zoom. This process ensured a secure and confidential environment in consideration of the challenges posed by the COVID-19 pandemic. My aim was to gather in-depth insights from participants, and I anticipated each interview to last between 60 and 90 minutes. I assigned a unique virtual meeting room to each participant to maintain confidentiality and contacted them through email. The details included the necessary information about their designated virtual meeting room, including the meeting link, ID, and password. I facilitated entry to the virtual meeting room 5 minutes before the scheduled time. The session commenced with a welcoming introduction. I provided an

overview of the research topic, the purpose of the interview, and an outline of the interview structure.

During the interview, I encouraged the participants to seek clarification and ask questions. I asked the questions from the interview guide developed for the study to explore the participants' perspectives on the use of language translation in standardized math tests for Spanish-native ELLs. I also asked follow-up questions as needed to delve deeper into participants' responses. Post interview, I transcribed the sessions and documented my initial interpretation of the findings. I then used a member-checking process to enhance the credibility of the interpretations. In this process, I provided the participants with the transcripts and my initial interpretations to review and provide feedback or corrections within a 7-day period. The process adhered to the predetermined guidelines and ethical considerations. The virtual Zoom format proved effective in maintaining participant engagement while ensuring the safety and convenience of all parties involved.

Data Analysis

The thematic analysis process for this study followed Braun and Clarke's (2019) six-step guide. I used NVivo 12 as an organizational tool for inductive coding. In the first phase of the analysis, I read the member-checked interview data for at least two rounds. In this phase, I highlighted and noted descriptive texts relevant to the research question.

In the second phase, I initiated inductive coding by creating initial codes based on textual similarities. I tagged these codes and organized them using NVivo. Subsequently,

in the third phase, I grouped initial codes into categories to identify emergent themes. Themes emerged from the similarities between codes within these categories.

In the fourth phase, I reviewed categories to explore potential emergent themes and developed a table to illustrate the relationships between codes and themes. I finalized and evaluated initial themes in the fifth phase, considering combinations or decompositions for coherence. I also provided descriptions for each completed theme. Finally, the sixth phase was reporting the findings. In this chapter, I list and describe the final themes, with justifications based on participants' answers. Table 2 shows a summary of code frequencies and associated themes, offering a concise and comprehensive overview of key qualitative insights.

Table 2

Exploring Spanish Translation Accommodations for English Learning Students

Research question	Code	Theme
How do teachers of ELLs perceive language translation strategies for the NAEP standardized math tests to foster the math scores and academic achievement of fourth- and eighth-grade ELL students in a northeastern state?	Quality of translation • Performance of ELLs on translated tests Language proficiency • Challenges of language proficiency Disadvantages of translation Advantages of translating tests to native language • Value of translated tests • Elimination of language bias Benefits of language translation for ELLs	Impact of translation and language proficiency on ELLs' test performance
	Professional development and passion of educators Level of support	Role of educators and community in ELLs' language education
	Factors influencing performance. • Increased student confidence • ELLs' experiences • Confidence and mindset among L students	Factors affecting ELLs' performance and confidence.
	Cultural relevance	Importance of cultural relevance in education
	Approaches to addressing language-related problems for ELLs in standardized tests. • Use of practice tests and scaffolding • Use of data in instruction • Manipulatives and visual aids • After-school and Saturday programs • Adaptive technology and resources Accommodations for nonreaders	Comprehensive strategies for addressing language-related issues in standardized testing

The research participants have enriched the understanding of the educational field for ELLs, particularly within the demanding milieu of standardized testing. Central to their discourse is the recognition that language translation and proficiency are pivotal to the academic standing of ELLs. Indeed, the integrity of translated assessments plays a significant role in presenting true academic capabilities. Participant 2 emphasized the need for preciseness, noting, "Well, the accuracy and clarity of translation are crucial ... it's essential to have high-quality translation to maintain the test integrity." Participant 4 reinforced this by stressing the importance of diligence in translation validation: "regular review, revision, and validation of translated tests are needed to maintain accuracy."

Beyond translation, the participants underscored the profound influence of educators and community engagement in bolstering ELLs' language development. It is evident that teachers are crucial catalysts of language proficiency, extending their impact outwards from the confines of their classrooms into the broader community. Participant 7 encapsulated the sentiment well: "fosters support for adults and helps raise awareness of their unique challenges," encapsulating the communal fabric essential for comprehensive language education.

The participants additionally cast light on diverse factors that interact to influence ELLs' performance and self-assurance in educational settings. Beyond the in-class lexicon, Participant 2 pointed to the broader effect of previous educational backgrounds: "The educational experiences of ELLs prior to coming to the new country can affect their performance." Participant 3 connected this to the confidence levels of test-takers, noting

the value of understanding test instructions in one's first language: "Students ... feel more confident when taking the test."

The critical need for culturally relevant content in education reverberated through the commentary. Participant 10 captured the essence of this necessity: "I recognize the critical need for cultural relevance in test questions ... fostering diversity in education." This eloquently underlines the quest for an education that resonates with the varied student backgrounds, advocating for assessments that are congruent with the rich mosaic of cultures represented in the classroom.

When addressing the specific topic of language-related challenges in standardized testing, the participants' contributions were replete with strategies for circumventing such hurdles. The discussion evoked imagery of education as a bespoke trajectory where utilization of data analytics and tailored instructional practices pave the way for ELL success. Participant 2 advocated for an insightful approach: "the previous test, the performance in standardized tests in the previous year." Moreover, Participant 4 highlighted the fundamental impact of data usage on instruction: "Data in my instructions is the most important thing."

The thematic insights assembled from this study go beyond mere scholastic particulars; they embody the broader educational quandaries and the criticality of language as a navigation tool through these challenges. There is a discernible call for not only maintaining the integrity of translation, but also fortifying community-backed support structures. Coupling culturally responsive pedagogy with data-driven approaches

elucidates a path forward—an academic odyssey grounded in diversity, attentiveness, and a relentless pursuit towards the flourishing of every ELL student.

