

A Study of School Finance in Arizona: Equity, English Language Learners, and the
Allocation of Funding.

by

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ABSTRACT

Closing the achievement gap between low-income, marginalized, racially, and linguistically diverse students has proven difficult. Research has outlined the effects of funding on student achievement in a manner that focuses the attention on dollars expended, in order overcome barriers to learning. Arizona has long been recognized for its education funding disparity, and its inability to balance fiscal capacity in a manner that serves to improve educational outcomes.

This dissertation examines how Arizona funds its education system. It measures horizontal inequity in a robust manner by examining those fiscal capacity resources directly related to learning and poverty. Recognizing districts with higher concentrations of special needs students will impact fiscal capacity at the district level, this dissertation applies a non-linear analysis to measure how English language learners/ limited English proficient (ELL/ LEP) student proportionality impacts federal and state revenue per pupil, ELL expenditures per pupil, and total expenditures per pupil.

Using the Gini Ratio, McLoone Index, Coefficient of Variation, and Theil inequality index, this dissertation confirms that significant education funding disparity exists across Arizona's school districts. This dissertation also shows the proportion of English language learners is negatively related to local revenue per pupil, and ELL expenditures per ELL pupil.

Arizona has characteristically funded the public education system inequitably and positioned its students in a manner that stratifies achievement gaps based on wealth. Targeted funding toward ELLs is in no way meaningfully related to the proportion of

ELLs in a district. Conceptually the way in which equity is defined, and measured, may require re-evaluation, beyond correlated inputs and outputs. This conceptual re-evaluation of equity must include the decision making process of administrative leaders which influence the quality of those resources related to student learning.

DEDICATION

For Beate Muehler-Martinez

You are the most loving partner anyone could ask for. You have shown poise through difficult times. You are the cornerstone of our family, and I am grateful to have found someone with such a big heart. From those long winters in Waukegan, to moves across countries, and now across states, it has been such a wonderful experience to be by your side. Lovely B, I love you now, tomorrow, and forever. Thank you.

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I dedicate this dissertation to every immigrant community around the world, and to every educator, and family in Brighton Park and Back of the Yards-Chicago. The roots of my education are so bitter, but the fruit is among the sweetest.

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CHAPTER 1

INTRODUCTION

Compulsory public education in the United States continues to develop as an integral part of the nation's fabric, attempting to mitigate disparities between socio-demographic classes (Roscigno & Ainsworth-Darnell, 1999; Yosso, 2005). One of the historical challenges imbedded within the system are stratified educational opportunities coinciding with the dividing lines between socio-demography (Brighouse & Swift, 2008). *Brown v. Board of Education (1954)* charged the Supreme Court of the United States with re-interpreting the Fourteenth Amendment and represented the racial tension present in 1950's United States which separated students, providing less opportunity for minority student educational attainment (Adams, 2006; Heise, 1995; Minorini & Sugarman, 1999; Rebell & Metzler, 2002; Thro, 1994; Versteegen, 1998). In *Brown v. Board of Education (1954)* the argument was explicit, "separate but equal" did not lead to racial educational equality, prompting the United States Supreme Court (SCOTUS) to conclude that "in the field of public education the doctrine of 'separate but equal' has no place. Separate educational facilities are inherently unequal."¹ Now, 64 years after *Brown*, full participation, and inclusion, go unrealized due to continued disparities grounded in socio-demographic conflict including fiscal capacity, and the dominant rule of social justice applied to education funding equity (Anyon, 1997; Bowles & Gintis, 2011; Gamoran, 2001; Powers, Fischman, & Berliner, 2016).

¹ Attributed to Earl Warren who served as the 14th Chief Justice of the United States Supreme Court 1953–1969.

The vacuous manner in which school funding equity is conceptualized stems from specific viewpoints about the types of justice required in order to provide greater educational opportunities. Education funding justice has been focused on the configuration of individual student need and the duty of federal, state, and local agencies to provide the fiscal resources necessary in order to address this need (Enrich; 1995; Gillespie, 2009; Thompson, Crampton, & Wood, 2012; Thro, 1994). The theoretical perspectives driving education funding justice take a specific redistributive form, and school finance scholars have used this position to measure the effect of more funding, or variations in funding, on education funding equity.

Scholars have assessed existing inequality in access to fiscal resources in order to understand if money matters (Burtless, 1996; Ferguson, 1991; Hanushek, 1986, 1989, 1991, 1999, 2007; Hedges, Laine, & Greenwald, 1994; Hyman, 2013; Rolle, 2004), and if so, how money matters (Card & Krueger, 1992; Goertz & Natriello, 1999). Scholars have largely accepted that policy implementation steering increased education funding can help remedy existing learning disparities (Condrón & Roscigno, 2003; Cross & Roza, 2007; Roza, 2008), but overcoming inequality of school resources due to taxation is much more difficult (Baker, 2005). Despite 50 years of evidence, school funding disparities continue to exist stratified by socio-economic and racial differences (Heise, 1995; Minorini & Sugarman, 1999; Verstegen, 1998).

This dissertation explores school funding disparities through an inter-district school finance equity examination of revenue and expenditures across Arizona's public, non-charter, local educational agencies (LEA). Furthermore, this dissertation focuses its analysis specifically on English language learners (ELL) as a subgroup marginalized by

fiscal capacity, segregation, language capacity, and cultural degradation through restrictive Arizona law and policy.

Research Questions

The purpose of this dissertation is to assess the level of educational resource disparity that exists across Arizona's traditional public school districts, and to determine if revenue and expenditure patterns are a function of the proportion of ELLs within a district. Arizona provides a unique environment in which to conduct this study for two distinct reasons:

1. Arizona currently uses an equalization formula, which should, to a large extent, negate resource disparities due to varied wealth across districts.
2. Arizona currently uses a one size fits all model of funding ELLs, which provides a student weight of 11.5% over the Basic Student Allowance (BSA) which may insufficiently mediate the academic needs of ELLs.

This dissertation expands the existing body of knowledge by investigating how a diverse Arizona fiscally responds to the demands of its language minority ELL student population across its districts. The following research questions guide the focus of this dissertation:

1. What are the salient revenue and expenditure patterns of horizontal equity that exist across Arizona's local educational agencies?
2. How does the proportion of English language learners (ELL) impact the distribution of resources across districts?

Statement of the Research Problem and Significance

Traditionally the percentage of ELLs in the United states has increased over time (Francis, 2006; Genesee, Lindholm-Leary, Saunders, & Christian, 2005). Table A1 in Appendix A shows the increases of ELL students over time and the growth in comparison to the entire student population in the United States. Table A1 shows the ELL student population grew to almost 10% in the years following the great recession and have remained in the range of 9% since that time.

The ELL population will continue to grow and need the proper educational resources in order to address learning challenges due to parent education levels, poverty, the inherent difficulties of second language learning, and inequitable school conditions (Abedi & Gándara, 2006; Abedi & Herman, 2010; Carlo et al., 2004; Gándara, Rumberger, Maxwell-Jolly, & Callahan, 2003).

Mandated educational opportunities. The search for equal educational opportunities have resulted in complicated litigation (e.g., *Serrano v. Priest* (I), 1971; *San Antonio School District v. Rodriguez*, 1973; *Castaneda v. Pickard*, 1978; *Levittown UFSD v. Nyquist*, 1982; *Rose v. Council for Better Education*, 1989), and thus far states and districts have continually failed to adhere to the minimum rule applied through the Equal Educational Opportunities Act (EEOA). Granularly EEOA does not dictate a set level of funding that constitutes the provision of an equal opportunity but does implicate in 20 United States Code § 1703 (f): *the failure by an educational agency to take appropriate action to overcome language barriers that impede equal participation by its students in its instructional programs*. Thus bringing up the question of what remedies sufficiently fulfill the mandate of 20 United States Code § 1703, what types of programs

are effectively addressing ELL student needs, who makes the final determination for these programs, and what is valued as equitable.

Repeatedly EEOA is discussed in disputes regarding the provision of opportunities to students, and compelled in educational funding litigation over barriers created by language acquisition, knowledge, and the resources necessary to provide students of diverse language and culture the necessary resources to overcome their own barriers toward learning (e.g., *Lau v. Nichols*, 1974; *Castaneda v. Pickard*, 1981; *Plyler v. Doe*, 1982; *United State v. Texas*, 1982; *Flores v. Arizona*, 1992; *Horne v. Flores*, 2009) (Cardenas, 1997; Gamoran & Long, 2006). These intersectional (i.e. language, pedagogical, curricular, fiscal) debates question those obstacles that impede appropriate action to overcome learning barriers due to language, and the rights of English language learners (Aleman, 2006; August, Shanahan, & Escamilla, 2009; Haas, 2005; Krashen, 1999). Additionally, federal legislative courts have extracted themselves from responsibility toward providing a finite rule often leaving the interpretation of equal educational opportunities largely to the discretion of states and districts. The final determination of *Castaneda v. Pickard*, 1981, dismantled the requirements of EEOA by misrepresenting the fundamental processes by which knowledge is legitimized (Haas, 2005).

Castaneda v. Pickard (1981), impacted the qualifications of what constitutes a scientifically based ELL program of instruction. The final rulings in *Castaneda v. Pickard* case allowed districts to propose unsound pedagogical practices without recourse if those practices are not effectively teaching students the necessary curriculum (e.g. *Flores v. Arizona* (1992)/ *Horne v. Flores* (2009)). School building leaders must then

follow blind rules that are molded by educational ideology, or political pressures, that ground decisions on internal beliefs of what constitutes a fair, equal, just, equitable system of education for all students (Aleman, 2006; Ball, 2012; Spring, 1998).

Educational Policy scholarship has illustrated the ever present educational achievement gap, and the presence of fiscal disparity as a mediator for increased achievement (Heise, 1995; Reardon, 2011; Verstegen, 1998). The continued attempts to reform local revenue generation disparity have ineffectively mitigated the ever present achievement gap in the United States. These continued inequities were highlighted in a report by the United States Commission on Civil Rights (2018) which stated, “all across the United States (U.S.), there are many millions of students who are unable to access a quality public education due to inequities in public education finance.” (p. 3) and continued later by detailing:

poorer schools often have less experienced and lower paid teachers, fewer high-rigor course offerings, substandard facilities, and less access to school materials and resources. School districts that serve the most disadvantaged students often require higher levels of funding to overcome the financial challenges of serving the needs of disadvantaged students, including students with disabilities, and English language learners, particularly those who come from low-income households and who are also students of color. (p. 7)

The United States Commission on Civil Rights report questions how states and localities are addressing the process of allocating funds toward schools, and how these allocations mitigate poverty in order to guarantee an equal educational opportunity for all students

despite differences in socio-demography.

Arguably Arizona, housing one of the largest proportions of ELLs, has created some of the most inequitable student conditions nationally, and continued to underfund education (Jimenez-Castellanos, Combs, Martinez, & Gomez, 2013). Arizona has also created laws that undermine dual language curricular access (e.g., Proposition 203) with damaging consequences. Arizona's remedy to sufficiently fund a program of instruction for ELLs has wholly segregated ELLs from at grade curriculum and peers, damaging their educational attainment and placing this group of students at an academic disadvantage (Chen-Gardini & Burr, 2016; Gándara & Orfield, 2010; Gándara & Orfield, 2012; Olsen, 2014).

Arizona school funding context. The state of Arizona is in constant debate over its public school funding policy, and the care its constitutional requirement guarantees to its students (Hogan, Peters, & Mackin, 2010; Jimenez-Castellanos, Combs, Martinez, & Gomez, 2013). The public education system in Arizona has been degraded by school choice advocacy, legislative austerity, and the minimization of socio-demographic poverty, which Arizona is unwilling, to address (Bulkley, 2005; Cobb & Glass, 2009; Hoffman & Rex, 2009; Jimenez-Castellanos et al., 2013; Wright, 2005). The school system in Arizona is primarily funded through local tax levies and local revenue generation marked by increasing levels of local revenue while state revenues continue to decrease; federal revenue remains stagnant. Arizona, for its part, has implemented a school-funding formula, now 35 years old, created before the school choice movement, and before cuts to school funding were the norm.

The Arizona state formula relies on its basic support level, \$3,683.27 (2017-2018), with weights added for special education, high school, ELLs, K-3 enrollment, sparsity (i.e., isolated or smaller), and the addition of district additional assistance funding, transportation funding, and equalization assistance funding (Arizona State Senate, 2016). Arizona's formula purports to equalize funding due to property wealth helping to provide more funding for low-property wealth districts. Despite equalization, Arizona continues to exhibit ineffective educational funding across the state, due to its continued austerity that began during the great recession (Baker, Sciarra, & Farrie, 2014; Leachman, Albares, Masterson, & Wallace, 2015)

Arizona ELL context. Arizona has developed and implemented educational policy (e.g. Proposition 203; House Bill 2064) that directly inhibits equity of opportunity for the ELL population the most damaging of which came out of legislation passed due to the *Flores v. Arizona* (1992)/ *Horne v. Flores* (2009) case (Jimenez-Castellanos & Garcia, 2017). Paradoxically the intention of *Flores v. Arizona/Horne v. Flores* was to increase the educational opportunities, and funding, provided for ELLs, yet the changes developed in legislation worked to further threaten ELL educational equity in the state (Arias & Faltis, 2012).

Proposition 203, English for the Children, and House Bill 2064 (HB 2064) abated local ELL curriculum and program flexibility opting for a structured English immersion (SEI) program model that limits the time students spend on curriculum outside of English. Currently Arizona students are required to obtain English Language Proficiency through a four-hour block of English immersion (Fredricks & Warriner, 2016; Jimenez-Castellanos et al., 2013). The segregated English immersion program of instruction forces

students into segregated classrooms, and limits access to curriculum outside of English. These changes were further bolstered by an increase in student weighted funding to 11.5% through House Bill 2010 (HB 2010) and an appropriation of \$40.7 million through Senate Bill 1096 (SB 1096) to fund SEI programs and not diverse bilingual or multilingual programs (Jimenez-Castellanos et al., 2013; Jimenez-Silva, Gomez, & Cisneros, 2014; Lillie et al., 2010). Arizona viewed these changes in legislation and policy as steps toward improving the educational opportunities for ELLs in the state, however this set of legislation did nothing to alleviate the already existing challenges, instead serving to further exacerbate the deplorable education of ELLs across the state (Lillie, 2016). The 21-year back and forth of *Flores v. Arizona* (1992)/ *Horne v. Flores* (2009), and subsequent legislation, came to a close in 2013 with no clear path toward increasing equitable educational opportunities for ELLs.

Arizona has also implemented policy that is culturally *Latino* restrictive (Arias, 2012; Jimenez-Castellanos & Garcia, 2017; Razfar & Rumenapp, 2012; Verri & Franca, 2013). As a bordering state to Mexico, Arizona has purposefully enacted laws that would inhibit how *Latinidad* (non-monolithic Latino identity grounded in historical, geopolitical, and ideological context) is valued amongst its citizenry (Caminero-Santangelo, 2007; Padilla, 1985; Rohrleitner, 2013). House Bill 2281 (HB 2281) was a bill supported by then Arizona State Superintendent of Public Instruction Tom Horne that prohibited schools from offering courses at any grade level that advocated ethnic solidarity, overthrow of the United States Federal government, or was taught for or toward any specific ethnic group. HB 2281, and Horne's approval, degraded culturally relevant pedagogy and curriculum by declaring Mexican American Studies program out

of compliance with A.R.S. § 15-112 (Cabrera et al., 2011; Cabrera et al., 2013; O’Leary et al., 2012). HB 2281 banned the teaching of ethnic studies in Arizona’s K–12 schools and while the battle to keep Mexican American Studies programs was fought in the Tucson Unified School District (TUSD), students across the state felt the impact of this implicitly racist policy (Cabrera et al., 2011; Cabrera et al., 2013; O’Leary et al., 2012).

Senate Bill 1070 (SB 1070) is arguably one of the toughest anti-immigration bills proposed in the United States (Campbell, 2011; Paris, 2012). Passed in 2010, SB170, proposed under the guise of creating a safer Arizona, allowed local police to perform random citizen checks for reasonable suspicion, not clearly defined in the legislation, and allowed Sheriffs the authority to ask Arizona citizens about their immigration status often referred to as the “papers please” (Campbell, 2011; Valdez, Padilla, & Valentine, 2013; Wallace, 2014). A second piece of legislation, House Bill 2121 (HB 2121), was proposed in 2017. The intent of HB 2121 was to criminalize the obstruction of an immigration detention enforcement order by a law enforcement or local government agency. Ultimately HB 2121 stalled in legislative session, but it displays Arizona’s political commitment to an anti-immigration agenda. These types of anti-immigrant bills impact the perception of *Latinos* in Arizona, and across the country, further marginalizing an already exhausted populous, and reify an anti-Latino sentiment across the state, finding its way into the education system (Feagin & Cobas, 2015; Santa Ana & Gonzalez De Bustamante, 2012).

In order to minimize the prevalent achievement gaps that exist across the United States between ELLs and their scholastic peers, it is imperative to produce school finance scholarship that recognizes the nuances of the English language learner student group and

their educational fiscal needs (Jimenez-Castellanos, 2017; McFarland et al., 2017). This type of culturally informed scholarship provides much needed insight into the types of fiscal changes necessary to begin effectively funding a successful program of instruction for ELLs. There are still significant concerns over Arizona's distribution of revenue across its districts, the mechanism of expenditures, and the relative impact of fiscal capacity on student learning (Jimenez-Castellanos et al., 2013). Arizona has attempted to neutralize local wealth disparities through an equalization formula but has seen tremendous competition amongst its LEAs through the expansion of choice, while simultaneously continuing recessionary austerity measures (Jimenez-Castellanos & Martinez, 2015, 2017).

This dissertation provides much needed understanding into how revenue and expenditures are distributed in Arizona and if the equalization formula is impacting local wealth disparity, especially in those districts with higher proportions of ELLs. This study impacts the scholarship by explicitly searching for relationships between school funding and English language learners, controlling for student socio-demographic characteristics with a high degree of multi-collinearity (i.e., proportion of students in the free and reduced lunch program, property valuation). Furthermore, this dissertation focuses on Arizona longitudinally (2006, 2009, 2012, 2015) as changes in legislative policy have continued to evolve the landscape of education across the state.

Overview of Dissertation

This dissertation is organized into six chapters: Chapter 1, centralizes the thesis of this dissertation as requiring an examination of district level fiscal disparity across the state of Arizona as a proportion of English language learners within the district due to

Arizona's intersecting restrictive educational policy, and educational fiscal austerity. Chapter 2, a literature review that describes the previous school finance literature, including the novel way in which scholars are attempting to provide nuance to the research base. In particular, chapter 2 will focus on the scholarly differences between equality, equity, equal educational opportunity, and adequacy as described in school finance literature. Chapter 3 will describe the sources of data employed and methods of analysis. Chapter 4 outlines the research findings. Chapter 5 addresses the findings as they pertain to the existing body of literature and the limitations of the current conceptual framework of equity. Chapter 6 concludes the study with a discussion of the implications of this dissertation toward improving school funding research, and the limitations of this study.

CHAPTER 2

LITERATURE REVIEW AND CONCEPTUAL FRAMEWORK

The main focus of this dissertation is on the population of students identified as English language learners (ELL). An ELL student is one that is actively acquiring English language proficiency, and whose primary language is other than English (Bardack, 2010). These students are amongst the most marginalized student groups in education, often residing in areas that have minimal levels of local tax revenue generation with the greatest amounts of educational need (Abedi, 2004; Baker, 2012; Betts & Roemer, 2005; Breen & Jonsson, 2005; Coleman et al., 1966; Garmoran & Long, 2006; Ladd, Chalk, & Hansen, 1999). The proportion of ELLs continues to increase across the national landscape (table A1). As the population of ELLs in the United States continues to increase, they will impact the economic development of the country however, ELLs must overcome educational barriers in order to realize their economic potential (Gándara & Rumberger, 2008; Gans, 2007). Tables A2 and A3 (Appendix A) show gaps in grade 4 and 8 reading and math National Assessment of Educational Progress (NAEP) scores between ELLs and their Caucasian and Latino English language peers. These achievement gaps persist year to year, and ELLs are consistently among the lowest achieving groups.

The United States Commission on Civil Rights report (2018) of educational access and equity explicitly recognizes the impact of pervasive and longitudinal school funding disparities that led to achievement gaps. The report references the legal obligation of states, schools, and districts to provide students with equal access to fair and just educational resources without regard to race, color, or national origin. Furthermore,

this report implicates funding disparities as leading toward opportunity gaps that mirror differences in racial and socioeconomic demography, occurring in schools educating higher percentages of low-income students, and students requiring accommodations for English language acquisition.

One major challenge states and districts face is how to effectively address ELL programs of instruction, and the fiscal need this creates (Horsford & Sampson, 2013; Iddings, Combs, & Moll, 2012; Jimenez-Castellanos, 2012). In order to meet the needs associated with educating large pockets of ELLs, states and districts must be willing to provide a system of education that is fully supported; a system which integrates and funds ELL education through varying resources and provides a diverse set of services bolstering academic material.

States and district fiscal policy decision makers must rely on valid empirical evidence in order to appropriately address the needs of ELLs as a diverse group (Garcia, Lawton, & Diniz de Figueiredo, 2010; Garcia & Menken, 2006). Currently, limited school finance scholarship exists that examines with nuance fiscal differences between districts and schools with higher proportions of ELLs (Jimenez-Castellanos, 2017). The school finance catalogue must continue to evolve in order to guide policy makers attempting to address the needs of this expanding multi-faceted group (Jimenez-Castellanos, 2017). Without focused scholarly work, ELLs will continue to struggle with lack of educational resources and inclusion, segregated not only from peers, but segregated from the academic material and supportive services necessary to develop formatively in an educational setting (Gándara, Maxwell-Jolly, & Driscoll, 2005; Gándara & Orfield, 2012a, 2012b; Jimenez-Castellanos, 2017). The challenge to educate

these linguistically diverse students has frustrated researchers, policymakers, stakeholders, and legislators (García & Kleifgen, 2010). This dissertation empirically examines the difference that exists in high versus low percentage ELL districts and how fiscal capacity effects student learning.

