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# Middle School Mathematics Teachers' Perception of Socioeconomic Status and Effects on Instruction

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The Office of the Provost

Walden University
2019

Abstract

Middle School Mathematics Teachers' Perceptions of Socioeconomic Status and Effects

on Instruction

by

Kristen A. Jones

CAS Educational Administration, SUNY Brockport, 2009

MSEd, American InterContinental University, 2005

BS, Quinnipiac College, 1988

Doctoral Study Submitted in Partial Fulfillment

Of the Requirements for the Degree of

Doctor of Education

Walden University

October 2019

Abstract

In a small but diverse suburban school district, the gap in mathematics performance between economically disadvantaged and economically nondisadvantaged students was slowly widening as evidenced by state test scores. The purpose and key research questions of this instrumental case study were designed to (a) identify what Grades 6, 7 and 8 mathematics teachers perceive the role socioeconomic status plays in ability to learn mathematics and to (b) understand what teachers believe affects their perceptions of students' ability to learn mathematics. The conceptual framework guiding this study was social reproduction theory. The nine participants were middle school (i.e., Grades 6, 7 and 8) mathematics teachers from a small, diverse, suburban school district. Data were gathered through semistructured interviews; publicly available aggregated demographic data; and a reflective journal used to assist in identifying themes, patterns, and any questions that were encountered during data analysis. The identified themes of academic performance, communication, expected student characteristics, personal experiences and influences on perceptions, preparation to teach low SES students, and student support were used to better understand how teacher perceptions affect mathematics instruction and student success. A position paper outlining a course of action intended to increase teachers' understanding of the needs of students from low socioeconomic backgrounds, and how to meet those needs, was created for presentation to the district leadership. The project study findings positively affect social change by identifying areas where professional development and focused instruction in teacher preparation programs on the unique needs of students from low socioeconomic backgrounds are needed in the local district.

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Dedication

This doctoral study is dedicated to my family. My husband has been my cheerleader throughout this process, putting up with long nights, long weekends, and no social life. My son and daughter have always believed in me, and it is for them and my grandchildren that I strive with this study to be a catalyst for social change and higher quality education for all children. Finally, my mother has been my rock, providing encouragement, comfort, and an incredible role model for life-long learning.

It is because of all of you that I am at this place today. Your constant support and belief in me are the reason for successful completion of this degree. Thank you all for standing by me.

Acknowledgments

I would like to express my sincere thanks to several who have been instrumental to my achievements and successes during this doctoral journey. First, I express my utmost gratitude to Dr. Michelle McCraney, my committee chair. You have been a never-ending source of wisdom, guidance, and encouragement, and for that I cannot thank you enough. I would also like to thank Dr. Gloria Jacobs for your positivity and sincere desire to help me succeed. Your feedback has been highly valued. Finally, to my husband, thank you for your patience, support, and love throughout this incredible adventure. I could not have done it without your encouragement.

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**The Local Problem**

Researchers have asserted that nationally, teachers should meet the needs of all

students, without bias, as best teaching practice (Bouguen, 2016; Shimoni, Barrington,

Wilde, & Henwood, 2013). The inclusion of professional development for teachers

specifically in mathematics in the district strategic improvement plan acknowledges that

the local district believes there is a problem in the teaching of mathematics. According to

the district policy handbook, teacher evaluation rubrics and communication with the

assistant superintendent, teachers were to be meeting the needs of all students in the

district, regardless of socioeconomic status (SES). According to the Department of

Elementary and Secondary Education, at the local level, in the past 5 years the number of

economically disadvantaged students testing in the warning/failing category in

mathematics has increased in percentage (i.e., 33% in Grade 6, 12% in Grade 7, and 11%

in Grade 8), while the number of noneconomically disadvantaged students testing in the

warning/failing category has decreased in percentage (i.e., 42% in Grade 6, 3% in Grade

7, and 5% in Grade 8.

Table 1

*Percentage of Low SES Students in Total vs in Mathematics Courses*

| Low SES | 2012–2013 | 2013–2014 | 2014–2015 | 2015–2016 | 2016–2017 |
|---|---|---|---|---|---|
| Total school | 12% | 10% | 8.8% | 10% | 9.1% |
| Mathematics | 10.3% | 10.1% | 9.1% | 9.3% | 8.4% |

Table 2

*Historical Data for Percentage of Students in Warning/Failing Category of Massachusetts Standardized Tests: Grades 6–8 Mathematics*

| SES/grade | 2013 | 2014 | 2015 | 2016 | 2017 |
|---|---|---|---|---|---|
| Low/6 | 73% | 64% | 63% | 58% | 72% |
| High/6 | 32% | 34% | 29% | 33% | 29% |
| Low/7 | 40% | 66% | 61% | 59% | 52% |
| High/7 | 31% | 48% | 45% | 35% | 44% |
| Low/8 | 63% | 57% | 48% | 64% | 67% |
| High/8 | 33% | 32% | 34% | 39% | 40% |

Teachers' perceptions of SES may influence their classroom teaching and expectations for their students (Tienken, 2012). A study on teacher constructs regarding homeless students and families found that teacher perceptions impacted relationships with students and families experiencing financial hardships (Powers-Costello & Swick, 2011). Powers-Costello and Swick (2011) also recommended that more research is needed regarding professional development for educators who serve homeless children. Reviewing the research regarding influences on student achievement, Rollin (2013) stated that "despite efforts to try to be sympathetic toward the plight of students who come from poverty, there are times when we are influenced by societal assumptions and stereotypes associated with poverty" (p. 50). This statement suggests that despite teachers' desires to meet the needs of all students, their own assumptions and perceptions may affect how students from different socioeconomic backgrounds are taught.

While there is current research examining the issue of SES on student achievement (Tienken, 2012) and on how teachers' perceptions affect student achievement (Tomul, Celik, & Tas, 2012), there is less research focused on understanding how teachers' perceptions about the effect of SES on learning readiness

affect teaching strategies and student success. Many times, teachers do not know what the expectations should be for low-income students or do they know how to adjust their teaching for these students to succeed (Jensen, 2013).

Currently, there is significant research showing that both teacher perceptions and SES each affect student achievement separately. There is less research showing the effects of teacher perceptions of SES and the relationship of these perceptions to student achievement. To address this problem locally, I gathered data that defined what teacher perceptions of SES and student achievement in mathematics were as well as data that explained what factors teachers believe affected their perceptions of student ability to learn mathematics.

## Rationale

In this project study, I sought to identify and understand middle school teachers' perceptions of SES and the ability of low SES students in Grades 6, 7, and 8 to learn mathematics. Locally, there was a need to better understand these factors as related to the use of culturally responsive pedagogy when teaching a group of students from diverse socioeconomic backgrounds as well as possible teacher bias regarding low SES students. In addition, there was a need to understand this problem so teachers would be better able to recognize barriers to learning mathematics created by their perceptions and, subsequently, be provided the appropriate professional development on strategies to overcome these perceptions and learn the skills necessary to reach all students regardless of SES. Finally, the results of this study may aid in identifying gaps in teacher education programs related to the barriers created by teacher perceptions in the teaching of

mathematics, which will allow programs to implement the teaching of strategies to overcome these barriers and perceptions before teachers enter the classroom.

## Definition of Terms

*Academic success*: The academic achievement, attainment of learning objectives, acquisition of skills and competencies, satisfaction, persistence, and post college performance of students (York, Gibson, & Rankin, 2015).

*Bias (rater)*: The presence of substantial and systematic error in ratings of performance or behavior caused by rater attitudes, beliefs, or experiences (Hoyt as cited in Mason, Gunersel, & Ney, 2014).

*Homelessness*: Experiencing changes in residency, such as living on the street, in a car, in emergency housing, or in a transitional shelter, without a permanent address (Nooe & Patterson, as cited in Milner, 2014).

*Low-income*: Families whose taxable income was less than 150% of the poverty level amount the preceding year (U.S. Department of Education, 2016).

*Poverty*: Lack of financial means to acquire adequate food, fuel, clothing, and/or housing (McKinney, 2014).

*Socioeconomic status (SES)*: Access to financial, social, cultural, and human capital resources (National Forum on Education Statistics, 2015).

*Universal Design for Learning*: A scientifically valid framework for guiding educational practice that: (a) provides flexibility in the ways information is presented, in the ways students respond or demonstrate knowledge and skills, and in the ways students are engaged; and (b) reduces barriers in instruction; and (c) provides appropriate

accommodations, supports, challenges, and maintains high achievement expectations for all students, including students with disabilities and students who are limited English proficient (National Center on Universal Design for Learning, 2016)

## Significance of the Study

At the local level, the significance of this project study is to provide district and building leadership with a better understanding of what teachers' perceptions are of students' ability to learn mathematics based on SES and what factors influence teachers' perceptions. Understanding teacher perceptions will allow the local district to implement professional development opportunities for teachers to better understand their own perceptions about how SES affects a student's ability to learn mathematics and to provide teachers with strategies to meet the unique learning needs of students from low socioeconomic backgrounds. The results of this study will also allow the local district to implement instructional strategies based on these perceptions to close learning gaps in mathematics as stated in the School Improvement Plan.

Identifying teacher perceptions about the ability of students from low-income families to learn mathematics and what influences those perceptions provides district and building leadership with insight into the professional development and strategies that may need to be implemented to minimize incorrect preconceptions about disadvantaged students and their ability to learn. Cluffetelli Parker (2017) conducted a study examining how teachers' stereotypical perceptions of students and families living in poverty changed following the provision of significant professional development. The findings revealed that once teachers' perceptions were reinterpreted, teachers implemented global

citizenship, inferencing, and social justice theory strategies to help increase the achievement of low SES students (Cluffetelli Parker, 2017).

Finally, the results of this project study derived from analysis of qualitative data regarding how teachers perceive their students' SES and ability to learn mathematics as well as what teachers believe affects their own perceptions of students' ability to learn and achieve in mathematics. The implications for social change resulting from this project study include increased professional development opportunities for teachers in how to recognize their perceptions of SES and how to overcome barriers present due to perceptions as well as increased discussion in teacher preparation programs regarding how to best serve students from low socioeconomic backgrounds. All of this will lead to greater classroom equity and opportunities for students from disadvantaged backgrounds.

**Research Questions**

I created the research questions that guided this project study to understand what teachers believe about SES and students' mathematics achievement as well as the teachers' beliefs about what factors influence their own perceptions about mathematics achievement. Determining teachers' beliefs concerning these topics could enable teachers at the local site to better understand the barriers they may be creating with their perceptions as well as allow them to create strategies to overcome their own perceptions. The research questions were formulated specifically for the middle school mathematics' teachers in this district based on documented state test performance data that identified a widening gap in test scores between disadvantaged and non-disadvantaged students. The qualitative research questions of this project study were as follows:

Research Question 1: What are Grades 6, 7 and 8 mathematics teachers'

perceptions about how their students' socioeconomic status affects the ability to

learn mathematics?

Research Question 2: What do Grades 6, 7 and 8 mathematics teachers believe

influences their own perceptions of students' ability to learn mathematics?

## Review of the Literature

## Conceptual Framework

I derived the conceptual framework that guided my development of the research

questions for this project study from social reproduction theory. According to Collins

(2009), social reproduction theory pursues the idea that schools are a catalyst in

perpetuating social inequalities and not places of equal opportunity. Auwarter and

Aruguete (2008) argued that if teachers have preconceived beliefs that SES and gender

predetermine student success, then teachers will not work as actively to reach these

students. Auwarter and Aruguete determined teacher perceptions of hypothetical students

by altering the scenarios of SES and gender. Participants in their study were given a

questionnaire packet that looked at future expectations for the student in the provided

paragraph (i.e., the likelihood of the student described dropping out of school), the need

for academic support services (such as the student benefitting from extra tutoring in a

certain subject), the personal characteristics of the described students (describing the

student as competent vs incompetent based on the background information provided in

the paragraph), believability (referring to the students in the paragraph and students in the

actual school system behaving in similar manors), and SES (Auwarter et al., 2008). The

researchers found that teachers perceived that students from a higher SES do better academically and that varied expectations affect student performance (Auwarter & Aruguete, 2008). In this project study, I used this framework to provide a better understanding of the perceptions middle school teachers hold regarding SES and the relationship between this status and the ability to learn mathematics. Identifying and understanding these perceptions aided in looking at how instruction and student achievement in middle school mathematics were affected.

Significant research has showed that both teacher perceptions and SES each affect student achievement separately. There is less research showing the effects of teacher perceptions of SES and the relationship of these perceptions to student achievement. To address this problem locally, I gathered data that defined what teacher perceptions of SES and student achievement in mathematics were as well as data that explained what factors teachers believe affected their perceptions of student ability to learn mathematics.

There were two concepts comprising the context of this project study. The first focused on how teacher perceptions affect student academic success. In this study, I sought to provide understanding about what factors contributed to teachers' perceptions of the academic achievement of students from low socioeconomic backgrounds, and whether these perceptions created barriers to learning for low SES students in the classroom. With the second concept, I examined the effect of student SES on academic achievement. The combination of the two connected the subject of this project study to social reproduction theory as demonstrated by Auwarter and Aruguete (2008). Auwarter and Aruguete's findings indicated that the perceptions teachers had about academic

achievement in students from lower socioeconomic backgrounds did affect the teachers'

willingness to work as hard for these students. This connects to social reproduction

theory because the lower degree of willingness to actively work to reach low SES

students aligns with the idea of schools perpetuating inequality and not providing equal

opportunity for success to all students.

Auwarter and Aruguete (2008) conducted a study in which teachers read

paragraphs about hypothetical students who had academic and behavioral struggles.

Based on the information provided in the student scenarios, the teacher participants

perceived that students who were presented as being from a low SES had less potential

for successful futures than did the hypothetical students portrayed as being from a higher

SES (Auwarter & Aruguete, 2008). The focus of my project study on teacher perception

of student SES and their readiness/ability to learn mathematics fit within the scope of

social reproduction theory.

**Review of the Broader Problem**

I found the scholarly literature for this project study via searches in the databases

accessible through the Walden University Library, including ERIC, SAGE, Education

Source, and Education Research Complete. Sites and literature found on the World Wide

Web were also included. In total, 125 articles were reviewed, with 67 articles referenced.

I excluded articles that were not peer reviewed and documents other than journal articles

(i.e., papers, reports, and presentations) from the literature review. The following key

words were most often used to search for appropriate scholarly literature: *teacher*

*perception, socioeconomic status, poverty, teacher expectations, academic achievement,*

*math achievement, student achievement, student success, classroom equity, teacher judgments, bias,* and *social equity.* Most of the literature reviewed had a publication date within 5 years of the start of this project study in 2016. The exception to this is the research comprising the conceptual framework, which was published in 2009. Information obtained from the Internet included local school district data and data from the U.S. Department of Education website.

In the following subsections, I provide a review of literature describing how SES affects student achievement and how teacher perceptions and expectations affect student achievement. These sections are followed by a subsection in which I discuss possible implications of this project study, then a summary of the findings of the literature review. In the review of literature, I also provide evidence supporting the two concepts that guided the formation of the research questions and aligning the chosen research questions to social reproduction theory.

**Socioeconomic Status (SES)**

In general, students from disadvantaged backgrounds have been shown to achieve at a lower level that those from a higher SES (Cameron, Grimm, Steele, Castro-Schilo, & Grissmer, 2015). In rural areas, families tend to fall into a lower SES, and these children have been shown to achieve less learning in high school mathematics than students from suburban or urban communities with a higher SES (Reeves, 2012). However, issues of poverty and populations of students from disadvantaged backgrounds are no longer only present in rural areas; school districts in suburban and urban communities are finding the

need to address learning needs based on low SES, poverty, and homelessness as well (Wilson, 2012).

Many impoverished families do not have the resources or education to successfully engage and support their children's learning in the home environment (Lam, 2012). In an analysis of several research studies looking at the relationship between SES and student achievement, Lam (2012) concluded that SES is an important factor in determining student success, especially in elementary and middle school, and that educators need to seriously consider how the academic performance of students from low SES backgrounds can be improved. Low SES, which results in a lack of access to educational resources, affects student mathematics achievement as early as kindergarten (Galindo & Sonnenschein, 2015). Lack of access to essential educational resources presents further barriers to student success in mathematics at all grade levels. Fewer opportunities for learning, less positive attention, and fewer instances of positive reinforcement are provided to students of low SES by both parents and teachers (Gut, Reimann, & Grob, 2013). Schools parents must partner in implementing strategies to provide positive support and encouragement to students both in and out of school in order to increase academic success (Bachman, Votruba-Drzal, El Nokah, & Heatly, 2015). In elementary school, opportunities to learn, or lack thereof, contribute to the socioeconomic achievement gap (Bachman et al., 2015). The results of these studies together confirm that SES affects learning opportunities for students beginning at young ages, which in turn affects the level of achievement reached by low SES students.

Engagement in mathematics declines during middle school, and factors associated with SES contribute to this decline (Martin, Way, Bobis, & Anderson, 2015). In their study, Martin et al. (2015) looked at 1,601 sixth, seventh, and eighth grade students in 200 classrooms covering 44 different schools. Using the multilevel regression model to look at variables of school, class, and home factors, engagement in mathematics significantly decreased from sixth grade to eighth, with SES contributing to this finding (Martin et al., 2015). Teachers need to recognize the differences between low-income and higher-income students; the important factors affecting engagement (i.e., health and nutrition, vocabulary, effort, hope, cognition, relationships, and distress); the reasons for these differences; and what needs to be done to overcome the barriers to learning created by these differences (Jensen, 2013).