I faced challenges with participants' truthfulness during data collection, potential teacher homogeneity, and difficulties achieving data saturation. Unexpected issues with the scope included external factors influencing test translation and the potential inclusion of different grade levels and geographic regions. As a result, these issues highlighted the need for careful interpretation.

Evidence of Trustworthiness

Credibility

Credibility relates to the techniques employed by the researcher to establish the accuracy of the data in faithfully reflecting the participants' perspectives, as acquired through the utilization of data collecting and analysis methodologies (Korstjens & Moser, 2018). In addressing threats to credibility, I used member checking as a crucial strategy. This procedure involved providing participants with summaries of their interviews during data analysis. I allowed participants to review and clarify their reflections. Through this method, I aimed to validate the accuracy of the interview data and mitigate potential misrepresentation issues.

Transferability

Transferability is a concept that pertains to the extent to which the findings of qualitative research can be applied to different contexts or settings (Lincoln & Guba, 1985). To enhance transferability, I concentrated on collecting full and rich explanations from participants. Additionally, I presented detailed demographic information and direct

answers. This approach was essential to provide future researchers with comprehensive data for assessing the applicability of the findings in other settings.

Dependability

Dependability refers to the degree of consistency and reliability exhibited by a study, as described by Lincoln and Guba (1985). I took measures to ensure dependability by thoroughly discussing the development of the interview protocol. This procedure included a review of the interview guide by an expert panel. The interview protocol ensured transparency in the study's methods and helped address potential threats to consistency and reliability in data collection.

Confirmability

Confirmability refers to the degree of objectivity exhibited in a study, as defined by Lincoln and Guba (1985). To address confirmability, I implemented a detailed audit trail, offering data collection and analysis transparency. A codebook and meticulous coding in NVivo 12 software contributed to confirming the study's objectivity. I aimed to establish a robust audit trail for readers by providing clear procedures and findings.

Results

The purpose of this study was to explore teachers' perceptions of language translation for the NAEP to uncover strategies of language translation to support the mathematics scores of Spanish-speaking ELLs in fourth and eighth grades in a northeastern state. The study focused on answering one research question. After data collection and analysis, five themes emerged, which included (a) impact of translation and language proficiency on ELLs' test performance, (b) role of educators and

community in ELLs' language education, (c) factors affecting ELLs' performance and confidence, (d) importance of cultural relevance in education, and (e) comprehensive strategies for addressing language-related issues in standardized testing.

Table 3

Research Question–Theme Correspondence

Research question	Themes
How do teachers of ELLs perceive language translation strategies for the NAEP standardized math tests to foster the math scores and academic achievement of fourth- and eighth-grade ELL students in a northeastern state?	Theme 1: Impact of translation and language proficiency on ELLs' test performance Theme 2: Role of educators and community in ELLs' language education Theme 3: Factors affecting ELLs' performance and confidence Theme 4: Importance of cultural relevance in education Theme 5: Comprehensive strategies for addressing language-related issues in standardized testing

RQ1: How Do Teachers of ELLs Perceive Language Translation Strategies for the NAEP Standardized Math Tests to Foster the Math Scores and Academic Achievement of Fourth- and Eighth-Grade ELL Students in a Northeastern State?

Theme 1: Impact of Translation and Language Proficiency on ELLs' Test Performance

The complex relationship between high-quality translation and its impact on ELLs' test performance is crucial. Although language proficiency is a recognized barrier, the influence of translation in either exacerbating or alleviating this barrier is significant. Precise and coherent translation serves as a vital academic resource that assists ELLs with navigating sophisticated test items. As one participant pointed out, upholding the integrity of the test is crucial and is closely linked to the quality of translation provided to students. Participant 4 expressed a concern on quality of translation saying that a poorly translated test could lead to misinterpretations and misunderstandings from students thus giving out incorrect answers. The participant said,

> As I've said that the quality of translation, sometimes if it is poorly translated test, it can lead to misinterpretations and misunderstandings. For example, a test question may be mistranslated in a way that changes its meaning. It leads to incorrect answers and distorted results. Also, that means we, as a teachers, we should be more focused on the question or maybe a term or maybe a vocabulary word that we are using, because if we keep on changing the words or terms or any, for example- Terminology

Participant 3 highlighted the importance of quality translation and the level of accuracy and clarity that is needed to avoid misinterpretation, saying,

> One factor that influences my perception is the quality of the translation. The accuracy and clarity of the translation are very crucial, because if the translation is not done well, it can create confusion and lead to misinterpretation of the test questions. Therefore, it is very, very essential to have a high-quality translation to maintain the test integrity, the validity, and reliability of the test.

Participant 7 added that the validity of the translation especially the choice of words when carrying out the translation was important. The participant noted,

> Okay. So first, I consider the validity of the translation. The explicitness of the translation is vital to both the standardized tests and the test takers in the said language. The choice of words used should not lead to misunderstand and incomprehension of the concept. It is therefore indispensable to have superior translated version of the test to sustain its validity.

The value of having quality translation was also emphasized by Participant 10 who pointed out that translated materials needed to be precise and readily comprehensible for leaners to understand. Participant 10 also noted that inaccurate translation caused significant confusion for the learners, leading to poor results. The participant said,

> First and foremost, I consider the quality of the translation process to be of paramount importance. It is crucial that translated materials are not only precise, but also readily comprehensible. Inaccurate or convoluted translations can introduce confusion and misinterpretation of test questions, potentially

> jeopardizing the integrity of the assessment. Therefore, meticulous translation is instrumental in upholding the reliability of the test.