This chapter outlines the relevant school finance scholarship informing this dissertation. This chapter outlines the conceptual frameworks employed in school finance research. I outline the major tenets of educational opportunity in school finance scholarship and analyze how the underlying conceptual foundations of opportunity have evolved. Finally, I highlight the salient evidence provided in school finance research that examines the nuances of ELLs.

In Search of Educational Opportunity

Most low-income, minority, marginalized students will require additional educational resources in order to counter balance the limiting nature of socio-economic demography (Knoepfel, 2007; Kozol, 1991; Reschovsky & Imazeki, 2001). Socio-economic inequality coupled with lack of language proficiency places ELLs at a greater risk for educational underachievement. Furthermore, the monochromatic/ monolithic treatment of all ELLs makes it difficult to ascertain how severe ELL educational needs have become. Currently scholars continue to investigate resource allocation disparities through big data (Miller & Rubenstein, 2008; Owens & Maiden, 1999; Schwartz, Rubenstein, & Stiefel, 2009) using whole populations of students based on broad socio demographic categories. The school finance research field itself has expended a minimal amount of intellectual inquiry focused on ELLs, although scholars have helped to bolster justice minded sentiments through their work (Jimenez-Castellanos, 2017). For decades,

scholarship has evolved, as the conceptual and theoretical paradigms framing school finance litigation have progressed, helping to underscore litigation with empiricism. The search for justice through equity frameworks has led both the courts and research community through three distinct conceptual periods from equality, to equity, then arguing for increased adequacy in order to provide all students an equal educational opportunity.

Equality. Through the infancy of school finance research reformers sought answers to equality debates that argued over Federal Constitutional Equal Protection and 14th amendment rights to education (Adams, 2006; Enrich, 1995; Heise, 1995; Minorini & Sugarman, 1999; Rebell & Metzler, 2002; Thro, 1994; Verstegen, 1998). Equality was defined in distinct ways; *Serrano v. Priest (I)*, 1971 would catalyze the reform movement arguing California's method for funding compulsory education had failed to meet the requirements of the Federal Equal Protection Clause and argued the existence of per pupil funding inequality led to an achievement gap amongst students in California (Heise, 1995; Verstegen, 1998; Minorini & Sugarman, 1999).

In *Serrano v. Priest (I)*, 1971, equality is defined as the existence of unequal funding distributions creating achievement gaps. The *Lau v. Nichols*, 1974, case positioned equality for all as insufficient proof that districts were providing the resources necessary for students to learn. *Lau v. Nichols*, 1974, defined equality as those instructional practices that supplement ELLs in a manner which allows participation in a full program of instruction. Equality became the de facto term encompassing arguments focused on the differences between property rich and property poor districts that created learning gaps. The litigation process would continue to search for solutions in order to

address learning challenges created by fiscal capacity, but the research catalogue at this time was reluctant to examine inequality based upon fiscal capacity due to the belief that these examinations were not fruitful, limiting early research (Espinosa, 1985).

Researcher epistemologies, data, and technology driving school finance scholarship hindered the field. Owens (1972) would challenge the research catalogue exclaiming the salience of school finance:

In the literature on state and local finance it is frequently assumed that municipal expenditures for public services, including education, are equally distributed among the recipients...However, this equal expenditure assumption is made without empirical justification. The distribution of educational resources described here and in the work cited in fn. 15 would tend to contradict it. (p. 27)

These empirical miscues were a function of the Coleman Report (1966) concluding student achievement was fundamentally influenced by factors outside of the school rather than within, though Owens' research refutes these claims (Espinosa, 1985). Owens (1972) examined the distribution of resources concluding salary expenditures per pupil, level of teacher experience, and verbal ability were lower in low-income and minority neighborhoods than in more affluent areas. The research community would continue to ignore these disparities choosing to largely endorse the research of The Coleman Report (Guthrie, Kleindorfer, Levin, & Stout, 1971; Hanushek & Kain, 1972), or examine the implications of court findings (Berke & Callahan, 1972), empirically disregarding the reality of school funding at the stakeholder level. The Supreme Court's decision in *San Antonio Independent School District v. Rodriguez*, 1973, asserting the right to an education was not mandated by the United State Constitution, and evolution of litigation

challenging state constitutions and educational clauses, would ultimately inch school finance research forward in search of greater educational justice.

Equity. The ideals of equality continued to develop through the 1970's and states continued to reform their school finance systems responding to litigation and political pressure (Downes, 1992; Espinosa, 1985). Through the 1970's the central tenets of equality and the continued examinations of school finance would evolve. This led to a realignment of educational justice ideals in research and the judicial community in order to update the definition of educational fairness now grounded in student need. Baratz (1975) examined school resources and the limitations of compliance with equalization ultimately concluding resource availability disparities between high minority and low minority enrollment schools. Summers and Wolfe (1976), through the backdrop of *Brown v. The Chicago Board of Education*, 1954, as well as *Hobson v. Hansen*, 1967, examined resource disparities with the use of school level data in a single district. The authors found schools with high shares of minority students and high shares of students from low socio-economic backgrounds had an administrative and teaching battery with lower quality post-secondary institutional certification and with less experience. Summers and Wolfe (1976) began to express ideas of equity stating:

First, in certain obvious instances, we recognize that equal inputs do not produce equal outputs. More resources are required to educate blind children than to educate sighted children. Similarly, equal inputs for those with socioeconomic disadvantages and those without would not represent equal educational opportunity. (p. 330)

Summers and Wolfe (1976) evolve opportunity beyond equality and express their beliefs

of equity in terms of inputs contributing to achievement based on a horizontal distribution, equal treatment of equals, and a vertical distribution, differentiation of funding dependent on need.

As the decade closed, the school finance scholarship continued resolving intellectual gaps through research grounded in equity. Ginsburg, Moskowitz, and Rosenthal (1981), examined the distribution of educational resources and the property wealth disparities driving school resource allocation. The authors undertook this research in order to better inform the legal system, and those school finance decisions made in the courts. The authors also attempted to better understand how disparities existing across educational inputs, versus educational revenue, impacted student learning. The incremental steps toward revolutionizing educational opportunity paradigms in school finance led to Berne and Steifels seminal works.

Robert Berne and Leanna Stiefel (1984) continued to study the equity dilemma focusing on three central questions in order to conceptualize their interpretation of equity in school finance:

1. Who? For whom do we seek equity? What do these groups look like and how do we best include these groups? These questions involve two key stakeholders including students educated in the public compulsory system of a state for whom reformers seek an equal opportunity for education and taxpayers, who provide funding through tax levy's that in some instances provide less funding depending on local tax levy's.
3. What? This question determines the types of resources, services, and level of education that should be distributed equally amongst all students in

compulsory education. At the school level this usually equates to the amount of revenue available and how it is expended. An example is the amount of revenue allocated for teachers with advanced degrees, or the amount of frontline staff available.

4. How is funding distributed? Is the distribution of resources equal across districts? Does the distribution of resources create better outcomes?

To this effect Berne and Steifel (1979, 1984) articulated two frameworks for equity in education, Horizontal Equity (HE) (an equal treatment of equals) and Vertical Equity (VE) (unequal treatment of unequals).

In essence horizontal equity is a measure of funding for every student in order to receive equal resources. Horizontal equity dictates that students from similar backgrounds and similar socio-economic statuses receive an equal, or as equal as possible, amount of resources necessary to have an equal amount of learning (Baker, 2001; Berne & Stiefel, 1984, 1994; Clotfelter, Ladd, & Vigdor, 2007; Hadderman, 1999; Rolle & Liu, 2007; Toutkoushian & Michael, 2007). The search for horizontal equity provides no way of addressing supplemental resources required to address the varied needs of students. Musgrave (1990) reaffirms this challenge to horizontal equity stating that horizontal equity only dictates “a minimal rule of fairness” (p. 113), leading to the second definition of equity used by Berne and Stiefel (1984) vertical equity.

Vertical equity measures an unequal treatment of unequals. That is, are students who have some extra need (e.g., language barriers, learning barriers) given treatment to the effect that resources will counteract learning barriers? In this case the treatments are supplemental resources helping to bridge gaps in student knowledge. Vertical equity

evolves notions of horizontal equity by accounting for the learning differences in students and counterbalancing those differences with an unequal treatment (more resources) (Berne & Stiefel, 1984, 1994, 1999; Iatarola & Stiefel, 2003; Iatarola & Rubenstein, 2007; Rodriguez, 2004; Rolle & Liu, 2007; Toutkoushian & Michael, 2007; Vesely & Crampton, 2004). These learning differences can stem from socio-economic status, access to support, secure housing, and/or education of the parent. Additionally, vertical equity holds that students who are at a basic disadvantage can require a greater amount of resources, and there should exist some system of allocation that provides these students with a greater amount of resources in order to reach an equivalent level of learning (Berne & Steifel, 1999; Ladd, 2008; Rebell, 2007). The evolving school finance scholarship would help develop legal paradigms as well, attempting to resolve funding disparity leading toward achievement gaps.

In 1986, a taxpayer lawsuit was filed alleging the Los Angeles Unified School District (LAUSD) resource allocation among its schools was discriminatory leading to a consent decree stipulating that LAUSD must: (1) equalize resources, teacher experience, and training among schools; (2) provide all students with maximum access to experienced, well-trained teachers; and (3) mitigate the consequences of limited teacher experience and training (Espinosa, 1985). The research behind this case, completed by Ruben Espinosa (1985), detailed in a later section, is the first piece of research that examines ELLs in some nuanced way. The success of this research led to changes in policy positively affecting ELLs, but as the decade came to a close, scant intellectual inquiry examining ELL learning disparities and fiscal capacity was produced as a separate framework emerged.

Adequacy. Theoretical inquiry in school finance has also shifted toward examining adequacy (Minorini & Sugarman 1999). School finance adequacy requires a sufficient level of resources enabling students to minimize the achievement gap. School finance adequacy scholarship reorganizes the school funding ideal away from aggregated fiscal equity, and grounds analyses in student learning (Heise, 1995; Roelke, Green, & Zielewski, 2004). Adequacy proposes measurement based on outcomes, opposing the view that inputs are the measurement by which a district provides equal opportunities (Baker, 2005; Gándara & Rumberger, 2008; Iatarola & Stiefel, 2003; Odden, 2003; Rebell, 2008). Adequacy, as a concept, is not self-comparative relying on comparisons against a set criterion (Ladd, Chalk, & Hansen, 1999; Odden & Picus, 2008; Verstegen, 1998). This type of comparison allows for individuals, states, and districts to demarcate their own level of sufficiency.

One of the most important definitions of adequacy occurred through *Rose v. Council for Better Education*, 1989; Kentucky. The term “adequate” would be defined as the development of every child to a basic level of knowledge in seven distinct areas:

1. Oral and written communication skills.
2. Knowledge of social, economic, and political systems.
3. Knowledge of the governmental process.
4. Knowledge of mental and physical wellness.
5. Grounding in the arts.
6. Adequate training for life work.
7. Sufficient academic and vocational training to compete with students in surround states. (para or page numbers?)

The defining characteristics of adequacy and the finance system driving student achievement as a matter of state responsibility forced reorganization of the entire Kentucky public education system. *Rose v. Council for Better Education*, 1989, served as a backdrop for adequacy theory providing a view of compulsory education as a right of all individuals, so that an achievement floor could exist. It specified achievement markers that all students regardless of family wealth should obtain. Determining the floor then becomes of increasing importance and requires legislatures, scholars, and litigators alike to participate in the discussion in order to determine what level of resources prevent students from falling below a specified floor (Augenblick, Meyes, & Anderson, 1997; Baker, Sciarre, & Fairre, 2010; Rubenstein & Miller, 2005). The tenets driving *Rose v. Council for Better Education*, 1989, can be seen in the school finance research that began emerging in the 1990's. Researchers wanting to understand how resources were affecting students, and what empirical evidence existed for increasing funds, began examining student achievement against the backdrop of funding and resources allocation.

School finance scholarship continues to evolve, helping legal paradigms develop in order to create inclusive school funding systems. Despite the existing work, students in poverty, special education, and language minority students continue to struggle, the achievement gap continues to grow, and educational opportunity continues to shrink. The bellowing voice of the United States Commission on Civil Rights has now highlighted the importance of these most marginalized populations and the need to target resources enabling their educational success.

School Finance Research Examining ELLs

School finance research has continually sought the answer to ending educational inequity, yet failed to sufficiently treat ELLs appropriately, a sub-population of students that will continue to grow and whom require some of the most delicate care (Garcia, 2011; Jimenez-Castellanos, 2017; United States Department of Education Common Core of Data, 2016). The marginal amount of research examining any aspect of ELLs has exposed the historical inequity existing within districts with the greatest need, especially urban and rural poor districts, as a driving force in achievement disparities between high ELL (high poverty) and low-ELL (low poverty) districts (Schwartz & Stiefel, 2004; Wittkopf, Robinson, Janczy, & Hunter, 2014) yet so few studies have disaggregated ELLs from the student measurement sample. With so few research studies dedicated toward ELL funding it is important to outline how this body of literature is developing.

Improving school funding for English Language Learners. An opportunity to learn is of the utmost importance not only for an individual but for society (Rawls, 1971). Education helps to increase personal income, that helps bolster the economic stability of the United States, and it enables the citizenry to critically analyze information presented to them in order to make informed decisions (Boudan, 1974; Ladson-Billings, 2006; Rawls, 1971). Unfortunately, there continues to exist a “*predictable racial, socio-economic and linguistic, academic achievement gap,*” in the United States compulsory public K-12 education system (Jimenez-Castellanos, 2008, p. 2, 2010; Orfield, Losen, Wald, & Swanson, 2004). In order to appropriately assess the severity of this achievement gap, and how disparate resources contribute to student learning, research must account for the treatment of specific populations, forgoing the existing

monolithicism of students (Artiles, Rueda, Salazar, & Hígarada, 2005; Gándara, Rumberger, Maxwell-Jolly, & Callahan, 2003; Rodríguez, 2000).

Espinosa (1985) found fiscal and facility resource disparity imbedded within the Los Angeles Unified School District led to disparate achievement across student populations. Espinosa concluded that in schools with higher concentrations of ELLs, LAUSD spent less per pupil than in schools with low concentrations of ELLs. The study found schools with a higher proportion of ELLs also receive lower proportionate amounts of base funding creating inequity in the facilities available for students and an environment requiring remedial curriculum facilitating achievement standards which inhibit achievement gains (Jimenez-Castellanos, 2008). Ultimately, this study informed the outcome of *Rodriguez v. Los Angeles Unified School District*, 1986.

Lankford, Loeb, and Wyckoff (2002) concluded that schools enrolling higher proportions of ELLs exhibited teacher tenure and certification inequity due to limited resource availability. Furthermore, the authors concluded ELLs are the sub-population most likely to be taught by teachers with emergency credentials, lower levels of aggregate years of education, and less certification (Boyd et al., 2007; Gándara et al., 2003). Other literature in this area outlines the favorable relationship between proper professional preparation and learning, especially in schools with a higher percentage of ELLs that can directly impact achievement (Darling-Hammond, 2002; Haycock, 1998). Yet, often schools are aligning additional resources for ELLs in areas other than frontline teaching staff, thus limiting educational opportunity and growth (Duncombe & Yinger, 1998).

Jimenez-Castellanos and Rodríguez (2009) concluded ELLs were correlated to a

higher percentage of under-certified teachers and that school districts with a higher concentration of ELLs were inequitably distributing resources. Furthermore, the authors stated low-income, Hispanic/Latino, and ELL students received more categorical funds and more administrative funds per pupil, but that these funds were negatively correlated with student achievement. The Jimenez-Castellanos and Rodriguez (2009) study also found schools with higher proportions of ELLs had teachers with lower salaries than low-ELL schools, these higher proportion ELL schools also had lower California State testing scores.

Rolle and Jimenez-Castellanos (2014) redefined the Texas Foundation School Program (FSP) mechanism by examining the individual components of the FSP for five sub-groups of districts stratified by percentage of ELLs by quintile. The authors concluded that the state's FSP distribution formula had failed to counter-balance the effect of local revenue generation. Rolle and Jimenez-Castellanos were also able to demonstrate that the FSP components representing percentages of students receiving ELL services were insignificant predictors of revenues per pupil. The stratified sample allowed for a much richer understanding of how higher concentrations of ELLs and revenues are related. The authors concluded that property value predicted revenue per pupil at a state and local level.

The United States compulsory public K-12 education system is not free of inequity, and continuing the examination of the relationship between funding and achievement is necessary in order to limit achievement gaps. School finance scholarship continues to evolve focus, and the studies above are examples of the commitment in the field to improving educational access for ELLs but there is still a need to continue

uncovering how funding affects learning for those populations already at a disadvantage due to poverty, developmental challenges, or language capacity.

The Need for Continued Examination

The importance of research that helps to inform policy decisions about the school funding process cannot be overstated. The overwhelming use of equity frameworks to inform school finance research is no longer sufficient, and the tools, conceptually, theoretically, and methodological, must begin to evolve in order to produce an evolved pocket of literature (Houck, 2010; Houck, 2011). Odden (2000) articulated these ideas about equity, asking if equity was still the major factor in determining educational justice. After a long history of underachievement, rising school prices, lower school revenue from states and the federal government, and after the pursuit of equality, equity, and adequacy has gone unfulfilled, are equality, equity, and adequacy still the dominant paradigms in education? Do they need re-examination, or reinterpretation in order to provide students more equal educational opportunity (EEO) and more educational justice?

Rodriguez and Rolle (2013) expounded on the idea of social justice as a driving force in education. Issues of justice and fairness in education and the finance structures associated with education have been challenged through courts and addressed through state legislative propositions yet social justice frameworks outside of a small pocket of finance literature have gone untapped. The next iteration of equity must bridge social justice, critical race, and democratic education frameworks in order to provide a sound solution for ELL education (Gándara & Orfield, 2012; Ladson-Billing, 1998).

Aleman (2006, 2007) examined school funding through ideals framed in critical

race theory to explain the duality of relationships amongst administration within a district. From the purview of critical race theory Aleman was able to inform administrative leadership decision making, and the policy regarding these decisions. Part of the process was to first help translate school finance and economics talk for practitioners and leaders. It is a process of helping to bridge one knowledge base to another. The second is to participate in school finance research at the school level. School finance researchers often use publically available datasets that provide a snapshot, and provide black and white conclusions, with little contextualization (Jimenez-Castellanos, 2008; Jimenez-Castellanos, 2010). Participation by the researcher melds empirical, critical, research focused work, with practitioner work, and bridges pure research with participatory action research, in order to provide action items for the schooling process.

Jimenez-Castellanos (2008) has made use of the case study to contextualize quantitative findings by providing a robust qualitative analysis within the sample site. While laborious as a tool, the case study coupled with quantitative analysis, is exactly what Rodriguez and Rolle (2013) call for in order to treat finance in a more socially just frame. In an earlier examination, Gándara and Rumberger (2008) were able to corroborate what they found in literature with what actually existed in the classroom and at the school level with the use of case study. Cost adequacy analysis for examining specific populations (Baker 2006; Duncombe, Lukemeyer, & Yinger 2004) have limitations, and Gándara and Rumbergers (2008) use of 15 administrative interviews pinpointed the exact resource need within different schools in the same district, in order to properly educate ELLs.

Conceptual Framework

School finance academic and legal research has attempted to challenge fiscal disparities driven by antiquated structural barriers that impede student learning in low-income, marginalized, and culturally diverse communities (Nieto, 2015; Stanton-Salazar, 1997; Talbert-Johnson, 2004). These socially motivated ideals toward greater equal educational opportunity for all students despite racial, cultural, or fiscal differences has impacted the discourse surrounding the education of students in the United States, but has been unable to curb the ever present achievement gap that persists between students of racially and linguistically diverse cultures, and their Caucasian middle class peers (Haycock, 2001; Ladson-Billings, 2006; Lee, 2002; Portes, 2005; Rothstein, 2001).

One of the challenges in school finance research toward achieving greater equal educational opportunity are the defining characteristics of equity within the research catalogue that for decades have applied the Aristotelian framework for equity developed in the 1970's and 1980's by Berne and Stiefel. Berne and Stiefel (1979; 1984) helped evolve equity by quantifying the relationships between fiscal justice and New York state's school fiscal planning (Chesterman, 2001; Culyer, 2001; Dyson, 2001; Mellers, 1982; Shanske, 2005; Sherwin, 2000; Young, 1995). Aristotle's equity principle is rooted in the theory that each sub-individual should participate in an apportionment of something that is distributed (Young, 1995). Young (1995) suggests this ideal is rooted in law and custom as a norm of distributive justice (p. 64), the ideology of which is driven by parity, proportion, or priority (Walster & Walster, 1975; Young, 1985).

Figure 1 illustrates Aristotelian equity and its relationship to dispersion within and between groups. Parity increase from the top left quadrant to the bottom right quadrant.

Proportionality increases from the bottom left quadrant to the top right quadrant. As parity increases from top left to bottom right so does *horizontal equity*. Vertical distributions are bound parity on the horizontal by greater equalization and finite resource availability. As proportionality increases from bottom left to top right so does *vertical equity*. Horizontal distributions are dispersed due in large part to varied need and resource accessibility. As you move up *vertical equity* allows for greater inter and intra-group dispersion but it must move away from greater amounts of parity in order to allow for greater amounts of dispersion.

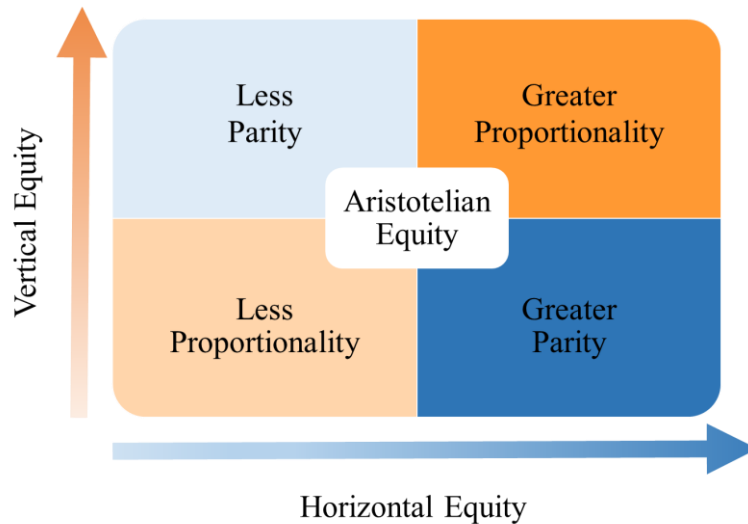


Figure 1. Intersection of horizontal and vertical equity

This exchange of equity is applied to student education at all levels, and at the policy and practical level as educational leaders have struggled to reconcile fiscal capacity with fiscal need, leaving students within a district to indirectly compete for funding based on intra-group need differences and the priorities of decisions makers. For instance, weighted student formulas are often applied as a policy for improving distribution equity of available resources to schools (Baker, 2009; Chambers, Levin, &

Shambaugh, 2010). These weighted formulas lend primacy to certain classifications of students, based on their specific student needs, in order to offset any learning barriers that may impede full participation in a compulsory program of instruction. Often, stakeholder leaders at the state educational level (i.e., state office of education), or the legislative level, working above the practical, classroom level, and often above the micro-district level make the final fiscal utility determinations.