Due to perceptions about the ability of students of a lower SES to learn, the opportunities to learn for these students are fewer, and these students are typically assigned to classrooms with less skilled, less qualified teachers (Minor, Desimone, Phillips, & Spencer, 2014). High learning expectations should be held for all populations of students in order to encourage higher achievement. The gaps in mathematics and reading based on SES begin to emerge early in the school experience, and these gaps cause low-income students to struggle in other content areas as well (Quinn & Cooc, 2015). Teacher from all content areas should be equipped with strategies to implement in the classrooms so that these gaps diminish as the students progress in school, not widen. Students from a lower SES are assigned to lower learning tracks, which results in fewer opportunities to engage with challenging content (McKown, 2013). SES alone should not

be the determining factor when assigning students to learning tracks because student self-efficacy will not increase if they are not assigned challenging work at the appropriate level (McKown, 2013). Low socioeconomic students are frequently considered weaker students and subsequently are assigned the simplest, least complex tasks when working in groups (Pescarmona, 2015). The apparent perceptions possessed by educators are key factors in the ways students from low SES backgrounds are assigned to classes, which in turn contributes to widening learning gaps and less challenging work being given to the students in the classrooms (Pescarmona, 2015).

A large discrepancy in mathematics scores exists between advantaged and disadvantaged students, and underachievement is viewed as a direct result of poverty (Tienken, 2012). The issue of poverty and its effect on student learning has been associated with inner-city and rural communities; however, suburban schools are now experiencing an increase in low-income students who are struggling (Wilson, 2012). Understanding teacher perceptions of low SES students and their ability/readiness to learn is necessary to ensure equity in learning opportunities in the middle school mathematics classroom.

The home environment of students, including their SES and the level of their parents' education, have significant impacts on the level at which students achieve in mathematics (Petty, Harbaugh, & Wang, 2013). Petty et al. (2013) came to this conclusion after studying 57,897 students in Grades 9–12 who were taking Algebra II. Student demographic data were used as variables in their study. Using a three-level hierarchical linear modeling method, Petty et al. were able to attest to the role home

environment, including SES, plays in the mathematic achievement of students. Students who come from families where parents have higher educational degrees tend to achieve higher in mathematics than students whose parents do not have higher educational degree (Petty et al. 2013). Yelgun and Karaman (2015) conducted a case study examining what factors caused lower achievement in a school where most of the families were from a low socioeconomic background. After interviewing two administrators, eight teachers, five parents, and five students, their findings showed that "the leading factor that negatively affected the academic achievement in a school located in a neighborhood with low socioeconomic status was the socioeconomic conditions of the families" (Yelgun & Karaman, 2015, p. 251).

Included in the SES of families and the effect on student success are parenting practices, background, and involvement. Mayo and Siraj (2015) looked at 35 different case studies in which children and parents were interviewed regarding parental involvement in school, the type of support provided at home to students, and the explanations from parents about their involvement/lack of involvement in their child's education. The findings of the study showed that when parents talked with their children about school daily, when parents were consistent in communicating the importance of school for the future, and when parents provided positive feedback and encouragement rather than pressuring their child the students were able to succeed beyond expectations (Mayo & Siraj, 2015).

Along the same lines, SES along with parental expectations play a role in student achievement. Using a sample of U.S. kindergarten students enrolled in the spring of

2000, Stull (2013) conducted a quantitative study looking at how SES and parental expectations affected student achievement. Student achievement data, parent interviews, teacher questionnaires, and administrator questionnaires were collected and analyzed using a regression analysis (Stull, 2013). The author concluded that family SES does affect the expectations parents have for their children, and SES both directly and indirectly affects the child's academic achievement (Stull, 2013).

The instances of family homelessness have been steadily increasing since the 1980s (Grant, Gracy, Goldsmith, Shapiro, & Redlener, 2013). Homeless students are at higher risk for absenteeism and instability of school enrollment, which contribute to lower academic achievement (Grant et al., 2013). While the No Child Left Behind Act of 2001 was intended to address the achievement of basic proficiency for all students, regardless of characteristics such as SES, there is still a gap between advanced achievement and poverty, as well as in college readiness (Lee & Slate, 2014). There are many barriers homeless children need to overcome to be successful in school, such as logistics to enrollment, educational readiness, and physical challenges (Tobin, 2014). However, it may be prudent for schools to target academic interventions toward all low SES students, and not simply homeless students, as the academic achievement between these two groups is relatively similar (Tobin, 2014). An equitable system of education must be considered for all students to obtain success and for knowledge gaps to be closed (Darling-Hammond, 2013). The statements regarding inequitable schools made by Darling-Hammond (2013) directly tie into the previously mentioned definition of social reproduction theory.

Low SES not only affects students in urban areas, but students in rural areas as well (Vernon-Feagans & Cox, 2013). Students living in poverty in rural areas may be isolated from resources and run the risk of having lower language skills and cognitive ability (Vernon-Feagans & Cox., 2013). The expectations of lower SES parents for their children's achievement are lower than those of middle and higher socioeconomic backgrounds (Stull, 2013). The data from the Trends in International Mathematics and Science Study (TIMSS) show that in both low and high-income countries, family background affects student achievement more than do school resources (Nonoyama-Tarumi, Hughes, & Willms, 2015). Nonoyama-Tarumi et al. (2015) were able to come to this conclusion after analyzing the data on fourth grade students from the TIMSS. Using qualitative analysis, the study concluded that the percentage of low-performing students is lower in high income countries (Nonoyama-Tarumi et al., 2015). Schools may be able to make a difference in student achievement by providing professional development and implementing programs which mediate a student's SES from inside school (Stull, 2013). Early assessment and new strategies to address the needs of students, especially those living in poverty, must be explored by schools to break the cycle of underachievement by students of low SES (Basque & Bouchamma, 2016).

While SES many times is equated with low academic performance, there are those students from disadvantaged backgrounds who succeed academically. In their study, Huang and Zhu (2017) examined the role student determination and the disciplinary climate of the school and how they predicted low SES students being highly successful in mathematics and science. In this quantitative study, a sample of 4,978 15-

year old students who had taken the Program for International Student Assessment U.S. in 2012 was used and their mathematics and science assessments were viewed. Demographic information such as individual student characteristics, family background and school characteristics were collected (Huang & Zhu, 2017). Their findings showed that approximately 30% of students whose families were categorized in the lowest quartile for SES had above average achievement in mathematics, and that school disciplinary climate and student grit had a significant relationship as to whether a low SES student was a high achiever (Huang & Zhu, 2017).

Student achievement gaps do not just happen; they develop. This idea was studied by Kuhfeld, Gershoff, and Paschall (2018). In their study, these researchers looked at students' achievement in mathematics and reading from ages 5 to 15 (school entry to middle school) to determine when the achievement gaps began to widen (Kuhfeld et al., 2018). Using longitudinal data sets over a time period of 20 years, the findings showed that all the poverty groups studied continued to grow in mathematics until later elementary school; at this point the achievement gaps began to widen (Kuhfeld et al., 2018).

**Teacher Perceptions**

When teachers judge the characteristics of students, it impacts the success and futures of those students (Kaiser, Retelsdorf, Sudkamp, & Moller, 2013). There may be bias in these judgments, and the bias may already be present in teachers when they are still teacher candidates (Roseboro, Parker, Smith, & Imig, 2012). The research conducted

by Roseboro et al. (2008) showed that when it came to handling classroom diversity, teaching with conscience did not always occur.

High school students whose teachers underestimated their abilities early in their school year(s) earned much lower scores on standardized math, reading, and vocabulary tests (Sorhagen, 2013). It was also found that teachers who are knowledgeable in equity pedagogy have more success in teaching mathematics to African American students (Jackson, 2013). Students attending higher socioeconomic schools perform better on year-end achievement tests than their peers attending lower socioeconomic schools (Peterson, Rubie-Davies, Osborne, & Sibley, 2016). Furthermore, the bias teachers may have on students of a lower SES, as well as on ethnic minority students, have a profoundly strong effect on student performance (Harvey, Suizzo, & Jackson, 2016). Harvey et al. (2016) studied 216 sixth grade students in a large urban school district. Using qualitative methods, the researchers collected data on self-efficacy, demographics, and teacher reported motivation of students to predict achievement in reading and mathematics. Independent $t$ tests were performed on the data, and regression analysis was utilized (Harvey et al., 2016). The conclusion of the study was that the effect of teacher bias on students' final grades was significant (Harvey et al., 2016). The results of this study were meaningful to this project study due to the conclusion that teacher bias affects student achievement.

Teacher collaboration and professional communities have been shown to increase student mathematics achievement in lower economic student groups (Moller, Mickelson, Stearns, Banerjee, & Bottia, 2013). Teacher perception of student ability plays an

important role in the students' achievement (Robinson-Cimpian, Lubienski, & Ganley, 2014). The level of expectation teachers place on students influences learning outcomes, possibly into students' future academic experiences (Friedrich, Flunger, Nagengast, Jonkmann, & Trautwein, 2015). The way teachers respond to students, and how students are perceived, are also influenced by SES (Kenyatta, 2012). Student perceptions are that teachers discriminate based on SES (Tomul et al., 2012).

Both students and teachers tend to link smartness with mathematics; the way students perceive teacher attitudes towards mathematics ability strongly influences the students, both positively and negatively (Wickstrom, 2015). When a teacher communicates the belief that students can learn and understand mathematics, students are more motivated to succeed regardless of SES (Gilbert, Musu-Gillette, Woolley, Karabenick, Strutchens, & Martin, 2013). The way teachers' perceptions of homeless students influence how they interact with students and families, and some of the negative perceptions come from limited personal experiences and stereotypes (Powers-Costello & Swick, 2011). Students might not make the connection between their SES and their relationships with their teachers; however, students who appear to be of a lower economic status are aware that their relationships with their teachers are not as positive as are that of their peers (Fitzpatrick, Cote-Lussier, Pagani, & Blair, 2013).

Students' social class influences the way perceptions and expectations are formed by teachers. It has been shown that middle school students' performance on standardized mathematics tests are affected by teacher perceptions and lowered expectations when the students are from a lower economic background (Webb & Thomas, 2015). Negative

teacher perceptions contribute to a widening of the achievement gap, and negative

perceptions also contribute to lower teacher expectations and, subsequently, lower

student achievement in mathematics (Harvey, Suizzo, & Jackson, 2016). Furthermore,

stereotype threat is a significant reason for racial minority students leaving mathematics

majors (Beasley & Fischer, 2012).

The degree of focus teachers put on student outcomes has an impact on how

students' achievement increases, as does building positive, supportive relationships

between teachers and students (Bolshakova, Johnson, & Czerniak, 2011). Many teachers

have perceptions about the disparities in education, and many of these have to do with

socioeconomic status (McKnight, 2015). Students at times feel that teachers do not care

about their backgrounds, but that having interest and caring in this area is part of being a

successful teacher, especially for students from low SES backgrounds (McKnight, 2015).

McKnight (2015) was able to come to these conclusions after studying 22 young adults

using a phenomenological approach and gathering data through personal narratives

regarding their school experiences and relational experiences with teachers. Furthermore,

students with a strong relationship with their teachers are more likely to feel a sense of

identification with school, which in turn affects achievement in a positive manner

(Tschannen-Moran, Bankole, Mitchell, & Moore, 2013).

The characteristics in families also play an important role in predicting the

academic success of students, along with family and teacher perceptions (Gut et al.,

2013). Students from lower SES backgrounds sometimes miss the financial and other

resources which aid with student achievement, and parents' and teachers' perceptions of

students from this background are less positive (Gut et al., 2013). The formation of teacher goals, especially relational goals, is therefore important in the students' perceptions of teacher support, mastery of instruction, and ability to achieve highly in the classroom (Butler, 2012).

Personal experiences play a role in the formulation of perceptions, and student teachers are no exception. Many student teachers may have little understanding of the relationship between SES and student achievement (Thompson, McNicholl, & Menter, 2016). To change perceptions before student teachers, enter the classroom, teacher preparation programs must work with schools as well as provide student teachers greater opportunities to work with lower socioeconomic backgrounds before entering the workforce (Thompson et al., 2016). Teachers who hold high expectations for their students are more effective in teaching students from lower socioeconomic backgrounds (Mundy & Leko, 2015). As such, since research shows that many preservice teachers do not have specific knowledge of the link between SES and student achievement, teacher preparation programs must also provide preservice teachers with opportunities to experience the relationship between teachers, schools, and students living in poverty, as well as opportunities to see students and families who are living in poverty yet have positive, successful characteristics (Mundy & Leko, 2015).

It has been shown that many student teachers do not have extensive exposure, or experience with, poverty (White & Murray, 2016). In addition, many student teachers hold stereotypical views of students living in poverty, such as that their parents do not hold high aspirations (White & Murray, 2016). To be effective teachers, and to meet the

needs of diverse sets of students, culturally responsive teaching practices need to become a more integral part of teacher preparations programs (Sobel, Gutierrez, Zion, & Blanchett, 2011). Since students living in poverty tend to achieve lower than students from a higher SES background, teachers need to be provided with the appropriate professional development and support to begin closing this gap (Dotson & Foley, 2016).

Once perceptions are formed, they may be difficult to change. Part of the equation in a student's mathematic success is the teacher's perception of mathematical "smartness" (Wickstrom, 2015). To look at this idea further, Wickstrom (2015) studied a mathematics teacher using an ethno-methodological case study approach. Doing so allowed Wickstrom to observe the teacher's perceptions during formative assessment as well as during regular classroom activities. The fourth-grade teacher studied had 15 years of experience in teaching, and in the school, the population consisted of 80% low-income students (Wickstrom, 2015). Data were collected via teacher-researcher interviews. Through the interviews, Wickstrom discovered that the teacher many times discussed ability rather than understanding of content. After examining the data with the researcher, the teacher changed her perception of the students in her class and changed the way she approached them (Wickstrom, 2015).

While the Wickstrom study prompted a teacher to change her perceptions of ability, there are cases to the contrary when the teacher's perceptions enable the gap to grow. In their 2014 study, Robinson-Cimpian et al. looked at data from the Early Childhood Longitudinal Study Kindergarten Class of 1998-1999 to determine how teachers' perceptions about the difference between girls' behavior and boys' behavior

affect the gap in mathematics performance. After analyzing the data, including SES, the findings were that teachers rated the mathematics ability of girls lower than that of boys, and that "teachers rate girls on par with similarly achieving boys only if they perceive those girls as working harder and behaving better than those boys" (Robinson-Cimpian et al., 2014, p. 1275).

Teachers' perceptions of ability are often formed well before they step foot in the classroom. Thompson et al. (2016) used questionnaires and discussion groups to determine the perceptions of student teachers regarding poverty and student achievement. Using a mixed-methods approach, Thompson et al. found that student teachers perceived that family and cultural factors played a bigger part in student achievement, and that they did not have much knowledge about how the SES affects student success. According to Thompson et al. some of the student teachers did end up changing their perceptions following completion of a course created to specifically teaches students about the implication of SES on children's academic performance.

A teacher's perception of a student's motivation may influence how that teacher believes the student can achieve. Harvey et al. (2016) performed a study using 215 low-income students and their teachers to look at how the differences in the teachers' perceptions of student motivation and the students' perception of their motivation differed and, in turn, affected student achievement in both mathematics and English. The data gathered from efficacy scales and brief questionnaires were analyzed using regression analysis. This analysis showed that "the effects of teacher bias on low-income,

minority students are stronger than the effects found on predominantly middle-class European American students" (Harvey et al., 2016, p. 521).

Teacher-student relationships play an important role in how students see themselves as able to succeed. A sample of 1,053 children was studied in order to examine how the teacher-student relationship with low SES students affects the students' achievement (McCormick, O'Connor, & Horn, 2017). Using data from the National Institute of Child Health and Human Development Early Child Care and Youth Development study as well as the Student-Teacher Relationship Scale, this quantitative study concluded that the teacher-student relationship in fact does factor in to the achievement of low SES students; the study also concluded that the teacher-student relationship needs to take specific outcomes and components of SES into consideration (McCormick et al., 2017).

SES, teachers' perceptions and students' attitudes and perceptions all have impact on student success. According to Webb and Thomas (2015), there are things that students and teachers can do to narrow the achievement gap. The results of a 2001 study showed that teachers who are "culturally relevant and generally sincere with and respectful of students…also have high expectations for all learners" (p. 5) see the best results (Webb & Thomas, 2015). Low SES students reported that mathematics was engaging, and their learning improved when teachers incorporated cooperative learning, group work, and classroom discussion, and when students could be involved in classroom activities (Webb & Thomas, 2015). Webb and Thomas concluded that "the entire school must work

together to alleviate the gap that is occurring for all students to overcome the statistics and for every student to achieve excellence" (p. 7).

## Implications

Understanding barriers to learning mathematics created by teacher perceptions relating to SES may be important in the development of equitable opportunities to learn in the mathematics classroom. Identifying what teachers do perceive regarding disadvantaged students' ability and readiness to learn mathematics may also reveal opportunities for professional development to remove these barriers. Providing teachers the opportunity to better understand their own perceptions and how those perceptions were formed allows for a change in mindset to occur. This mindset change, coupled with professional development opportunities, will play a role in increasing mathematics achievement in students from disadvantaged backgrounds.

A further implication of this study may be the identification of gaps in teacher education programs. Developing strategies to identify potential biases regarding the socioeconomic status of students and learning in the mathematics classroom may be a gap in teacher training on which teacher education programs need to place more emphasis and provide more education so that new teachers entering the classrooms have a strong grasp on equity pedagogy. Teacher preparation programs may consider implementing specific classroom discussion and activities to address potential bias. Teacher education programs may also consider implementing mandatory preservice experiences in schools with a high economically disadvantaged population in order to

allow student teachers to identify their biases and develop strategies to overcome them prior to having the responsibility of their own classrooms.

## Summary

The literature review revealed that while both teacher perceptions and SES have direct effects on student achievement in mathematics, there is a need to further understand how teachers' perceptions about SES affect students' achievement in mathematics. The literature also revealed that teachers may come into the classroom already possessing biased opinions about low-income students. As a result, students may feel that teachers do discriminate based on SES in the assignment of grades as well as in the personal interactions between student and teacher.

The peer-reviewed articles included in the literature review related the effects of SES and teacher perceptions on student achievement to social reproduction theory through research showing how the achievement gap is persisting. The research included in the literature review supports social reproduction theory in that it reveals schools were not providing the equitable educational experience to all students. The literature revealed the importance of each variable individually; however, there still needs to be deeper understanding of how teacher perceptions coupled with SES affects student achievement in mathematics.