Regarding language proficiency, the participants noted that different ELL students had different levels of proficiency even in their native language and asserted that this variation affected their performance. For instance, Participant 2 noted that different ELL's have varying level of language proficiency just like native English speakers students. The participant said,

> Language proficiency, it is important to recognize that ELLs have varying levels of proficiency, just like native English speaker students. Some ELLs may have limited proficiency in their first language, which can still pose challenges in understanding and responding to the translated test. The level of language proficiency in their native language can significantly impact their performance.

Participant 3 mentioned that some ELL's have limited proficiency in their first language, which poses the challenge of understanding tests or responding accurately to tests:

> Number one, it is important to recognize the ELLs of varying levels of proficiency, as just mentioned, even in their own native language as well. Some ELLs may have limited proficiency in the first language, which can still pose challenges in understanding, responding to the test or translated test. The level of language proficiency in their native language can significantly impact their performance.

Participant 10 added that ELLs have a wide spectrum of proficiency levels, which brings about the challenge of comprehending and responding to translated tests. The participant said,

> First, it's essential to recognize that ELLs exhibit a wide spectrum of proficiency levels in their native languages. For some, limited proficiency in their native language can pose challenges in comprehending and responding to translated tests. This proficiency directly impacts their test performance.

This theme was identified as one of the major factors that influence the performance of ELL students when their mathematics tests are translated to Spanish. According to the participants, the quality of the translation and the level of proficiency affected students' performance. By ensuring the accuracy and clarity of translations, educators can contribute substantially to offering fair testing environments.

Theme 2: Role of Educators and Community in ELLs' Language Education

Educators exert a significant impact on the language education of ELLs, and their viewpoints profoundly influence the development of supportive systems. Situated at the intersection of policy and actual practice, educators directly shape how translation strategies are implemented in educational contexts. Their insights also tie into the wider community, highlighting the importance of collective efforts in aiding ELL students. Regarding the role of educators, Participant 2 said, "The level of support provided by teachers and educational institutions is crucial. Teachers who are trained in working with ELLs and who provide additional support, such as pre-teaching relevant vocabulary and

concepts, can positively impact test performance." Participant 3 noted that the support given by teachers and educational institutions was very important:

> Then number four, the level of support provided by teachers and educational institutions is very crucial. Teachers who are trained in working with ELLs and who provide additional support, such as pre-teaching, relevant to cable line concepts, this one can positively impact the test performance. Of course, the availability of support services such as English as second language program or the ESL program can also make a difference.

Similarly, Participant 9 pointed out that students will perform better when they are supported:

> So instead of having these students memorize the rules, they should be trained to communicate. I have also here support. In my state Public Schools, students are very well supported. There are many support personnel who provide services like speech, counseling, and tutoring, etc. However, no matter how much effort the DOE provides, if these efforts are not maintained outside the four walls of school, students' progress are far to be attained and their full potential are to be brought not to be brought out.

Regarding the involvement of the community in providing support to ELL students, Participant 4 said, "Because engaging parents and the community in the assessment process, this can be used of translated tests and fostering support for adults and help raise awareness of their unique challenges and strengths." Participant 7 underscored the necessity of community involvement, explaining that it "fosters support

for adults and helps raise awareness of their unique challenges." In this regard, Participant 8 noted, "We partnered them with the English speakers and somehow somewhere it helps. When students that understand or speak English at the same time, Spanish speaks, help them on their math activities."

The participants also gave responses regarding the role of parents as a supporting system to their children when they went home with schoolwork. They said that this was also a contributing factor to the performance of the ELL students. For example, Participant 4 said,

> I believe that some other factors that I need to consider are the parents assessment, the parents' contributions, parents' participation, especially in the consistency of their children in understanding the mathematics concepts based on the translation and also a consistent assessment from the parents' so that there will be a continued learning and development of their academic skills based on the translations in their own language.

Participant 7 mentioned how parents are provided with curriculums to help monitor their children when at home. Parents were seen as a great support system for children especially in helping them in the translation. The participant said,

> Yeah, we usually involve parents. We give the curriculum in advance so that the parents can monitor what their children are learning. We really encourage them to help them at home so that when they come to school, they will not struggle that much anymore because they are also having support at home. The parents are also given instruction like that so that it's not only the teacher that is working with

> their children, the parents also must be highly involved with the education of their children.

Participant 10 showed how parents' involvement fostered a positive home-school connection. The participant said,

> This benefit extends beyond the classroom and can be applied to students' homes. Translated tests also serve to benefit parents, particularly those who are more comfortable with their native language. By providing access to test content in their native language, parents can offer enhanced support for their children's learning and better understand the test materials, thus fostering a positive home school connection.

This theme highlighted the role of educators, parents, and the community in offering language support to ELL students. The participants noted that through this support, ELLs were able to improve in their test scores. A community-oriented method significantly shapes the field of language education and reinforces the support network vital for ELLs' success.

Theme 3: Factors Affecting ELLs' Performance and Confidence

Some of the factors affecting ELLs' performance as asserted by the participants included prior education experiences that students had, their home environment, the format of the tests, the emotional and psychological conditions, and their ease of understanding of ELL tests when offered in the native language. The confidence and performance of students, particularly ELLs, are intimately connected. For ELLs, their

comprehension of test instructions in their primary language significantly boosts their confidence.

On the issue of prior educational experience, Participant 2 narrated how students who had a strong foundation in mathematics back in their home country were performing better and those who did not have a good foundation in mathematics found themselves also struggling in their performance. Participant 2 said,

> Also, the educational experiences of ELLs prior to coming to the new country or region can affect their performance on translated tests. Ells who had strong math education in their home countries may perform differently from those who had limited exposure to math instruction. If they were strong in math back home, they'd still be strong in math here. If they had difficulties back home, they'd still have difficulties here.