Another example, and one more closely related this study, is the distribution of school level resources to those linguistically diverse students in Arizona's public schools. The Arizona Department of Education, based on the decisions proposed, written, and passed in legislation provide public school districts an ELL weight of 11.5% on the BSA (Jimenez-Catellanos et al., 2013). The ELL student weight of 11.5% is based on what legislation felt was a sufficient amount of funding for ELLs, the defining characteristics and beliefs held within the state about the ELL group, and the ill-defined premise that all ELLs residing in the state require the same types of services (Jimenez-Catellanos et al., 2013). Regardless of the distribution of resources the ELL student weight dictates a within group dispersion limited by equality, regardless of learning barriers due to language proficiency within the ELL student population, racial demography, or poverty. While there may exist some form of vertical equity by providing ELL students an 11.5% weight, this weight is capacity reducing, treating all ELLs monolithically, requiring the same services, negating equity for within group equality. The interest here is in the distribution of educational resources, object of distribution, toward those pupils who require them (Berne & Stiefel, 1984; Odden & Picus, 2008). Furthermore, while Arizona does employ a quintile to determine ELL English language proficiency, it does not

allocate resources in accordance with intra-group language proficiency differences; if a student falls into the top tier versus the lower tier. These decisions may occur at the school, or local-district level, but there is no literature currently that can definitely account for within group resource allocation differences due to ELL language proficiency in the state of Arizona, how these decisions are made, or what types of equity are applied to this student sub-group.

Conclusion

While it is true that some school finance studies have brushed against the challenges of educating ELLs, only a handful thus far have truly delved head first into the issues surrounding ELL education (Jimenez-Castellanos, 2017). Most school finance studies have failed to distinguish a comprehensive treatment for ELLs or provide ELLs with the necessary equal educational opportunities to close the achievement gap. ELLs require opportunities to learn (Baker, 2005; Darling-Hammond, 2004; Espinosa & Ochoa, 1992; Gándara & Rumberger, 2008; Iatarola & Stiefel, 2003; Kozol, 2005; Odden, 2003; Rebell, 2008). ELLs require improved pedagogy by a teaching battery that is prepared to teach what is required to close the achievement gap. ELLs require the necessary spaces to learn not only in the classroom but also in the entire school (Espinosa, 1985; Jimenez-Castellanos, 2008). ELLs require individualization and movement away from treating them as a monolithic/monochromatic group. Research has yet to ask how ELL groups are different and what the salient intricacies of ELL groups coming from different countries might be, particularly within regions in a country. Finally, the entire education system requires a re-evaluation on the outlook of ELLs and the additive principles built from stereotypes that have existed since antebellum.

It is up to the research policy community to determine what resources ELLs require now and will require as time passes. With litigation still pending (e.g., *Martinez v. New Mexico*; *DJ v. California*) it is imperative that researchers begin developing targeted research for ELLs that provide a base for sound decision making in the courts. ELLs enter the public compulsory education system with a plethora of linguistic and cultural resources, yet are left to languish within the system with few advocates interested in improving the outcomes of ELLs. Without the necessary research to support increases in ELL funding, a change in ELL funding utility, or a re-evaluation of the structures hindering ELLs in compulsory education, this group of students may continue to fall behind.

CHAPTER 3

METHODOLOGY

Traditionally, school finance research examines the differences in resource allocation across a state or district, and the impact of property tax revenue generation on resource allocations (Berne & Stiefel, 1984; Houck, 2010). In addition, school finance researchers investigate the relationship between property tax revenue generation, socio-demography (e.g., race, class, socio-economic status), and school resource variation (Berne & Stiefel, 1994; DeAngelis, Presley, & White, 2005; Duncombe & Yinger, 2006). Ultimately researchers attempt to correlate student learning with varying types of school resources, revenue generated, or expenditure per-pupil (Carr, Gray, & Holley, 2007; Thomas B. Fordham Foundation, 2008), and variation in teaching battery (e.g., salary, sorting, experience, credentialing) (Owens & Maiden, 1999; Rubenstein, Schwartz, Stiefel, & Amor, 2007) to search for the combination of school level resources that can close the persistent achievement gap that exists in the United States.

In this dissertation, I utilize two main methodological approaches to answer the research questions. To answer the first question (What are the salient revenue and expenditure patterns of horizontal equity that exist across Arizona's local educational agencies?), I use descriptive analysis with measures of horizontal equity including range, Gini ratio, the coefficient of variation, McCloone index, and Theil index of wealth disparity. To answer the second question (How does the proportion of English language learners impact the distribution of resources across districts?), I make use of non-linear estimation to examine the relationship of specific revenue and expenditure categories as a function of the proportion of ELLs within a district.

Data

The data for this dissertation were collected from publically available sources including the Arizona Department of Education and the United States Department of Education National Center for Educational Statistics Common Core of Data. The entire data set spans 2006-2015 school years and includes 1.12 million district level observations for 500 measures and outcomes. The data were merged, compiled, cleaned, coded, and analyzed using *Excel v14.0*, *SPSS v22.0*, *Stata v15.1*, *RStudio v1.0.153*, and *R v3.3.3*.

First, that data were checked for outliers. Of the 1.12 million individual cases of data, after imposing restrictions, 4633 total cases of fiscal and demographic data across the ten-year sample, were deleted due to extreme deviation from the mean. The bounding limits for deviation were set to the upper limits of the 95% confidence interval. The analytic sample includes only traditional K-8 local education agencies (LEA) in Arizona for years 2006, 2009, 2012, and 2015. For the purpose of my main analysis I restricted the sample to 408,000 total observations at the district level; 102,500 in 2006, 102,000 in 2009, 102,000 in 2012, and 101,500 in 2015.

These years were isolated as they correspond to some of Arizona's most important legislation involving ELLs. The passage of HB 2064 (2006) as an ELL learning reform measure would lead to achievement growth demonstrated by 2009, this potentially could have led to learning outcomes improvements from 2006 to 2009 in those districts with higher proportions of ELL students. HB 2064 also raised the ELL per student funding allowance from \$355 to \$462 leading to a formal increase in student spending. The passage of SB 1096 (2008) would potentially increase state level funding

in those districts with higher proportions of ELLs when comparing 2006 to 2009 and 2012. The passage of HB 2010 (2010) increase the ELL weight to 11.5% and thus would create further increases in per-pupil revenue availability in those districts with higher proportions of ELLs. Independent, private, and charter LEAs were excluded in this analysis, and are not captured in the main database as they are often small sample local educational agencies, structurally incongruous, and would not be comparable with the traditional LEAs. Table B1 (Appendix B) provides an overview of those key variables of interest isolated and analyzed in this dissertation partially derived from Martinez, Begay and Jimenez-Castellanos (*forthcoming*).

Analysis

Horizontal equity. School finance research has employed descriptive and horizontal equity analysis in order to determine differences in resource allocation across districts and how these resource differences affect achievement (Baker & Green, 2009; Berne & Stiefel, 1994; Clotfelter, Ladd, & Vigdor, 2005; Ginsberg, Moskowitz, & Rosenthal, 1981). The following measures of horizontal equity are commonly used in descriptive analysis of school finance:

1. Range analysis, the differences between the smallest and largest value of the variable of interest in a distribution (Berne & Stiefel, 1984). If the difference between the largest and smallest value in a range is large, and the more variance exists in education funding, the less equitable.
2. The McLoone Index where $MI = \frac{\Sigma(\text{values below median})}{(\text{median} * \text{number of values below median})}$, divides the sum of all observations below the median, by the median multiplied by the number of observations below

median. A McLoone index ranges in value from 0 to 1 and as the index approaches 1, there is more equity (Berne & Stiefel, 1984; Iatarola & Stiefel, 2003; Rubenstein, 1998).

3. The Gini ratio is best understood with the use of the Lorenz curve and is equal to twice the area enclosed between the Lorenz curve and the equality diagonal. If there is perfect equality, the Gini ratio is equal to zero, and the Lorenz curve is equal to the equality diagonal (Berne & Stiefel, 1984; Burke, 1999).
4. The Coefficient of Variation $C_v = \sigma/\mu$, is a distribution's standard deviation divided by its mean (Betts, Rueben, & Danenberg, 2000; DeAngelis, Presley, & White, 2005; Odden & Picus, 2008). A coefficient of variation much like a McLoone index varies from 0 to 1 with 0 indicating perfect equity.
5. The Theil Index of Economic Inequality as calculated, measures income inequality distance where the higher the index coefficient, the more inequality that measure contains (Theil, 1967). Prototypically the equation for Theil takes the following form:

$$I_{\text{Theil}}(F) := \int \frac{x}{\mu(F)} \log\left(\frac{x}{\mu(F)}\right) dF(x)$$

Non-linear analysis. In order to answer the second research question, I use a non-linear analysis (quantile regression) of the relationship among revenues, expenditures, and share of ELLs. One of the major challenges with attempting to estimate changes in fiscal capacity, as ELL proportion changes, is the extreme high versus low percentage of ELLs in any given district. Non-linear analysis is robust against significant deviations from the mean, as it estimates the dependent variable based on the proportionality of the

independent variables within the quantile. Quantile analysis allows me to compare the effect of ELL proportionality on fiscal per pupil as the proportion of ELLs grows. I fit the following model for the 10th, 20th, 30th, 40th, 50th, 60th, 70th, 80th, and 90th percentile:

$$(1) \text{ Fiscal Capacity } PP_{ij} = \beta_{0ij} + \beta_1 ELL_{ij} + \varepsilon_{ij}$$

where:

Fiscal Capacity PP_{ij} = revenue or expenditure variable per pupil
for district i in year j

$\beta_1 ELL_{ij}$ = percentage of ELLs for district i in year j

Because ELL proportionality is extreme across districts, and the analysis is district level data, I explore the distributional changes of ELLs for deciles to measure gaps from extreme low ELL percentage districts, to extreme high percentage ELL districts.

CHAPTER 4

RESULTS

In chapter four, I describe the results of the analysis including information regarding district level demographics, achievement, and revenue and expenditures among Arizona's traditional public Elementary and Unified school districts. The data include per-pupil revenue and expenditure, student demographics, Arizona Instrument to Measure Standards (AIMS) or AZMerit scores, property value, tax information, and median household income, for 2006, 2009, 2012, and 2015. Overall, the descriptive findings presented demonstrate that funding in Arizona contains nuance beyond aggregate revenue and expenditure differences. There is considerable variation in dispersion across districts. For this reason, a horizontal equity analysis (i.e., Gini Ratio, McLoone Index, Coefficient of Variation, Theil Index of Economic Inequality) was performed on the revenue and expenditure variables of interest, helping to locate which resources have the greatest amount of inequity. The variables with the greatest horizontal inequity are then further investigated with the use of quantile regression, helping to identify the direction, size, and strength of the relationships between resources and shares of ELLs (the district level population of interest), and an instrumental variables model in order to measure how the fiscal variables with the greatest amount of inequity in the sample affect achievement as measured by AIMS and AZMerit.

Descriptive Statistics

Student demographics. Table A4 (Appendix A) shows the overview of Arizona's Non-Charter Elementary and Unified school districts' student composition. The Arizona sample consists of 205 districts in 2006, 204 in both 2009 and 2012, and 203

districts in 2015. Mean total student enrollment per district is stable across the sample with approximately 4100 students in 2006-2009-2015, although there is a slight increase in 2009 to 4300 students. Table A4 also illustrates a large standard deviation for total enrollment, this is expected considering schools' locale of Arizona. Due to population spread, some areas of Arizona will have large populations, thus increasing the number of students per district (e.g., Maricopa County). These large deviations from the mean are demonstrated across most variables in the sample due to the nature of Arizona's population clustering. In order to address those challenges here, the fiscal variables are presented as those amounts per-pupil, and the population variables are presented as not only mean aggregates across districts, but also mean aggregate percentages of population groups across districts.

Arizona's school districts are predominantly comprised of Caucasian and Latino students. The demographic composition remains stable over the years of analysis. The mean percentage of Caucasian students per district has seen a decrease of 8% from 2006 (45%) to 2015 (37%) with some districts enrolling 100% Caucasian students. The Latino student population across districts has also displayed a slower increase from 2006 (35%) to 2015 (38%), with some districts also enrolling 100% Latino students. Focusing on the population of interest in this study, ELLs, Table A4 shows the ELL population decreasing approximately 11% between 2006 (19%) to 2015 (8%). There are several possibilities for the decrease including diasporic movement due to economic downturns during the recession, Arizona's change of the Primary Home Language Other Than English Home Language Survey (PHLOTE), or the Arizona political landscape, although it is difficult to ascertain from this study why Latino students have displayed

predominantly flat enrollment and ELLs decreasing enrollment (Jimenez-Castellanos et al., 2013). Additionally, the maximum mean percentage of African American students has increased from 2006 (17%) to 2015 (23%). Finally, the percentage of students eligible for the Federal Free and Reduced Lunch Program (FRLP), a marker often used in fiscal analysis as demonstration of district need or poverty, has also decreased from 2006 (61%) to 2015 (54%), although some districts continue to enroll large percentages of eligible students upwards of 95% in 2015.

Achievement. This section presents district achievement as the percentage of students passing 4th and 8th grade English/Reading and Math on the AIMS (2007, 2009, 2012) and AZMerit (2015) exam. AZMERIT was adopted on November 3, 2014 and implemented starting March 30, 2015, replacing AIMS, which was implemented in 2006. The use of 2007 in this sample serves as replacement for 2006, as no AIMS information is publicly available in 2006. Requests for this information were denied by the Arizona Department of Education.

4th and 8th grade reading and English. Table A5 (Appendix A) displays a decrease in 4th grade and 8th grade reading and English percentage passing rate standards after the change to AZMerit by the Arizona Department of Education (AZDE). Prior to the change, Arizona mean 4th grade reading AIMS test passing rate was 69.31% in 2012, with 59.68% passing the 8th grade version. In 2015, the percentage passing rate is 27.22% for 4th grade English AZMerit, and 23.58% for the 8th grade version. The results indicate that overall in Arizona there are fewer students within districts, approximately 36% less, passing the English standards set by the AZDE. It is not possible from the analysis to determine the reasons why there exists a decrease of percent passing. For AIMS the

lowest minimum percentage passing rate for 4th grade AIMs reading occurred in 2007 (13%) while the highest maximum percentage passing rate occurred in 2009 (100%). Additionally, the 8th grade highest mean percentage passing rate occurred in 2009 (100%), with the lowest minimum percentage passing rate occurring in 2007 (17%).

4th and 8th grade math. As with English-reading, Table A5 exhibits a declining percentage passing rate in math between the AIMs and AZMerit exams. For the 2015 administration of the 8th grade AZMerit, percentage passing rate in math was 23.09%, and 28.66% in 4th grade. In both grades the minimum percent passing was 0, meaning there are some districts where no students in those particular districts passed the AZMerit math exam. In 4th grade AIMs math, the highest mean percentage passing was in 2007, at approximately 70%, with a minimum of 13% passing, and a maximum of 100%. In 8th grade AIMs math, the highest mean percentage passing was 57.58% in 2009, with lowest in 2012 at 51.02%. Finally, for 8th grade AIMs math, the lowest minimum was 5.05% and the highest maximum was 96%, both in 2007.

Revenue per pupil. This section provides an overview of the district level revenue allocations per pupil in 2006, 2009, 2012, and 2015 for all revenue sources, federal sources, state sources, local sources, and revenue allocated toward maintenance and operation costs. Table A6 (Appendix A) presents the mean revenue from all sources per pupil has remained flat across the sample years, although there is an increase of \$750.32 from 2006-2015. The range shows that district level revenue from all sources is becoming increasingly disparate with 2012 exhibiting the highest range in revenue from all sources at \$55048.08. The range is the difference between the smallest and the largest values in the distribution and the larger the range, the wider the variation in funding in

the system. In 2012, the minimum per pupil revenue allocation from all sources was \$5292.42 and the maximum was \$60340.50.

When examining revenue from federal resources the mean per pupil allocation is also flat with 2012 representing the highest mean per pupil federal revenue allocation year at \$2088.08. The most dispersive year in federal revenue per pupil allocations was in 2015 with a range of \$9373.64; minimum per pupil revenue allocation of \$0.00 and a maximum of \$9373.64. Arizona districts have seen a decrease in the amount of per pupil funding stemming from state allocated revenue sources decreasing the proportionality of total revenue stemming from state sources. In 2006, the mean per pupil state allocation was \$4598.61, while in 2015 it was \$3609.05. The lowest mean per pupil state revenue allocation was 2012 at \$3449.86. The state has exhibited decreases in state revenue per pupil dispersion from a min/max difference of \$14747.73 in 2009 to \$10968.32 in 2015.

Table A6 displays the mean per pupil revenue allocation from local sources increasing from 2006 (\$4199.61) to 2015 (\$4933.11), with the highest local revenue per pupil allocation in 2012 (\$5154.59). The maximum range difference occurred in 2012 (\$22821.68), with the minimum range difference occurring in 2009 (\$20265.86). Additionally, 2012 also had the highest maximum per pupil local revenue allocation of \$21960.58. The per-pupil analysis indicates local revenue sources are making up increasing amounts of the per pupil revenue allocations toward districts. Figure C1 shows that in aggregate the assumption raised in the per-pupil local analysis is correct, local revenue per pupil is an increasing percent of total revenue per pupil. In 2006, revenue from local sources accounted for 38% of the total revenue per pupil allocation, while state sources accounted for 46%. In 2015, this relationship flipped with local sources

making up 46% of the total revenue allocation toward districts while state sources made up 38%. When examining revenue designated for maintenance and operations (MO) costs per pupil, Table A6 illustrates the highest maximum MO per pupil allocation in 2009 at \$34034.00; 2009 also represents the highest range difference of \$30774.38, and lowest minimum of \$3259.62. Mean sources allocated for MO are highest in 2009 (\$7985.91) and lowest in 2006 (\$7071.85), with a mean MO revenue allocation increase from 2006-2015 of \$250.59.

Expenditure per pupil. This section provides an overview of the district level expenditures per pupil in 2006, 2009, 2012, and 2015 for total expenditures, MO expenditures, classroom instructional expenditures, and ELL expenditures per ELL pupil. Table A7 (Appendix A) shows mean expenditures increased from 2006 (\$8436.46) to 2015 (\$9760.13) by approximately \$1323.67.

The total expenditure per pupil maximum difference between 2006 (\$25599.60) and 2015 (37042.33) is \$11742.43. It is important to highlight this difference as a maximum difference, and not a true range difference, due to the district reported minimums across the sample years. It is improbable that any district expended \$0.00 per pupil, although it is reported as such in the publicly available data. In whole, total expenditures are increasing, although the increase is moderate at best.

Table A7 shows that MO expenditures per pupil fluctuated but overall increased from 2006 (\$7104.67) to 2015 (\$7517.51). In 2009, Arizona school districts expended the highest mean amount (\$8122.69) on MO costs. Further, 2009 also had the highest minimum MO expenditure amount at \$4411.61. Range differences have fluctuated as well, with 2006 exhibiting the highest range difference (\$26116.86), while 2012 had the

lowest (\$23156.82). Classroom instructional (CIE) expenditures per pupil have remained flat across all years of the sample. In 2009 CIE mean expenditures were highest at \$5003.43. Between 2006 and 2015, CIE increased by \$69.49 and the maximum range difference was \$1658.72. Arizona decreased CIE from 2009 to 2015 by \$452.56. As with total expenditures per pupil, it is improbable that any district expended \$0.00 on classroom instruction although the district minimums across all years are reported as \$0.00.

Also highlighted in Table A7 is the descriptive analysis for ELL expenditures per ELL pupil. The sample across all years for ELL expenditures per ELL pupil is smaller than the sample for the other expenditure categories. This is due to the nature of ELL funding in Arizona and how districts report expenditures from the school level up to the local LEA and to the state governing agency (AZDE). There are also some districts who reported having 0 ELLs overall, thus these districts were stricken from analysis. ELL expenditures per ELL pupil increased by \$362.85 from 2006 (\$555.68) to 2015 (918.53). There was a slight decrease of \$119.39 from 2012 (\$1037.92) to 2015 (918.53). The highest maximum expenditure in the variable also occurred in 2012 (\$4625.58), with the lowest minimum at \$0.18 and the highest sample size at 89 districts.

Property value and tax rate. Table A8 (Appendix A) displays property value, tax rate, and median income. The primary assessed valuation, limited property value, is used to calculate the maintenance and operation budget of School Districts, while the secondary assessed valuation, full cash value, is used to calculate the tax for bonds, budget overrides, and special districts (Arizona Department of Revenue, 2018). Primary value on property decreased from 2012 (\$2.28M) to 2015 (\$1.99M). The highest

maximum property value was 2012 (\$2.28B). Tax rates remained almost flat throughout the sample years increasing a total of 0.12% from 2006 to 2015. In 2009 and 2012, these tax rates decreased. The tax rate decreases are due to several legislative Tax Foundation State-Local Tax Burden cuts proposed by the varying administrations through the sample years (Rex, 2016). The highest maximum primary tax rate is 14.33% in 2006 but decreased to 2.23 from 2006 to 2015, while the minimum has remained flat.

Secondary value on property exhibited the same patterns of increase and decrease. The largest mean secondary property value is 2012 (\$2.37M), while the lowest is 2006 (\$1.78M). The highest maximum secondary property value is 2009 (\$2.48B), with the lowest maximum being 2015 (\$2.24B). Examining the minimums, Table A8 illustrates the minimum secondary tax value increasing from \$226,530 in 2006, to \$533,839 in 2015. The secondary mean tax rate was almost identical in 2006 (1.49%) and 2015 (1.48%). The secondary mean tax rate was lowest in 2009 (1.12). In 2006 and 2015, the maximum secondary tax rates were identical at 3.31, while the minimums differed 0.23% in 2006 and 0.11% in 2015.