In Section 2 I discuss the methodology chosen for this project study, which is a qualitative case study design. It will contain explanations of the research design, the study participants, the participant selection method, and data collection/analysis

procedures. In Section 2 I also discuss ethical considerations, researcher relationship, and

information regarding the interview questions used for data collection.

Section 2: The Methodology

## Introduction

While there is much evidence that teacher bias and SES affect student achievement, a more in-depth approach must be taken to specifically understand the biases possessed by the mathematics teachers in the local setting. The local setting was a small, suburban school district with a middle school (i.e., Grades 6, 7, and 8) population of 869 students housed in one building, with 12 mathematics teachers, including special education, serving these students, according to the Department of Elementary and Secondary Education. In turn, identifying biases possessed by the participant teachers regarding the ability of students from a lower SES to learn mathematics will aid in discovering how these biases affect student achievement. To further understand these variables and identify professional development needs regarding the teaching of mathematics to low SES students in the local setting, I conducted an instrumental, qualitative case study.

## Research Design

**Approach**

I used a qualitative, instrumental case study approach to explore and gain insight to the perceptions and biases mathematics teachers may have related to the ability of low SES students to learn mathematics. Stake (2005) identified case studies in three categories: (a) intrinsic, (b) instrumental, and (c) collective. Instrumental case studies focus on a specific issue with the purpose of better understanding that issue (Creswell, 2012). As I sought to understand a specific issue in a specific, single location in this

project study, the instrumental case study was the most appropriate choice for the research method.

Other types of qualitative designs considered for this project study were grounded theory and phenomenology. Like case study research, grounded theory also involves inductive processes and triangulation of data; however, the focus of grounded theory research is the development of a substantial theory (Merriam, 2009). I did not select this research design for this project study because the focus of the study was not the development of theory. Phenomenology requires the researcher to convey the essence of the experiences of the participants (Merriam, 2009). While this project study included teachers' experiences that may play a role in developing their perceptions, it did not focus on conveying the meaning of the teachers' experiences. For this reason, phenomenology was not chosen as the research design for this project study.

Researchers seek to understand phenomena more in-depth by analyzing several types of data when using the case study approach (Creswell, 2012). Stake (2005) identified the instrumental case study as one undertaken to better understand a specific issue. The data that I analyzed in this project study included responses in semistructured interviews conducted with the middle school mathematics teachers and publicly available demographic information from the school district. Publicly available test scores for the school district and information from the school district website documents were referenced as contextual information. For the purposes of this project study, I chose the instrumental case study as the research design because it allowed teachers to communicate their experiences and thoughts as well as describe what happens in their

classrooms, all of which provided me with data to understand how teachers perceive

students coming from low socioeconomic backgrounds and their ability to learn

mathematics.

**Description**

Merriam (2009) described case studies as offering the researcher a way to

examine complex social units with more than one variable that would be important in

understanding the phenomenon being studied. Furthermore, case studies are important in

expanding the knowledge base in the field (Merriam, 2009). With the purpose of this

project study being to further understand how teacher perception regarding SES and the

ability to learn affects instruction, this case was bounded by the content area of

mathematics and the physical boundary of middle school (i.e., Grades 6, 7, and 8).

Though these bounds exist, each teacher's experiences and perceptions differed greatly.

In this project study, I looked at (a) teachers' perceptions of how SES affects students'

ability to learn, (b) what teachers believe affects their perceptions of low SES students,

and (c) teachers' understanding of the use of culturally responsive teaching in the cases of

students from low socioeconomic backgrounds. The use of the case study approach was

justified because the data generated came from the teachers' experiences and perceptions

via semistructured personal interviews. Examining the similarities and differences in the

data aided in understanding the phenomenon more completely.

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**Participants**

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The participants in this project study were mathematics teachers for Grades 6, 7

and 8 in a small, suburban school district. Due to the size of the district, the number of

participants was targeted at 12, if all the teachers agreed to be part of the project study. However, less than 12 agreed to participate, so I cited the lower number of participants (i.e., nine) as a limitation of the project study. Purposeful convenience sampling was used to recruit the participants for this project study.

**Criteria for Selection**

As required with qualitative research, I used purposeful sampling in selecting participants for this project study. With purposeful sampling, the participants are chosen intentionally to better understand a phenomenon (Creswell, 2012). For this project study, middle school (i.e., Grades 6, 7, and 8) mathematics teachers were the participants. Homogenous sampling was also used because the group of participants consisted solely of middle school mathematics teachers. Homogenous sampling brings together participants with similar backgrounds, makes analysis easier, and affords for the use of focus group interviews (Nastasi, 2017).

In a study of sampling practices in education research, Guetterman (2015) found that there is little research in qualitative sample sizes. Creswell (2012) stated that it is usual for qualitative research to study few participants but did not provide a recommended number. The number of participants in a qualitative research study depends on the study itself (Creswell, 2012). According to Creswell, sample sizes in qualitative studies vary. Numbers of participants or cases are smaller in qualitative research due to each added participant causing a decreased ability to provide in-depth information (Creswell, 2012).

In this project study, I asked 12 total middle school mathematics teachers to participate. This accounted for all Grade 6, 7, and 8 mathematics teachers employed by the local district. The school district under study was a small, public district, with a population of 869 students in Grades 6–8 all housed in the district's only middle school building. Only nine of the mathematics teachers agreed to participate, and this was noted as a limitation of the project study.

I gained access to the participants following the standards of Walden University research protocol. A letter requesting permission to conduct research was presented to the local school district. Approval was granted by the Walden University Institutional Review Board (Approval # 03-02-18-0434162), and written consent was obtained from the assistant superintendent of curriculum and instruction as well as the building principal.

I took the following steps to recruit participants: (a) a staff information briefing by the assistant superintendent, (b) sent an initial e-mail introducing the purpose and processes of the project study; and (c) sent a letter of informed consent delivered both electronically and in hard copy form. An opportunity for teachers to ask questions regarding the study, confidentiality, informed consent, processes, and reporting was arranged. Following this session, the middle school mathematics teachers were sent another e-mail asking them to participate in the project study and submit a completed and signed letter of informed consent via e-mail or via U.S. mail (a stamped return envelope was provided with the hard copies of the letters). Teachers received a hard copy of the letter of informed consent via their school mailboxes and received the letter electronically

via e-mail attachment. Once I obtained the outlined approvals, permissions, and informed consents, individual teacher interviews were scheduled.

**Participant/Research Working Relationship**

Currently, I hold the position of administrator in a private, Christian school located in same town as the site of the project study. I do not hold any position in the district where the site is located. In addition, I did not have any relationship, personal or professional, with any of the teachers who participated in the project study. Through respectful, honest, and open communication, I worked to build an environment of trust and positive rapport with the participants of the project study.

**Ethical Considerations**

In 1979, the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research published *The Belmont Report* (U.S. Department of Health & Human Services, 1979). *The Belmont Report* was created to set forth ethical principles to be used when engaging human subjects in research as well as to set guidelines that should be followed to ensure the ethical principles are used when research involving human subjects is conducted (U.S. Department of Health & Human Services, 2017). According to *The Belmont Report*, the basic ethical principles to be considered are: (a) respect for persons, including recognition of autonomy and protection for those with diminished autonomy; (b) beneficence, which is safeguarding subjects from harm; and (c) justice, or equitable distribution of benefits and burdens resulting from the research conducted (U.S. Department of Health & Human Services, 1979). I applied

these ethical principles in this study through informed consent, the assessment of risks

and benefits, and the selection of subjects for participation in the research.

**Informed consent.** Informed consent is a crucial element in building trust,

rapport, and credibility with the participants of the project study. Through the process of

obtaining informed consent, participants were fully educated about the objectives and

processes for the study. They were given ample opportunity to ask questions about any

stage of the project study prior to being asked to participate and were provided the letter

of informed consent both electronically and in hard copy form. In addition, I clearly

communicated that participation in the project study was voluntary and that a teacher

may choose not to continue participating at any time. This process of informed consent

fulfilled the principle of respect for persons and recognition of autonomy as dictated by

*The Belmont Report*. Permission to audio record interviews was requested in the letter of

informed consent to ensure accuracy and minimize introduction of researcher bias.

**Confidentiality.** Though I did not have any type of relationship with the intended

participants, confidentiality was vital. The local site and teachers' names were never

used; instead, the school was referred to as MS1, and teachers were identified using

participant numbers. Any personal characteristics that were shared during the interview

process were removed from transcription. The use of participant numbers and not

identifying the school fulfilled the principle of beneficence described in *The Belmont*

*Report* because the subjects are being safeguarded from harm.

**Protection from harm.** When conducting research of any kind, ethical issues

must be a priority consideration. Maintaining confidentiality and integrity, obtaining

informed consent, and understanding the implications of involving children in research were imperative for me. Ethics need to be in the forefront of the researcher's mind throughout the entire research process (Abed, 2015). Furthermore, the researcher must be cognizant of their own personal conduct and integrity during the research process (Abed, 2015). To address the recognition of my own conduct and integrity, I kept a research journal. In this journal, I documented self-reflections following personal interviews with teachers, and this aided in recognizing potential issues throughout the process so that they were resolved as quickly as possible.

## Data Collection

For this project study, I collected data through multiple avenues. Documents found on the school district website, such as the school improvement plan, were examined. Documents that were publicly available through the U.S. Department of Education provided contextual information. Finally, semistructured individual interviews were conducted with the mathematics teacher participants (see Appendix B).

One annual document used as contextual information was the School District Report Cards from 2011–2016. This data showed the increase or decrease in standardized test scores in mathematics for middle school students for the past 5 years. This document also displayed the data for test scores broken down by SES. A second document used for contextual information was the School Committee Policy Manual, available on the district website. This document outlined the policy in place for meeting the needs of all students. Finally, I referenced the rubric for teacher evaluation to identify the criteria used to determine if a teacher is effectively meeting the needs of all students.

Interviews are a tool used by researchers to better understand the facts of and gain knowledge about the phenomenon being studied (Mojtahed, Nunes, Martins, & Peng, 2014). According to Drever (1995), semistructured interviews are useful in small-scale educational research, such as this project study, due to the flexibility of the method. This project study used a series of questions designed to acquire data about teacher biases, experiences with low socioeconomic individuals, factors that teachers believe influence their perceptions, and what the perceptions were of students from low socioeconomic backgrounds related to ability to learn (see Appendix B). The interview questions were developed based on the data desired for the project study, as well as the use of the definition of social reproduction theory.

Table 3

*Alignment of Interview Questions to Research Questions and Social Reproduction Theory Elements Presented by Auwarter and Aruguete (2008)*

| Interview Questions | Research Question or Element |
|---|---|
| 1. How do you perceive how students' socioeconomic status affects teachers their ability to learn mathematics? | RQ1 (Qualitative): How do grades 6, 7 and 8 mathematics<br><br>perceive how their students' socioeconomic status affects their ability to learn mathematics? |
| 2. What characteristics have you encountered in students from lower socioeconomic backgrounds that lead you toward this perception? | "Personal characteristics of the student" (Auwarter & Aruguete, 2008) |

(*table continues*)

| Interview Questions | Research Question or Element |
|---|---|
| 3. How have these characteristics manifested in the classroom? | "Personal characteristics of the student" (Auwarter et al., 2008) |
| 4. Did you anticipate encountering these characteristics in this student population? Why or why not? | RQ2 (Qualitative): What do grades 6, 7 and 8 mathematics teachers believe influences their own perceptions of students' ability to learn mathematics? |
| 5. How did you know to anticipate differences in this student population regarding learning mathematics? | RQ2 (Qualitative): What do grades 6, 7 and 8 mathematics teachers believe influences their own perceptions of students' ability to learn mathematics?<br><br>Socioeconomic status" (Auwarter et al., 2008) |
| 6. How do you see your low SES students performing in mathematics compared to their higher SES peers? | "Socioeconomic status" (Auwarter et al., 2008)<br>"Believability" (Auwarter et al., 2008) |
| 7. To what do you attribute the difference in performance (if one is present)? | "Need for academic services" (Auwarter et al., 2008)<br>"Socioeconomic status" (Auwarter et al., 2008)<br>"Characteristics of the student" (Auwarter et al., 2008)<br>RQ1 (Qualitative): How do grades 6, 7 and 8 mathematics teachers perceive how their students' socioeconomic status affects their ability to learn mathematics? |

*(table continues)*

| Interview Questions | Research Question or Element |
|---|---|
| 8. What strategies are used to mitigate the difference in mathematics performance? | "Need for academic services" (Auwarter et al., 2008) |
| 9. What do you believe influences your own perceptions of students' ability to learn mathematics? | RQ2 (Qualitative): What do grades 6, 7 and 8 mathematics teachers believe influences their own perceptions of students' ability to learn mathematics? |
| 10. What personal experiences with economically disadvantaged students have you had that contributed to the formation of your perceptions? | RQ2 (Qualitative): What do grades 6, 7 and 8 mathematics teachers believe influences their own perceptions of students' ability to learn mathematics? |
| 11. What barriers have these perceptions created? | "Future expectations" (Auwarter et al., 2008) |
| 12. What preparation for teaching mathematics to student from low socio-economic backgrounds specifically have you been provided through your teacher preparation program? | RQ2 (Qualitative): What do grades 6, 7 and 8 mathematics teachers believe influences their own perceptions of students' ability to learn mathematics? |
| 13. What types of professional development have you been offered in teaching mathematics effectively to economically disadvantaged students? | "Socioeconomic status" (Auwarter et al., 2008) |
| 14. How have you implemented what you learned through the professional development in the classroom? | "Future expectations" (Auwarter et al., 2008) "Believability" (Auwarter et al., 2008) "Need for academic services" (Auwarter et al., 2008) |

There were nine initial interviews conducted, with each lasting 1 hour. The interviews were conducted at a private location of the teachers' choice. Once the data were coded and analyzed using NVivo software, themes began to emerge. Each participant was notified of the emergent themes and was also informed as to which participant number pertained to him/her so that he/she could pay closer attention to his/her own contributions to the data. The provided feedback was documented for accuracy.

**Role of the Researcher and Potential Bias**

While the private school at which I was, an administrator was in the district where my data collection took place, I did not have any working relationship with teachers in this district, nor am I employed in any way by the district. To identify any personal biases, I kept a reflective journal (see Appendix C) throughout the course of the project study to record personal thoughts, feelings, and insights. The reflective journal was used to identify personal biases throughout the process and used to minimize bias as much as possible. I wrote in the reflective journal following personal interviews, when I had questions during the research process, whether those questions were/were not answered and how answers were derived, and during the transcription and coding processes.

**Data Analysis**

**Data Management**

Qualitative data collected from the multiple sources was analyzed to identify emerging patterns and themes. This data will be kept for 3 years and will be stored in password-protected files on my computer. The data will also be stored on an external

hard drive. The reflective journal will be kept for 3 years and will be stored with the external drive in a locked file cabinet. Data from documents found on the school district website and from publicly available documents from the Department of Education were analyzed at the beginning of the study process and compared. Personal interviews with the middle school mathematics teachers were compared to each other, to the data collected from the documents early in the process, and to the literature review to identify common themes and discrepant themes. Data were analyzed throughout the course of the project study to develop initial codes and categories and recognize any patterns present.

Interviews were transcribed verbatim (see Appendix D), and each transcription completed immediately following the interview using NVivo software. Following the transcription process, results were coded using color codes to identify text segments. Data collected from the personal interviews and document studies were fully analyzed once all interviews were completed, and data was coded using in vivo coding to identify commonalities emerging from the analysis. In vivo coding uses a word or phrase from a section of data and assigning a label to it (SAGE Encyclopedia of Qualitative Research Methods, 2017). Codes were listed and examined for redundancy, and categories were developed. Codes were categorized, and themes were identified from the categorized codes. The QSR NVivo software provided professional organization, coding and categorization of the qualitative data.

**Accuracy, Validity, and Reliability**

It is important that steps be implemented to exclude researcher bias in the findings of a research study. The use of a reflective journal aided in decreasing the chance of

researcher bias being introduced to the study. Triangulation of data is another way the introduction of researcher bias was minimized. The process of triangulation involves the use of several data sources, methods, or individuals to support the accuracy of the study (Creswell, 2012). For this case study, data were collected through publicly available documents and individual teacher interviews. Each of the data sources aligned with the research questions, and focused on the purpose of the study which was to understand what Grades 6, 7, and 8 mathematics teachers' perceptions were of the ability of their students from low socioeconomic backgrounds to learn mathematics, and what the teachers' believed influenced these perceptions. The individual interview results were compared to each other as well as to the publicly available data to support the accuracy and credibility of the findings and to identify discrepant cases.

Another method used in qualitative research to provide accuracy to study data is the use of member checks. According to Creswell, in member checking the researcher reports findings back to participants of the study and asks them to review the accuracy of the information. For this project study, a summary of the findings was provided to each participant interviewed. The participants were asked to review the findings for accuracy, completeness and fair representation in the responses (Creswell, 2012). The participants' feedback was documented, and the study findings reviewed for accuracy based on this feedback.

Thomas maintained that the inductive process in analyzing qualitative research results in reliable, valid results. Developing a summary form the initial data analysis, establishing links between data collected from multiple sources, and identifying

experiences present in the data also result from implementing the inductive process in the analysis of qualitative data (Thomas, 2006). The inductive process was followed throughout the course of this case study. Links between data collected from multiple sources were identified as themes emerged from the data analysis, and the accuracy of these themes was verified through the process of member checking.

Case study research has encountered much criticism, including reliability of results due to the large amounts of data this methodology entails (Larrinaga, 2017). According to Larrinaga, procedures testing constructive validity, internal validity, external validity, and reliability will provide evidence of the quality of the case study. Throughout the course of this project study, the interview process was followed in an identical manner for each individual interview. During the participant interviews, the interview questions were asked in the same order to every participant. This consistency in procedure increased the reliability of the study results.