Participant 10 also pointed out that students who had a good foundation of mathematics from their home countries performed better. The participant said,

> Furthermore, the educational backgrounds of ELLs before their arrival in a new country or region can have a significant influence on their performance in translated tests. Those with a solid foundation in mathematics from their home countries may demonstrate different capabilities compared to those with limited prior exposure to the subject.

Regarding the students' home environment as a factor affecting ELLs performance, Participant 3 mentioned that some homes have limited resources to help

students. Other students also face the challenge of not getting any assistance from their parents at home and this affected their performance. The participant said,

> Another thing, support and resources available, students' home environment, which also play a role in their test, like their performance. Ell students from home with limited access to education materials or parents who may not be able to provide homework assistance may face additional challenges. We must understand that some of these parents, they don't have this background and they come to the United States to work.

Participant 10 also said that students whose parents offer minimal assistance encounter additional challenges,

> Lastly, it's worth noting that the level of support and resources available within students' home environments is a contributing factor. Ells hailing from homes with limited access to educational materials or parents who may not be able to assist homework can encounter additional challenges.

The format of the tests was also a factor that was highlighted by participants influencing the performance of ELL students. For instance, Participant 6 talked about how the tests were constructed and suggested that students should be given a chance to familiarize themselves with the questions first. The participant said,

> I think the format or the way it's being constructed, at least to let the students familiarize how the test is being constructed, then you'd be able to ... When the test comes, you'd be able to … Really, it's easy for them already to understand because you can see the pattern. We have test prep months before the state test.

> We have that thing. During math block, we use the old materials, the old state test as the practice test, aside from the curriculum that we're using.

Participant 10 also highlighted that some question structure required a higher level of understanding and said,

> The test format itself can exert a significant influence on ELL's performance. Some tests may feature intricate question structures, demanding a high level of language comprehension. Even in their native language. Recognizing and addressing these complexities and test design is paramount to ensure fair and accurate assessment.

Students who had a difficulty in translation experienced emotional and psychological stresses as asserted by participants. For example, Participant 3 gave an example of a student who said they got a headache immediately the test was presented to them. The participant said,

> They are. It is important to consider their emotional and psychological factors because this can contribute to test anxiety and explore ways to mitigate it. Just like yesterday, I was teaching my students. By just looking at the test, he told me, Oh, I have a headache. They're already sick. Then he said, Can I go to the nurse? I said, yes, you can go to the nurse. When the nurse asked him, when did your headache start? I said, When I look at the test.

Participant 4 emphasized that students experience some level of anxiety when they get tests that are not translated into their native language. On the flip side, when the students get tests that are translated, their level of anxiety and worry reduced. Participant 4 said,

> Reduced also the test anxiety, and I would consider this one because if the student has ... If the student knows that they have a translation from English to their own language, it reduces their anxiety, their worriedness, their confusion, because it can reduce test anxiety, because it's associated with language proficiency. That is already their language, so they can more accessible and can be able to deepen their thoughts or maybe ideas, or maybe that they can extend more, they can make their own strategy, and a lot of approaches that they can do because of the translations. That means it reduces their worriedness.

Six participants mentioned that there was ease of understanding of the tests when they were offered in the Spanish language. This affected their performance. For instance, Participant 1 said, “It's very important to have it translated because they feel like they can do it. I noticed that when it is read to them in their native language, they can understand it better, even when it's read to them.” Participant 8 also said, “Providing Spanish-versed translation allows Spanish-speaking students to fully understand and engage with the test content, ensuring that their true abilities are reflected in their scores.”

Regarding the effect of confidence, the participants said that tests that were in their native language boosted their confidence, and this reflected positively on their performance. This was evidenced by Participant 3 who said,

> Number two, increased confidence. The translated tests can boost the confidence of ELL students. When students can understand the instructions and questions in their native language, they tend to feel more at ease, which can positively impact their performance. I've seen in my class, I've seen students who previously were

> very hesitant and unsure of what they do, they become more confident, when they can read and understand the content in their native language.

Participant 9 pointed out that translating the tests was beneficial to the students because they become more confident to handle the tests. The participant said,

> Those are the only basis in saying that translated version is really helping these students. At the end of the school year, towards the end of the school year, you can see more ELL students are more confident. They are socially confident. They are already participating more in the learning process. Those ones, I must say, are enough justification or enough proof that translating any material, not only the standardized tests, is beneficial to these students.

Participant 10 also noted the ripple effect of translation on confidence level, "When math tests are made available in the native language of ELLs, it... has a ripple effect on their confidence level... they tend to feel more at ease during testing, which subsequently has a positive impact on their overall performance." For ELLs to engage with exams confidently and with full understanding, it is essential to consider both their present linguistic skills and their overarching educational backgrounds, which shape their self-concept and test results.

Theme 4: Importance of Cultural Relevance in Education

Cultural relevance serves as a foundational element in providing equal educational opportunities that recognize and value diversity and inclusion. Translating assessments may not always capture the nuances of every culture. How tests are translated from the English language to the native language of the ELLs should be

considered. Different students have been brought up under different culture even though they all speak the same Spanish language. The cultural context is recognized as equally vital as the linguistic aspect, especially for ELLs. Participant 2 addressed this concern, stating,

> While tests aim to be culturally sensitive, translating assessments may not always capture the nuances of every culture. Certain test items may inadvertently reflect the cultural context of the translating team, which can be a disadvantage to some ELLs. For example, a question designed to be culture neutral in a translation may still include implicit cultural references that some students may not understand. Also, the quality of translation can vary, and errors in translation can lead to misinterpretation of test questions.

Participant 4 pointed out that the culture of the students should be taken into consideration. This is because mathematics can be taught differently in different cultures. The participant narrated,

> Number four, cultural relevance. One challenge that needs careful consideration in ensuring cultural relevance in the translated tests because mathematics can be taught differently in various cultures, and certain terminologies might differ. It is very crucial that the test translated into their native language should be culturally sensitive and it should not doesn't have disadvantage or ELL students due to their differences in mathematical terminology or teaching methods… Other factors or disadvantages may be cultural nuances. When I say cultural nuances, it refers to the test which aims to be culturally sensitive and translating assessment may not

> always capture- Of which? Yeah, from every culture. There are certain test items that may be inadvertently reflect the cultural context of translating. I think the test developer and those who are assigned to translate, they should be culturally sensitive of the test.