Median household income increase from 2006 (\$41894.16) to 2015 (\$46653.56). Adjusting the median household income by the Bureau of Labor Statistics consumer price index, one would expect median household income to equal approximately \$49254.11, a difference of \$7359.95 over the nine years of analysis. Between 2006 and 2015, the median household income increased by \$4759.40.

District high-low total revenue per pupil. Table A9 (Appendix A) highlights the descriptive information of the high-low total revenue and expenditure per pupil in districts in Arizona for 2006, 2009, 2012, and 2015.

2006 high. The district with the highest total revenue per pupil allocation had a total population of $n=275$ and median household income of \$52522.00. The total number of students in this district was $n=43$, approximately 949 students lower than the median, $M=992$. This district had a total 5 to 17 year-old population of $n=19$, and a 5 to 17 year-old poverty rate of 22.62%. This district's total revenue per-pupil allocation was \$24204.84. The geographic area is rural and is in the southwestern part of the state. The district has one school, serving one single community. The student demographic population of this district was reported as 100% Latino, 88% of whom qualify for free and reduced lunch.

2006 low. The district with the lowest total revenue per pupil allocation had a total population of $n=19766$ and median household income of \$39669.00. The total number of students in this district was $n=1941$, approximately 1000 students above the median, $M=992$. This district had a total 5 to 17 year-old population of $n=2516$, and a 5 to 17 year-old poverty rate of 17.05%. This district's total revenue per-pupil allocation was \$5893.28. The geographic area is rural and is in the western-most part of the state bordering Nevada and California. The student demographic population of this district was 69% Caucasian, 20% Latino, 2% African American, and 8% Native American. As of 2017, the district has 3 schools according to the National Center for Education Statistics.

2009 high. The district with the highest total revenue per pupil allocation in 2009 had a total population of $n=141$ and median household income of \$43786.00. The district's total number of students was $n=6$, 1056 students less than the median, $M=1062$. This district had a total 5 to 17 year-old population of $n=10$, and a 5 to 17 year-old poverty rate of 20.00%. This district's total revenue per-pupil allocation was \$40749.83.

The geographic area is rural and is in the south-eastern corner of the state. For 2009, the district was 50% Caucasian, 33% Latino, and 17% Native American.

2009 low. The district with the lowest total revenue per pupil allocation in 2009 had a total population of $n=5074$ and median household income of \$40837. The district's total number of students was $n=39$, 1023 students less than the median, $M=1062$. This district had a total 5 to 17 year-old population of $n=188$, and a 5 to 17 year-old poverty rate of 21.24%. This district's total revenue per-pupil allocation was \$6229.74. The geographic area is rural and is in the west-central part of the state. The district is described as a bussing district that transports students from the nearest most town to the school district. For 2009, this district did not report a disaggregated racial student profile. As of 2017, the district has one school according to the National Center for Education Statistics.

2012 high. The district with the highest total revenue per pupil allocation in 2012 had a total population of $n=175$ and median household income of \$43397. The district's total number of students was $n=2$, 972 students less than the median, $M=974$. This district had a total 5 to 17 year-old population of $n=15$, and a 5 to 17 year-old poverty rate of 33.33%. This district's total revenue per-pupil allocation was \$60340.50. The geographic area is rural and serves one single town situated in the central part of the state. The student demographic population of this district was two students total, both Caucasian.

2012 low. The district with the lowest total revenue per pupil allocation in 2012 had a total population of $n=7455$ and median household income of \$41080. The district's total number of students was $n=1528$, 554 students less than the median, $M=974$. This district had a total 5 to 17 year-old population of $n=1460$, and a 5 to 17 year-old poverty

rate of 21.23%. This district's total revenue per-pupil allocation was \$5292.42. The geographic area is rural and serves one single town situated in the Upper Gila River Valley. The district is described as a bussing district that transports students from the nearest most town to the school district. For 2012, this district did not report a disaggregated racial student profile. The current? student demographic population of this district is 76% Caucasian, 20% Latino, 1% African American, and 1% Native American. As of 2017, the district had 4 schools according to the National Center for Education Statistics.

2015 high. The district with the highest total revenue per pupil allocation in 2015 had a total population of $n=329$ and median household income of \$56017.00. The district's total number of students was $n=116$, 848 students less than the median, $M=964$. This district had a total 5 to 17 year-old population of $n=85$, and a 5 to 17 year-old poverty rate of 49.41%. This district's total revenue per-pupil allocation is \$36792.15. The geographic area is rural and is in the southwestern part of the state. The district has one school, serving one single community. The student demographic population of this district was reported as 100% Latino, 88% of whom qualify for Free and Reduced lunch.

2015 low. The district with the lowest total revenue per pupil allocation in 2015 had a total population of $n=462$ and median household income of \$47107. The district's total number of students was $n=14$, 950 students less than the median, $M=964$. This district had a total 5 to 17 year-old population of $n=69$, and a 5 to 17 year-old poverty rate of 13.04%. This district's total revenue per-pupil allocation was \$3788.21. The geographic area is rural and located in the southern part of Arizona, bordering Mexico. The district itself belongs to a county level school district administration organization

consisting of $n=18$ total single school, single building, districts. For 2015, this district did not report a disaggregated racial student profile. As of 2017, the district had zero schools according to the National Center for Education Statistics.

District high-low total expenditures per pupil. 2006 high. The district with the highest per pupil total expenditure had a total population of $n=169$ and median household income of \$40923. The total number of students in this district was $n=5$, approximately 987 students below the 2006 median, $M=992$. This district had a total 5 to 17 year-old population of $n=14$, and a 5 to 17 year-old poverty rate of 14.29%. This district's total expenditure per-pupil was \$25599.60. The geographic area is rural and serves one single town situated in the central part of the state. The district had a total of 5 students, 100% Caucasian.

2006 low. The district with the lowest per pupil total expenditure had a total population of $n=4262$ and median household income of \$40923.00. The total number of students in this district was $n=327$, approximately 665 students below the 2006 median, $M=992$. This district had a total 5 to 17 year-old population of $n=566$, and a 5 to 17 year-old poverty rate of 14.13%. This district's total expenditure per-pupil was \$4066.75. The geographic area is rural and is in the north-central part of the state. The student demographic population of this district was 68% Caucasian, 25% Latino, 2% African American, and 5% Native American. As of 2017, the district has 1 school according to the National Center for Education Statistics.

2009 high. The district with the highest per pupil total expenditure in 2009 had a total population of $n=141$ and median household income of \$43786.00. The district's total number of students was $n=6$, 1056 students less than the median, $M=1062$. This

district had a total 5 to 17 year-old population of $n=10$, and a 5 to 17 year-old poverty rate of 20.00%. This district's total expenditure per-pupil was \$33619.33. The geographic area is rural and is in the south-eastern corner of the state. For 2009, the district was 50% Caucasian, 33% Latino, and 17% Native American.

2009 low. The district with the lowest per pupil total expenditure in 2009 had a total population of $n=3873$ and median household income of \$43786.00. The district's total number of students was $n=474$, 588 students less than the median, $M=1062$. This district had a total 5 to 17 year-old population of $n=577$, and a 5 to 17 year-old poverty rate of 14.21%. This district's total expenditure per-pupil was \$5183.77. The geographic area is rural and is in the south-western part of the state, serving the San Pedro Valley. The district was 93% Caucasian and 7% Latino. As of 2017, the district has two schools according to the National Center for Education Statistics.

2012 high. The district with the highest per pupil total expenditure in 2012 had a total population of $n=128$ and median household income of \$51442.00. The district's total number of students was $n=27$, 947 students less than the median, $M=974$. This district had a total 5 to 17 year-old population of $n=24$, and a 5 to 17 year-old poverty rate of 54.17%. This district's total expenditure per-pupil was \$30072.63. The geographic area is ex-urban (i.e., adjacent to an urban/suburban region). This district enrolled 30% Caucasian, 59% Latino, and 7% African American students and serves one total school.

2012 low. The district with the lowest per pupil total expenditure in 2012 had a total population of $n=48748$ and median household income of \$50362.00. The district's total number of students was $n=10,661$, 9,687 students more than the 2012 median, $M=974$. This district had a total 5 to 17 year-old population of $n=1421$, and a 5 to 17

year-old poverty rate of 13.33%. This district's total expenditure per-pupil was \$4965.25. The geographic area is suburban and is a unified district serving six elementary schools, two middle schools, and one high school. The student demographic population of this district was 41% Caucasian, 35% Latino, 12% African American, and 7% Native American.

2015 high. The district with the highest per pupil total expenditure in 2015 had a total population of $n=160$ and median household income of \$43451.00. The district's total number of students was $n=6,958$ students less than the 2015 median, $M=964$. This district had a total 5 to 17 year-old population of $n=22$, and a 5 to 17 year-old poverty rate of 40.91%. This district's total expenditure per-pupil was \$37042.33. The geographic area is rural and is in the west-central part of the state. The district is described as a bussing district that transports students from the nearest most town to the school district. For 2015, this district did not report a disaggregated racial student profile. As of 2017, the district has one school according to the National Center for Education Statistics.

2015 low. The district with the lowest per pupil total expenditure in 2015 had a total population of $n=462$ and median household income of \$47107.00. The district's total number of students was $n=14,950$ students less than the median, $M=964$. This district had a total 5 to 17 year-old population of $n=69$, and a 5 to 17 year-old poverty rate of 13.04%. This district's total expenditure per-pupil was \$684.71. The geographic area is rural and located in the southern part of Arizona, bordering Mexico. The district itself belongs to a county level school district administration organization consisting of $n=18$ total single school, single building, districts. For 2015, this district did not report a

disaggregated racial student profile. As of 2017, the district had zero schools according to the National Center for Education Statistics.

Horizontal Equity

The descriptive analysis presented earlier is useful in providing an overview of Arizona's traditional public schools' LEA fiscal and demographic profile, but does not allow for understanding the extent of fiscal equity across districts. The most basic approach to determining equity, as described in Chapter 2, is to use of horizontal equity measures. This horizontal equity analysis includes four measures of economic inequality: coefficient of variation (CV), McLoone index, Gini ratio, and Theil's index. The evaluation of this horizontal analysis conforms to standards proposed by Odden and Picus (2008).

The first measure to look at is the coefficient of variation (CV). The standard for the CV is less than or equal to 0.10, a coefficient of variation of zero (0) indicates perfect horizontal equity and lower CV values indicating fiscal capacity is close to the mean, while larger CV values indicate greater amounts of dispersion. The standard for the McLoone Index is greater than or equal to 0.95, a McLoone Index value of one (1) indicates perfect horizontal equity with districts often falling between 0.70 and 0.90 (Odden & Picus, 2008). The standard for the Gini ratio is less than or equal to 0.05, a Gini ratio value of zero (0) indicates perfect horizontal equity.

This analysis also includes a Theil's Index statistic. The rationale for conducting a Theil Index is due to the flexibility of Theil's equation structure and its ability to provide a robust marker of equity against the function of publicly accessible data. The type of data used for analysis originate at sources that may include input errors or incomplete

cases. Robust data sets free of error respond well to measurement through a coefficient of variation or Gini Ratio. However, these inequality measures require methodology that can respond to data driven anomalies. Therefore, using Theil Index in conjunction with other horizontal equity measures provides a practical approach for horizontal equity analysis. For the Theil index there is no standard cut value to denote inequality, however, Theil is used to comparatively identify which per pupil fiscal variables contain greater inequality in comparison to each other. The higher the Theil Index score, the greater the inequality.

Horizontal equity requires that districts have access to comparable resources, regardless of socio-demography (Clotfelter, Ladd, & Vigdor, 2007; Iatarola & Stiefel, 2003). This approach treats all need groups (i.e., states, districts, schools, students) equally, an equal treatment of equals, and does not take into account those differences in need or cost of service. Thus, the horizontal analysis serves to identify which fiscal variables are least equitably distributed across Arizona's traditional public-school districts answering research question one (What are the salient revenue and expenditure patterns of horizontal equity across Arizona's local educational agencies?).

Revenue per pupil. Gini ratio (GR). Table A10 (Appendix A) shows the horizontal equity analysis metrics for total, federal, state, local, and MO revenue per pupil. Table A10 illustrates that across all years and all five revenue per pupil funding variables, there exists horizontal inequity that surpasses the standards proposed by Odden and Picus (2008). The total revenue per pupil GR in 2006 is closer to the 0.05 standard but still at $GR_{2006}=0.19$ displays a great deal of inequity. Total revenue per pupil inequity is greatest in 2012 at $GR_{2012}=0.95$. The two least inequitable funding variables are MO

and state revenue per pupil with 2006 representing the lowest GR in across year, State ($GR_{2006}=0.23$) and MO ($GR_{2006}=0.24$). The two variables with the greatest amount of inequity, as measure by GR, are local and federal revenue per pupil. Local revenue per pupil inequity is flat across the years of analysis with the highest level of inequity in 2006 ($GR_{2006}=0.45$). Federal revenue per pupil inequity is also flat across all years with the highest level of inequity in 2009 ($GR_{2009}=0.50$). Thus far the Gini ratio indicates that local and federal revenue per pupil display the greatest amount of inequity.

McLoone index. Local revenue per pupil has a minimum MI of $MI_{2009}=0.60$ in 2009, an index 0.35 lower than the standard indicated by Odden and Picus (2008). Federal revenue, while closer to the 0.95 standard of $MI_{2006}=0.66$, is still 0.29 lower than the equity standard. Total revenue $MI_{2006}=0.86$ and MO revenue $MI_{2015}=0.87$ are the most equitable fiscal variables and years. Table A10 shows that State revenue per pupil is also horizontally inequitable across years, although to a lower extreme than federal or local. The state revenue per pupil MI for 2006 and 2009 are equal at $MI_{2006\&2009}=0.71$, as are the 2012 and 2015 at $MI_{2012\&2015}=0.63$. Similar to the Gini ratio, the McLoone index indicates that local and federal revenue per pupil shows the greatest amount of inequity. The Coefficient of Variation (CV) and Theil Index will help further solidify the extent of inequity contained in federal and local revenue per pupil.

Coefficient of variation. Once again, local and federal revenue per pupil are the most inequitable fiscal sources. Across all years and variables, the CV is outside of the standard, but the greatest inequity is contained in these two variables. Examining local revenue per pupil the greatest inequity occurred in 2006 ($CV_{2006}=0.91$), with no year coming near the 0.00 indication of perfect equity, or the 0.10 standard. Federal revenue

displays greater amounts of inequity peaking in 2009 ($CV_{2009}=1.17$). Total, state, and MO revenue per pupil display inequity as well, with the greatest total inequity occurring in 2015 ($CV_{2015}=0.52$), the greatest state inequity occurring in 2012 ($CV_{2012}=0.52$), and the greatest MO inequity occurring in 2009 and 2012 ($CV_{2009\&2012}=0.58$). Finally, the CV for federal revenue exceeds 1.00 in both 2006 and 2009. This indicates a standard deviation greater than the mean. As explained earlier, sparsity in some areas of Arizona indicate larger than optimal standard deviations which impact the CV as the calculation relies on the standard deviation; $CV = (\text{Standard Deviation } (\sigma) / \text{Mean } (\mu))$.

Theil index. As with the previous measures, Theil's index indicates that federal and local revenue per pupil contain the greatest amount of horizontal inequity. Theil's index for local revenue per pupil in 2006 is $TH_{2006}=0.34$ and in 2015 is $TH_{2015}=0.32$. For local revenue per pupil, these two years contain the greatest amount of inequity. The greatest amount of inequity in federal revenue per pupil is in 2006 ($TH_{2006}=0.36$) and 2009 ($TH_{2009}=0.45$) the highest across the sample. Theil's index is lowest for total revenue per pupil at $TH_{2006}=0.06$. From the revenue per pupil horizontal equity analysis, it is clear that local and federal revenue per pupil display the greatest amount of inequity across the sample and across years. The next step is to determine which expenditure measures per pupil contain the greatest amount of horizontal inequity.

Expenditures per pupil. Gini ratio (GR). Table A11 (Appendix A) displays the horizontal equity analysis metrics for total, MO, classroom instructional, and ELL expenditures per pupil. Table A11, as with the revenue analysis, shows that across all years, and all four expenditure per pupil funding variables there exists horizontal inequity surpassing the standards proposed by Odden and Picus (2008). The total expenditure per

pupil GR remains flat above 0.20 in all years, four times the 0.05 standard. Total expenditure per pupil are most equitable in 2009 ($GR_{2009}=0.21$). MO expenditures per pupil remain flat across the sample years as well, with the greatest inequity again displayed in 2006 ($GR_{2006}=0.25$). Classroom instructional expenditures are most equitably distributed overall, with all years still well above the 0.05 standard. The lowest GR across the sample is classroom instructional expenditures in 2009 ($GR_{2009}=0.18$). ELL Expenditures per ELL pupil displays the greatest amount of inequity ranging from $GR_{2009}=0.51$ to $GR_{2012}=0.61$. Thus far the GR analysis indicates that total expenditures, MO, and classroom instructional expenditures are similarly inequitable, ranging from $GR_{2009}=0.18$ to $GR_{2006}=0.25$. ELL expenditures are by far the least equitably distributed expenditures, although this is a function of district level ELL dispersion with ELL students predominantly residing in areas of Arizona with greater amounts of urbanity.

McLoone index. The total expenditure per pupil MI remains flat above 0.80 in all years for total, MO, and classroom instructional expenditures per pupil, and ranges from $MI_{2006}=0.51$ to $MI_{2012}=0.35$ for ELL expenditures per ELL pupil. Total expenditures per pupil are most equitable in 2009 ($MI_{2009}=0.85$). MO expenditures per pupil remain flat across the sample years as well, with the greatest horizontal equity displayed in 2012 and 2015 ($MI_{2012\&2015}=0.88$). The highest MI across the sample is classroom instructional expenditures 2006 and 2009 ($MI_{2006\&2009}=0.87$). Once again, ELL Expenditures per ELL pupil displays the greatest amount of inequity ranging from $MI_{2012}=0.35$ to $GR_{2009}=0.51$. Thus far the MI analysis, like the GR analysis, indicates total, MO, and classroom instructional expenditures are similarly inequitable, while ELL expenditures are by far the least equitably distributed expenditures.

Coefficient of variation. The expenditure per pupil CV, once again, remains flat above 0.30 in all years for total, MO, and classroom instructional expenditures per pupil, and ranges from $CV_{2006}=1.08$ to $CV_{2012}=1.22$ for ELL expenditures per ELL pupil. ELL expenditures per ELL pupil displays the greatest amount of inequity with the lowest CV in 2009 ($CV_{2009}=1.04$). Classroom instructional expenditures per pupil are most equitably distributed, still well above the standard. The lowest CV is classroom instructional expenditures ($CV_{2009}=0.38$). MO expenditures per pupil remain flat across the sample years, with the greatest horizontal equity displayed in 2009 and 2015 ($CV_{2012\&2015}=0.52$). Finally, inequity within total expenditures per pupil has increased from $CV_{2006}=0.47$ to $CV_{2015}=0.49$.

Theil index. As with the four previous measures, Theil's index indicates ELL expenditures per ELL pupil displays the greatest amount of horizontal inequity. Theil's index for ELL expenditures per ELL pupil ranges from $TH_{2009}=0.45$ to $TH_{2012}=0.65$. The other expenditure variables remain flat, with classroom instructional expenditures containing the lowest horizontal inequity ($TH_{2009}=0.06$). The greatest amount of inequity in federal revenue per pupil is 2006 ($TH_{2006}=0.36$) and 2009 ($TH_{2009}=0.45$) the highest across the sample. Theil's index is lowest for total revenue per pupil ($TH_{2006}=0.06$). From the revenue per pupil horizontal equity analysis, it is clear that local and federal revenue per pupil display the greatest amount of inequity across the sample and across years. The next step is to determine which expenditure measures per pupil contain the greatest amount of horizontal inequity. Theil's index indicates a slightly elevated MO expenditure per pupil inequity, at a maximum $TH_{2012}=0.12$. This is slightly higher than the total

expenditure per pupil maximum of $TH_{2012\&2015}=0.09$ or classroom instructional expenditures per pupil maximum of $TH_{2006\&2012}=0.08$.

Conclusion. The fiscal data show that horizontal inequity exists in Arizona across its districts. The results indicate that inequity exists across all years, and all variables, in the sample, surpassing the standards proposed by Odden and Picus (2008). Ultimately, local and federal revenue per pupil displayed a greater degree of horizontal inequity than state, maintenance and operation, or total revenue per pupil. Federal funding inequity can exist as greater amounts of federal funding will go toward districts with greater need or a greater proportion of specific subsets of students. One example of supplemental federal funding allocated for specific needs are Title I funds, those funds allocated toward schools with high numbers or high percentages of children from low-income families. Another example of funding allocated to districts from federal sources are Johnson-O'Malley program funds. These funds are provided in Part 273 of Title 25 of the Code of Federal Regulations and authorize contracts for the education of eligible Indian students enrolled in public schools. Finally, federal Title III funds, authorize federal funding toward English-language-acquisition programs. Thus, a district may see their share of federal funds increase dramatically, as the proportion of students suitable to receive federal funding increases.

Figure C2 presents the relationships of federal revenue per pupil and students qualifying for the federal free and reduced lunch program for years 2006-2016. C2 shows a positive linear relationship between federal revenue per pupil and students qualifying for the federal free and reduced lunch program. Figure C3 presents the relationship of federal revenue per pupil and median household income. C3 shows an inverse

relationship between those districts with higher median income households and federal revenue per pupil. Figure C4 displays the relationship between federal revenue per pupil and the percentage of Native American students. C4 shows a positive relationship between Native American students and revenue per pupil. Finally Figure C5 demonstrates a positive linear relationship between ELLs and federal revenue per pupil.