For this project study, external validity and reliability strengthened the quality of the results. External validity refers to how well the results of the research can be generalized to other situations (Indiana University, 2017). The use of carefully developed interview questions, specifically defining the participants, and analyzing how the data answers the research questions via the methods described in the methodology section for this project study ensured the external validity was met. This project study was not analyzing a causal relationship; internal validity is not applicable.

According to Golfashani (2003), reliability in qualitative research can also be described as dependability or trustworthiness. Golfashani also stated that "the consistency

of data will be achieved when the steps of the research are verified through examination of such items as raw data, data reduction products and process notes" (p. 601). The coding and analysis of the interview responses as well as the research journal documenting process and researcher reflections provided reliability to the results of the project study.

**Discrepant Cases**

Purposefully analyzing the collected data for discrepancies is important for establishing credibility in a case study. The practice of negative case analysis, according to Lodico et al. (2010), identifies whether the sources of the data are in support of the interpretation of the researcher. For this qualitative case study, I watched for data from the participant interviews that differed from the other interviews conducted. There were two instances of discrepant cases identified through the participant interviews. In these cases, the responses from the two participants to at least one of the interview questions differed significantly from the other participant responses. Through the process of member checking I verified the accuracy of the discrepancies with the participants and received clarification of the discrepancies. These cases were described and noted as discrepant cases in the research findings. Directions for future research in the subject of the study emerged from the analysis of discrepant data in addition to strengthening the validity of the study.

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**Data Analysis Results**

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Data for this project study were generated through direct analysis of publicly available documents from a small suburban school district and via individual

semistructured participant interviews. The mathematics test scores for Grades 6, 7, and 8 over a 5-year period (2011-2016) were analyzed for gaps between disadvantaged and nondisadvantaged students. The analysis showed a slowly widening gap in these scores. The interviews were audio recorded and immediately transcribed verbatim using NVivo software. Following the interviews, all data was analyzed using NVivo software in order to identify themes, patterns and relationships. The themes identified from the data analysis were in alignment with the framework of social reproduction theory as described by Collins (2009). The themes also aligned with the arguments of Auwarter and Aruguete (2008) in their study examining student success based on socioeconomic status and gender.

**Findings**

The purpose of this qualitative case study was to further understand middle school mathematics teachers' perceptions of how socioeconomic status affect students' ability to learn mathematics and what factors teachers believed affect their perceptions. The project study findings were guided by the research questions posed and the purpose of the project study. The organization of the findings were related to the findings of Auwarter and Aruguete (2008) and the relationship to the social reproduction framework as described by Collins (2009). The findings are presented and organized by the themes which emerged from the data analysis. A discussion of the relationship of the findings to the research questions is included in this section.

Research Question 1: What are Grades 6, 7 and 8 mathematics teachers'

perceptions about how their students' socioeconomic status affects the ability to

learn mathematics?

Research Question 2: What do Grades 6, 7 and 8 mathematics teachers believe

influences their own perceptions of students' ability to learn mathematics?

According to Collins (2009), social reproduction theory pursues the idea that

schools are a catalyst in perpetuating social inequalities, and not places of equal

opportunity. In addition, Auwarter and Aruguete (2008) argued that if teachers have

preconceived beliefs that socioeconomic status and gender predetermine student success,

then teachers will not work as actively to reach these students. The findings of this

project study are organized by the categories emerging from the data analysis, which are

academic performance, behavior, communication, expected student characteristics,

personal experiences and influences on perceptions of low SES students, preparation to

teach the population of low SES students (including professional development), and

student support in and out of school.

Table 4

*Alignment of Themes and Subthemes to Research Questions*

| Themes Question | Subthemes | Research |
|---|---|---|
| Academic performance | Low foundational skills Mindset/willingness to learn Ability to learn | RQ1 (Qualitative): What are grades 6,7, and 8 mathematics teachers' perceptions about how their students' socio-economic status affects the ability to learn mathematics? |
| Classroom behavior | Motivated, rested students are more resilient and have more positive behavior, therefore achieving higher | RQ1 (Qualitative): What are grades 6, 7, and 8 mathematics teachers' perceptions about how their students' socio-economic status affects the ability to learn mathematics? |
| Communication | Students whose parents communicate with teachers achieve at higher levels | RQ1 (Qualitative): What are grades 6, 7, and 8 mathematics teachers' perceptions about how their students' socio-economic status affects the ability to learn mathematics? |

*(table continues)*

| Themes Question | Subthemes | Research |
|---|---|---|
| Expected characteristics of low SES students | Low SES students show a lack of desire to learn, focus, respect and participation. Have an attitude of defeat. | RQ1 (Qualitative): What are grades 6, 7, and 8 mathematics teachers' perceptions about how their students' socio-economic status affects the ability to learn mathematics? |
| Influences on perceptions | Personal experiences Personal background Conversations with other teachers | RQ2 (Qualitative): What do grades 6, 7, and 8 mathematics teachers believe influences their own perceptions of students' ability to learn mathematics? |
| Preparation to teach low SES students | No preparation in college No professional development | RQ2 (Qualitative): What do grades 6, 7, and 8 mathematics teachers believe influences their own perceptions of students' ability to learn mathematics? |
| Student support | No support outside of school Not enough support offered inside of school More needs to be done to encourage parent involvement | RQ1 (Qualitative): What are grades 6, 7, mathematics teachers' perceptions about how their students' socioeconomic status affects the ability to learn mathematics? |

**Theme 1: Academic Performance**

The findings about academic performance in students from low socioeconomic backgrounds align with social reproduction theory in that the teachers shared they do see these students performing at a lower level academically and the students may not have the same opportunities for success as their peers coming from higher socioeconomic backgrounds. The teachers felt that SES did affect their students' ability to learn mathematics. There were three areas the teachers saw as problematic for the lower SES students. They were foundational skills, mindset and willingness to learn, and ability to learn related to SES.

Many of the teacher participants stated that they see very weak foundational mathematics skills in their students coming from low socioeconomic backgrounds. The participants believed the weakness was related to lack of practice and homework supervision at the students' homes. When Participant 1 was asked to elaborate on her answer that her low SES students do perform lower and why she felt this was the case, she stated,

> I think they do lower because the basic skills are not there. Some of it might be special ed related but I think special ed gets slammed when the fundamentals are there. I always tell the kids that when they come in to sixth grade, I do a quick assessment on the basic facts, and they don't know them and I really can't do anything.

Teacher participants also shared that they see the issue spiraling when students do not know their basic facts, which is a big contributor to the lower SES students

performing lower academically. Participant 2 was also asked the question about why she

feels this performance is perpetuated from grade to grade, and her response was,

> It's a lot of their foundation and that they know mathematics is all cumulative. If
>
> they didn't understand Step 1 then when we get to Step 2, they might not be
>
> enthusiastic for it because they didn't understand Step 1. If they have a poor
>
> foundation and don't have the basic mathematics facts, then it's just kind of
>
> catching up to them.

There were two teacher participants whose responses to the question of academic

performance were discrepant from the others. While most of the participants stated they

did believe there was a correlation between SES and mathematics achievement, two

participants felt there was no correlation. Participant 3 felt very strongly that SES does

not affect the students' ability to learn or in their academic performance. When asked

about SES and ability to learn mathematics, he stated,

> I don't think it impacts their ability to learn at all. It's just their ability to show up
>
> to school and have the right supplies and all of that. You know what I mean?
>
> Like, no matter where you come from, we are here to do mathematics, and this is
>
> what you must do. So again, that could just be how important is homework? How
>
> important is reading? We do see gaps that weren't addressed in the younger
>
> grades.

Participant 4 also felt strongly that SES does not affect students' ability to learn

mathematics. When the same question was posed to him, he responded,

I don't think that there is a correlation between their ability to perform well in mathematics and their socioeconomic status. With mathematics, a lot of it is having the mind to make those critical thinking connections; I don't think that's necessarily something that comes with social status. Just because you come from that [background] doesn't mean you don't have the ability to do well or you're destined to fail.

Though two teacher participants were discrepant in their thoughts about socioeconomic status and the ability to learn mathematics, the teachers agreed that a large piece of the success of students from low socioeconomic backgrounds is their mindset along with their willingness to learn. The teacher participants felt that part of the mindset of success was related to the educational level of parents; if parents had received more education, then they pass along the value of education and the mindset of success in a stronger manner. Regarding mindset and willingness to learn, Participant 5 stated, "It's about the ability to show up to school and have the right supplies. If they are willing to overcome that, then teachers will generally provide them with supplies." He went on to say that, "You've got to bring a willing attitude. No matter where you come from, we are here to do mathematics, and this is what you must do. If you're willing to learn, you can learn."

Participant 1, though in agreement that mindset matters, had a different take. Her response to the question of mindset was, "If the kids go into special ed, they almost use it as a crutch that they don't have to do anything. They feel they don't have to because they are in a special program." Participant 2 stated,

I would say that they are not as concerned with their performance academically as

much as they are socially and making sure that they are trying to fit in somehow.

They're not as concerned that you're trying to teach mathematics. They are more

concerned with whether their peers are taking notes than being engrossed in the

subject. I do know that some students are extremely motivated and want to

overcome where they have come from, so they are ready to learn all the time.

The findings regarding SES and academic performance correlate to Research

Question 1. How this set of teacher participants perceive their low SES students' ability

to learn mathematics was clearly answered in the interview process. Most participants

stated they saw a correlation between SES and the ability to learn mathematics. Two

participants were identified as discrepant cases because they did not agree there was a

correlation between SES and ability to learn mathematics.

**Theme 2: Classroom behavior**

Teacher participant interviews categorized low SES student behavior in the

classroom and the ability to succeed in mathematics into three groups: motivated students

and mathematics success; unmotivated students and mathematics success; and no

correlation between behavior and mathematics success. The findings from this portion of

the interviews are consistent with social reproductive theory in that teacher participants

felt that there was not much they can do to help students who are unmotivated to learn,

nor can they change the students' motivation.

Teacher participants reported that they usually see low SES students as

unprepared, unengaged, and making excuses for why work is not complete or why they

are not achieving in class. Teacher participants also stated that the students from low socioeconomic backgrounds also show poor behavior due to frustration and stress and can become very disruptive to the learning of the rest of the class. Participant 4 stated, "There is always some reason why something either wasn't completed on time or they didn't have the ability to complete it. I think that there was always some sort of level of excuse making in the end."

Participant 6 shared, "I had a student last year who was homeless, and some days it was up all the time and some days it was all over the place; she was very disruptive." Other teacher participants shared that they see low SES students as more tired, not focused, angry and withdrawn. They noted that this population of students also do not identify well with their peers.

Another set of teacher participants felt that students from low socioeconomic backgrounds are more resilient. They observed that many of these students are more grateful for help they are given. Participant 5 shared, "Sometimes these students are a little bit more used to having to work, to put a little more effort into trying to get to where they need to be."

There was one teacher participant who did not fall into either the side of students misbehaving and not being motivated or the side of students being more motivated and trying harder. This discrepant case, Participant 4, felt very strongly that there is no strong correlation between socioeconomic status and behavior. This participant was noted as a discrepant case because the opinion shared differed significantly from the other participants.

The findings from this category correlate to Research Question 1, as it helps to identify and understand how teacher perceptions of the behavior of low SES students affects their ability to achieve in mathematics.

**Theme 3: Communication**

The data stemming from the teacher participant interviews regarding communication shows that the teacher participants believe communication between them and parents, them and students, and among each other is extremely important in helping students from low socioeconomic backgrounds succeed. The findings regarding communication are in alignment with social reproduction theory, as the teacher participants communicated that if parents and students are not putting in effort to communicate, they do not feel that they should continue to pursue them.

The teacher participants all agreed that opening a line of communication with parents is important, and that the line needs to stay open. Teacher participants generally seemed to want to support students and parents, but they also believe that the parents and students must be willing to reciprocate and do their part for the student to succeed. E-mail communication seemed to be the preferred method of reaching out to parents, and several opportunities for parents to come in to meet with teachers are provided throughout the year.

A source of frustration for teacher participants is the lack of engagement of parents on their child's behalf. There has been low attendance at events such as Mathematics Night and parent conferences, which is discouraging for teacher participants who are trying to help this population of students succeed. Parents and students have

access to grades and assignments, yet many of the parents are not utilizing this tool for communication with teachers. Participant 1 had this to say:

> You don't hear from people as much. They don't know what questions to ask. I didn't get e-mails; I didn't get phone calls. I didn't get parents pestering me about grades and things like that because it just wasn't a priority.

She also added:

> If we know a student is failing and we have heard nothing from the family, we will reach out to the guidance counselor who might reach out and ask for a meeting. We want to meet so that the parents don't come back at the end of the day and say they didn't know. They should always know. We reached out even more so it shouldn't be a surprise because it's so transparent.

Furthermore, Participant 2 shared that there are open houses and parent conferences, and if a student is not doing well a letter is sent home stating the student should attend academic support in the afternoon. This is a service the school provides for struggling students.

The findings about communication relate to Research Question 1. The teacher participants perceived that students who do not have parents who communicate have a lower ability to achieve in mathematics. The information shared by the participants did not reveal any discrepancies regarding this theme.

**Theme 4: Expected Characteristics**

The characteristics of students from low socioeconomic backgrounds expected by the teacher participants interviewed were extremely similar across the board. The most

discussed expected characteristics were lack of a desire to learn; difficulty with comprehension due to lack of focus; disrespectful attitudes; lack of participation in class; and attitude of defeat. This data aligns with social reproduction theory in that due to the characteristics of disadvantaged students expected by the teachers, the teacher participants felt there was nothing they would be able to do to reach these students from the get-go. This data also aligns with Research Question 1, as the teacher participants perceive the characteristics expected in the students hinder the achievement in mathematics. Regarding characteristics expected from students from low socioeconomic backgrounds, Participant 5 stated, "It's just really about their attitude and what they bring to the table. It's what they're willing to do in class; are they willing to ask a question or are they just going to sit there."

Participant 3, who is an experienced teacher, shared that his expectations of these students were very much like Participant 5's. However, as the interview progressed, Participant 3 stated that his expectations changed drastically after he began working with students from low socioeconomic backgrounds. He shared the following:

You must make sure all the other needs are met to even address the academics, because a lot of the time they are going to fight you on the academic. It's a behavior issue, but it's not about the mathematics; it's not about me.

Participant 6 was surprised at the characteristics of the lower socioeconomic students in this school district, but in a different way. Due to the demographics of the community, she did not expect to encounter as much poverty as she has. She shared this:

I didn't expect to encounter things like homeless kids in this community. So that

was shocking to me that my kids would come to me with dirty clothes and they

don't smell so good. It does shock me less as I go on because I think now how can

I move on from this and help them? What can I do about it? It was just kind of a

slap in the face; they don't really tell you about that in school.

**Theme 5: Personal Experiences and Influences on Perceptions**

Each teacher participant interviewed had personal experiences, whether as

children themselves or as adults, with individuals coming from a low socioeconomic

background. They agreed that their personal experiences did have a significant influence

on their perceptions of students coming from a disadvantaged background. The data

gathered from this part of the interviews aligns with Research Question 2 because it helps

further understanding of what the teacher participants feel influences their perceptions of

this student population.

Several of the teacher participants shared that they came from difficult

backgrounds themselves, and that their attitudes towards learning were strong because of

their experiences as students. These teacher participants stated they now expect students

from low socioeconomic circumstances to have a future if they are willing to participate

in their education and push to succeed. Participant 3 had a different perspective. He stated

this about his experiences:

I always thought I was poor, and both my parents worked. But my mother was

always able to get home from work, someone was always home with us. Some of

the kids I drove to football practice when I was in college had it much tougher

than I did. What kind of barriers do we think can be created in the classroom by teachers' perceptions of the more disadvantaged population of students? I know I don't always think about what these students may or may not have [regarding resources for things like school supplies].

Participant 4 drew from his own experience in school when talking about what he feels influences his perceptions of disadvantaged students. He shared that when he was in school, there were always teachers he did not "jive" with in the way they presented material or with their teaching style, but that he had to figure it out and not blame the teacher if he was not learning. He felt very strongly that the lower socioeconomic students expect teachers to adapt their teaching to every person in class. He stated:

I think that I'm very open to helping kids who want to be helped. There's a lot of kids who do want to be helped but I also think that it's tough for me to then try to tailor everything that I'm doing around what may be going on in their lives, and that's unfortunate.

Finally, Participant 7, Participant 8, and Participant 2 all felt that conversations and information from the students' previous teachers influenced their perceptions of the students themselves before they even had the opportunity to teach them. However, in getting to know the students, many times they realized the students did have the abilities they needed to be successful in mathematics and were simply lazy. Participant 2 shared the following: "I think the students are willing. All students can learn. Some of them are less willing to try. I think that anyone can overcome certain situations where they're

from." Participant 3 added that he thinks the perception is that everyone's going to be like the teachers, and if they're not then there's something wrong with them.

**Theme 6: Preparation to Teach Low SES Students (Teacher Preparation Program and Professional Development)**

The data gathered from the teacher participant interviews regarding the preparation they have received to meet the academic needs of low socioeconomic students, both via teacher preparation programs and professional development, aligns with social reproductive theory in that the interviews reveal pervasive ideas that schools are a catalyst for promoting social inequality and not institutions of opportunity. This data also aligns with Research Question 2 because the interviews showed that the teacher participants' preparation, or lack of preparation, to teach this population of students influenced their perceptions of the students' abilities to learn mathematics.

The teacher participants interviewed stated that they had not had any formal instruction through their teacher preparation programs in how to meet the needs of students from low socioeconomic backgrounds. They recalled informal discussions in some of their courses, but they were not intentionally equipped to teach disadvantaged students and what the unique needs of this population are. The teacher participants felt unanimously that teacher preparation programs need to include more experiences and instruction about how to successfully meet the needs of students from low socioeconomic backgrounds, as their needs are different from students who are English language learners or special education students. Participant 6 shared:

I took mathematics courses that teach you all the different ways to teach mathematics, but I can't think of any specific preparation for teaching students from lower socioeconomic backgrounds. They did prepare me to teach the content, but not specifically for the needs of low SES students.