Participant 9 also noted, “These students may have taken exams test constructed differently. They come from different educational system." Participant 10 highlighted that the background of the students ought to be factored in and said,

> I recognize the critical need for cultural relevance in test questions. Standardized tests often incorporate cultural references that may be unfamiliar to ELLs from various backgrounds. Ensuring that translated tests take these cultural disparities into account is essential to guarantee a fair assessment … language translation serves as a testament to the acknowledgment of the diverse cultural backgrounds of ELLs. It goes a step further to respect and accommodate the linguistic and cultural differences these students bring to the classroom. This respect for diversity contributes to a more inclusive and welcoming educational environment where ELLs feel recognized and valued, fostering a positive atmosphere for learning.

By incorporating cultural references with which ELLs can identify, educators can deliver a more proportionate depiction of the material, allowing ELLs to genuinely connect with the testing content and thereby afford them an equitable chance to showcase their academic talents. This theme helped answer the research question on how teachers perceive the effect of language translation on students’ performance.

Theme 5: Comprehensive Strategies for Addressing Language-Related Issues in Standardized Testing

An integrated approach is crucial for tackling the linguistic challenges that arise in standardized testing. Insights from educators indicate that using practical strategies including use of clear and simple instructions, offering glossaries, use of practice tests, use of data in instructions, use of manipulatives and technology, and offering after school and Saturday programs. The findings revealed that when these strategies are incorporated when testing students, there was a difference made in their performance and confidence. On providing clear and simple instructions, Participant 10 underscored the importance of having straightforward instructions and stated,

> Regarding to the test itself, it's imperative that the standardized test features questions and instructions, again, that are clear and straightforward, avoiding the complex sentence structures and obscure vocabulary. This approach to test design benefits all students by enhancing the overall accessibility of the assessment. I think we can agree that having a clear and straightforward question is better, not just in math and not just with the ELLs, but just in general for students.

Participant 2 asserted that offering glossaries could help. The participant noted that bilingual glossaries offered to students brought about improvements in understanding and performance. He stated,

> Also, I've witnessed ELL students grappling with mathematical terms in the language of instruction. Offering the bilingual glossaries is an aha moment. The improvement in understanding and performance when they have access to

> translated math terminology has been unmistakable because sometimes kids are hesitant to ask. But if they have the glossary there, they can just help themselves right away and find a translation. Use of clear and simple language.

On the strategy of using practice tests, Participant 6 stated, "The practice sets are in translated version as well. That's a factor that would add to their readiness when it comes to the actual standardized test." Seven participants suggested the use of data in instructions as part of the strategies. The participants noted that the use of data helped teachers monitor the test performance of each student in their class. For instance, Participant 4 showed how they use data in instructions by stating,

> Impact on instruction. Because the impact on instruction, this would also consider how using the translated test impacts, especially in their instructional decisions. If the results from the translated test led to more targeted and effective instruction, it can be seen as a valuable tool … Data in my instructions is the most important thing, because it would be the basis that how we determine the student in understanding the mathematical concepts or instructions based on the ... Aside from the translations. Meaning that if the student got higher scores based on the data through.

Regarding the use of manipulatives and scaffolding, seven participants gave their responses on the same. Students were seen to be more comfortable when teachers used visuals when teaching them. The use of manipulatives also brought a difference in the performance of students. Participant 6 underscored the relevance of manipulatives and scaffolding and said,

> What we do is we have a lot of visuals in the classroom, especially in some of those years, we still don't know the number. You must start from the basic. We look at the data, and then we're going to create an instruction specific with that student. We have a lot of visuals; we have a lot of manipulatives. We use them. Especially the EELs, they need a lot of manipulatives. We also do a lot of vocabulary words with visuals, and they are on their desktop that it's very accessible to them. Then we have the math toolkit that's also accessible to them so that it should be easy for them to understand the concepts.

Another strategy that was mentioned by participants was the use of technology in providing translation services. Participant 8 narrated on the use of Google translate and said,

> I think because of technology this time, although I'm not a native Spanish-speaking teacher, but because of technology this time, I think you can ... It's easy now. It's very easy to just do Google translate. If I think the question is typed in and you put it on the SMART board or even in Word, you can just click that Google translate and it will translate the question, the English version of the test to Spanish. I'm not going to say that the translation is really accurate, but at least probably 90% of those words are translated in Spanish language.

To assist learners in their translation, some school administrations provided after school programs and Saturday programs. This was evidenced by Participant 6 who gave an example of the iRead program. The participant said,

> We also have the supplementary program, we call that, I don't know, I'm not sure if you're familiar with that, iReady. We have iReady Reading, we have iReady Math. We have that one. In fact, in iReady Math, we also have the translated version… We have after-school programs also that would help the students. We have after-school programs for math, and then we also... Our curriculum has changed also this year, and we have a lot of things that we could also use approaches.

This forward-looking use of historical data, along with uniform translation of teaching materials, can customize the educational process to enhance ELLs' engagement and comprehension, creating a supportive setting for both learning and evaluation. This theme helped highlight the strategies that teachers use to help ELL students. It also helped answer the research question.