This same pattern of inequity is then expected when examining local revenue per pupil. If federal funds go toward those districts with the greatest need, and those funds are largely distributed across districts, inequitably, then inferentially the expectation would be a significant inequity in local revenue per pupil distribution as well. Figure C6 shows the relationship of federal funding per pupil, and local revenue per pupil. C6 illustrates an inverse linear relationship, thus the presumptive logic holds; the greatest amount of federal funding is allocated to those districts with the greatest local need and horizontal inequity is expected in local revenue per pupil, if there exists federal revenue per pupil inequity. Table A10 shows this relationship as well. Local revenue per pupil displays a greater amount of inequity than MO, state, or total. Thus federal funds are siphoning to poorer districts, those poorer districts likely generating lower revenue from the localized tax base, the levels of revenue inequality in these two revenue variables are similar.

The horizontal equity analysis also suggests that ELL expenditures per ELL pupil have a greater degree of horizontal inequity than, MO, total, and classroom instructional expenditures per pupil. It is difficult to determine why this occurs. MO, total, and classroom instructional expenditures per pupil remained flat across all years across the sample. The descriptive and horizontal equity analyses provide a foundation for

determining which fiscal variables would likely exhibit some amount of significant distributional differences contingent upon the proportion of ELLs within a district. The impact of ELL proportionality on local and federal revenue per pupil, the two least equitable revenue variables, as well as ELL and total expenditures per pupil, are explored further in the next section.

Non-Linear Analysis of the Relationship between Fiscal Variables and Share of ELL Students

The descriptive and horizontal equity findings are an overview of the fiscal and demographic profiles of Arizona's traditional public school districts and the existing inequity across districts. Both analyses provide artifact information necessary to determine what fiscal variables would likely exhibit patterns of fiscal difference, contingent upon student group proportionality. This section attempts to determine if federal revenue, local revenue, total expenditures, or ELL expenditures per pupil, the least equitable fiscal variables, display any statistically significant differences due to the proportion of ELLs in a district.

This analysis employs a non-linear estimation in order to determine if there are statistically significant education funding differences between districts due to ELL proportionality. All school districts are categorized into deciles based on the share of ELL students in the district. Using a non-linear decile analysis helps to control for ELL proportionality bias in the model, making the regression estimates more robust against extreme outlier in the response measurements. Extreme high-low ELL proportionality may bias ordinary least squares regression results, using a non-linear decile analysis allows for an analysis that negates the proportionality bias. The final model controls for

student racial demography, students with an individualized education plan, students eligible for the federal free and reduced lunch program, and median household income. In this manner, a quantile regression provides an opportunity to learn about the nuances of fiscal capacity as a function of ELL student proportionality, thus answering research question two (How does the proportion of English language learners impact the distribution of resources across districts?).

Non-linear analysis results. Table A12 (Appendix A) displays the estimation results for the percentile analysis of fiscal capacity (i.e., federal and local revenue per pupil, total and ELL expenditures per pupil) versus ELL proportionality.

Federal revenue per pupil. As a whole, the percentile analysis indicates federal revenue increases across percentiles as the proportion of ELLs increase. For 2006, the OLS estimation coefficient indicates that as the percentage of ELLs increases by 1% within a district, district federal revenue per pupil capacity increases \$922.81; statistically significant. The 50th (\$418.09), 80th (\$696.90), and 90th (\$1097.22) percentiles all indicate statistically significant increases as the percentage of ELLs increases. In 2009, the OLS estimation coefficient indicates a statistically significant increase of \$720.97 within a district as the percentage of ELLs increases by 1%. For 2009, there exists a greater amount of high-low funding increase difference as ELL percentages increase. For instance, the 60th percentile is \$631.13, but the 80th percentile drops to \$611.39, while the 90th decreases further to \$364.19. The pattern of high-low variation may be due to changes in how funding was allocated in 2009 versus other years. It may also be due to federal recessionary austerity. This analysis is not acute enough to determine why these patterns occur. For 2012, the OLS estimate indicates that as a district's proportion of

ELLs increases by 1%, there is also a statistically significant increase of \$902.61.

Particularly interesting is the significance and magnitude of change across the percentile analysis. Examining only the 90th percentile, there is an increase of \$1458.06 for every 1% increase in the ELL population of a district. In 2015, the OLS estimate indicates large and positive increase in funding as the percentage of ELLs increases (\$557.70); not statistically significant. The 30th (\$279.05), 40th (\$299.30), 50th (\$319.14), and 60th (\$439.54) percentiles all have significantly positive increases in federal revenue per pupil as a district increases its enrollment of ELLs by 1%.

Local revenue per pupil. Unlike federal revenue, local revenue per pupil displays a negative relationship with the percentage of ELLs. For 2006, the OLS estimate indicates that as the proportion of ELLs increase by 1% local revenue will decrease by \$697.39. The 10th (\$499.96), 20th (\$411.73), and 90th (\$2472.54) percentiles all have decreases in revenue as districts increase their ELL enrollment by 1%. The decrease at the 90th percentile is extremely large and negative, meaning the districts that educate the highest number of ELL students will also have the lowest local revenue per pupil allocation. For 2009, the OLS estimate is \$765.65. In 2009, local revenue per pupil continues to decrease across percentiles, although they are not statistically significant with the most significant decrease of \$553.63 at the 80th percentile. The OLS estimate for revenue per pupil in 2012 indicates an increase of \$315.61 as ELL increases by 1%; not statistically significant. Of note, in 2012 is the relative positive direction of the estimates across percentiles. The largest increase in local revenue per pupil is at the 60th percentile (\$964.61). None of the estimates in 2012 are statistically significant. In 2015, for every 1% increase in enrollment, the OLS estimate indicates there is a local revenue per pupil

decrease of \$827.67. None of the non-linear estimates are statistically significant. The largest negative estimate indicates a \$1750.14 decrease in funding for every 1% increase in ELL district enrollment.

Total expenditures per pupil. Total expenditures per pupil show a positive relationship as the percentage of ELLs increase. The OLS estimate in 2006 indicates an increase of \$633.02 for every 1% increase in district ELL enrollment, which is not statistically significant. In 2006, the only significant result is the 10th percentile (\$873.48). In 2009, the estimates continue the positive directionality, but are not statistically significant. The largest increase in 2009 is at the 80th percentile (\$489.55) and smallest is at the 60th percentile (\$191.25). The OLS estimate indicates a non-significant increase of \$214.87 for every 1% increase in ELL district enrollment. In 2012, the OLS estimate indicates an increase of \$1938.85 for every 1% increase in district enrollment. The 20th (\$863.19), 30th (\$883.36), 60th (\$1876.07), 70th (\$2449.35), 80th (\$2656.30), and 90th (\$2709.21) percentiles all have statistically significant increases in total expenditures as the proportion of ELLs increases within a district. In 2015, the OLS estimate shows an increase of 52.57 for every 1% increase in district ELL enrollment. The smallest estimate is the 90th percentile (\$44.86, $b=476.23$) and the largest is the 80th percentile (\$410.86).

ELL expenditures per ELL pupil. ELL expenditures per pupil have a negative relationship with the percentage of ELLs across districts. The OLS estimate in 2006 indicates a decrease of \$200.75 for every 1% increase in district ELL enrollment. In 2006, 10th (\$205.48) and 20th (\$204.20) percentiles display a statistically significant inverse relationship between ELL expenditures and the percent of district ELL enrollment. The largest negative relationship is the 90th percentile \$298.20 decrease. This

result indicates, that as a district enrolls more ELLs they expend less funding designated for the student group; the result was not statistically significant. In 2009, ELL revenue per ELL pupil continues the inverse relationship and lack of statistical significance. The largest negative relationship in 2009 is the 80th percentile (\$525.66) and smallest is the 10th percentile (\$13.35). Further, 2012 displays the same negative relationships. The OLS estimate indicates a decrease of \$544.05 for every 1% increase in ELL district enrollment. The largest decrease in 2012 is the 90th percentile (\$1147.57) and smallest is the 10th percentile (\$136.61). In 2015, the OLS estimate indicates a decrease of \$399.72 for every 1% increase in ELL district enrollment. The largest decrease in 2015 is the 90th percentile (\$987.48).

Conclusion. In summary, the non-linear analysis of the relationship among revenues, expenditures, and share of ELL suggests the percentage of ELL students in a district is associated with the federal and local revenue allocation, albeit not always statistically significant across percentiles. With regard to federal funds, districts that have higher proportions of ELLs, even at the 10th percentile, have increasing proportions of federal funding. As was stated above, this is a reasonably plausible expectation due to the district socio-demography; those districts enrolling higher percentages of ELLs are likely Title I districts and districts with higher percentages of ELLs will also likely receive greater amounts of Title III funds. Title III funds are those funds used to supplement state language instruction educational programs. Title III funds are designed to help ELL students with district achievement metrics. The percentile analysis was useful in determining to what extent federal funds impact total district revenue.

Arizona's resident sparsity, and extreme density, impacted the non-linear analysis. The OLS regression was significant in 2006, 2009, and 2015, but the non-linear analysis suggests that across ELL enrollment densities, the relationship between local revenue and the proportion of ELLs is not as important. Putting aside statistical significance, there exists an inverse relationship between the share of ELL enrollment within a district and local revenue per pupil.

From examining expenditures, the non-linear analysis shows funding designated for ELLs per ELL pupil is not statistically related to the proportion of ELLs. While ELL funding per ELL pupil is negative across all years, and most percentiles, the differences due to proportionality are not significant. When examining the OLS regression, the results show that ELL expenditures per ELL pupil are statistically significant and negative in 2006, 2012, and 2015, with the largest statistically significant relationship occurring in 2012.

Finally, when looking at the relationship between total expenditures and the proportion of ELLs, the results show the proportion of ELLs in a district will impact how much that district spends per pupil. In 2012, the relationships at the 20th, 30th, 70th, 80th, and 90th percentile are all statistically significant. Of note is the lack of statistical significance in 2006, 2009, and 2015. One reason for this effect may be the size of the student group itself. The proportion of ELLs may not be robust enough across districts for statistical modeling to capture significant relationships.

The data presented in the previous sections are useful in determining the distribution of funding and how horizontally equitable this funding is across years and fiscal variables. The percentile analysis allowed me to determine if the proportion of

ELLs was in some way impacting funding at the district level and what, if any, relationships existed between the proportion of ELLs in a district and the amount of funding available or expended toward that district. The final section, discussion, contains a section outlining insights into the relationship between those determinants of available revenue and expenditures (i.e. median household income and property value) and achievement.

CHAPTER 5

DISCUSSION

Student achievement has been a central point of allocation funding literature since the Coleman report with researchers standing on both sides, some believing funding does not affect achievement as much as environmental factors (Hanushek, 1991, 1999, 1997) and others believing that resource allocation does have an effect on student achievement (Baker, 2009; Baker & Green, 2009; Betts, Ruben, & Dannenberg, 2000). Researchers have searched for ways to minimize inequities that exist which indirectly create achievement gaps (Baker & Levin, 2014; Owen, 1972; Rubenstein, Schwartz, Stiefel, & Amor, 2007; Stiefel, Rubenstein, & Berne, 1998; Summers & Wolfe, 1976). Revisiting Tables 2 and 3, it is clear that racially and linguistically diverse students are trailing their Caucasian peers. Ultimately, the school finance scholarship has determined that resource differences between students of color, students in poverty, and their Caucasian middle class peers will negatively impact the achievement gap that exists between middle class Caucasian students and minority Urban poor students. This dissertation continues the debate examining school finance inequality in a fiscally restrictive state that has often treated its marginalized student population with disregard (Gándara & Orfield, 2010; Gándara & Orfield, 2012a; Gándara & Orfield, 2012b; Jimenez-Castellanos et al., 2013).

Arizona's School Finance Inequity

My findings suggest there remains a significant amount of revenue and expenditure horizontal fiscal inequity in Arizona. Moreover, the horizontal equity analysis suggests greater inequity occurs in regard to local and federal revenue generation and ELL expenditures. These results are not incongruent from the current literature as

many of the horizontal inequities found in the literature center on localized inequities shaped by racial and social class stratification (Ball, 1994; Boudon, 1974; Condrón & Roscigno, 2003; Darling-Hammond, 1995; Jencks, 1980; Ladson-Billings and Tate IV, 1995). These locally driven inequalities amount to specific resource gaps when comparing low poverty school districts with high poverty school districts. Research also shows that while these inequalities are not individually capable of creating achievement gaps on a large scale, the additive qualities of poverty, less experienced staff, teacher turnover, lower salaries, lower quality and type of credentials, larger class sizes, and minimized supplant funding utilization all coalesce to create the existing pervasive achievement gaps in high poverty, high crime, underprivileged districts (Betts, Reuben, & Danneberg, 2000; Boyd et al., 2007; Greenwald, Hedges, & Laine, 1996; Lafortune, Rothstein, & Schanzenbach, 2018; Odden & Archibald, 2000).

Revenue availability is a challenge for districts with large proportions of marginalized students. Federal funding is provided to those schools designated as Title I, often associated with marginalization. Title I funding is meant to alleviate (supplement) the pressures associated with having a school with a large student body that needs supplemental services. However, this type of funding is also dependent on how much each state spends per student (Thomas B. Fordham Institute, 2006). This creates two challenges. First states that spend more money per student will receive more funding from federal sources for schools that are designated as Title I and districts/schools already struggling with low funding levels will be further penalized by their low spending. For instance, Arizona (\$7412 per pupil) would receive less money for Title I services than Alaska (\$18,359), putting students in Arizona at a marked disadvantage

(McFarland et al., 2017). Furthermore, a large degree of horizontal inequity occurs across districts that have large pockets of poverty, as the distribution of federal revenue increases, the level of localized revenue generation decreases, as is the case in my analysis.

The second challenge is avoiding the supplant clause of Title I funding. Recent research suggests some districts utilize Title I funds to supplant general funds expenditures on school purchases and by using these funds for teacher salary allocations (Jimenez-Castellanos & Okhremtchouk, 2013; Owen & Maiden, 1999; Roza, Hill, Sclafani, & Speakman, 2004). Supplanting minimizes the potential positive effects of the nature of supplemental federal funding, grounded in existing funding disparities. Overall, the makeup and utility of funding will determine how effective it is and how students can gain from it.

The descriptive and horizontal analysis indicates revenue and expenditures are impacted by district size. It is not surprising to see smaller rural districts generating the greatest amount of revenue and spending the most on education. There exists significant evidence suggesting revenue and expenditure variation is a function of scale (Reschovsky & Imazeki, 2001). In fact, in states with greater amounts of sparsity, as with Arizona, there will continually exist high levels of horizontal inequity (Baker & Duncombe, 2004). Arizona also provides small districts, less than 600 average daily memberships, with a small school (rural) weight. The small school (rural) weight provides greater amounts of funding to smaller districts, thus creating large revenue and expenditure differences.

ELL Proportionality as a Mediator of Fiscal Capacity

One of the major functions of this dissertation was to examine how the percentage

of ELLs impact those fiscal capacity resources that were most horizontally inequitable. School finance research will continue to measure funding inequity, but more attention must be paid to specific subsets of students including ELLs appropriately, a pocket of students that will continue to grow (see Table A1). The current research examining ELLs against fiscal capacity with nuance has highlighted historical inequity existing within districts, especially urban and rural poor districts, as a driving force in achievement disparities between high ELL (high poverty) and low-ELL (low poverty) districts (Wittkopf, Robinson, Janczy, & Hunter, 2014). Examining fiscal capacity as a function of ELLs using a non-linear analysis adds to the research base and is highlighted as a methodological tool capable of measuring nuances within inequitable districts (Houck, 2011).

The results of my non-linear analysis indicate that ELLs are a federal revenue and total expenditure generating group. In fact, in 2006 and 2015, greater amounts of funding were expended at the 90th percentile ELL group, than all other percentiles. Student proportionality based funding difference is not readily discussed in the current literature, and particularly nuanced in this dissertation. The federal result is expected due to the allocation of Title III funds to those districts with higher proportions of ELLs, and Title I funds that go toward districts with higher amounts of poverty. The total expenditure and ELL proportionality relationship is also not unexpected. The school finance literature dictates ELLs reside in lower local tax base districts, districts that generate less local revenue per pupil, which my non-linear analysis shows (Abedi & Gándara, 2006; Haas, 2005; Horsford & Sampson, 2013; Jimenez-Castellanos & Garcia, 2017). Rubenstein, Schwartz, Stiefel, and Amor (2007), however, found that districts with larger percentages

of ELLs will positively impact total expenditures, although these findings are much more nuanced. In their study Rubenstein et al. also revealed the proportion of ELLs are inversely correlated to types of teaching staff credentialing and teaching staff education, highlighting a particular limitation increasing expenditures.

Focusing on targeted ELL expenditures per ELL pupil, my results indicate those schools that have larger proportions of ELLs expend less funding than districts with lower percentages of ELLs. This result, in particular, is alarming despite statistical significance. Specifically, *Flores v. Arizona* (1992)/ *Horne v. Flores* (2009) sought to remedy learning challenges, through fiscal increases, within the ELL population of the state. In *Flores v. Arizona* (1992)/ *Horne v. Flores* (2009), the plaintiffs alleged the civil rights of ELLs were violated due to Arizona's failure to provide a program of instruction that included adequate language acquisition, academic instructional programs, and funding for at-risk, low-income, minority students. In response Arizona passed several measures:

1. Proposition 203 (2000) was introduced as a ballot measure leading to the English Language Learner Task Force that would inevitably adopt the structured English immersion model to educating ELLs.
2. HB2064 (2006) resulting in approved funding to the schools of approximately \$40.7 million, and the September 2007 adoption of the English Language Learner Task Force and the formal adoption of structured English immersion.
3. SB 1096 (2009), which appropriated \$40.7 million in FY 2008-2009 to fund task force adopted models.

Despite increases in targeted funding for ELLs my analysis indicates these policies did not stimulate increases in targeted ELL expenditures per ELL pupil. My analysis shows that Arizona's school districts have an inverse relationship between ELLs and ELL targeted per pupil funding, a discouraging results in spite of countless state funding reforms (e.g., equalization, improved funding formulas). In Arizona it seems that current reforms targeting ELLs have not been able to reduce funding inequity targeting the ELL student population of Arizona. These results are cause for concern since this specific pocket of funding should, in some meaningful way, relate to the population of students it is intended to help. Districts and the state of Arizona must continue to examine how ELL policy, especially policy that affects funding for ELLs, is related to the population of students. A next step funding analysis would need to include state level revenue percentile estimation and a combined state and local revenue percentile estimation in order to determine the relationship between the proportion of ELLs in a district and their relationship to state level revenue, and how this revenue impacts spending. If the state is allocating funds in accordance with the weight applied to ELLs (11.5%), one could reasonably expect to see increase's in student funding from state levels as proportions of ELLs increase. For now, this four-year analysis suggests that at every percentile of ELL student enrollment, ELL spending is negatively impacted. The major analysis of this study focused on the least equitable resources as tested through horizontal equity, but in no way implicated the causal nature of spending on achievement. The final section provides insight into the possible need for further examination.

Spending, Local Fiscal Capacity, and Achievement

A substantial amount of evidence suggests achievement is correlated to school funding, although not always in the direct manner expected. For instance, Card and Payne (2002) found increases in educational spending correlate to increases in SAT scores controlling for intra-family demography. The authors ultimately concluded that increases in the amount of state aid available to poorer districts led to increases in the spending of these districts, narrowing the spending gap between richer and poorer districts, which then led to the narrowing of test score outcomes across family background groups. Papke (2005) found that increased spending has statistically significant effects on math test pass rates, with the magnitude of these results largest for schools with poorer performance and lowest-spending districts. Jackson, Johnson, and Persico (2015) found increases of funding to districts serving low-income students have long term educational impacts. The authors further assert a 22% increase in school spending for low income students, across all 12 years of public education, could potentially eliminate the achievement gap that exists due to poverty. Lafortune, Rothstein, and Schanzenbach (2018) found increases in spending minimizes gaps in NAEP scores, especially in low-income school districts. The primary finding is that it is possible to counteract the effects of poverty in education, but a substantial investment must be made up front and continued throughout the process.

In order to understand the potential impact of poverty on education in Arizona, I graphed the linear relationship of achievement on property value, median income, and students qualifying for free and reduced lunch. The subsequent figures are calculated predictions of achievement from a linear regression of achievement on these poverty variables, along with a confidence interval. Figure C7 shows the linear relationship of

2015 property value on achievement. In 4th and 8th grade math and English, there is a positive linear relationship between achievement and property value. Similarly, Figure C8 shows a positive linear relationship between median household income and achievement. Figure C9 shows the relationship of the percentage of students qualifying for free and reduced lunch on achievement. Additionally, Figure C9 shows an inverse relationship between achievement and those districts with higher free and reduced lunch enrollment. The relationships, although linearly predicted, without controls or instruments, indicate that in some manner poverty impacts achievement negatively. Taken as a set, Figures C7-C9 indicate that achievement and poverty are correlated in Arizona, consistent with the previous scholarship. These results have no indication for the causal nature of funding and achievement in Arizona. A secondary analysis could attempt to measure the causal relationship of funding and achievement. Another plausible conclusion of the relationship between funding and achievement implicates the management of spending patterns, and quality of those items purchased (i.e., teachers available, facilities, student support services) as creating inadvertent inequities that impact achievement.

Inadvertent Inequities

School finance literature has measured funding equity and highlighted the neutralization of increased funding due to the decision making process within a district (Miller, Roza, & Swartz, 2004; Monk & Hussain, 2000; Rubenstein, Schwartz, & Stiefel, 2006). In their 1999 study, post-*Abbott v. Burke* (1997), Goertz and Natriello (1999) found that organizational decisions drive resource allocation patterns (Andrew, & Goettel, 1972). They also found that in poorer districts spending patterns mimic spending

in low-need districts, rendering additional funding obsolete. By no fault of their own, school leaders have become sifters at best, making the most positive decisions they can, based on the limited information available and political pressure, in order to maximize the amount of funding available. As Roza (2008) states, “district leaders don’t quite recognize the strategies they employ to allocate resources, or the alternatives available” (p 1). In turn, district budgeting becomes a piecemeal process that hopes to predict expenditures based on some anticipated amount of revenue without thoroughly recognizing which resources ultimately impact student learning (Odden, Archibald, Fermanich, & Gross, 2003).