The teacher participants interviewed all shared this same information regarding their teacher preparation programs. None of the participant teachers felt they had any specific preparation to meet the needs of disadvantaged students. Furthermore, all the participants felt that teacher preparation programs need to do more to prepare teachers for what low SES students' academic needs involve.

The teacher participants were asked about what types of professional development (PD) they had been offered or participated in with regards to teaching to the unique needs of students from disadvantaged backgrounds. Each one answered that they have not participated in nor have they been offered PD on how to effectively teach this population of students. They all shared that they have had a significant amount of PD in special needs and meeting social-emotional needs of students, but nothing targeted to low SES students. The teacher participants unanimously stated that there needs to be more information given and PD provided on how to help students from disadvantaged backgrounds succeed in mathematics, and in school in general, to their full potential.

**Theme 7: Student Support**

The support students receive both in and out of school plays a significant role in student success according to the teachers interviewed. The discussion of support both in and out of school aligns with social reproductive theory in that it reveals schools as

continuing social inequality as well as teachers feeling they may not work as hard to reach certain students. This data also aligns with Research Question 1 because it speaks to teacher participants' perceptions of their students from lower socioeconomic backgrounds and the ability to learn mathematics.

Teacher participants identified support at home as a significant indicator of how well a student from a lower socioeconomic background will succeed. They shared that many times nobody is home to help with homework, there is not an appropriate place for homework to be completed, the students are caring for younger siblings, and having enough food is an issue. Many times, these students are exhausted. In addition, the teachers found that when they tried to contact parents regarding student performance, either there was no response or the response was, "I don't understand mathematics so I can't help."

Due to responses such as this from parents, the teacher participants stated they have tried to implement support inside of the school. Most of the teachers shared that they offer after-school help. The guidance counselors are involved with supporting struggling students in school. There is a community fund available to help disadvantaged students obtain the school supplies needed to succeed. Participant 4 shared this:

> Is there a support system at home? Their lives are totally separate. They go to
> school and are there; then they go home, and they don't think about school. I
> think that's where you run into a lot of problems in terms of their abilities to
> succeed in class.

**Alignment of Themes to the Research Questions**

**Findings for Research Question 1**

The participants interviewed shared they do see these students performing at a lower level academically and the students may not have the same opportunities for success as their peers coming from higher socioeconomic backgrounds. The teacher participants felt that SES did affect their students' ability to learn mathematics. There were three areas the teacher participants saw as problematic for the lower SES students. They were foundational skills, mindset and willingness to learn, and ability to learn related to SES. Many participants stated that they see very weak foundational mathematics skills in their students coming from low socioeconomic backgrounds.

The teacher participant interviews categorized low SES student behavior in the classroom and the ability to succeed in mathematics into three groups: motivated students and mathematics success; unmotivated students and mathematics success; and no correlation between behavior and mathematics success. The teacher participants reported that they usually see low SES students as unprepared, unengaged, and making excuses for why work is not complete or why they are not achieving in class. Teacher participants also stated that the students from low socioeconomic backgrounds also show poor behavior due to frustration and stress and can become very disruptive to the learning of the rest of the class.

The data stemming from teacher participant interviews regarding communication shows that the teachers believe communication between them and parents, them and students, and among each other is extremely important in helping students from low

socioeconomic backgrounds succeed. The teacher participants all agreed that opening a line of communication with parents is important, and that the line needs to stay open. Teacher participants generally seemed to want to support students and parents, but they also believe that the parents and students must be willing to reciprocate and do their part for the student to succeed. E-mail communication seemed to be the preferred method of reaching out to parents, and several opportunities for parents to come in to meet with teachers are provided throughout the year.

The characteristics of students from SES backgrounds expected by the teachers interviewed were extremely similar across the board. The expected characteristics discussed most were lack of a desire to learn; difficulty with comprehension due to lack of focus; disrespectful attitudes; lack of participation in class; and attitude of defeat. This data aligns with research question 1 in that due to the characteristics of disadvantaged students expected by the teacher participants, the teacher participants felt there was nothing they would be able to do to reach these students from the get-go. This data also aligns with Research Question 1 because the teacher participants perceived the characteristics expected in the students hinder the achievement in mathematics.

Teacher participants identified support at home as a significant indicator of how well a student from a lower socioeconomic background will succeed. They shared that many times nobody is home to help with homework, there is not an appropriate place for homework to be completed, the students are caring for younger siblings, and having enough food is an issue. Many times, these students are exhausted. In addition, the teacher participants found that when they tried to contact parents regarding student

performance, either there was no response or the response was, "I don't understand

mathematics so I can't help."

There were two discrepant cases in the findings for Research Question 1. Two of

the teacher participants strongly felt that SES did not have any effect on students' ability

to learn mathematics. These two teacher participants believed that students from low

socioeconomic backgrounds succeed if they have a mindset for success. The teacher

participants also believed that motivation, determination and effort contributed more to

student success than SES. These two cases were noted as discrepant in the study findings.

**Findings for Research Question 2**

Each teacher participant interviewed had personal experiences, whether as

children themselves or as adults, with individuals coming from a low socioeconomic

background. They agreed that their personal experiences did have a significant influence

on their perceptions of students coming from a disadvantaged background. Several of the

teachers shared that they came from difficult backgrounds themselves, and that their

attitudes towards learning were strong because of their experiences as students. These

teacher participants stated they now expect students from low socioeconomic

circumstances to have a future if they are willing to participate in their education and

push to succeed.

The data gathered from the teacher participant interviews regarding the

preparation they have received to meet the academic needs of low socioeconomic

students, both via teacher preparation programs and professional development, align with

Research Question 2 because the interviews revealed that the teacher participants'

preparation, or lack of preparation, to teach this population of students influenced their perceptions of the students' abilities to learn mathematics. The teacher participants unanimously stated that there needs to be more information given and professional development provided on how to help students from disadvantaged backgrounds succeed in mathematics, and in school in general, to their full potential.

## Summary of the Data

In general, the teacher participants felt that coming from a low socioeconomic background did negatively impact a student's ability to learn mathematics. They identified attitude, willingness to learn, and support both in and out of school as significant factors contributing to student success and agreed that students coming from disadvantaged backgrounds tend to have a much lower level of support at home, impacting their learning. Two discrepant cases were noted where the participants did not agree there was a connection between low SES and the ability to learn mathematics.

The teacher participants interviewed felt that their own personal experiences with individuals from low socioeconomic backgrounds played a role in the formation of their perceptions of this student population. In addition, they felt that discussions with teachers who had taught the students previously contributed to the continuation of these perceptions, even before they had the opportunity to teach the students themselves. Observed behavior by the students in the class also factored into the teachers' perceptions of students from low socioeconomic backgrounds.

Finally, the teacher participants interviewed unanimously communicated that more needs to be done both in teacher preparation programs and in professional

development opportunities to better equip teachers to meet the needs of students from low socioeconomic backgrounds. While they have been exposed to teaching and professional development for serving students with special needs and for English language learners, they have not experienced professional instruction in the unique needs of disadvantaged students and how to help them succeed in learning the intricacies of mathematics. All the teachers participating expressed an excitement in the possibility that this type of professional learning could possibly be an option in the future.

## Project Deliverable

The purpose of this study was to understand the perceptions of middle school mathematics teachers about the ability of students from low socioeconomic backgrounds to learn mathematics and to determine what the teachers believed contributed to the formation of these perceptions. The research uncovered several themes regarding teacher perceptions about the connection between SES and the ability to learn mathematics. These themes included student motivation, student behavior, student support opportunities both inside and outside of school, lack of focused preparation on what the unique needs of students from low socioeconomic backgrounds were, and lack of professional development on how to meet those unique needs.

There were two genres of project deliverables considered for this study: PD program and position paper. The findings of this study revealed that teachers felt more could be done to support students in school, and that more could be done to support and involve families in their child's education. The findings also revealed that teachers felt unprepared to specifically address the unique needs of low SES students as well as a lack

of professional development in this area. Based on the information gathered during the research, a position paper explaining the findings and presenting suggestions for change to the local district administration was deemed most appropriate. The position paper will outline the local problem, explain the research findings, support those findings through significant peer-reviewed literature, and present suggestions for change within the district based on the research outcomes and peer-reviewed literature.

Section 3: The Project

**Introduction**

The proposed project based on this case study was a position paper to local school district leadership. The data I gathered from the individual interviews revealed the teachers' sense of a lack of preparedness in the area of meeting the needs of low SES students. The teachers also felt they were not given any type of professional development in this area and would like to have more specific training in meeting low SES students' needs. I wrote a position paper explaining the findings and presenting suggestions for change to the local district administration and will present to local school administration. In the position paper, I outlined the local problem, explained the research findings, supported those findings through significant peer-reviewed literature, and presented suggestions for change within the district based on the research outcomes and peer-reviewed literature.

I designed this case study using the framework of social reproduction theory along with the work of Auwarter and Aruguete (2008) surrounding teacher perceptions about students from low socioeconomic backgrounds and academic achievement. In the target district, interviews with mathematics teachers disclosed that factors surrounding their perceptions about this student group and their ability to learn mainly developed from student motivation and personal experiences. The teachers also shared that student support both outside and inside of school make a difference in the academic achievement of lower SES students. Finally, the mathematics teachers all disclosed that they received virtually no instruction or guidance in their teacher preparation programs regarding the

unique needs of students from impoverished backgrounds or instruction in how to best meet those needs or had they received any type of professional development opportunity from the district in these areas. These findings aligned with the framework of social reproduction theory because they showed perpetuating inequalities in the school district. The teachers' disclosure of not as actively trying to reach these students based on their preconceived perceptions and personal experiences also aligned with the work of Auwarter and Aruguete.

The project derived from this study was a position paper. Merriam-Webster.com (2019) defined a position paper as "a detailed report that recommends a course of action on a particular issue". In the report generated from the data collected, I presented the problem in detail, supported the findings with current literature, and detailed a course of action recommended to provide opportunity for teachers to not only better understand the needs of students from low SES families but also to provide teachers with the necessary tools to more successfully reach those students.

## Rationale

Personal interviews with mathematics teachers participating in this project study revealed that teachers possessed perceptions about their students from low socioeconomic backgrounds and their ability to learn mathematics, which affected how the teachers viewed these students in the classroom. For example, participant responses addressing Research Question 2 indicated that experiences teachers had early in their lives and/or teaching careers still affect how low SES students were viewed in their current classrooms. Additional data revealed the teachers felt there was not much more they

could do to reach these students because they had not received any formal instruction about the needs of this population and how to meet them through their teacher preparation programs or had they been offered any professional development opportunities through their school district in this area. Extant research also supported the disclosure that preservice teachers need to have intentional instruction and discussions within the context of their preparation programs to have an increased understanding of the difficulties students from low SES backgrounds face to better understand the reasons these students may achieve at a lower level academically and to better understand poverty itself (Hanneke, 2016).

I considered two genres of possible projects to address the findings of this study: professional development and a position paper. The position paper was chosen because it would immediately benefit the district leadership by giving a detailed account of the findings and recommending professional development as part of the course of action to take to remediate the broader problem. While professional development would impact the teachers and students in the local district, a position paper would impact teacher preparation programs as well by recommending more focused discussion with preservice teachers on this topic.

In the position paper, I addressed the issues of student motivation, student support outside of school (i.e., parent involvement), student support in school (i.e., teacher relationships), teacher preparation, and teacher professional development as identified by the data collected. In the position paper, I also cited extant research corresponding with these areas of concern to aid the district in understanding the importance of the results.

Finally, I recommended strategies and actions for the school district to consider

implementing to mitigate the issues uncovered in the data analysis.

## Review of the Literature

I located and accessed the peer-reviewed research used in the literature review in

the Walden University Library via searches in the education databases, specifically

Education Source, ERIC, and Sage Journals. The key terms searched were *socioeconomic*

*status, socioeconomic background, student motivation, classroom behavior, parent*

*involvement, student support, teacher relationships, teacher preparation, professional*

*development, preservice teachers,* and *poverty.* The peer-reviewed articles I located were

published within the last 5 years, rendering them current. All articles reviewed were

chosen based on their relevance to the data analysis findings of the project study.

### Student Motivation

According to the theory of social and cultural reproduction, a student's level of

academic achievement is closely associated with the educational performance of his or

her parents (Burger & Walk, 2016). As inequality in education continues, many students

become unmotivated to break this cycle. Burger and Walk (2016) recommended that

future research be conducted that takes student ability and prior educational achievement

into account and not simply the educational performance of the parents. The reason for

this recommendation was that it will allow the "extent to which the effects of parental

education on a child's outcomes mediated by family characteristics such as home

learning environments or parenting strategies" affect student motivation and to gain

insight into whether or not children may be able to break this cycle (Burger & Walk, 2016, p. 708).

A student's SES can have a direct link to their educational and future aspirations. In their 2015 study of eighth grade students, Guo, Parker, Morin and Yeung (2015) found that students who came from higher SES backgrounds showed higher mathematics achievement as well as higher educational aspirations. The researchers also found that behaviors related to mathematics achievement could be positively predicted based on SES (Guo et al., 2015). Given these results, motivation to do well and to pursue educational aspirations can be directly affected by SES.

Students coming from low socioeconomic backgrounds face challenges unique to this population. Judging student motivation to succeed simply by looking at their SES can be a dangerous practice (McKay & Devlin, 2016). McKay and Devlin (2016) recognized a need for low SES students to be empowered to succeed and to acknowledge that these students are "hard working, high achieving and determined to succeed" in most cases and that it is important for teachers to hold high expectations for all students regardless of socioeconomic background (p. 359).

Students from low socioeconomic backgrounds often exhibit behavior issues in the classroom, as by Gage, Larson, Sugai and Chafouleas (2016). In their study, Gage et al. maintained that one of the characteristics of successful schools is creating an environment that promotes academic achievement for all students. Their study of 3,797 students and the number of office disciplinary referrals showed that students who were from low socioeconomic backgrounds were more likely to be referred to the office in

need of behavioral interventions (Gage et al., 2016). Gage et al. suggested that schools should hold students from low socioeconomic backgrounds to high standards of behavior and should also ensure parents communicate the importance of education to their children, ensuring environments conducive to positive learning.

Motivation in students can be affected by the support received from teachers inside of school. Yu and Singh (2018) looked at the relationship that teacher practices had on student motivation, especially in the area of high school mathematics. Their findings indicated that "when teachers care and respect students, and believe all students can be successful, students are more likely to believe they are capable in mathematics" (Yu & Singh, 2018, p. 90). This includes low-income students. Yu and Singh cited that previous research shows "persistent achievement gaps among different ethnic groups and SES groups" (p. 91), indicating a need for future research using these specific population groups as participants.

**Student Support Outside of School**

The support a student receives outside of school plays a role in their academic achievement .Families from low socioeconomic backgrounds are not always able to provide the support their students require for success. Parental support and involvement are key, and there are many ways parents can be involved in their students' education. Lack of financial resources hinders access to essential academic resources that would further support increased achievement for student from low socioeconomic backgrounds. Schools need to examine ways in which to successfully support families in increased engagement in their students' educational experience.

**Parental involvement.** Prior research has shown that parental involvement can make a difference in the performance of students from low socioeconomic backgrounds, including a study by Park and Holloway (2017). Park and Holloway examined different types of parental involvement and the effect that involvement had on their students' academic achievement in mathematics. The types of parental involvement researched were involvement in activities concerning an individual student, involvement in activities meant to improve the achievement of a group of students, and parent networking (Park & Holloway, 2017). Their study revealed that parents' SES did affect the level of involvement and support provided to students outside of school. Park and Holloway found that obstacles, such as finances and time, hinder parental involvement in low SES students' education despite the desire for engagement on the part of the parents. Park and Holloway also found that low SES parents tend to have a more negative perception about their children's chances of educational success, and therefore, possess a lower level of confidence in advocating for their children. The conclusion from the study was that positive relationships between parents, students, and teachers are built when schools try to engage parents both at home and at school (Park & Holloway, 2017).

In looking further into the role parental support at home plays on the achievement of low SES students, Bhargava and Witherspoon (2015) undertook a study focusing on parental involvement during middle and high school years. Their study showed that parents from low socioeconomic backgrounds were less likely to be involved at both home and at school (Bhargava & Witherspoon, 2015). According to Simons et al. (as cited in Bhargava & Witherspoon, 2015), "…research suggests that parents living in

disadvantaged neighborhoods, characterized by low SES as well as high unemployment rates and female-headed households, are less likely to engage in communication with their adolescents" (p. 1705). Based on these results, Bhargava & Witherspoon suggested that the developmental needs of students and strategies to engage parents must be in alignment, and schools must take this into consideration when implementing strategies to increase parental involvement. Bhargava & Witherspoon noted the need for further research looking at which activities undertaken by schools and school staff, including administration, either increases or creates barriers to parent involvement in their children's education and which strategies have the most positive effect on student success. Bhargva & Witherspoon also encouraged schools to look at how programs designated for economically disadvantaged students can better encourage parents to be actively involved in school.

The Effective Provision of Pre-School, Primary, and Secondary Education research project looked at students from low socioeconomic backgrounds and who were achieving at a higher than expected level academically (May & Siraj, 2015). The study used interviews with students and their parents to look at the parents' involvement in school during the primary and secondary years (May & Siraj, 2015). May and Siraj used data from this study to create a report to look at the connection between how some families from disadvantaged backgrounds can successfully support academic success with the home environment as a key factor. May and Siraj found that the practices for supporting student academic achievement are much more diverse that strictly quantitative studies previously showed. May and Siraj reported that specific practices are also

perceived differently by parents with similar backgrounds, and that these differences in perception were also related to "significant differences in attitudes, beliefs and practices" (p. 61). These results support the idea that even though parents may come from similar SES backgrounds, the differences in their beliefs about education and the practices put into action in the home environment may significantly affect the level of academic success attained by their children.