Summary

This study focused on understanding teachers' perceptions of language translation for NAEP, specifically examining strategies for supporting the math scores of Spanish-speaking ELLs in Grades 4 and 8 in a northeastern state. The overarching research question addressed how teachers perceive language translation strategies for standardized math tests and their impact on ELL students' academic achievement. Following extensive data collection and analysis, five key themes emerged, covering various dimensions of the research question. These themes include (a) impact of translation and language proficiency on ELLs' test performance, (b) role of educators and community in ELLs' language education, (c) factors affecting ELLs' performance and confidence, (d)

importance of cultural relevance in education, and (e) comprehensive strategies for addressing language-related issues in standardized testing. The next chapter contains a detailed discussion and interpretation of the results presented in Chapter 4.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this basic qualitative study was to explore teachers' perceptions of language translation for the NAEP to uncover strategies of language translation to support the math scores of Spanish-speaking ELLs in fourth and eighth grades in a northeastern state. The nature of the study involved a basic qualitative research design that was appropriate for exploring phenomena within their natural environment and for gathering in-depth, rich data related to the research question. Qualitative methodology was more suitable for this study than quantitative or mixed methods, as the focus was on understanding participants' perceptions and experiences regarding language translation in standardized math tests for ELLs. I did not use a quantitative methodology because my goal was not to establish relationships between variables using numerical data. I also deemed mixed methodology inappropriate because the focus of this study was not establishing relationships among variables, and the study lacked a quantitative component. The basic qualitative research design supported an in-depth exploration of the experiences and perceptions of ELL teachers, aligning with the purpose and research question of the study.

This study addressed one research question. The outcome was the emergence of five distinct themes through data collection and analysis. These themes include (a) impact of translation and language proficiency on ELLs' test performance, (b) role of educators and community in ELLs' language education, (c) factors affecting ELLs' performance and confidence, (d) importance of cultural relevance in education, and (e) comprehensive strategies for addressing language-related issues in standardized testing. Exploring

comprehensive strategies for addressing language-related issues in standardized testing and the positive impact of translating tests into the native language provided valuable insights into enhancing accessibility, reducing bias, and promoting fair and equitable education for ELLs. This study revealed crucial aspects of language translation in the context of standardized math tests that are useful for educators, policymakers, and researchers.

Interpretation of the Findings

Theme 1: Impact of Translation and Language Proficiency on English Language Learners' Test Performance

In assessing the impact of translation and language proficiency on ELLs' test performance, the research by Abedi et al. (2020) is of particular importance. Their work suggests that the precision of translation is central to the maintenance of test substance, ensuring that ELLs grasp questions as they are intended. The translation quality, according to their findings, has a profound influence on ELLs' performance, notably in mathematics assessments. Complementing this perspective, Norval (2019a) highlighted how language simplifications and other linguistic adjustments could yield positive learning outcomes for ELLs in particular subject areas. These findings conform to Krashen's (1981) theory of comprehensible input, which argues that accessible language input is critical for effective language acquisition. Accordingly, teachers have emphasized the need for translations that preserve the integrity of tests for ELLs, reflecting Krashen's position that language input should be both intelligible and suitably challenging for learners.

Theme 2: Role of Educators and Community in English Language Learners' Language Education

This theme emphasizes the significant influence of educators and the community within ELLs' language education. Wissink and Starks (2019) suggested that specialized training is pivotal for educators to improve interactions and academic support for ELL students. Additionally, the study emphasizes the role of teacher support and community engagement, including parental involvement, in enhancing ELLs' outcomes. This perspective is consistent with Krashen's (1981) theory on the provision of comprehensible input as a critical method for language acquisition. The interconnected roles that educators and community support play in nurturing an environment conducive to language learning for ELLs is reaffirmed.

Theme 3: Factors Affecting ELLs' Performance and Confidence

This theme illustrates the multifaceted influences shaping ELLs' performance and confidence in testing environments. Swanson et al., (2018) explored how language proficiency and educational experiences affect ELLs' confidence and performance. This study points out the benefits of diversified instructional methods, which Sorto et al. (2019) also determined lead to enhanced ELL performance. The incorporation of Krashen's (1981) theory in these discussions confirms the complex relationship between language proficiency, educational experiences, and confidence. The importance of a supportive educational environment that prioritizes language needs is posited as a key element in bolstering ELLs' confidence and success.

Theme 4: Importance of Cultural Relevance in Education

Cultural relevance is highlighted as a critical dimension of education for ELLs. Sorto et al. (2019) and Rahman et al. (2017) illuminated the necessity of culturally responsive pedagogy and assessment translation methods to ensure equity in assessment. Similarly, de Araujo (2017) cautioned against oversimplifying content, underscoring the need to uphold cognitive challenges relevant to the cultural contexts of learners. Krashen's (1981) assertions about the importance of culturally appropriate and comprehensible input are reflected in these insights, advocating for an inclusive education that acknowledges and respects cultural diversity.

Theme 5: Comprehensive Strategies for Addressing Language-Related Issues in Standardized Testing

Addressing language-related challenges in standardized testing requires comprehensive strategies, as suggested by Banes et al. (2018) and Driver and Powell (2017). They advocated for the use of data-driven methods and informed instructional decisions to enhance ELLs' outcomes. The findings emphasize the effectiveness of accommodations such as translation in providing ELLs with comprehensible input, aligning with Krashen's (1981) theory on language teaching. This approach supports the use of empirical strategies to address language barriers and promotes educational equity for language learners.

Limitations

This study had several limitations that could have influenced the reliability of its findings. My biases toward the study's subject matter were a significant constraint.

Despite attempts to minimize these biases by acknowledging personal experiences, expectations, and prior knowledge related to the topic, achieving absolute objectivity remains challenging in qualitative research, as posited by Kross and Giust (2019). I used reflexive journaling throughout the research process to identify and address biases, thereby validating interpretations based on actual data before incorporating them into the study's official results and findings. I also employed an interview guide to counter potential biases during data collection, which served as a structured tool to prevent irrelevant and biased questioning. The effectiveness of this strategy was, however, contingent on its meticulous and sincere implementation. Despite these measures, biases could have persisted in constructing the interview guide or emerged during the dynamic interactions of qualitative interviews.