Roza (2008) has also associated inertia with spending patterns, resulting in ineffective historical allocation patterns that affect decision-makers’ ability to capitalize on funding changes. District practices, policies, and spending habits are often remnants of resource allocation based in historic misappropriations. These past decisions and lack of innovative strategies cause a ripple effect that hinder the potential for improved allocation based solely on previous technical knowledge. These types of inertia driven decisions lead to disparate results across schools in one district with few administrators having the potential to note specific inequities as resources are assigned (Condrón & Roscigno, 2003; Roza, 2008; Thomas B. Fordham Foundation, 2006).

The operation of funding public education is no small task. District leaders are often left to make allocation decisions based on past legislation, current revenue, minor changes in policy, and the minimal knowledge of specific needs, often based on data collected and analyzed, at best, one year earlier (Condrón & Roscigno, 2003; Roza, 2008). The intersectional nature of school finance administrative decision making causes

a myriad of complications including staffing issues that affect the everyday operation of schools. For instance, Monk and Hussain (2000) found that per-pupil spending is a stronger indicator of staffing than aggregate wealth or poverty, yet lack of staffing oversight leads to gross disparities in faculty available per-pupil in high versus lower poverty schools. Furthermore, the authors conclude that when staff are hired into academic positions, in high versus lower socio-economic status (SES) schools, the faculty are grossly under qualified to meet the needs of their students. Jiménez-Castellanos and Rodriguez (2009) similarly found high need schools were receiving more funding, funds which were allocated for administrative purposes and not frontline teaching staff. Even when funding is utilized for teaching staff, there is no way to control for who wants to work in a high poverty district.

Teacher sorting. One major area of concentration in school finance research is teacher sorting patterns (e.g., teacher credentialing, salary, tenure, education). Researchers have likely focused on this area due to the amount of resources expended on teachers often reaching 80% of total expenditures per student nationally (Aud et al., 2013). Teacher positions are classified by education, experience, and post-secondary coursework and can vary significantly (Anyon, 1996; Greenwald, Hedges, & Laine, 1996; Picus, 1999). These variations over time create large gaps in staffing equity between the highest and lowest socioeconomic (SES) schools (Roza, 2008; Roza & Hill, 2004). Berne and Stiefel (1994) found that high poverty students receive higher expenditure and budget amounts, yet high poverty middle and junior high schools expend less on teacher salaries. Iatarola and Stiefel (2003) found that often while horizontal equity may exist, there is significant vertical inequity in the teaching battery due, in large

part, to teacher salaries. EdTrust (2005) found that teacher salaries are often unequally sorted by high/low poverty, where schools with high poverty expend much less on teacher salaries. Finally, Miller and Rubenstein (2008) found that schools exhibit inequality in teacher preparation as well teacher salary, something exhibited earlier in Betts, Reuben, and Dannenberg (2000).

In their 2008 study Miller and Rubenstein examined equity amongst not only teacher salary, but also teacher tenure, something equally important to student learning (Greenwald, Hedges, & Laine, 1996). Clotfelter, Ladd, and Vigdor (2005, 2006) focus on the interaction of student racial demography and teacher tenure. They found that schools with higher proportions of African American students will have teachers with less tenure. Rubenstein, Schwartz, Stiefel, and Amor (2007) found that a higher concentration of low-income pupils led to higher per-pupil spending, yet the teachers will have a less teaching tenure, less education, and are less well-paid. The researchers also found primary schools that house a greater number of special-needs students would have more teachers available per student, but those teachers would have lower salaries. EdTrust (2008) found similar results; Latino, African-American, and high poverty students are assigned to teachers with less tenure and teachers who have subpar credentials as well.

These findings exhibit a dangerous mix of underpaid and underprepared teachers in high poverty schools. While one prevalent theory would perpetuate the belief that teachers prefer certain types of students over others (Hanushek, Kain, & Rivkin, 1999), Lankford, Loeb, and Wychoff (2002) classify these sorting patterns as systematic. Minority students are more likely to have lower paid teachers not certified in any specific courses taught, teachers with less tenure, and with less education overall. Teacher ability,

teacher education, and teacher experience are associated with salary and have implications for both expenditures and student learning when examined through the lens of poverty (Greenwald, Hedges, & Laine, 1996). Currently, the school finance research findings highlight gross disparities in aggregate funding levels, allocations across staffing, and the quality of services increased funding provides. School finance scholarship has been instrumental in attempting to improve equity across the educational landscape, but has been inhibited by the preferred methodologies, paradigm of justice, and framework to ground the research body. It is possible that alternative theories of justice could bring new insight into what constitutes school finance equity (Aleman, 2013; Alexander, 2013; BenDavid-Hader, 2016; Houck, 2011).

Conceptual Limitations

The current school finance theoretical framework of equity relies on the premise that all individuals within a group should be equally treated if they have equal needs (i.e., horizontal equity), or have varied treatments dictated by individual need (i.e., vertical equity) (Paquette, 2005). Paquette claims that Aristotle left an unrefined set of opposing circumstances in his *Nichomachaen Ethics* stating these are “two, unhappily opposing, dimensions, namely, treating equals equally and treating unequals unequally (p. 570).” The opposing circumstances create a dilemma that continues to resonate in contemporary society and into school finance, as applying the horizontal rule leads toward greater equality and not equity, and applying a greater proportionality rule, or vertical equity, leads away from perceived fairness. Furthermore, while classical utilitarianism (i.e., distributive justice for maximization) and Rawlsian equity (i.e., minimizing the maximum difference in the distribution) have their individual nuances, which alleviate

some of the paradoxical relationships imbedded within Aristotelian equity, they too rely heavily on a form of justice that is hindered as distributive.

The school budgeting process. The school budgeting process itself is complex and iterative, reflecting current attitudes toward education and shifting paradigms (Thompson, Crampton, & Wood, 2012). A summative example of these changes are the shifts in reform, legislation, litigation, and policy reflected after each subsequent equal educational opportunity interpretation was applied to student learning, then shifted toward what was perceived as a more effective model for determining how students should participate (Baker & Green, 2005; Baker & Welner, 2011; Heise, 1995). The formal budgeting process, and subsequent need, is projected from previous year's purely quantitative information including student teacher ratios and per-pupil formulas in proposals by the state education agencies, acting within the guidelines of the state governance (Thompson, Crampton, & Woods, 2012). Legislative committees will then determine the exact amount allocated toward education and the legislature will, as a whole, vote on this revenue amount. The budgeting process will then dictate the total amount of revenue allocated from the state-controlled budget for education (Baker & Green, 2008; Davis, Vedder, & Stone, 2016). This budgeting process takes into account minimal contextual information, relying on equity to arise in legislature against a state budget based on the political environment or political pressure (Bosworth, 2014; Brimley, Verstegen, & Garfield, 2015; Heise, 1998). The types of equity valued are then displayed in legislative propositions, as well as senate and house legislative bills, toward educational funding, the availability of funding for education, and educational priorities held within that decision making structure, and state agency proposals for education

funding (Berne & Stiefel, 1999; Imazeki & Reschovsky, 2004; Odden, 1983; Rapley, 2008).

The budget process would then move from legislation directly to a centralized state level agency of education that serves as a basin for fiscal spending. The state agency would determine micro-district budget packages as a function of any planned expenditures coded according to funding source and major activity (e.g., instruction, pupil support, administration, FTE, supplements, weights) as equity is once again constrained by dictating policy and the decision making processes within the state agency. Often these decisions are based on a minimal amount of purely quantitative information from the districts, with seemingly no micro-district strategy of fiscal alignment reflecting the true need of students (Roza, 2008). At the micro-district level, leaders find themselves with little agency in order to make decisions over funding, adhering to the equity interpretations of the legislative body, or state educational leaders who make decisions based on the availability of funding and educational priorities they see as most salient for student improvement, which may not reflect what the micro-district or school leaders feel are priorities for their students (Adams, 1997; Aleman, 2006, 2007; Jimenez-Castellanos, 2008; Okhremtchouk, 2011). For instance, Aleman (2006) found variation in the agency exhibited by school leaders that enabled districts to obtain and approximate a sufficient level of equality in the objects for distribution.

At all levels of compulsory education, legislators, state departments of education, district budgeting officers, and school budgeting managers use some form of vertical or horizontal equity (Aristotelian equity) to make their budgeting determinations (Brimley, Verstegen, & Garfield, 2015; Chambers et al., 2008; Roza, 2011). They most often

employ this form of equity as distributive in the form of distributive justice taking into account only the dispersion of proportionality. To that extent, the Aristotelian concept of equity oversimplifies the daily operation of schooling, the fiscal requirement of educating a large set of diverse learners, and the constraints local leaders will face from both federal and state legislation placed on the system (i.e., accountability measures, austerity).

Equity in this form limits the possibility of fairness, superficially opting for fiscal neutrality through redistribution as a proxy for equal opportunities. Justice then, is limited as redistributive, dependent upon the availability of fiscal resources, summarily providing an educational “ideal,” limited by that which is amenable toward an expected legal norm, tested, examined, and defensible, as is allowable through the historical structure and its own *cognitive consistency*. *Cognitive consistency* is a concept derived from cognitive dissonance theory within social psychology that proposes an individual has an internal need to maintain their core belief system static, avoiding dissonance. Leon Festingers (1957) work in cognitive dissonance theory led toward a basic hypothesis with two premises:

1. the existence of psychological conflict (dissonance) motivates individuals to seek reduction of the discomfort in order to achieve a level of consistent psychological balance
2. in the presence of dissonance an individual will avoid information that increases conflict.

Effectively *cognitive consistency* is the desire of an individual to return to and maintain a static level of ideology in response to discordance (Gawronski, 2012; Hoshino-Browne, 2012; Kruglanski & Shteynberg, 2012).

The theoretical perspectives driving a form of equity that opts for fiscal neutrality as justice perpetuate the status quo, solely relying on that which is possible, ignoring that which is truly equitable, providing itself an opportunity for abdication by the same belief system that built the structure ignoring pluralism (i.e., that which is unequal juxtaposed against that which is equitable) through self-rationalization. In this manner, equity, fairness, and justice, no matter the course of action, or legal ramification, is unattainable. The present interpretation of equity as a conceptual framework in school finance serves to implicate the defining characteristics of “equity” as creating discordance, necessitating a re-evaluation toward a framework of equity that is inclusive in a manner that is currently not fully realized. In order to establish this neo-equity framework, it is critical to first unpack the tenets of Aristotelian equity so frequently employed in school finance research.

Equity as Distributive Justice

Currently school finance research has grown to define equity hierarchically, assessing the level of fairness through distributions of educational resources existing within districts across its schools and into the classroom (Hertert, 1993; Hertert, 1995). Rubenstein, Schwartz, and Stiefel (2007) assert that this occurs within a system of constraints competing through the interaction of multiple policies rather than directed as an effort to target resources that can address the specific needs of students across schools. Baker and Rebell (2006) and Baker (2009) argue that these constraints (i.e poverty, learning differences, fiscal capacity, state political concessions to spread wealth) affect the budgeting process. They also argue that the alignment of resources toward achieving equal educational opportunities for all students, especially in those high poverty urban

district schools, renders any notion of need-based funding system to be unattainable. The focus of equity then becomes the distribution of inputs necessary to improve the learning process of those students within the district.

Researchers attempted to correlate student learning to funding by analyzing the dispersion of resources, revenue generated, or expenditure per-pupil in order to identify an optimal level of school resources needed to close the persistent achievement gap in the nation (Carr, Gray, & Holley, 2007; Owens & Maiden, 1999; Rubenstein et al., 2007; Thomas B. Fordham Foundation, 2008). Equity, in this manner, is quantitatively measured from the dispersion, with less dispersion equaling greater equity. “Perfect equity is achieved when revenues per child are identical for each child” (Berne & Stiefel, 1979, pg. 112), or when a group of children requiring access to greater amounts of resources are provided the overage.

There are many major complications with this concept, two of which lay in the defining characteristics of their philosophical underpinnings. First, horizontal equity measures equity in so far as it dictates equality, a concept that excludes the possibility of fairness all together when examining variation amongst the population. It is impossible that one set of resources would sufficiently allow all students, with all of their subtle intricacies, to achieve at the same level. Second, vertical equity violates horizontal equity by allowing for varied allocations and is inhibited in its ability to define the group of need or the object of distribution.

Defining the need group. School finance research examining vertical equity has defined the providers as, those stakeholders controlling the resources and allocation decisions, and the recipients as, those stakeholders requiring resources in order to achieve

a goal, in this case achievement, as invariably tethered (Berne & Stiefel, 1994, 1997; Condron & Roscigno, 2003). The decision makers will then dictate allocations on the perception of the need group, those objects requiring funding (i.e., students, teachers), and their own internal interpretation of what constitutes equity. For instance, in Arizona the legislation has written policy that equalizes the BSA for education in order to negate the effects of property wealth on education (Arizona State Senate, 2016; Baker, 2014; Jimenez-Castellanos & Martinez, 2015; Reschovsky & Imazeki, 1997). Federally, the United States Department of Education allocates funding toward school districts with a characteristic high percentage of poverty (e.g. Title I funding). Here, the controlling decision makers allocate and then dictate redistribution of funding to the inter-district group, those students residing in property poor districts. This is a horizontal distribution as the formula equalizes, not equitizes, fiscal capacity.

Defining the object of distribution. The second major caveat is in defining those objects to disperse. School finance research has often demarcated these as school resources, revenue generated, or expenditure per-pupil (Carr, Gray, & Holley, 2007; Thomas B. Fordham Foundation, 2008), or variation in the teaching battery (Owens & Maiden, 1999; Rubenstein et al., 2007). These inputs intrinsically include those tangible and intangible objects that when combined provide students with an effective compulsory school system.

These inputs are measured in actual dollars available or expended, price adjusted spending, or physical resources, including buildings, books, and teachers, but neglect the quality of that distribution (Haycock, 2001; Ladson-Billings, 2006; Owen, 1972; Rothstein, 2004; Stiefel, Rubenstein, & Berne, 1998; Rubenstein, Schwartz, Stiefel, &

Amor, 2007; Summers & Wolfe, 1976). Neglecting quality is one of the major challenges with attempting to obtain equity, as a function of distributive justice, there is no control over the quality of the distributed item. Exploring this theme, Jimenez-Castellanos (2008) found anomalous variations in square footage per student. Where funding was allocated for school improvements, and could be examined per pupil, there was no process for determining if these increased allocations were affectively impacting the amount of space available for each student. Furthermore, Baker (2009) asserts if district resources are insufficient to provide an opportunity for the highest need schools to actively target specific need-based student groups, attempting to provide fairness or justice as a function of a distribution of resources creates inequitable barriers. Finally, as equity begins to fail in its attempt to provide equal educational opportunities through distributive justice, and conflict begins to arise, the abject decision makers rely on *cognitive consistency* in order to rationalize its ineptitude.

Cognitive Consistency

Administrator stakeholders, academic, and legal researchers have examined the ramifications of allowing inequity to persist in the United States compulsory public K-12 education system. Often, sweeping reform efforts attempt to meagerly moderate the education system through more policy with little improvement in the ever-growing achievement gap (e.g., Equal Educational Opportunity Act of 1974 (EEOA); Elementary and Secondary Education Act (ESEA), Goals 2000 (G2K), No Child Left Behind Act of 2001 (NCLB); Every Student Succeeds Act (ESSA)). At the center of these relationships are the rationalizations and psychology for creating policy that “should” improve student outcomes, but do not. Often change inducing, evolutionary, policy decisions are hindered

by the vantage point of those stakeholders creating new regulation, their perception of the need group, their perception of the object of distribution, what is possible through capacity, and what is obligatory through policy and politics (Anyon, 2014; Elmore, 1979; Janis & Mann, 1977; Monroe, 1979; VanMeter & VanHorn, 1975; Wrapp, 1967).

Policymakers are motivated to seek solutions based on data derived through coherence, group attitudes, their own personal thoughts, beliefs, and values, behaviors of the system (i.e., education), the market (i.e., school choice), and all stakeholders (Baldrige, 1978; Cohen, McCabe, Michelli, & Pickeral, 2009; Copeland, Weston, & Shastri, 1983; Elmore, 1979; LeGrand, 1991; Mann, 1975; Marsh, Pane, & Hamilton, 2006). This information guides the decision making process and maintains ineffective policy through the reduction of tension for the sake of stasis. All stakeholder groups seek to obtain stasis and satiate their own *cognition*. *Cognitive consistency* seeks to balance an individual perspective when internal beliefs conflict with external stimuli and inconsistencies existing in an environment create tension. Tension then becomes the catalyst for change, leading an individual back toward stasis, and in practice, back to the fiscal and budgetary practices of their immediate past.

Figure 2 illustrates the process of *cognitive consistency*. A person is called to action based on their belief structure and this belief structure will impact the action taken. Consistency creates an internal self-image that remains balanced unless there is an external stimulus, some form of dissonance, which will move someone toward a change in their belief structure and the preferred action (Cooper & Fazio, 1984). At this point the corresponding action is informed by the belief, but in order for an individual to take any action, they must feel sufficient pressure from the external stimuli to change their beliefs

and feel compelled by this change in belief to take action (Cooper & Fazio, 1984; Festinger, 1957). The action and belief are not correspondent, and the individual will, after taking action, seek relief in the action taken in order to rationalize their adjustment. The individual then seeks to rebalance and obtains a revised self-image (Cooper & Fazio, 1984; Festinger, 1957; Hoshino-Browne, 2012; Suh, 2002).

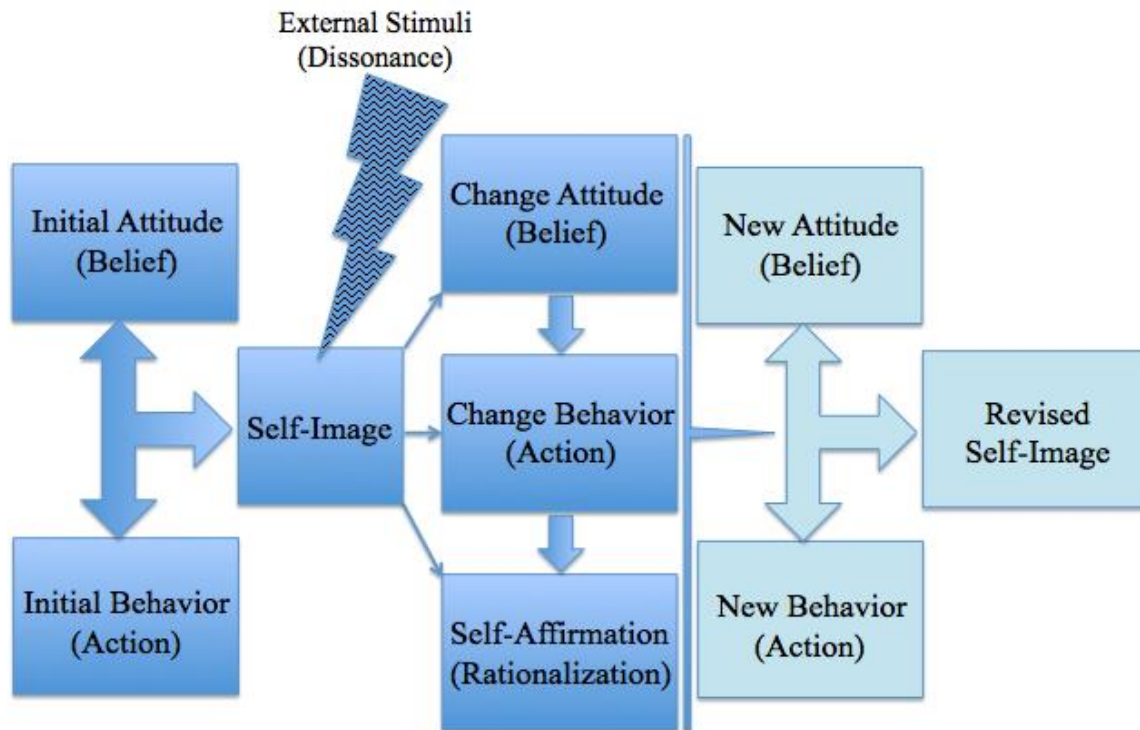


Figure 2. Stasis through cognitive consistency

Budgeting and allocation strategies, whether the result of thoughtful strategic planning processes, competing political forces within the organization, or the bargaining for resource shares, seek to maximize the utility of funding available in order to improve student outcomes and minimize inequity (Heise, 1995; Lee, Johnson, & Joyce, 2004; Rolle, 2004). One of the challenges to improvement is the default of year to year decisions toward inertia (Roza, Guin, & Davis, 2007). Fiscal decisions are often based on

the most efficient manner to bring the system back to stasis, not the most effective or equitable strategies (Mitchell et al., 1993). The legislative body, state agency, district policies, habits, and attitudes recreate approximately the same environment year after year (Lee, Johnson, & Joyce, 2004; Roza, Guin, & Davis, 2007; Roza, 2011). These types of static decisions will impact what change is possible, and any ineffectiveness is rationalized with the use of heuristic. Heuristics are time saving cognitive methods often used in decision making that simplify the decision making process (Kahneman & Tversky, 1972). Heuristics often work to form representative relationships that substantiate changes in behavior (Kahneman, 2003). Behavioral economists have studied heuristics to understand the impact of risk or uncertainty on decision making.

Behavioral economic research established links between inter-personal psychology and decision making under risk in order to assess the effect of perceived risk on decisions. Drs. Daniel Kahneman and Amos Tversky have produced some of the most salient behavioral economics work, exploring three specific themes; heuristic and bias, choice under risk, framing effects (Kahneman, 2003). In their work Kahneman and Tversky indicate decision makers when presented with risk or uncertainty will default to inter-psychological rules (heuristics) that bias the affective choices made by the individual, and the determinant decisions (Kahneman & Tversky, 1972; Kahneman & Tversky, 1979; Kahneman et al., 1982; Tversky & Kahneman, 1973; Tversky & Kahneman, 1974; Tversky & Kahneman, 1992). Furthermore, there is indication to believe perceived losses, deficits, or disadvantages impact the final decision more than any perceived gain (Tversky & Kahneman, 1991). If implicated together, the intersection of heuristic decision making and *cognitive consistency* lead policymakers to drive

solutions for a self-determined allowable equilibrium framed within the sub-context of beliefs about what inherent risks are present, and how to best address those risks without creating greater dissonance.