**Access to resources.** The limited access to essential resources and other opportunities of families from low socioeconomic backgrounds can have a negative impact on the academic achievement of their children (Davis-Kean & Sexton and Turney & Kao as cited by Malone, 2017). Malone (2017) found that many times, parents from disadvantaged backgrounds felt that it was the job of the school and the school administration to provide guidance for parents in becoming more actively involved in their child's education outside of the home setting as well as to ensure parental involvement in ways that may not be as visible to the school is recognized positively. Given Malone's findings, schools may want to consider investigating ways in which they can assist families in accessing essential resources. Schools may also consider examining ways in which to partner with families to determine what needs should be addressed in order to increase parental involvement.

**Supporting parent engagement.** Malone (2017) suggests that schools consider implementing ways to support parental involvement such as English as a Second Language classes or parenting classes held on the school campus to aid parents in feeling welcome and comfortable in the school setting. Malone also suggests that schools look at

creative ways to assist parents in overcoming the known barriers, such as transportation issues, by providing bus transportation to parents when the school is holding major activities (i.e. back to school night, open houses, etc.; Malone, 2017). The findings in the study done by Malone indicated that parental involvement takes on many forms, some more visible than others. Malone also found that when examining visible forms of parental involvement, parents from high SES families tend to be more engaged that parents from low SES families, affecting the academic achievement of the students. Malone's findings also went on to provide a reminder to educators to actively search for ways for all parents to be actively engaged in their child's learning at school.

**Student support in school**

It is important for students from low socioeconomic backgrounds to feel they can succeed in school. There are several key factors that contribute to this support of students in the school setting. The relationships students have with their teachers are linked to academic success. Recognition by teachers of the potential risk of low SES students experiencing adversity in the classroom is an important factor in supporting student success. Student perception of positive teacher support also plays an important role in increasing the academic achievement of students from low socioeconomic backgrounds.

**Student-teacher relationships.** Relationships between students and their teachers play an important part in student achievement. McCormick et al. (2017) examined how stronger relationships with elementary teachers affected academic performance for students from lower SES backgrounds. The results of the study did find a link between student-teacher relationships and mathematics performance in students from

disadvantaged backgrounds compared to their classmates from higher SES backgrounds (McCormick et al., 2017). Since this study was done based on teacher-reported relationships, it may be beneficial for schools to examine the effect of student-teacher relationships on performance based on student-reported relationships as well (McCormick et al., 2017).

**Classroom-level adversity.** Students from lower socioeconomic backgrounds may also experience more adversity at the classroom level, leading to difficult behaviors. In their study, Abry et al. (2017) found that students from low SES families had a higher likelihood of being assigned to classrooms experiencing an increased level of adversity within. The study indicated that this could lead students to act out or withdraw (Abry et al., 2017). Abry et al. encouraged schools to look at how classroom-level adversity affects students who are already considered at-risk, and what schools may be able to do to intervene in these situations, especially with students who are considered most disadvantaged. The researchers stated "…the findings of the present study present compelling evidence of the need for researchers, educators and policy makers to attend to the aggregated risk characteristics of children in classrooms" (Abry et al., 2017, p. 508).

**Global citizenship.** An area in which students from lower socioeconomic backgrounds need in-school support is global citizenship (Goren & Yemini, 2017). The researchers interviewed fifteen teachers to determine their perceptions on the relevancy of global citizenship education for their low SES students. These interviews found that there was indeed a gap in global citizenship education for these students, and results indicated that if these needs are avoided as globalization progresses, students from low

SES backgrounds will be left behind (Goren & Yemini, 2017). Goren and Yemini stated that "…findings indicate the existence of a gap based on student SES which may be attributed somewhat to teacher perceptions of their own students." (p. 20). Furthermore, the researchers encourage educators to be more sensitive to differences in SES not only in the area of global citizenship but in all areas, and recommend further research be done which specifically examines teachers' own backgrounds, looking to understand their own perceptions (Goren & Yemini, 2017).

      **Student perception of support.** The way students perceive support from teachers, especially students from disadvantaged backgrounds, plays a role in student achievement and the findings from a study done by Ulriksen, Sagatun, Zachrisson, Waaktaar, and Lervag (2015) showed direct association between student perceptions of social support from teachers and their academic achievement. The researchers state that "it might be important to promote a positive student-teacher relation, as students' perception of teachers support are positively related to their grades and educational plans." (p. 369). Ulriksen et al. also encouraged future research looking at whether the promotion of school programs for the social support of students is an important factor in the improvement of academic performance among students from low socioeconomic backgrounds.

      Other research also addresses how support from teachers and instructional practice affects student motivation and achievement. Yu and Singh (2018) looked at how teacher practices and relationships affected student motivation and achievement in mathematics. The results found that students from higher SES families had a higher

perception of teacher support, and that the perception of teacher support did influence the students' mathematics achievement (Yu & Singh, 2018). The researchers also recommend that future research be conducted using different samples and different SES groups, especially given that prior research shows there are achievement gaps that persist between socioeconomic groups (Yu & Singh, 2018).

**Teacher Preparation**

Understanding the needs of diverse student populations is important for pre-service teachers. Preservice teacher placements, internships, student teaching and coursework are ways to help student teachers prepare for what they may encounter from diverse student populations in the classroom, including students from low socioeconomic backgrounds. In a 2016 study, Hanneke evaluated a course taken by student teachers in which the goal is to help them better understand how poverty impacts students. The goals of this course were to educate teachers on the obstacles faced by students from disadvantaged backgrounds, to ensure student teachers developed an understanding of factors behind the lower achievement levels of students from disadvantaged backgrounds and how teachers can increase or minimize this obstacle, and to ensure student teachers understood the facets of poverty and what power education actually has to impact it (Hanneke, 2016).

In another study done by Rodriguez and Magill (2016), it was noted that student teachers many times do not have enough experience with students coming from poverty or from diverse backgrounds, which inhibits their grasp on implications for their classroom teaching practice. According to Rodriguez and Magill the participants in their

study favored the middle-class students while delivering their lessons while diverse students were isolated and ignored. Rodriguez and Magill stated that there must be multicultural and culturally relevant teacher education in order to have the needs of unique populations of students met. They also revealed that

> "The ways teachers and students understand the unique living expressions of teaching and learning as they approach the curriculum is the difference between ensuring the further creating of a servant class or an emancipated, critical and democratically functioning public who possess the agency to transform the world for generations to come" (p. 15).

A study done by Graham, Robson, and Mtika (2019) examined how the social relationships of the five student teacher participants with their students and the connections they made helped lessen the effects of poverty on the students' academic outcomes. The study was done throughout the practicum experience of the student teachers, and through the interviews done with the participants, it was noted that the student teachers were not prepared in the context of the schools at which they were placed. According to Graham et al., "Practicum preparation must encompass the knowledge and skills for student teachers to enact pedagogy, including co-practice, beneficial for pupils living in poverty" (p. 133). The results of the study also revealed a crucial need for better preparation in supporting the professional learning of student teachers (Graham et al., 2019).

Teaching in rural communities is oftentimes very different from teaching in urban settings. In a study done by Moffa and McHenry-Sorber (2018), the ways the teacher preparation program contributed to the perceptions of first-year teachers in a rural setting were evaluated. The study targeted a rural community in Appalachia. Interviews with the five participants revealed that teacher preparation programs do not provide teacher candidates with enough genuine experiences working in rural communities for new teachers to successfully understand the unique needs of this population (Moffa & McHenry-Sorber, 2018). The interviews also revealed teacher candidates felt unsupported and that they were not offered relevant professional development once they entered the classroom as teachers (Moffa & McHenry-Sorber, 2018).

Teacher perceptions may also play a role in the expectations they hold for their students' performance in mathematics. In a study looking at mathematics anxiety in student teachers, Mizala, Martinez, and Martinez (2015) found that expectations about students were influenced by the student teachers' own mathematics anxiety levels. The study results revealed that the ability of student teachers to create an inclusive learning environment in their classrooms may also be affected by their math anxiety, thereby inhibiting the potential achievement of students they are teaching (Mizala et al., 2015). Mizala et al. suggested that future research examine the complexity of mathematics anxiety and the implications for teachers; they also suggest that

> "further research on mathematics anxiety and expectations should
> focus on in-service teachers. This is relevant because if the effects
> we found in our research take place in real classroom settings,

children could be affected by such negative expectations

and in turn develop negative self-concepts about mathematics" (Mizala

et al., 2015, p. 75).

According to Kretchmar and Zeichner (2016), teacher preparation programs must

not only produce effective teachers, they must also make connections to social justice

struggles. Kretchmar and Zeichner maintain that teachers much understand the history of

the communities in which they serve and that they have a responsibility to teach in ways

which challenge the standard teaching and school practices. In their paper, Kretchmar and

Zeichner advocated for academic programs, educators and communities to work together

to adequately prepare teachers to develop new strategies if issues of poverty and equity

are to be addressed successfully. All students, regardless of socioeconomic background,

deserve the opportunity to learn and succeed at their full potential. It is the responsibility

of teacher preparation programs to ensure preservice teachers are given the knowledge

they need to successfully meet the learning needs of all students, including those from

disadvantaged backgrounds.

**Professional Development**

It is important for school districts to offer relevant professional development

opportunities to teachers in order to ensure continued professional growth and to equip

teachers to meet the needs of the students they serve. Professional development in the

area of how to meet the needs of students coming from a lower socioeconomic

background should be included in professional development experiences. Teachers

cannot be expected to inherently understand the learning needs of students from

disadvantaged backgrounds. It is the responsibility of school districts to ensure their teachers are adequately equipped to meet the needs of all students, including those from low socioeconomic circumstances. An effective way to achieve this is through targeted professional development.

One method of providing professional development to teachers is via professional learning communities (PLC). According to Feldman and Fataar (2014), the PLC affords teachers the opportunity to wrestle with a specific problem in order to implement adaptations in their own classrooms. Through participation in a PLC, teachers are constantly reflecting on their practice, having conversations, conducting action research in their classrooms, and starting the process again in order to create a range of possibilities in how to best adapt their teaching practice.

Feldman and Fataar (2014) found that in the face of education continuing to change, teachers who regularly reflect on their practice are better able to adjust and refine their teaching and to respond to circumstances more effectively. One of the suggestions made by Feldman and Fataar is to ensure teachers are including "social justice commitments" in their teaching practice and providing teachers an "engaging platform to generate pedagogical practices that recognize and include a diversity of learners in their classroom teaching" (p. 1534).

Critical professional development is another way to meet professional development needs of teachers. According to Kohli, Picower, Martinez, and Ortiz (2015), this method of professional developments allows for "critical and dialogical practice" (p. 7). In their study, Kohli et al. found that teachers who possessed a genuine interest in

social justice required professional development that centered on social justice and which posed actual problems concerning social justice. Providing these opportunities using a critical professional development approach allows for cooperative dialogue, the opportunity to build unity, the opportunity for leadership to be shared, and the ability to meet the needs of the teachers themselves (Kohli et al., 2015). The findings of Kohli et al. demonstrated:

> "…the transformative power of PD constructed through cooperation and authentic dialogue, unity through an intentionality of community building, organization of shared power, and cultural synthesis where the needs and perspectives of students, communities, and teachers were centered over the interests of the leaders" (p. 14).

The critical professional development model was developed based on the unique needs of several communities including working-class and communities of color along with teachers who strongly believe in social justice and want to work to change inequity in their students' communities (Kohli et al., 2015).

## Project Description

This project will be presented to school leadership in the form of a position paper. The position paper will address the findings of the research done for this study as it relates to the local school district. The goal of this project is to help local school leadership understand how mathematics teachers perceive the ability of their students from low socioeconomic backgrounds to learn mathematics, and to better understand what factors contribute to the teachers' perceptions. The project will help local school

leadership understand how they can better equip teachers to meet the needs of these students. Finally, the project will ultimately help students coming from low socioeconomic backgrounds as their teachers will have a better understanding of their learning needs and will be better equipped with strategies to successfully meet those needs. It will be my responsibility to create a well-written, clear position paper and present it to the local school leadership. I will contact the school administration to determine the best time and location to present the paper. It will be the responsibility of the local school administration to provide a location for the presentation, to attend the presentation, and to determine whether they will implement the recommendations made in the position paper.

Based on the study findings, the position paper will provide recommendations to school leadership in each area identified as affecting teacher perceptions of their students coming from low socioeconomic backgrounds including student motivation, support outside of school, support inside of school, and teacher preparation/professional development. A key component for leaders to consider is implementing an assessment for teachers so that they can identify their own perceptions of students coming from low socioeconomic backgrounds prior to the beginning of each school year. The paper will also recommend the district develop and provide professional development focused on the unique needs of students coming from disadvantaged homes. The PD should include input from community agencies and supports to help address and explain the unique needs of this population. It should also include strategies and supports teachers can use with this population of students in the classroom. The PD should be revisited throughout

the year, with assessments of what was implemented and the outcomes for the students targeted.

The outcomes of this project will be that increased opportunities for parents to be involved in their children's education will be provided; better communication between school departments (guidance, instructional, administration) will be implemented in the approach to supports disadvantaged students may need; increased awareness among teachers regarding community resources available to help support students from low socioeconomic backgrounds; the development of an assessment for teachers in order to provide them with an understanding of their own perceptions; creation of a professional development program to help teachers understand the learning needs of students from disadvantaged homes; professional development to equip teachers with strategies to meet the unique needs of this student population; development of relationships with community agencies in order to better meet the academic needs of students from low SES backgrounds; and tracking of the implementation of strategies and the subsequent student outcomes.

### Resources, Supports, and Potential Barriers

The resources I will require in order to present this project to the school district are hard copies of the position paper. I will request a meeting with the district leaders and school principal in order to discuss the findings of the case study and present the recommendations via the position paper. I will distribute copies of the position paper to the participants in advance via e-mail as well as hard copy.

One potential barrier to the presentation of this project is the availability of the intended participants. This barrier can be overcome with flexibility in meeting with them either as a group or individually, accommodating each participant's schedule. Another potential barrier to presenting the project is available space. This barrier can be overcome by consulting with the principal to schedule the best place to hold the meeting. It can also be overcome by meeting with each participant in his/her office individually. A third potential barrier is an unwillingness of the potential participants to meet to discuss the project outcomes. This barrier may be overcome by acknowledging the resistance to meeting in person, sending the position paper electronically, and inviting the participant(s) to contact me with any questions or concerns as well as leaving the door open to meeting in the future should they so desire.

## Project Implementation and Timetable

The timetable for meeting with the school district leadership would be as soon as possible at the start of the school year in the fall. Doing so would allow the leadership to develop and implement a teacher perception assessment in late fall, and then to develop and present the first professional development offering early in the second half of the school year. Going forward, the assessment would be done during the professional development days prior to the start of the school year, and follow-up offerings provided throughout the course of the year.

## Project Evaluation Plan

A position paper was chosen for this project to present the research findings to school leadership and to make recommendations of ways the school district can improve

outcomes for students from low socioeconomic backgrounds based on the data collected

from the teacher participant interviews. The evaluation plan for this project will be both

goals and outcomes based. I chose this type of evaluation plan based on the themes

identified in the data analysis, the genre of the project, and the overall desired outcome

for the teachers and students. The goals for this project are to successful present the

research and recommendations to school and district leadership; for leadership to

consider the results and the implementation of the recommendations; and for leadership

to develop a plan to address the research findings. The desired outcomes of the project to

be evaluated are increased opportunities for parents to be involved in their children's

education will be provided; better communication between school departments (guidance,

instructional, and administration) will be implemented in the approach to supports

disadvantaged students may need; increased awareness among teachers regarding

community resources available to help support students from low socioeconomic

backgrounds; the development of an assessment for teachers in order to provide them

with an understanding of their own perceptions; creation of a professional development

program to help teachers understand the learning needs of students from disadvantaged

homes; professional development to equip teachers with strategies to meet the unique

needs of this student population; development of relationships with community agencies

in order to better meet the academic needs of students from low SES backgrounds. The

key stakeholders affected by this project are the district and school leadership who will be

responsible for participating in the project presentation and making decisions regarding

the implementation of the recommendations; the mathematics teachers who will be

responsible for participating in any professional development offerings presented and implementing the strategies learned; the parents who will be better supported and encouraged in participating in their children's education; and the students who will ultimately see increased academic achievement in mathematics.

Assessment of the project implementation and follow through is important to determine the success of the project. The evaluation plan for this project will assess the quality of the meeting with school leadership to present the position paper (engagement, questions, willingness to pursue implementation of suggestions). The evaluation plan will also include follow up with school leadership regarding any assessment given and professional development offerings created, response from teachers, information gleaned from the assessments, and changes in student outcomes based on the implementation of strategies presented in professional development into the actual classrooms. The overall goal of the evaluation plan is to track the implementation of the recommendations, track teacher implementation of strategies learned via professional development in the classroom, track teacher perceptions of SES and the ability to learn and track subsequent student outcomes via state test score changes.

## Project Implications

This project has the potential to affect the mathematics success, as well as success in other content areas, for many students in the local district coming from a low socioeconomic background. There is the potential to increase parent involvement and support to students outside of school. The project also has the potential to better equip teachers to meet the unique needs of students coming from disadvantaged homes by

providing training and understanding of what the needs are and how to address them. The potential exists to create positive relationships between the school and the local community by partnering with each other to support low-income students both in and out of school. Finally, this project may play a part in helping teacher preparation programs realize the importance of spending more time addressing the unique learning needs of students from low socioeconomic backgrounds and exposing student teachers to the challenges faced by this population, both in classroom discussion and practicum experiences.

## Conclusion

The project based on the outcome of this case study is a position paper discussing the local problem and making recommendations to the school district based on a review of the literature relevant to the study findings. In Section 3 the project was outlined, the recommendation of a position paper versus other project genres discussed, and literature relevant to the research findings reviewed. Section 3 also includes a discussion of the project itself, identification of potential barriers and how they may be overcome, implication of the project implementation and a project evaluation plan. In Section 4 I will discuss the strengths and limitations of the project and the personal growth I experienced throughout the research process.