The context-specific nature of the study raises questions about the applicability of the findings beyond the specific setting, thus limiting the external validity of the results. Additionally, social desirability bias could have swayed participant responses, and recall bias may have affected the accuracy of participants' memories. The study lacks explicit details about potential time constraints during data collection and analysis, creating uncertainty regarding the depth and thoroughness of the research process. Although I implemented strategies to address biases, the inherent limitations of qualitative research and the potential for biases underscore the need for cautious interpretation of the study results. Transparent reporting of the research process and an explicit acknowledgment of these limitations may contribute to the overall credibility and dependability of the study's findings.

Recommendations

Despite its inherent strengths and limitations, this study provides a foundation for several recommendations that can guide future research. First, future research could benefit from expanding the participant pool to include teachers and ELL students from diverse language backgrounds. This approach, which aligns with Solano-Flores's (2014) emphasis on considering various language backgrounds in standardized test development, could enhance the generalizability of findings and illuminate potential variations in experiences based on linguistic diversity. Second, although the current study focused on teachers' perspectives, incorporating ELL students' viewpoints in future research could offer unique insights for improving testing practices. This recommendation aligns with the broader literature highlighting the importance of incorporating student voices in educational research.

Third, a more focused exploration of the practical implementation of language translation strategies in the classroom setting could provide nuanced insights into the challenges and successes faced by educators. This recommendation aligns with the comprehensive strategies theme identified in the current study. Fourth, future researchers could delve into the specific types of educational support that have proved most effective for ELLs in the context of standardized testing. Understanding the types of support that positively impact test performance could inform targeted interventions and support structures.

Fifth, given the emphasis on cultural relevance in education, future researchers could explore specific ways to incorporate cultural sensitivity into standardized test

questions. Investigating methods to infuse cultural relevance into testing practices could contribute to more inclusive assessment approaches. Sixth, building on the insights from the impact of translation themes, future research could specifically focus on validating translation quality. Investigating methods for ensuring accurate and culturally appropriate translations could contribute to developing best practices in test translation. Connecting teachers' perceptions to actual academic achievement outcomes could strengthen the study's findings. Understanding the link between teachers' perceptions and students' performance could provide a more robust basis for shaping educational practices. This recommendation aligns with Short and Boyson's (2012) emphasis on academic achievement to reduce gaps for ELL students.

Implications

At the individual level, the study illuminates the challenges Spanish-speaking ELLs face in standardized math testing. Researchers can develop targeted interventions and support by understanding the impact of language translation on test performance and the factors influencing ELLs' confidence and proficiency. This suggestion aligns with a study by Swanson et al. (2018), who demonstrated the effectiveness of paraphrasing interventions in improving problem-solving accuracy among third-grade students. With insights into the diverse language proficiency challenges and factors shaping ELLs' performance, teachers can tailor their approaches to meet individual student needs better. This individual-level transformation can potentially lead to improved academic outcomes for ELLs.

Within the family context, the study's findings underscore the crucial role of educational support for ELLs. The recommendation for increased collaboration between educators, parents, and the community aligns with the understanding that a holistic support system positively impacts ELLs' test performance. Recognizing the importance of cultural relevance in education suggests that involving parents and the community in the assessment process can foster understanding and support for the unique challenges faced by ELL students (Cardoza & Brown, 2019). This collaborative approach at the family level can contribute to an environment that encourages ELLs to thrive academically.

Organizationally, the study has implications for positive social change by advocating for comprehensive strategies to address language-related issues in standardized testing. Recognizing the positive impact of translating tests into the native language highlights the need for inclusive testing practices (Guzman-Orth et al., 2016). Test developers and educational institutions may consider incorporating input from ELL students of various language backgrounds during test development to mitigate biased language and improve test performance outcomes. This organizational-level transformation aligns with the broader goal of reducing performance gaps and promoting equitable education for ELLs.

The study contributes to positive social change at the societal and policy levels by addressing the persistent performance gap between ELLs and non-ELL peers in mathematics. The themes identified, such as the impact of translation on ELLs' test performance and the importance of cultural relevance, offer insights that can inform

policy changes. Recommendations for incorporating cultural sensitivity into test questions and exploring flexible reclassification criteria align with broader initiatives to create more inclusive and fair educational policies. Legislative policy changes, increased funding, and restructuring school curricula, as suggested by Garcia-Felix (2019), represent potential societal-level transformations that can positively impact ELL students.

Methodologically, the exploration of teachers' perceptions in the current study provides a foundation for future researchers to delve deeper into the practical implementation of language translation strategies in the classroom. The emphasis on accurate translation for maintaining test integrity and validating interpretations through reflexive journaling contributes to methodological considerations. Future researchers could build upon these insights, exploring the longitudinal effects of language translation and comparing regional variations in teachers' attitudes toward translation strategies.

Theoretical implications arise from the study's alignment with Krashen's (1981) theory of comprehensible input. The emphasis on language acquisition, comprehension, and the influence of a person's first language aligns with the study's focus on improving mathematics achievement among ELLs through language translation. This alignment underscores the importance of considering the first language in language acquisition, as emphasized by Krashen (1981).

The study enhances the empirical understanding of the challenges faced by Spanish-speaking ELL students in standardized mathematics exams, offering a nuanced exploration of teachers' perspectives. Through comprehensive interviews, the study revealed themes related to the impact of translation on ELLs' test performance, the

influential role of educators in language education, the necessity for educational support for ELLs, and the challenges ELLs encounter in language translation. These themes are intricately connected to the empirical insights derived from Morita-Mullaney et al. (2021). Morita-Mullaney et al. argued that an increased emphasis on English in the classroom may not necessarily enhance mathematics achievements among ELL students. This view aligns with the present study's findings on the importance of considering native and current English language proficiency.