Kahneman (2003) implicates the simplification of a decision with substitution as leading toward unconscious decisions that may not lead toward improvement. In this manner, the policymaker unconsciously derives policy congruent to their goals and what they perceive as factually occurring. The policy may not effectively treat the need group, but may satiate, in a nominal manner, the internal personal need of the policymaker to create legislation they view as moving toward equity. Dissonance is remedied through additive policy which steer solutions toward stasis that is criticized for creating lack of improvement, and inequity persists (Hanushek, 1981; Hanushek, 1991; Hanushek, Lindseth, & Rebell, 2009; Heise, 1995; United States Commission on Civil Rights, 2018).

Practically *cognitive consistency* and equity as distributive justice are exhibited in distinct policy remedies and the perception these distributive remedies can lead toward greater equity; weighted student formulas, district fiscal capacity equalization, and legislative propositions or bills attempting to redistribute funding in order to remedy inequity (Younts & Mueller, 2001). Weighted student formulas (WSF) attempt to moderate the effect of learning barriers by providing students a supplemental funding overage. Often, arguments surrounding WSFs focus of not being on the structural barriers that prevent student access and full participation, but, rather, the amount/percentage of the weight (Miles & Roza, 2006). In a large-scale American Institutes for Research study, Chambers, Shambaugh, Levin, Murali, and Poland (2008) found that WSFs did provide

greater fiscal distributions, though this approach would not lead to fundamental education finance reform change. Baker (2009) found the success of WSFs are largely unpredictable and may not address student need. The author further stated revenue resource levels in urban schools are often insufficient, despite weighting, and that these schools may not have the necessary revenue resource levels to achieve similar student outcomes as neighboring school districts. Thus, weights may, in fact, require increase, or delineation, but if structural barriers for participation still exist, then the funding is rendered moot.

Like WSFs, equalization formulas attempt to alleviate the pressures of local fiscal capacity. Often, as is the case in Arizona, the state will attempt to redistribute revenue through legislation, whether by redistribution of wealth or state supplementation. Hoxby (1998) found that redistribution of wealth is ineffective, positioning unintended consequences through redistribution as a function of property wealth whose value fluctuates depending on how the community values their immediate locale. The author further concluded that finance equalization also falters as it not only redistributes wealth from property wealthy to property poor districts, but also from schools that are more productive to schools that are less productive and do not account for structural barriers or educational preference differences that may exist within the locale. Inclusively, justice and fairness are only as allowable as the structures congruence will tolerate. Guiding equity away from these normative epistemologies is then absolutely necessary in order to obtain resolution and procedural justice, which may lead to a nuanced school funding policy decision making process that is contingent upon a moral imperative toward education, not affirmation within the structure.

Equity as Procedural

Procedural justice stems from an area of legal research that dictates the basic civil procedures, and course, to manage civil disputes (Minow, 1984). Procedural justice places the position of equity on the perspective of the need group (i.e., individual), retracting the perspective of equity from control of the provider group. Equity is then measured by what the need group perceives as fair and what resources are necessary in order to provide a greater amount of fairness (Buttram, Folger, & Sheppard, 1995; Miller, 1979, 1980; Vincent, 2003). In this manner, procedural justice allows for horizontal equity at the revenue level, and vertical equity at the expenditure level, so long as the artifact of distribution is of equal value and quality (i.e., revenue, teaching battery), and is robust enough to support differences within the need group so that learning improves (i.e., student learning capacity).

Procedural justice's main premise is the creation and implementation of decisions in accordance with a fair process, devoid of subjectivity, away from the purview of the dominant structure or those individuals who have a less than neutral position (Miller, 1980). This perspective is not driven by the distribution of the allocation itself, but how fair and neutral the decision and policy-making process was that created the distribution, and what impact that distribution has on the relative outcome. The philosophical underpinnings for procedural justice stem from the work of Thibaut and Walker (1975) whose theories about the psychological procedural preferences in litigation have found their way through the legal justice system.

Thibaut and Walker (1975) examined a set of three experiments comparatively

exploring adversarial and inquisitor procedures and their ability to provide unbiased information. The authors' major conceptual theory implied that two conflict resolution objectives occur, that of "justice" and that of "truth." "In most instances one or the other of these objectives is dictated by the subject matter of the dispute, or more specifically by the outcome relationship that exists between the individual parties to the conflict" (Thibaut & Walker, 1975, pg. 543). This theory would then implicate all of the stakeholders who control, directly or indirectly, the final decision-making process and any product coming from these decisions. Conflict resolution would then come from the standpoint of a third party that holds no controlling stake in the system. In school finance research and litigation, this position is personified as the courts or researchers.

Third party defined. The third party acts as a decision maker or advisor within the system and holds no control or interest over the system itself. The interest of the third party is to act as cognitive conflict and conflict of interest resolver between the binary (i.e. need group, provider group) (Thibaut & Walker, 1978). Lind and Tyler (1988) applying Thibaut and Walker (1975, 1978), however, have proposed a group-value theory that intermingles neutrality, information, and preference as the major influences over the final decisions. Tyler (1989), studying this psychological phenomenon, tested the theory and found:

1. judgments about neutrality, trust, and social standing have an independent impact on judgments of procedural justice.
2. Thibaut and Walker's control theory is valid and control issues are central to the setting in which the procedure takes place.
3. Standing and trust are more important than neutrality, that is standing in the

group, and trust the group imparts on the third party.

4. Individuals have a long-term commitment to the group, its authoritative structure, and favor social standing within the group.

Group values influence the court's decision process and, as was demonstrated in Arizona, greatly impacts the legal process.

Policy Context in Arizona

Arizona's contemporary education system and its mechanism for funding schools are marked by inadequate and unfair regulation and policy that has negatively impacted student learning (Gándara & Rumberger, 2006, 2008; Jimenez-Castellanos et al., 2013; Orfield, Losen, Wald, & Swanson, 2004). First, Prop 203 was a direct reflection of the then, and current, conservative nature of the state. Historically, Arizona has been plagued by conservative economic and political ideology exacerbated in recent years by the Great Recession. Legislators, viewing themselves as the third party, implicitly, made resource and curriculum decisions that negatively impacted large swaths of Arizona's students (Gándara & Rumberger, 2006, 2008; Orfield et al., 2004). Second, the 9th district, acting as the third party, favorably found for the plaintiffs (i.e., need group) for decades, but when challenged, conceded to the pressure of its own *cognitive consistency*, making final judgments for Arizona. The final consideration is that of judges as elected positions and the implications of Tyler's (1989) third and fourth premises. In order for procedural justice to persist, the third party must hold neutrality. Considering the legal system's limitations, researchers are then positioned as the defacto third party, often compelled by the courts as expert witnesses.

Establishing the third party position from the researcher epistemology must

include the ability to maintain neutrality in the decision making process, empathy toward both the need and provider groups (what Tyler (2006) views as respect), provide both groups with the opportunity to have their needs heard, and positioned within the policy crafting process (what Tyler views as understanding). This includes allowing participation in open dialogue. Finally, the researcher acting neutrally has a responsibility, if procedural justice holds, to provide as helpful information as is possible with the data available, providing balance although this premise is limited (Greenberg, 1987; Greenberg & Tyler, 1987; Kahn, 1987). A researcher's neutrality, and their final determination, is contingent on the availability of valid data and all of the information necessary to make their decisions. Therefore, equity as procedural justice (i.e., fairness of the decision making process toward the process of distribution, not the distribution) must include some form of deontology to protect the best decision for those groups with the most need.

Pluralistic deontology. The struggle to continue a neutral stance and create the best policy in order to provide the best possible outcomes for students must in some fashion obtain a level of pluralistic deontology. By definition this dictates a decision making process that is to the benefit of the moral imperative and likens the concept of equity as procedural justice toward the Kantian so that the providing actors are in accordance with duty-based ethical decision making (Bentham & Bowring, 1834; Davis & Singer, 1991; Kant, 1795). The deontological system serves to focus the decision making process based on the moral value and duty of that which is decided. To that affect, morality is iterative and should extend from the understanding of the application of the decision, not from the understanding of the individual who exploits a void (Dodge,

1998; Leflar, 1966; Ross, 1930, 1954). Deontologically, a resolution must be carried out in accordance with corrective action so that, above all else, the duty to provide the best morally objective decision is remanded. Failing to adhere to the moral imperative when finalizing the decision is then an act of negligence, an act of immorality.

From the standpoint of utilitarianism, decisions do not always conform to true morality and in many ways, especially in the case of Arizona policy decisions, and education as a system, is made for the sake of efficiency, liberty, or in the case of this conceptual argument the interpretation of equity. To Sir William David Ross KBE FBA (1930), as adapted by Garrett (2004), positioned deontology in a manner inclusive of Pluralism developing seven Prima Facie Moral Duties:

1. Fidelity: duty to abide by promises and contracts, and not engage in deceptive contractual practices. (p. 21)
2. Reparation: duty to supplement any harm. (p. 21)
3. Gratitude: duty to provide courtesy of support. (p. 21)
4. Justice and Fairness: duty to distribute in the most morally sound manner possible, benefit and burden. (p. 21)
5. Beneficence: duty to foster the well-being of those in need. (p. 21)
6. Self-Improvement: duty to promote the good of the system, or ones own good. (p.21)
7. Non-Malfesance: duty to avoid placing others in a position of implicit or explicit harm. (p. 21)

Duty, in this manner, is to provide the resources necessary so that all students have the potential for equal educational opportunities, as dictated by law, and to create policy that

positions students in such a manner (Ross, 1930; Ross & Straton, 2002). In this manner, the distribution is not more important than the decision making process toward that distribution. The distribution is still necessary but must be guided by policy or an individual that recognizes the need, and can act to remedy this need in a manner that creates less disparity. Prima facie moral duty then becomes the imperative. In the United States, compulsory public K-12 education system prima facie moral duty is dictated by state constitutions, in Arizona by “general and uniform” program of instruction, and in national legislation through EEOA. Equity, as a function of procedural justice and pluralistic deontology, can co-exist within the political sub-contexts of the decision-making process that includes new reform, legislation, litigation, and policy (Gangle, 2003; Rapley, 2008). However, states must have a system to test against pluralism and the seven Prima Facie Moral Duties, and must be willing to make the necessary changes that lead toward higher order levels of educational justice.

Arizona’s Moral Violation of Education

If pluralistic deontology and the moral imperative are acceptable foundations for equity, and Ross’s Kantian vision of the moral imperative is valid, then by definition Arizona has violated the Prima Facie code of Moral Duty. Arizona not only violates federal law restricting access to a full curriculum, but also violates its own constitution which dictates a “general and uniform” program of instruction. The state has made no reparations (e.g., ELL funding per ELL pupil in this analysis is inverse) and suppressed any and all educational improvement through misalignment of resources (e.g., horizontal equity analysis is shows Arizona is grossly inequitable). Arizona has subsequently attempted no gracious remedy and has a history of fighting in the judicial system against

improvement. Conclusively, Arizona has explicitly or implicitly acted with malfeasance and provided a compulsory education system that lacks fairness for all students regardless of socio-cultural, socio-demographical difference.

Arizona has continually fought against educational self-improvement, refusing incremental increases in tax revenue, and cut state funding year after year. Since 2009 Arizona has suspended district additional assistance (DAA) and charter additional assistance funding, a total of \$930.7M K-12 DAA cuts since 2009. In FY 2018 these cuts amount to \$352M in DAA and \$18M in CAA cuts. Arizona has allowed for educational competition and treated those students exercising their educational right unjustly. Arizona's proposals expanding educational spending accounts, Senate Bill 1431 and House Bill 2394, automatically place districts at a marked fiscal disadvantage. These proposals provide up to 90% of the allowable cost to educate a student. The state has relied heavily on local and federal sources of revenue to fund its state education system and has focused on creating greater disparity, leading to greater fiscal inequity, instead of remedying inequity through improved legislative action. From the vantage point of justice as procedural, deontologized, to neutrally balance decisions for the moral imperative, Arizona has failed in its duty to provide a "uniform" program of instruction.

By maintaining a structure of fiscal inequity in its public education system, Arizona has violated the seven Prima Facie Moral Duties. It has failed to protect the wellbeing of its students and failed to provide its children with a system of education that positions all, despite demographic or linguistic diversity, for future success. Finally, in order to obtain resolution, the system of decision making may need to move toward a form of justice that includes re-evaluating those procedures employed to create policy,

distribute funds, and spend the available revenue. In this manner, procedural justice can help inform the redistributive nature of school finance equity leading to a nuanced school funding policy decision making process that is contingent upon a moral imperative toward education, not affirmation within the structure.

CHAPTER 6

CONCLUSION

The omission of educational opportunities for low-income, minority, marginalized students imbedded within the United States compulsory public K-12 education system has created conflict between the actual (i.e., what occurs daily within the system of schooling) and theoretical (i.e., the advocacy speak often unrealized), to the detriment of those students with the most need (Cuban, 1990; Darling-Hammond, 2004; Hanushek, 1991). The Office for Civil Rights of the United States Department of Education (OCR) in 2014, and United States Commission on Civil Rights in 2018 recognized these needs issuing statements questioning the equal educational opportunities available for all students regardless of race/ethnicity or socio-economic status (SES). This pursuit of Equal Educational Opportunities has been a focal point of school finance policy, research, and reform efforts underscored by 50 years of litigation and a growing body of research that has developed concurrently. The research catalogue highlights greater fiscal need in order to contend with sparser budgets, growing diversity, expanding populations, and litigation attempts to align policy and law toward this greater inclusion (Goertz & Natriello, 1999; Monk & Hussain, 2000; Rubenstein et al., 2007).

These historical conceptual changes of what constitutes educational opportunity have attempted to discern what qualities in compulsory education are absolutely necessary in order to create the greatest opportunities for students, but the defining characteristics of the interpreted opportunities have changed, as has the defining litigation that attempts to implicate the best solution. Figure 3 outlines the movement of both research and litigation as they subsequently come to a close and usher in new educational

opportunity delineations. The next wave of research must support the next wave of school finance litigation in a manner that provides nuance to the student group, evolves the paradigm of equity to include forms of social justice outside of redistributions, and re-interprets the measures of equity in order to find solutions that can positively impact student achievement.

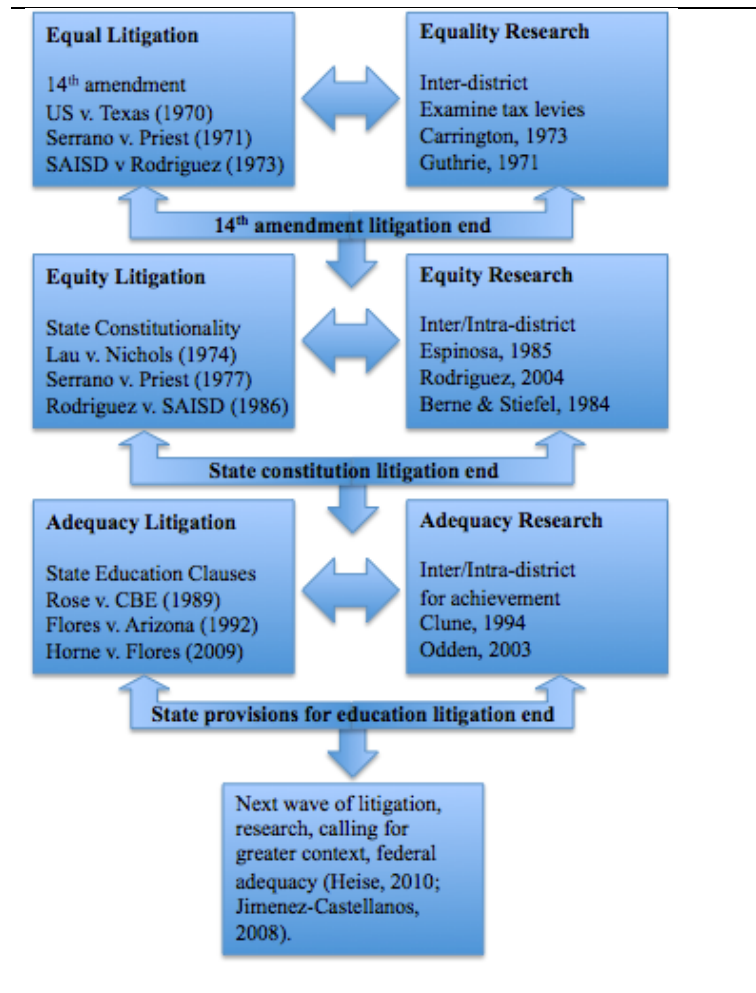


Figure 3. Graphic illustration of research and litigation evolution

The purpose of this dissertation was to add to the school finance empirical base by measuring: (1) horizontal equity across Arizona’s public-school districts, and (2) the distribution of funding in high versus low ELL enrollment districts with the use of a non-

linear analysis. While this dissertation is grounded in traditional equity philosophies, it attempts to add to the literature by implicating student demographic economies of scale, primarily focusing on English language learners. It attempts to use a nuanced methodological treatment (i.e., non-linear analysis), and caps the analysis with a conceptual reframing of justice by taking into account the decision making process of distribution.

Policy Implications and Recommendations

This study suggests Arizona's contemporary education system and its mechanism for funding education has not provided ELLs, and those districts educating the highest proportions of ELLs, with the necessary resources in order to provide an equitable system of education. Arizona, is plagued with historical inequity, inadequacy, and insufficient funding. This study also suggests that despite equalization, there continues to exist horizontal inequity across districts. In the context of these findings, there are three salient implications of this study. First, Arizona must end its continued educational funding austerity. Arizona has struggled to reach a balance between the austerity it desires, and the funding it needs to manage a growing public school system. Local wealth, geography, and economies of scale all impact funding towards districts. Despite a funding formula that indicates districts would be funded equitably in some manner, there is no indication this is the case. Districts exhibit a high degree of horizontal inequity. Arizona must begin to increase revenue toward education in order to fund a full system of education. Arizona must re-evaluate how equalization is occurring, and reorganize the equalization process in order to diminish the level of inequity that currently exists.

Second, Arizona must continue to seek solutions to fund their program of English instruction for ELLs. As districts continue to struggle with lack of sufficient funding, and inequity, Arizona may need to re-evaluate their investment in education for ELLs as well. Arizona must reorganize their ELL policy, driven by bigoted anti-Latino sentiments, and begin to fund a meaningful program of instruction for ELLs that can provide greater educational opportunities. Furthermore, Arizona must immediately increase funding for ELL programs of instruction especially toward those districts with higher proportions of ELLs.

Third, poverty matters. This study does not indicate a causal relationship between poverty and achievement, it does however indicate a relationship between wealth and achievement requiring further examination. This study suggests that as property value and median household income increase there is an increase in student achievement. The state must recognize poverty and achievement are correlated in some manner. Arizona must begin to provide schools the necessary compensatory education funds (i.e. funds related to at-risk students or those student living in poverty) to mediate the effects of poverty that potentially lead to stagnant or decreased achievement for certain student groups. Currently Arizona's constitution allows for compensatory funds for ELL programming, but this analysis indicates this funding is insufficient. Furthermore, Arizona's increased reliance on supplemental Federal funds may harm those students most vulnerable to the effects of poverty, if those Federal funds are decreased or fully eliminated.

Limitations

There are several limitations of this study. First, the data for this project is comprised of only publically available data. Fiscal data is available through the Arizona department of Education but it is incomplete. Cleaning and recoding was required in order to robustly analyze the data. Second, although a horizontal equity analysis was used, it may not effectively capture the true nature of inequity across districts. Furthermore, horizontal equity methodologies may not acutely account for revenue and expenditure shifts due to changing student demographics, or district location. In order to minimize some of this bias several horizontal equity analytic methods were employed comparatively, and the level of aggregation for the analysis was per pupil. Third, my findings are only applicable to Arizona and the context of Arizona schools. This prevents any form of generalizability outside of Arizona. Finally, this study in no manner applies causality to student achievement. Providing linear relationships between median household income, property value, and achievement is used to implicate a correlation between poverty and achievement, not a causal relationship between poverty and achievement.

Indications for Future Research

Additional research is necessary in order to provide Arizona policymakers and legislators with information that can potentially inform their future educational funding decisions. First, a state wide, school level, intra-district analysis. An intra-district analysis is beneficial to show differences of funding across schools. This could help Arizona identify which schools require an influx of fiscal resources to improve student outcomes. Second, a causal analysis of achievement and resources. This analysis can provide much

needed information into the impact of fiscal capacity on student achievement in Arizona, and how local poverty plays a causal role in student achievement. Third, intra-school qualitative analysis. This type of qualitative analysis has the potential to contextualize quantitative findings that are currently removed from the everyday existence of schooling. The school finance research base continues to make strides and has helped to improve educational funding inequity. Currently it may be possible to once again evolve conceptually.

The next theoretical iteration of equity must continue to seek school funding solutions grounded in critical theory, social justice, and democratic education frameworks in order to provide salient resolutions capable of realizing an equitable educational opportunity for all students. These solutions would include theory outside of finance, input and output models, and would inform decision making. The next evolution of school finance scholarship should also attempt to align decision making processes against social justice paradigms, in order to aid educational administration in their task to fund education. An equitable solution would not vacuously focus on fiscal capacity alone, but would also associate the psychology of decision making to fiscal capacity in a manner that creates solutions which can help educational leaders make the best choice for their specific students. A viable social justice oriented solution requires a novel approach to the study of school finance grounded in the community of schooling. This community grounded school finance solutions require school finance scholars to incorporate greater amounts of participatory action research allowing for intra-district contextualization against the analytic findings. This would also allow for greater amounts of leadership participation within the scholarship leading toward self-advocacy.

While it is true the school finance research base has brushed against critical theory, only a handful thus far have truly delved head first into critical context to ground the primary quantitative analysis. Examining the intersections of race, poverty, class, language, and school finance could potentially add the nuance crucial to allocating and spending school funding in a manner that creates great educational opportunities for all students (Baker, 2005; Darling-Hammond, 2004; Espinosa & Ochoa, 1992; Gándara & Rumberger, 2008; Iatarola & Stiefel, 2003; Kozol, 2005; Odden, 2003; Rebell, 2008; Thompson, Crampton, & Wood, 2012).