Section 4: Reflections and Conclusions

**Introduction**

The purpose of this project was to understand mathematics teachers' perceptions of the ability of students coming from low socioeconomic backgrounds to learn mathematics and to better understand what factors the teachers believed helped form these perceptions. I conducted individual, semistructured interviews with nine participants to collect data, then analyzed and summarized the data and performed two, thorough literature reviews. I decided that a position paper discussing the local problem and suggesting actions to be taken was the best vehicle with which to present the study findings to the local school leadership.

In Section 4, I discuss the strengths and limitations of this project and make suggestions for alternate ways of addressing the problem. The section also includes a discussion of my learning and growth as a scholar and practitioner as related to the research processes and research and development of the project. Finally, I reflect on the importance of this project and what was learned overall.

**Project Strengths and Limitations**

**Project Strengths**

In creating this project, I gathered the first-hand experiences of the mathematics teachers via personal interviews. This is a strength of the project because the data collected were directly relayed by the teachers themselves. The participants were given the opportunity to provide direct feedback based on the summary of findings, which gave strength to the accuracy of the data. My decision to create a position paper was directly

determined from the data provided by the individual teacher interviews, which gave strength to the recommendations provided and the choice of genre for the project.

Another strength of this project is that the recommendations in the position paper have the potential to benefit teachers and students in any school district. The second literature review supported the study findings that teacher preparation programs do not spend enough time discussing the unique needs of students from low socioeconomic backgrounds. The literature review also supported the findings that there are virtually no professional development opportunities focused on ensuring teachers understand the unique needs of this population, equipping them to meet these needs, and following up on student outcomes in classrooms where teachers implement strategies to meet the learning needs of disadvantaged children. If my recommendations for creating professional development and partnering with community agencies to do so are implemented and follow up is completed on student outcomes, this project has the potential to have far-reaching benefits in both teacher preparation programs and other school districts. The project recommendations are adaptable to any content area and grade level, not only middle school mathematics.

**Project Limitations**

There were several limitations to this project. One of the limitations was the small number of participants. Having only nine teachers participate makes the results difficult to generalize to other populations. I conducted this case study to specifically address the issue in the local district, which makes generalization to other districts more difficult. Using participants from only one content area makes it more difficult to generalize the

results to other content areas as well. My recommendations in the position paper were specific to the local school district and based on the literature reviews, the data gathered, and the data analysis. They may not be appropriate to all school districts examining the same problem, creating another limitation of the project.

Finally, since the inception of the project study, the school district leadership has completely changed. The current leadership may not perceive the stated local problem as an actual problem. There is the possibility that the district leadership will not be interested in a presentation of the findings of this project, which will make a presentation to the school building leadership more difficult. The potential of disinterest by the district leadership creates a further limitation to this project.

## Recommendations for Alternative Approaches

There are several other approaches to addressing the local problem other than the presentation of a position paper. One possibility would be to design a professional development program focusing on the formation of teacher perceptions of students from low socioeconomic backgrounds and how they learn, the unique learning needs of this population of students, community partnerships, and equipping teachers to meet these learning needs. The professional development would be offered by the designer, and student outcomes would be examined at the end of the school year. Consistent follow up would be performed in classrooms throughout the year as well in order to support teachers in implementing learned strategies.

Another alternative approach to addressing the local problem would be to perform observations in the mathematics classrooms. The intent of the observations would be to

determine how well the presentation of the curriculum addresses classroom inequities, and how well the teachers adapt to the needs of their students. The outcome would be the creation of a program evaluation.

Finally, teachers could be encouraged to perform action research in their own classes based on students' socioeconomic background and performance. The teachers could then collaborate and engage in reflective discussion, forming their own PLC focused on the needs of disadvantaged students. In addition, recommendations could be made to district leadership to include students from disadvantaged backgrounds in their policy manual addressing the expectation of meeting the learning needs of all students. This category of student is not specifically included.

### Scholarship, Project Development and Evaluation, and Leadership and Change

When I began this journey at Walden University, I had absolutely no experience doing research of any kind. The amount of learning and knowledge I have gained through this process cannot sufficiently be put into words. I have learned the importance of peer review and to effectively use databases I had never heard of before beginning this program. I have learned and grown in the area of scholarly writing. The importance of using scholarly literature to guide the field of education has been ingrained in me.

The development of this project has helped me grow in numerous ways. I have a new-found patience and perseverance I had not experienced before. The importance of time management and organization were magnified by this project. I have been able to develop my writing as a practitioner along with my presentation skills. Through the development of this project, I have learned to efficiently collect data, successfully

analyze the data, and understand the implications of what the data tells me. Finally, I have been able to implement these new skills to help me continue to grow in my current position as an educator.

The entire process of working on this degree has enabled me to become a better leader. I have started to recognize areas in my own position where the knowledge I have gained and skills I have learned should be implemented to benefit my own school population. As a leader, I have learned the importance of providing my teachers with data about their students and to ensure they understand what the data says and how it can inform their instruction to help increase student success. I believe my experience at Walden will provide me with lifelong insight into how to continue to grow as a transformational leader in education.

## Reflection on Importance of the Work

I chose to pursue a doctoral degree because I have a strong passion to be part of ensuring all students are given equal opportunity to achieve academic success regardless of their circumstances. My committee chair and all the professors I had the honor of working with provided guidance, wisdom, and support along the way, always communicating that through this work, change is possible. I believe the work done in this project can have a strong impact locally in promoting social justice and possibly even have farther-reaching effects in the field of teacher preparation.

Prior to this journey I did not have a strong knowledge base on the needs of students coming from disadvantaged homes or did I have information regarding the perceptions held by teachers about this student population. Through the project

development, I have gained insight into how important understanding students from low

socioeconomic backgrounds is to their success. I have learned the importance of

equipping teachers to meet these needs, partnering with community agencies to support

this student population and their families, all members of the educational team

communicating with each other to increase these students' academic success, and helping

teachers understand how their perceptions of students are formed.

### Implications, Applications, and Directions for Future Research

In this project, I focused on understanding how mathematics teachers perceive

students from low socioeconomic backgrounds and their ability to learn, especially in

mathematics, as well as what factors teachers believe contributed to the formation of

these perceptions. The method chosen to pursue these questions was a qualitative case

study of a local middle school based on publicly available data showing a gap in

mathematics scores between students categorized as "economically disadvantaged"

versus "economically nondisadvantaged." The implications for positive social change in

this study emerged from data collected during individual teacher interviews. The research

findings revealed gaps in teacher knowledge of the needs of disadvantaged students,

communication between teachers and other departments regarding this student

population, opportunities for increased student support both in and out of school, and

opportunities for more focused professional development. Potential implications of

providing increased knowledge to teachers and support to families and students are

increased parent involvement and increased student achievement.

I conducted this study based on information from a specific local district; therefore, the project is applicable to the entire district and may be applicable to content areas other than mathematics. However, it may be difficult to apply this project and the results of this study to other school districts due to the specificity of the research to this local district. Other districts may be able to apply the general principles and recommendations made in this project based on the specific perceptions identified in their own teachers as well as specific supports and professional development already in place. I hope that the information presented in this project will be instrumental in aiding districts found in areas with higher populations living in poverty and that it will also bring an awareness of the importance of including discussions of students living in poverty as well as practicum experiences in these areas for preservice teachers.

The findings of this study provide direction for possible future research. Studies could be undertaken to look at the actual outcomes for students in districts where specific professional development has been provided to teachers to meet the needs of impoverished students. Research on the outcomes of students from low socioeconomic backgrounds whose teachers were provided coursework and practicum experiences during their preparation programs targeted to this student population could also be conducted. Finally, research on perceptions of teachers in content areas other than mathematics and at educational levels other than middle school about disadvantaged students and how those perceptions affect instruction could be performed.

**Conclusion**

This project study was rooted in my passion for ensuring students from all socioeconomic backgrounds are given equal opportunities for academic success and for understanding how teacher perceptions of students may affect the students' achievement. Through the process of literature review, I learned that there is a gap in practice due to lack of preparation of preservice teachers in the areas of understanding and meeting the needs of disadvantaged students, both in classroom discussions and practicum assignments, as well as a gap in practice with practicing classroom teachers in the offering of relevant professional development in these same areas. The local problem was present in a small, suburban school district where achievement inequities in middle school mathematics had been observed on state mathematics tests over a 5-year period. As a result, I designed this study to identify teacher perceptions of their students from low socioeconomic backgrounds and their ability to learn mathematics as well as what factors the teachers believe contributed to the formation of these perceptions.

This project study was grounded in social reproduction theory. I employed the research design of qualitative case study. The data collection was guided by two qualitative research questions. Data were collected through personal, individual, semistructured interviews with middle school mathematics teachers. Specific themes were identified through the process of coding, and data were organized accordingly. The findings revealed several areas affected by teacher perceptions as well as factors identified by teachers as contributing to the formation of their perceptions. The resulting project was a position paper explaining the study findings and making recommendations

to school leadership in each of the areas regarding students from low socioeconomic backgrounds, their families, and teacher-identified gaps. The positive social change anticipated by the implementation of the recommendations is the increased understanding and ability of teachers to meet the needs of underprivileged students, increased support and involvement for families of these students, and increased student achievement in the local middle school as a result.

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Appendix A: The Project

Strategies to Increase Academic Outcomes for Low SES Students Based on Middle

School Mathematics Teachers' Perceptions

**Background**

The intent of this position paper is to provide information to the school building

and district leadership of a small suburban school district. The focus of the paper is the

identified perceptions of middle school mathematics teachers regarding students from

low socioeconomic backgrounds and the ability of these students to learn mathematics,

the factors teachers believe contribute to their identified perceptions, and steps the school

leadership can take to better equip families and teachers to support these students,

resulting in increased academic outcomes. The need to conduct a case study originated

with a desire to understand a slightly increasing gap in mathematics test scores between

middle school students categorized as economically disadvantaged versus economically

non-disadvantaged.

While there is, current research examining the issue of socioeconomic status on

student achievement (Tienken, 2012), and on how teachers' perceptions affect student

achievement (Tomul, Celik, & Tas, 2012), there is less research focused on

understanding how teachers' perceptions about the effect of socioeconomic status on

learning readiness affect teaching strategies and student success. Teachers many times do

not know what the expectations should be for low-income students, nor do they know

what to adjust in their teaching for these students to succeed (Jensen, 2013).

Currently there is significant research showing that both teacher perceptions and SES each affect student achievement separately. There is less research showing the effects of teacher perceptions of SES and the relationship of these perceptions to student achievement. This project study sought to identify and understand middle school teachers' perceptions of socioeconomic status and the ability of low SES students in grades 6, 7 and 8 to learn mathematics. Locally, there was a need to better understand these factors as related to the use of culturally responsive pedagogy when teaching a group of students from diverse socioeconomic backgrounds as well as possible teacher bias regarding low SES students. In addition, there was a need to understand this problem so that teachers are better able to recognize barriers to learning mathematics created by their perceptions, and subsequently be provided the appropriate professional development in strategies to overcome these perceptions and to learn the skills necessary to reach all students regardless of socioeconomic status.

Through individual interviews with mathematics teachers, several areas affecting teacher perceptions of the learning ability of students from disadvantaged backgrounds were identified. These areas were student motivation, student support outside of school, student support in school, teacher preparation and professional development. The recommendations made in this position paper originate from the outcomes found through the interviews with teachers in the local district and an extensive review of the literature. Each recommendation will require support from district leadership in implementation but may not pose significant financial resources to be exhausted.

**Student Motivation**

**SES, Behavior, and Future Aspiration**

A student's socioeconomic status can have a direct link to educational and future aspirations. In their 2015 study of 8th grade students, Guo, Parker, Morin and Yeung found that students who came from higher SES backgrounds showed higher mathematics achievement as well as higher educational aspirations. The study also found that behaviors related to mathematics achievement could be positively predicted based on socioeconomic status (Guo et al., 2015). Given these results, motivation to do well and to pursue educational aspirations can be directly affected by socioeconomic status.

Students coming from low socioeconomic backgrounds face challenges unique to this population. Judging student motivation to succeed simply by looking at their SES can be a dangerous practice (McKay & Devlin, 2016). McKay et al. (2016) recognized a need for low SES students to be empowered to succeed and to acknowledge that these students are "hard working, high achieving and determined to succeed" in most cases (p. 359) and that it is important for teachers to hold high expectations for all students regardless of socioeconomic background. Understanding the challenges faced by low SES students is important for classroom teachers for high standards to be held appropriately. Positive encouragement from teachers is also important to promote student motivation to succeed.

Students from low socioeconomic backgrounds often exhibit behavior issues in the classroom, as shown in a study done by Gage, Larson, Sugai and Chafouleas (2016). In their study, Gage et al. maintain that one of the characteristics of successful schools is creating an environment that promotes academic achievement for all students (2016). The

study of 3,797 students and the number of office disciplinary referrals showed that

students who were from low socioeconomic backgrounds were more likely to be referred

to the office in need of behavioral interventions (Gage et al., 2016).

**Motivation and School Support**

Motivation in students can be affected by the support received from teachers

inside of school. Yu and Singh (2018) looked at the relationship teacher practices had on

student motivation, especially in the area of high school mathematics. The findings

indicated that, "When teachers care and respect students, and believe all students can be

successful, students are more likely to believe they are capable in mathematics" (p. 90).

This includes low-income students. When students feel their teachers believe in them,

their self-efficacy increases and their level of motivation to succeed increases with it.

Students need to feel someone believes in their ability to achieve in order to meet high

standards that should be held for them.

In order to address the motivation of students from low socioeconomic

backgrounds to learn mathematics, school and district leaders should provide transparent

information to teachers regarding the needs of their students, ensure that teachers are

holding high expectations for all students regardless of background and implement a

tracking instrument to document these expectations, ensure each teacher is creating a

positive learning environment for all students and document this environment, and

provide training to teachers so that care, respect and belief in success are being conveyed

to students in a consistent manner. Any of these recommendations already in place should

be evaluated annually to determine what further motivational strategies or changes in protocol need to be added or amended.

## Student Support – Outside of School

### Parent Involvement

Prior research has shown that parental involvement can make a difference in the performance of students from low socioeconomic backgrounds, including a study performed by Park and Holloway (2017). In their study, Park and Holloway examined different types of parental involvement and the effect that involvement had on their students' academic achievement in mathematics. The types of parental involvement researched were involvement in activities concerning an individual student, involvement in activities meant to improve the achievement of a group of students, and parent networking (Park et al., 2017).

The study revealed that parents' socioeconomic status did affect the level of involvement and support provided to students outside of school. Park et al. (2017) found the following:

> Although many low-SES parents want to be involved in their children's education, financial and time constraints may limit their involvement. Moreover previous research suggests that low-SES parents are less likely to be optimistic about their children's educational chances ad confident about intervening on behalf of their children, which may undermine their effectiveness and limit the benefits gained from their school participation. (p. 11)

The conclusion from the study was that positive relationships between parents, students

and teachers are built when schools try to engage parents both at home and at school

(Park et al., 2017). In looking further into the role parental support at home plays on the

achievement of low SES students, Bhargava and Witherspoon (2015) undertook a study

looking at parental involvement during middle and high school years. The study showed

that parents from low socioeconomic backgrounds were less likely to be involved at both

home and at school (Bhargava et al., 2015).

The Effective Provision of Pre-School, Primary and Secondary Education

research project looked at students from low socioeconomic backgrounds and who were

achieving at a higher than expected level academically. The study used interviews with

students and their parents to look at the parents' involvement in school during the

primary and secondary years. May and Siraj (2015) used data from this study to create a

report to look at the connection between how some families from disadvantaged

backgrounds can successfully support academic success with the home environment as a

key factor.

May and Siraj (2015) found that the practices for supporting student academic

achievement are much more diverse that strictly quantitative studies previously showed.

Their study also revealed that specific practices are also perceived differently by parents

with similar backgrounds, and that these differences in perception were also related to

"significant differences in attitudes, beliefs and practices" (p. 61). These results support

the idea that even though parents may come from similar SES backgrounds, the

differences in their beliefs about education and the practices put into action in the home

environment may significantly affect the level of academic success attained by their children.

**Access to Resources**

It is well-known that research shows how the limited access to essential resources and other opportunities had by families from low socioeconomic backgrounds can have a negative impact on the academic achievement of their children (Davis-Kean & Sexton, Turney & Kao as cited by Malone (2017)). Research done by Malone (2017) found that parents from disadvantaged backgrounds many times felt that it was the job of the school and the school administration to provide guidance for parents in becoming more actively involved in their child's education outside of the home setting, and to ensure parental involvement in ways that may not be as visible to the school is recognized positively.

The school leadership is encouraged to examine which activities undertaken by schools and school staff, including administration, either increase or create barriers to parent involvement in their children's education and which strategies have the most positive effect on student success. Based on the work of Bhargava (2015), schools are also encouraged to look at how programs designated for economically disadvantaged students can better encourage parents to be actively involved in school. In addition, schools should consider implementing ways to support parental involvement such as ESL classes or parenting classes held on the school campus to aid parents in feeling welcome and comfortable in the school setting. It is also suggested that schools look at creative ways to assist parents in overcoming the known barriers, such as transportation issues, by providing bus transportation to parents when the school is holding major activities (i.e.

back to school night, open houses, etc.) (Malone, 2017). All educators should constantly be evaluating and looking for creative ways to involve parents in their children's education, identifying possible barriers, and collaborating on solutions for overcoming those barriers.

<div align="center">**Student Support – In-school**</div>

**Student-Teacher Relationships**

Relationships may play an important part in student achievement. McCormick, O'Connor and Horn (2017) examined how stronger relationships with elementary teachers affected academic performance for students from lower SES backgrounds. The results of the study did find a link between student-teacher relationships and mathematics performance in students from disadvantaged backgrounds compared to their classmates from higher SES backgrounds (McCormick et al., 2017). Leadership should consider a survey of students looking at their perceptions of the strength of relationships with teachers.

**Classroom-Level Adversity**

Students from lower socioeconomic backgrounds may also experience more adversity at the classroom level, leading to difficult behaviors. In their study, Abry, Bryce, Swanson, Bradley, Fabes and Corwyn (2017) found that students from low SES families had a higher likelihood of being assigned to classrooms experiencing an increased level of adversity within. The study indicated that this could lead students to act out or withdraw (Abry et al., 2017). School leadership is encouraged to look at how classroom-level adversity affects students who are already considered at-risk, and what is

being or may be able to be done to intervene in these situations, especially with students who are considered most disadvantaged. The results of interventions should then be tracked.