The practice recommendations derived from the study align with these empirical insights and findings. Encouraging educators to consider both native language proficiency and current English language proficiency when evaluating the mathematical ability of ELLs corresponds with the recommendations of Foster et al. (2019) and Morita-Mullaney et al. (2021). The current study supports classroom and test adjustments, emphasizing the importance of incorporating input from ELL students in developing standardized tests. This assertion resonates with the recommendations proposed by Solano-Flores (2014). The focus on comprehensive strategies for addressing language-related issues in standardized testing aligns with the broader implications suggested by Short and Boyson (2012) regarding the importance of academic achievement in reducing gaps faced by ELL students. These recommendations, grounded in empirical findings and supported by existing literature, provide practical guidance for educators to create an inclusive and supportive learning environment for Spanish-speaking ELL students.

Summary

The purpose of this basic qualitative study was to explore teachers' perceptions regarding language translation for the NAEP and its impact on the math scores of Spanish-speaking ELLs in fourth and eighth grades in a northeastern state. Adopting a basic qualitative research design in the study facilitated a rich exploration of five distinct themes, offering valuable insights into language translation in the context of standardized math tests. The implications of the study are multi-dimensional. At the individual level, the findings provide a foundation for targeted interventions to enhance academic outcomes for Spanish-speaking ELLs. This study underscores the value of collaborative efforts among educators, parents, and the community, considering the crucial role of educational support. Organizationally, the study's findings support positive social change by promoting comprehensive strategies in standardized testing to reduce biases and improve outcomes for ELLs.

The implications extend to the societal and policy levels. This study contributes to the discourse on reducing performance gaps and fostering equitable education for ELL students. Methodologically, the study's alignment with Krashen's theory of comprehensible input lays a theoretical foundation for future research in this area. The empirical insights gained from exploring teachers' perceptions offer a nuanced understanding of the challenges faced by Spanish-speaking ELL students in standardized math exams. Recommendations stemming from the study include practical guidance for future research endeavors, such as expanding participant pools, including ELL student perspectives, and conducting a focused exploration of the practical implementation of

language translation strategies in the classroom. These recommendations, grounded in the study's findings, aim to inform educational practices and contribute to ongoing efforts to create inclusive and supportive learning environments for ELL students.

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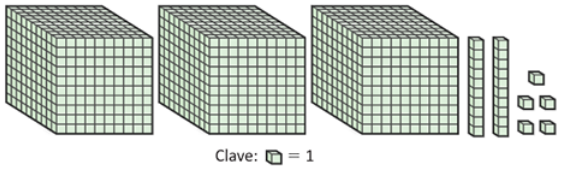
Appendix A: Interview Guide

1. What were your perceptions with using a standardized mathematics test that was translated from English test to Spanish for your ELLs?
    a. Can you describe factors that influenced (such as experiences) your perceptions with using a standardized mathematics test that was translated from English test to Spanish for your ELLs?
2. Please describe your perceptions in relation to the scores and performance of ELLs in standardized mathematics tests that were translated to the native language of your ELLs.
    a. Can you provide specific examples of your perceptions in relation to the scores and performance of ELLs in standardized mathematics tests that were translated to the native language of your ELLs?
    b. Are there any other factors you would like to note that may contribute to your perceptions in relation to the scores and performance of ELLs in standardized mathematics tests that were translated to the native language of your ELLs?
3. What do you think are the benefits of language translation in a standardized mathematics test?
    a. Please cite examples.
    b. What specific benefits can you discuss that are associated with language translation in a standardized mathematics test?
    c. Are there any other factors that could provide beneficial outcomes for language translation in a standardized mathematics test?

4. What do you think are the disadvantages of language translation in a standardized mathematics test?
    a. Please cite examples.
    b. Can you describe why you believe that these are disadvantages based on your perceptions and previous experiences?
    c. Is there anything else that you can think of to address the disadvantages of language translation in a standardized mathematics test?
5. What do you think should be done to address language-related problems for ELLs that are taking up standardized exams?
    a. What specific approaches would you recommend to address language-related problems for ELLs that are taking standardized exams?
    b. Why do you suggest these specific approaches?
    c. Did any previous events, or experiences, lead to your perception of these specific approaches to be useful for addressing language-related problems for ELLs that are taking standardized exams?
6. Is there anything you would like to add about the topic of this study?

Appendix B: Examples of Mathematics Test in Spanish



¿Cuál de los siguientes números está representado por los bloques de base diez?

A ○	325
B ○	370
C ○	3,025
D ○	3,205

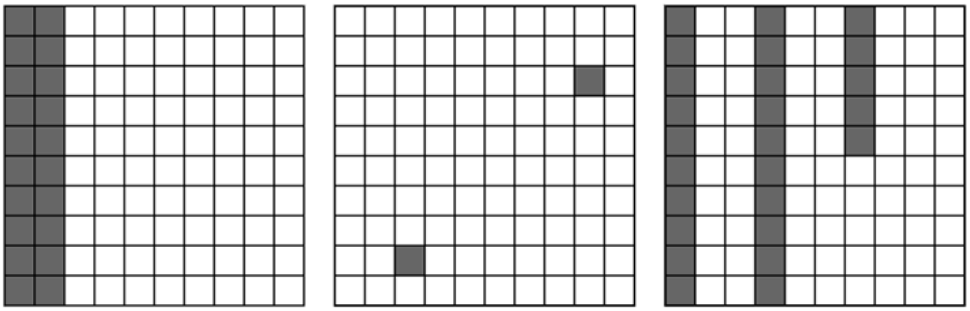
Clear Answer

Cada cuadrícula está hecha de 100 cuadrados pequeños que son todos del mismo tamaño.

¿Qué parte de cada cuadrícula está sombreada?

Arrastra un decimal a cada cuadro para mostrar tu respuesta.

0.02 0.20 0.25 2.0 2.5



Clear Answer