**Global Citizenship**

An area in which students from lower socioeconomic backgrounds need in-school support is global citizenship (Goren & Yemini, 2017). The researchers interviewed fifteen teachers to determine their perceptions on the relevancy of global citizenship education for their low SES students. These interviews found that there was indeed a gap in global citizenship education for these students, and results indicated that if these needs are avoided as globalization progresses, students from low SES backgrounds will be left behind (Goren et al., 2017). Goren et al. (2017) state that "…findings indicate the existence of a gap based on student SES which may be attributed somewhat to teacher perceptions of their own students." (p. 20). Educators must be sensitive to differences in SES not only in the area of global citizenship but in all areas. It is recommended a vehicle be created for teachers to look at their own backgrounds, looking to understand their own perceptions.

**Student Perception of Support**

The way students perceive support from teachers, especially students from disadvantaged backgrounds, plays a role in student achievement and the findings from a study done by Ulriksen, Sagatun, Zachrisson, Waaktaar and Lervag (2015) showed direct association between student perceptions of social support from teachers and their academic achievement. The researchers state that "it might be important to promote a

positive student-teacher relation, as students' perception of teachers' support are positively related to their grades and educational plans." (p. 369). The local school district should consider looking at whether the promotion of school programs for the social support of students is an important factor in the improvement of academic performance among students from low socioeconomic backgrounds.

Other research also addresses how support from teachers and instructional practice affects student motivation and achievement. Yu and Singh (2018) looked at how teacher practices and relationships affected student motivation and achievement in mathematics. The results found that students from higher SES families had a higher perception of teacher support, and that the perception of teacher support did influence the students' mathematics achievement (Yu et al., 2018). School leadership should discuss surveying students to determine their perceptions of the level of teacher support, and then create development opportunities for teachers based on the survey results.

## Teacher Preparation

Understanding the needs of diverse student populations is important for pre-service teachers. Pre-service teacher placements, internships, student teaching and coursework are ways to help student teachers prepare for what they may encounter from diverse student populations in the classroom, including students from low socioeconomic backgrounds. In a 2016 study, Hanneke evaluated a course taken by student teachers in which the goal is to help them better understand how poverty impacts students. The goals of this course were to educate teachers on the obstacles faced by students from disadvantaged backgrounds, to ensure student teachers developed an understanding of

factors behind the lower achievement levels of students from disadvantaged backgrounds and how teachers can increase or minimize this obstacle, and to ensure student teachers understood the facets of poverty and what power education actually has to impact it (Hanneke, 2016).

In another study done by Rodriguez and Magill (2016), it was noted that student teachers many times do not have enough experience with students coming from poverty or from diverse backgrounds, which inhibits their grasp on implications for their classroom teaching practice. According to Rodriguez et al. (2016), the participants in their study favored the middle-class students while delivering their lessons while diverse students were isolated and ignored. Rodriguez et al. (2016) stated that there must be multicultural and culturally relevant teacher education in order to have the needs of unique populations of students met. They also revealed that "The ways teachers and students understand the unique living expressions of teaching and learning as they approach the curriculum is the difference between ensuring the further creating of a servant class or an emancipated, critical and democratically functioning public who possess the agency to transform the world for generations to come" (p. 15).

A study done by Graham, Robson and Mtika (2019) examined how the social relationships of the five student teacher participants with their students and the connections they made helped lessen the effects of poverty on the students' academic outcomes. The study was done throughout the practicum experience of the student teachers, and through the interviews done with the participants, it was noted that the student teachers were not prepared in the context of the schools at which they were

placed. According to Graham et al. (2019), "Practicum preparation must encompass the knowledge and skills for student teachers to enact pedagogy, including co-practice, beneficial for pupils living in poverty." (p. 133). The results of the study also revealed a crucial need for better preparation in supporting the professional learning of student teachers (Graham et al., 2019).

Teaching in rural communities is oftentimes very different from teaching in urban settings. In a study done by Moffa and McHenry-Sorber (2018), the ways the teacher preparation program contributed to the perceptions of first-year teachers in a rural setting were evaluated. The study targeted a rural community in Appalachia. Interviews with the five participants revealed that teacher preparation programs do not provide teacher candidates with enough genuine experiences working in rural communities for new teachers to successfully understand the unique needs of this population (Moffa et al., 2018). The interviews also revealed teacher candidates felt unsupported and that they were not offered relevant professional development once they entered the classroom as teachers (Moffa et al., 2018).

Teacher perceptions may also play a role in the expectations they hold for their students' performance in mathematics. In a study looking at mathematics anxiety in student teachers, Mizala, Martinez and Martinez (2015) found that expectations about students were influenced by the student teachers' own mathematics anxiety levels. The study results revealed that the ability of student teachers to create an inclusive learning environment in their classrooms may also be affected by their mathematics anxiety, thereby inhibiting the potential achievement of students they are teaching (Mizala et al.,

2015). Mizala et al. (2015) suggest that future research examine the complexity of mathematics anxiety and the implications for teachers; they also suggest that "further research on mathematics anxiety and expectations should focus on in-service teachers. This is relevant because if the effects we found in our research take place in real classroom settings, children could be affected by such negative expectations and in turn develop negative self-concepts about mathematics" (Mizala et al., 2015, p. 75).

According to Kretchmar and Zeichner (2016), teacher preparation programs must not only produce effective teachers, they must also make connections to social justice struggles. Kretchmar et al. (2016) maintain that teachers much understand the history of the communities in which they serve and that they have a responsibility to teach in ways which challenge the standard teaching and school practices. In their paper, Kretchmar et al. (2016) advocate for academic programs, educators and communities to work together to adequately prepare teachers to develop new strategies if issues of poverty and equity are to be addressed successfully.

While the local school district is not responsible for direct teacher training, school leadership should consider asking questions of teacher training programs regarding preparation for teaching students from disadvantaged backgrounds. The local district should also provide feedback to the teacher preparation programs regarding the experiences and observations made of student teachers completing practicum in the district as they relate to meeting the needs of students from low socioeconomic backgrounds.

**Professional Development**

It is important for school districts to offer relevant professional development opportunities to teachers in order to ensure continued professional growth and to equip teachers to meet the needs of the students they serve. There are several methods in which to provide professional development to teachers, including professional learning communities and critical professional development. Either of these methods will contribute to ensuring teachers are better prepared to meet the needs of students from low socioeconomic backgrounds.

The creation of professional learning communities (PLC) can be an effective method of providing professional development to teachers. According to Feldman and Fataar (2014), the PLC affords teachers the opportunity to wrestle with a specific problem in order to implement adaptations in their own classrooms. Through participation in a PLC, teachers are constantly reflecting on their practice, having conversations, conducting action research in their classrooms, and starting the process again in order to create a range of possibilities in how to best adapt their teaching practice. Feldman et al. (2014) found that in the face of education continuing to change, teachers who regularly reflect on their practice are better able to adjust and refine their teaching and to respond to circumstances more effectively. One of the suggestions made by Feldman et al. (2014) is to ensure teachers are including "social justice commitments" in their teaching practice and providing teachers an "engaging platform to generate pedagogical practices that recognize and include a diversity of learners in their classroom teaching" (p. 1534).

Critical professional development is another way to meet professional development needs of teachers. According to Kohli, Picower, Martinez and Ortiz (2015), this method of professional developments allows for "critical and dialogical practice" (p. 7). In their study, Kohli et al. (2015) found that teachers who possessed a genuine interest in social justice required professional development that centered on social justice and which posed actual problems concerning social justice. Providing these opportunities using a critical professional development approach allows for cooperative dialogue, the opportunity to build unity, the opportunity for leadership to be shared, and the ability to meet the needs of the teachers themselves (Kohli et al., 2015).

The findings of Kohli et al. (2015) demonstrated the "transformative power of PD constructed through: cooperation and authentic dialogue, unity through an intentionality of community building, organization of shared power, and cultural synthesis where the needs and perspectives of students, communities, and teachers were centered over the interests of the leaders" (p. 14). The critical professional development model was developed based on the unique needs of several communities including working-class and communities of color along with teachers who strongly believe in social justice and want to work to change inequity in their students' communities (Kohli et al., 2015).

When determining professional development offerings and personalized development plans for teachers, targeted professional development in the area of how to meet the needs of students coming from a lower socioeconomic background should be included. Relevant strategies taught should then be implemented in classrooms, follow up provided throughout the course of the year, and student outcomes tracked and

documented. Information gleaned from the teacher perception surveys should be used to guide the types of development necessary. Community agencies should also be partnered with in order to provide comprehensive information to teachers about the needs of the low SES population in the district.

**Conclusion**

The purpose of this position paper is to help local school leadership understand how mathematics teachers perceive the ability of their students from low socioeconomic backgrounds to learn mathematics, and to better understand what factors contribute to the teachers' perceptions. The paper intent is also to help local school leadership understand how they can better equip teachers to meet the needs of these students. Recommendations are provided to school leadership in each area identified as affecting teacher perceptions of their students coming from low socioeconomic backgrounds including student motivation, support outside of school, support inside of school, and teacher preparation/professional development. A key component for leaders to consider is implementing an assessment for teachers so that they can identify their own perceptions of students coming from low socioeconomic backgrounds prior to the beginning of each school year. It is recommended that the district develop and provide professional development focused on the unique needs of students coming from disadvantaged homes. The PD should include input from community agencies and supports to help address and explain the unique needs of this population. It should also include strategies and supports teachers can use with this population of students in the classroom. The PD should be

revisited throughout the year, with assessments of what was implemented and the outcomes for the students targeted.

The intended outcomes in following the recommendations made are that increased opportunities for parents to be involved in their children's education will be provided; better communication between school departments (guidance, instructional, administration) will be implemented in the approach to supports disadvantaged students may need; increased awareness among teachers regarding community resources available to help support students from low socioeconomic backgrounds; the development of an assessment for teachers in order to provide them with an understanding of their own perceptions; creation of a professional development program to help teachers understand the learning needs of students from disadvantaged homes; professional development to equip teachers with strategies to meet the unique needs of this student population; development of relationships with community agencies in order to better meet the academic needs of students from low SES backgrounds; and tracking of the implementation of strategies and the subsequent student outcomes. The greatest potential outcome of all is increased academic success in mathematics for students from low socioeconomic backgrounds.

Appendix B: Interview Questions

Thank you for participating in this project study. At any time, you may decide to refuse to answer a question, or you may decide to withdraw your participation entirely with no personal or professional penalty. There is no risk to you, either personally or professionally.

**Interview Question 1:** How do you perceive your students' socioeconomic status affecting their ability to learn mathematics?

**Interview Question 2:** What characteristics have you encountered in your students from lower socioeconomic backgrounds that lead you toward this perception?

**Interview Question 3:** How have these characteristics manifested in the classroom?

**Interview Question 4:**  Did you anticipate encountering these characteristics in this student population when learning mathematics? Why or why not?

**Interview Question 5:** How did you know to anticipate differences in this student population regarding learning mathematics?

**Interview Question 6:** Overall, how do you see your low SES students performing in mathematics compared to their higher SES peers?

**Interview Question 7:** To what do you attribute the difference in performance (if one is present)?

**Interview Question 8:** What strategies are used to mitigate the difference in mathematics performance?

**Interview Question 9**:  What do you believe influences your own perceptions of students' ability to learn mathematics?

**Interview Question 10:** What personal experiences with economically disadvantaged individuals have you had that contributed to the formation of your perceptions?

**Interview Question 11:** What barriers have these perceptions created?

**Interview Question 12:** What preparation for teaching mathematics to students from low socioeconomic backgrounds specifically have you been provided through your teacher preparation program?

**Interview Question 13:** What types of professional development have you been offered in teaching mathematics effectively to economically disadvantaged students?

**Interview Question 14:** How have you implemented what you learned through the PD in the classroom?

Appendix C: Sample Reflective Journal Entries

May, 2018:

I have begun the data collection for my project study. My first interview was a 45-minute discussion with Participant 1. The discussion flowed well, and she provided very useful information when answering the interview questions. I did find myself making statements such as, "It must be hard for you to….", or "When students do that it must be frustrating." I realize after listening to the recorded interview that I HAVE to keep statements like out of the interview discussions and stick to the interview questions and follow-up questions that may come from them. I am glad that I realized this during the first interview so that I can be conscious of it going forward, and so that I can be sure those statements do not affect the actual data collected and the analysis of such.

June 4, 2018:
The second interview was done today with Participant 2. Again, the discussion flowed well, and I learned some interesting information about the formation of her perceptions not only regarding lower socioeconomic students but students in general. She provided very similar responses to the first interview; however, she went much more in depth on some of the questions, allowing for secondary questions to be asked. As the researcher I was much more conscientious of keeping personal statements out of the conversation, though I realize I did still slip up a couple of times. I need to be able to find the balance of keeping my own statements out of the interviews while keeping the conversation moving in a natural way. I also found myself thinking a few times, "Wow, I feel the same way!" or "Wow, I don't feel that way at all!" While I did not verbalize these thoughts, I need to keep them removed from the interviews as well.

June 17, 2018:

During the past week three more interviews were conducted. One was with Participant 3; one with Participant 4; and one with Participant 5. Some common themes are now starting to emerge; however, I believe I may have encountered the first discrepant case. Participant 3 almost ranted about his belief that socioeconomic status does not affect a student's ability to learn mathematics, and that it is completely willingness and motivation or lack thereof. It will be very interesting to see if any of the remaining participants voice these feelings. That particular interview was extremely difficult to keep myself from interjecting my own thoughts, of which I had many, but I was able to do so despite it creating several moments of slightly awkward silence. This is definitely a difficult task!

June 18, 2018:

Participants 6 and 7 were interviewed today. I was stunned when Participant 6 began voicing the same beliefs as Participant 3 regarding SES and the ability to learn mathematics. He felt almost as strongly as Participant 3 did that SES had nothing to do

with the ability to learn, but that mindset and willingness played the biggest part. Listening to the two teachers voice opinions so different from the others has made me really start to think about my own perceptions. I want to fully understand my feelings about this topic so that I can be proactive in ensuring they do not influence the progression and outcomes of the research. I need to be on top of this, and I want to know at the end of the process that the data I have is valid and reliable. I had no idea at the beginning of this process how hard it would be to keep my own thoughts and feelings in check. Even though I am at the beginning of the journey with this project, I am learning so much about the importance of keeping the process consistent and pure.

Appendix D: Sample Interview Transcript

00:01   SPEAKER:    OK well first I just want to thank you again for being willing to sit

down and talk with me and answer some questions about socioeconomic status and

mathematics.

00:12   SPEAKER:    At any time, you can decide not to answer a question you can

withdraw your participation entirely at any time with no personal or professional

repercussions. And there's no risks to you at all for participating. So, the first question is

how do you perceive your student's socioeconomic status affects their ability to learn

mathematics.

00:36   Participant 5:  So think so I don't think that there is a correlation between their

intelligence level meaning their ability to perform well in mathematics and their socio

economic status.

01:00   Participant 5:  I think and I'm sure this is probably going to be a question of

further down the line of factors or whatever the case may be. But I think that the question

is how do you proceed with students socioeconomic status.

01:12   SPEAKER:    How does it affect their ability to manage.

01:15   SPEAKER:     So I guess the question is how does that affect their ability to learn mathematics.

01:21   Participant 5:   I frankly don't think there's much. I mean this is my ninth year of teaching as my first year here. I taught at a school a charter school in XXXXXXX which I believe the socio-economic status I could be wrong obviously. I haven't done a lot of research into this, but it seems like that socioeconomic status is there were a little bit more diverse because it was a charter school it was a lottery-based system to get in.

01:50   Participant 5:   So really anyone from five surrounding communities could get into the school you know. So I mean when you're only working with one town then typically, I think you're going to see less variation like you were here. XXXXXXXX high school so in theory all the students come from when we attend you're going to see less variation in their socioeconomic status whereas the charter school I was working at before we were pulling kids from 5 towns and the range was probably drastic in terms of socioeconomic status.

02:20   Participant 5:   But in terms of their ability to learn I didn't see much in terms of what I thought would be their ability and I want it when I say that what I mean is I didn't see much in terms of her. I don't see much difference in their ability to learn in the sense that I felt like there were probably plenty of students in my class who came from a worse socio economic background than others that had the capability of learning the material

and prove that they were intelligent enough to understand what I was saying and to follow the instructions and so on and so forth. I think the follow through then from in terms of keeping up with homework and in terms of you know anything that had to do with technology anything that had to do with printing stuff outside of school I think that's where you started to see things start to fall through the cracks because of maybe they didn't have the ability at home maybe they didn't have the support system at home that other the other children did. But when it came to the actual ability to learn I don't think there's much of a difference. I think that is that specifically mathematics a lot of it is just a need. A lot of it is you know just having that mind of being able to meet those you know critical thinking connections.

03:38   Participant 5:   And I don't think that's necessarily something that comes with social status and weight characteristics have you encountered in your students who maybe do come from the more disadvantaged background.

03:53   Speaker:       As far as their success and mathematics go whether they're successful or not successful what kind of characteristics have you seen in the classroom.

04:05   Participant 5:   If it can't be more challenging back yeah I think as I mentioned a second ago I think a lot of it was the structure and the support system outside of school seemed to weigh on them a lot more heavily than students who come from a higher socioeconomic background. It seemed like there was a lot of you know I don't mean this

word in such a negative connotation but there was a lot of just like excuses that would come up a lot and maybe some of them were totally legitimate maybe some of them weren't. But it was a lot of well I didn't have time for this because I was doing X Y and Z. You know I had to pick up my brother responsible for this person. My mom is working here is so I have to go. I have to follow her after school and have time to go home and get my textbook you know there was a lot of there was a lot of that which came up quite often. And I think going back to a minute wasn't necessarily the ability but it was those two factors that kind of went into there.