Finally, research indicates poverty and marginalization effect student outcomes (Baker, 2012; Betts & Roemer, 2005; Breen & Jonsson, 2005; Coleman et al., 1966; Gamoran & Long, 2006; Ladd, Chalk, & Hansen, 1999). Policymakers and legislators must continue to find solutions in order to meet the needs associated with educating large pockets of marginalized students. States and districts must be willing to provide a system of education that is fully supported, and the research community must be willing to provide the empirical base for sound policy decisions. It is up to the research policy community to determine what types of resources are necessary in order to create greater amounts of equity. Without this empirical literature, marginalized students may continue to struggle with lack of educational resources and inclusion, segregated not only from peers, but segregated from the academic material and supportive services necessary to develop formatively in an educational setting (Gándara & Orfield, 2012a, 2012b).

References

- Abedi, J. (2004). The no child left behind act and English language learners: Assessment and accountability issues. *Educational Researcher*, 33(1), 4-14.
- Abedi, J., & Gándara, P. (2006). Performance of English language learners as a subgroup in large-scale assessment: Interaction of research and policy. *Educational Measurement: Issues and Practice*, 25(4), 36-46.
- Abedi, J., & Herman, J. (2010). Assessing English language learners' opportunity to learn mathematics: Issues and limitations. *Teachers College Record*, 112(3), 723-746.
- Adams, J. E. (1997). Organizational context and district revenue allocation: Does the setting matter? *Journal of Education Finance*, 2(3), 234-258.
- Adams, M. (2006). Radical Integration. *California Law Review*, 94(2), 261-312.
- Aleman, E., Jr. (2006). Is Robin Hood the "Prince of Thieves" or a pathway to equity? Applying Critical Race Theory to school finance political discourse. *Educational Policy*, 20(1), 113-142.
- Aleman, E. (2007). Situating Texas school finance policy in a CRT framework: How "substantially equal" yields racial inequity. *Educational Administration Quarterly*, 43(5), 525-558.
- Aleman, E. (2013). Critical race theory and human capital theory: Framing the discourse on the nexus of social justice and education finance. In G. M. Rodriguez & R. A. Rolle (Eds.), *To what ends and by what means* (pp. 47-70). New York, NY: Routledge Publishing.
- Alexander, R. (2013). *Versions of primary education*. New York, NY: Routledge Publishing.
- Andrew, R., & Goettel, R. J. (1972). School-by-school resource allocation and educational need in three urban districts. In J. S. Berke, A. K. Campbell, & R. J. Goettel (Eds.), *Financing equal educational opportunity: Alternatives for state finance* (pp. 143-167). Berkeley, CA: McCutchan.
- Anyon, J. (1996). Teacher development and reform in an inner-city school. *Teachers College Record*, 96(1), 14-31.
- Anyon, J. (1997). *Ghetto schooling: A political economy of urban educational reform*. New York, NY: Teachers College Press.
- Anyon, J. (2014). *Radical possibilities: Public policy, urban education, and a new social movement*. New York, NY: Routledge Publishing.

- Arias, M. B., & Faltis, C. (Eds.). (2012). *Implementing educational language policy in Arizona: Legal, historical and current practices in SEI*. Bristol, UK: Multilingual Matters.
- Artiles, A. J., Rueda, R., Salazar, J. J., & Higareda, I. (2005). Within-group diversity in minority disproportionate representation: English language learners in urban school districts. *Exceptional Children, 71*(3), 283-300.
- Arizona Department of Education. (n.d.). *Superintendent Annual Financial Report digital data* [data file]. Retrieved from <http://www.azed.gov/finance/reports/>
- Arizona House Bill 2010, 45th Legislature, 2nd Special Session (Arizona 2001).
- Arizona House Bill 2064, 47th Legislature, 2nd Regular Session (Arizona 2006).
- Arizona Proposition 203, English for the Children, (Arizona 2010).
- Arizona Senate Bill 1070, 49th Legislature, 2nd Regular Session (Arizona 2010).
- Arizona Senate Bill 1096, 48th Legislature, 2nd Regular Session (Arizona 2008).
- Arizona State House Bill 2281, 49th Legislature, 2nd Regular Session (Arizona 2010).
- Arizona State House Bill 2121, 53rd Legislature, 2nd Regular Session (Arizona 2018).
- Arizona State Senate. (2016). *Arizona School Finance System*. Phoenix, AZ: Author.
- Aud, S., Wilkinson-Flicker, S., Kristapovich, P., Rathbun, A., Wang, X., and Zhang, J. (2013). *The Condition of Education 2013*. Washington, DC: US Department of Education, National Center for Education Statistics. Retrieved from <http://nces.ed.gov/pubsearch>.
- August, D., Shanahan, T., & Escamilla, K. (2009). English language learners: Developing literacy in second-language learners-Report of the National Literacy Panel on Language-Minority Children and Youth. *Journal of Literacy Research, 41*(4), 432-452.
- Augenblick, J. G., Myers, J. L., & Anderson, A. B. (1997). Equity and adequacy in school funding. *The Future of Children, 7*(3), 63-78.
- Baker, B. D. (2001). Balancing equity for students and taxpayers: Evaluating school finance reform in Vermont. *Journal of Education Finance, 26*(4), 437-462.
- Baker, B. D. (2003). State policy influences on the internal allocation of school district resources: Evidence from the common core of data. *Journal of Education Finance, 29*(1) 1- 24.

- Baker, B. D. (2005). The emerging shape of educational adequacy: From theoretical assumptions to empirical evidence. *Journal of Education Finance*, 30(3), 277-305.
- Baker, B. D. (2006). Evaluating the reliability, validity and usefulness of education cost studies. *Journal of Education Finance*, 32(2), 170-201.
- Baker, B. D. (2009). Within-district resource allocation and the marginal costs of providing equal educational opportunity: Evidence from Texas and Ohio. *Education Policy Analysis Archives*, 17(3), 1-31.
- Baker, B. D. (2012). *Revisiting the age-old question: Does money matter in education?* Washington, DC: Albert Shanker Institute.
- Baker, B. D. (2014). *America's most financially disadvantaged school districts and how they got that way: How state and local governance causes school funding disparities*. Washington, DC: Center for American Progress.
- Baker, B., & Duncombe, W. (2004). Balancing district needs and student needs: The role of economies of scale adjustments and pupil need weights in school finance formulas. *Journal of Education Finance*, 29(3), 195-221.
- Baker, B. D., & Green III, P. C. (2005). Tricks of the trade: State legislative actions in school finance policy that perpetuate racial disparities in the post-Brown Era. *American Journal of Education*, 111(3), 372-413.
- Baker, B., & Green, P. (2008). Conceptions of equity and adequacy in school finance. In H. F. Ladd & E. B. Fiske (Eds.), *Handbook of research in education finance and policy* (pp. 203-221). New York, NY: Routledge Publishing.
- Baker, B. D. & Green, P. C. (2009). Equal educational opportunity and the distribution of state aid to schools: Can or should school racial composition be a factor? *Journal of Education Finance*, 34(3), 289-323.
- Baker, B., & Levin, J. (2014). *Educational equity, adequacy, and equal opportunity in the commonwealth: An evaluation of Pennsylvania's school finance system*. San Mateo, CA: American Institutes for Research.
- Baker, B. D., Farrie, D., & Sciarra, D. (2010) *Is School Funding Fair?* Newark, NJ: Education Law Center of New Jersey, Rutgers Graduate School of Education.
- Baker, B. D., Farrie, D., & Sciarra, D. (2014) *Is school funding fair? 2013 Edition*. Newark, NJ: Education Law Center of New Jersey, Rutgers Graduate School of Education.

- Baker, B., & Welner, K. (2011). School finance and courts: Does reform matter, and how can we tell. *Teachers College Record*, 113(11), 2374-2414.
- Baldrige, J. V. (1978). *Policy making and effective leadership: A national study of academic management*. Los Angeles, CA; Higher Education Research Institute.
- Ball, S. (1991). *Politics and policy making in education. Explorations in policy sociology*. New York, NY: Routledge Publishing.
- Ball, S. (1994). *Education reform: A critical and post-structural approach*. New York, NY: McGraw-Hill Education.
- Ball, S. (2012). *Foucault, power, and education*. New York, NY: Routledge Publishing.
- Baratz, J. C. (1975). *A Quest for equal educational opportunity in a major urban school district: The case of Washington, D.C.* Washington, DC: Education Policy Research Institute.
- Bardack, S. (2010). *Common ELL terms and definitions*. Washington, DC: American Institutes of Research. Retrieved from <https://files.eric.ed.gov/fulltext/ED528632.pdf>
- BenDavid-Hadar, I. (2016). School finance policy and social justice. *International Journal of Educational Development*, 46(C), 166-174.
- Bentham, J., & Bowring, J. (1834). *Deontology; Or, the science of morality in which the harmony and co-incidence of duty and self-interest, virtue and felicity, prudence and benevolence, are explained and exemplified*. London, UK: Longman, Rees, Orme, Browne, Green, & Longman. Retrieved from <https://archive.org/details/deontologyorthe01bentuoft>.
- Berke, J. S., & Callahan, J. J. (1972). Serrano v. Priest: Milestone or millstone for school finance. *Journal of Public Law*, 21(1), 23-70.
- Berne, R., & Stiefel, L. (1979). Concepts of equity and their relationship to state school finance plans. *Journal of Education Finance*, 5(2), 109-132.
- Berne, R., & Stiefel, L. (1984). *The measurement of equity in school finance: Conceptual, methodological and empirical dimensions*. Baltimore, MD: Johns Hopkins University Press.
- Berne, R. & Steifel, L. (1994). Measuring equity at the school level: The finance perspective. *Education Evaluation and Policy Analysis*, 16(4), 415-421.

- Berne, R., & Stiefel, L. (1999). Concepts of school finance equity: 1970 to the present. Equity and adequacy in education finance: Issues and perspectives. In H.F. Ladd, R. Chalk, & J.S. Hansen (Eds.), *Equity and adequacy in education finance issues and perspectives* (pp. 7-33). Washington, DC: National Academy Press.
- Betts, J., & Roemer, J. E. (2005). *Equalizing opportunity for racial and socioeconomic groups in the United States through educational finance reform*. San Diego, CA: Department of Economics University of California at San Diego. Retrieved from <https://escholarship.org/uc/item/0gq4z4m9>
- Betts, J. R., Rueben, K. S. & Danenberg, A. (2000). *Equal resources, equal outcomes? The distribution of school resources and student achievement in California*. San Francisco, CA: Public Policy Institute of California. Retrieved from www.ppic.org/content/pubs/report/R_200JBR.pdf.
- Bosworth, M. H. (2014). *Courts as catalysts: State supreme courts and public school finance equity*. New York, NY: State University of New York Press.
- Boudon, R. (1974). *Education, opportunity, and social inequality: Changing prospects in western society*. Hoboken, NJ: John Wiley & Sons.
- Bowles, S., & Gintis, H. (2011). *Schooling in capitalist America: Educational reform and the contradictions of economic life*. Chicago, IL: Haymarket Books.
- Boyd, D. J., Lankford, H., Loeb, S., Rockoff, J. E. & Wyckoff, J. H. (2007). *The narrowing gap in New York City teacher qualifications and its implications for student achievement in high poverty schools*. Washington, DC: National Center for the Analysis of Longitudinal Data in Education Research.
- Breen, R., & Jonsson, J. O. (2005). Inequality of opportunity in comparative perspective: Recent research on educational attainment and social mobility. *Annual Review of Sociology*, 31(1), 223-243.
- Brighthouse, H., & Swift, A. (2008). Putting educational equality in its place. *Education Finance and Policy*, 3(4), 444-466.
- Brimley, V., Verstegen, D. A., & Garfield, R. R. (2015). *Financing Education in a Climate of Change*. London, UK: Pearson Publishing International.
- Brown v. Board of Education, 347 U.S. 483 (1954).
- Bulkley, K. (2005). Understanding the charter school concept in legislation: The cases of Arizona, Michigan, and Georgia. *International Journal of Qualitative Studies in Education*, 18(4), 527-554.

- Burke, S. M. (1999). An analysis of resource inequity at the state, district, and school levels. *Journal of Education Finance*, 24(4), 435-458.
- Burtless, G. (1996). Worsening American income inequality: Is world trade to blame? *The Brookings Review*, 14(2), 26-31.
- Buttram, R. T., Folger, R., & Sheppard, B. H. (1995). *Equity, equality and need: Three faces of social justice in conflict. Cooperation, and justice: Essays inspired by the work of Morton Deutsch*. San Francisco, CA: Jossey-Bass Publishers.
- Cabrera, N. L., Mesa, E. L., & Rodriguez, R. (2011). The fight for ethnic studies in Tucson. *North American Congress on Latin America's Report on the Americas*, 44(6), 20-24.
- Cabrera, N. L., Meza, E. L., Romero, A. J., & Rodríguez, R. C. (2013). "If there is no struggle, there is no progress": Transformative youth activism and the school of ethnic studies. *The Urban Review*, 45(1), 7-22.
- Caminero-Santangelo, M. (2007). *On Latinidad: US Latino literature and the construction of ethnicity*. Gainesville, FL: University Press of Florida.
- Campbell, K. M. (2011). The road to SB 1070: How Arizona became ground zero for the immigrants' rights movement and the continuing struggle for Latino civil rights in America. *Harvard Law Review*, 14(1), 1-22.
- Card, D., & Krueger, A. B. (1992). Does school quality matter? Returns to education and the characteristics of public schools in the United States. *Journal of political Economy*, 100(1), 1-40.
- Card, D., & Payne, A. A. (2002). School finance reform, the distribution of school spending, and the distribution of student test scores. *Journal of Public Economics*, 83(1), 49-82.
- Cardenas, J. A. (1997). *Texas school finance reform: An IDRA perspective*. San Antonio, TX: Intercultural Development Research Association.
- Carlo, M. S., August, D., McLaughlin, B., Snow, C. E., Dressler, C., Lippman, D. N.,... White, C. E. (2004). Closing the gap: Addressing the vocabulary needs of English-language learners in bilingual and mainstream classrooms. *Reading Research Quarterly*, 39(2), 188-215.
- Carr, M., Gray, N., & Holley, M. (2007). *Shortchanging disadvantaged students: An analysis of intra-district spending patterns in Ohio*. Columbus, OH: The Buckeye Institute for Public Policy Solutions.

- Chambers, J., Shambaugh, L., Levin, J., Muraki, M., & Poland, L. (2008). *A tale of two districts: A comparative study of student-based funding and school-based decision making in San Francisco and Oakland Unified School Districts*. Washington, DC: American Institutes for Research.
- Chambers, J. G., Levin, J. D., & Shambaugh, L. (2010). Exploring weighted student formulas as a policy for improving equity for distributing resources to schools: A case study of two California school districts. *Economics of Education Review*, 29(2), 283-300.
- Chen-Gaddini, M., & Burr, E. (2016). *Long-term English learner students: Spotlight on an overlooked population*. San Francisco, CA: REL West.
- Chesterman, S. (1997). Beyond fusion fallacy: The transformation of equity and Derrida's 'The Force of Law'. *Journal of Law and Society*, 24(3), 350-376.
- Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2005). Who Teaches Whom? Race and the Distribution of Novice Teachers. *Economics of Education Review*, 24(4), 377-392.
- Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2006). Teacher-student matching and the assessment of teacher effectiveness. *Journal of Human Resources*, 41(4), 778-820.
- Clotfelter, C. T., Ladd, H. F., & Vigdor, J. L. (2007). Teacher credentials and student achievement: Longitudinal analysis with student fixed effects. *Economics of Education Review*, 26(6), 673-682.
- Cobb, C. D., & Glass, G. V. (2009). School choice in a post-desegregation world. *Peabody Journal of Education*, 84(2), 262-278.
- Cohen, J., McCabe, L., Michelli, N. M., & Pickeral, T. (2009). School climate: Research, policy, practice, and teacher education. *The Teachers College Record*, 111(1), 180-213.
- Coleman, J. S., Campbell, E. Q., Hobson, C. J., McPartland, J., Mood, A. M., Weinfeld, F. D., & York, R. (1966). *Equality of educational opportunity*. Washington, DC: US Government Printing Office.
- Condron, D. J., & Roscigno, V. J. (2003). Disparities Within: Unequal spending and achievement in an urban school district. *Sociology of Education*, 76(1), 18-36.
- Cooper, J., & Fazio, R. H. (1984). A new look at dissonance theory. *Advances in experimental social psychology*, 17(1), 229-266.

- Copeland, T. E., Weston, J. F., & Shastri, K. (1983). *Financial theory and corporate policy*. Reading, MA: Addison-Wesley Publishing.
- Cross, C. T., & Roza, M. (2007). *How the federal government shapes and distorts the financing of K-12 schools*. Seattle, WA: Center on Reinventing Public Education.
- Cuban, L. (1990). Reforming again, again, and again. *Educational researcher*, 19(1), 3-13.
- Culyer, A. J. (2001). Equity-some theory and its policy implications. *Journal of Medical Ethics*, 27(4), 275-283.
- Darling-Hammond, L. (1995). Changing conceptions of teaching and teacher development. *Teacher Education Quarterly*, 22(4), 9-26.
- Darling-Hammond, L. (2002). Research and rhetoric on teacher certification. *Education Policy Analysis Archives*, 10(36), 1-55.
- Darling-Hammond, L. (2004). Standards, accountability, and school reform. *Teachers College Record*, 106(6), 1047-1085.
- Davis, N. A., & Singer, P. (1991). Contemporary deontology. In P. Singer (Ed.), *A companion to ethics* (pp. 205-218). Malden, MA: Blackwell Publishing.
- Davis, M., Vedder, A., & Stone, J. (2016). Local tax limits, student achievement, and school-finance equalization. *Journal of Education Finance*, 41(3), 289-301.
- DeAngelis, J. B., Presley, B. R., & White, B. R. (2005). *The distribution of teacher quality in Illinois*. Chicago, IL: Illinois Education Research Council.
- Dodge, W. S. (1998). Extraterritoriality and conflict-of-laws theory: An argument for judicial unilateralism. *Harvard International Law Journal*, 39(1), 102-169.
- Downes, T. A. (1992). Evaluating the impact of school finance reform on the provision of public education: The California case. *National Tax Journal*, 45(4), 405-419.
- Duncombe, W. D., Lukemeyer, A., & Yinger, J. (2004). *Education finance reform in New York: Calculating the cost of a sound basic education in New York City*. Syracuse, NY: Center for Policy Research.
- Duncombe, W., & Yinger, J. (2006). *Understanding the incentives in California's education finance system*. Syracuse, NY: The Maxwell School.
- Dyson, A. (2001). Special needs education as the way to equity: An alternative approach? *Support for Learning*, 16(3), 99-104.

- Elementary and Secondary Education Act (ESEA) of 1965, Public law 89-10 U.S.C. § 79 Statute 27 (1965).
- Elmore, R. F. (1979). Backward mapping: Implementation research and policy decisions. *Political Science Quarterly*, 94(4), 601-616.
- Enrich, P. (1995). Leaving equality behind: New directions in school finance reform. *Vanderbilt Law Review*, 48(101), 100-194.
- Espinosa, R. W. (1985). *Fiscal resources and school facilities and their relationship to ethnicity and achievement in the Los Angeles Unified School District*. San Diego, CA: Social Equity Center.
- Espinosa, R., & Ochoa, A. M. (1992). *Educational Attainment of California Youth: A Public Equity Crisis*. San Diego, CA: Policy Studies Department, College of Education, San Diego State University.
- Every Student Succeeds Act of 2015, Public Law 114-95 § 114 Statute 1177 (2015).
- Equal Educational Opportunity Act (EEOA) of 1974, Public Law 20 U.S.C. Section 1701-1758 (1974).
- Ferguson, R. F. (1991). Paying for public education: New evidence on how and why money matters. *Harvard Journal on Legislation*, 28(1), 465-498.
- Festinger, L. (1957). *A theory of cognitive dissonance*. Evanston, IL: Row & Peterson Publishing.
- Feagin, J. R., & Cobas, J. A. (2015). *Latinos facing racism: Discrimination, resistance, and endurance*. New York, NY: Routledge Publishing.
- Francis, B. (2006). Heroes or zeroes? The discursive positioning of ‘underachieving boys’ in English neo-liberal education policy. *Journal of Education Policy*, 21(2), 187-200.
- Fredricks, D. E., & S. Warriner, D. (2016). “We speak English in here and English only!”: Teacher and ELL youth perspectives on restrictive language education. *Bilingual Research Journal*, 39(3-4), 309-323.
- Gamoran, A. (2001). American schooling and educational inequality: A forecast for the 21st century. *Sociology of Education*, 74(1), 135-153.
- Gamoran, A., & Long, D.A. (2006). *Equality of educational opportunity: A 40-Year retrospective*. Madison, WI: Wisconsin Center for Education Research. Retrieved from https://wcer.wisc.edu/docs/working-papers/Working_Paper_No_2006_09.pdf.

- Gándara, P., Maxwell-Jolly, J., & Driscoll, A. (2005). *Listening to teachers of English language learners: A survey of California teachers' challenges, experiences, and professional development needs*. Santa Cruz, CA: The Center for the Future of Teaching and Learning.
- Gándara, P., & Orfield, G. (2010). *A return to the "Mexican Room": The segregation of Arizona's English learners*. Los Angeles, CA: Civil Rights Project/Proyecto Derechos Civiles.
- Gándara, P., & Orfield, G. (2012a). Segregating Arizona's English learners: A return to the "Mexican Room". *Teachers College Record*, 114(9), 1-27.
- Gándara, P., & Orfield, G. (2012b). Why Arizona matters: The historical, legal, and political contexts of Arizona's instructional policies and US linguistic hegemony. *Language Policy*, 11(1), 7-19.
- Gándara, P. C., & Rumberger, R. W. (2006). *Resource needs for California's English learners*. Stanford, CA: Institute for Research On Education Policy & Practice.
- Gándara, P., & Rumberger, R. W. (2008). Defining an adequate education for English learners. *Education*, 3(1), 130-148.
- Gándara, P., Rumberger, R., Maxwell-Jolly, J., & Callahan, R. (2003). English Learners in California Schools: Unequal resources, unequal outcomes. *Education Policy Analysis Archives*, 11(36), 1-54.
- Gangl, A. (2003). Procedural justice theory and evaluations of the lawmaking process. *Political Behavior*, 25(2), 119-149.
- Gans, J. (2007). *The economic impact of immigrants in Arizona*. Tucson, AZ: Udall Center for Studies in Public Policy
- García, O. (2011). *Bilingual education in the 21st century: A global perspective*. Hoboken, NJ: John Wiley & Sons.
- García, O., & Kleifgen, J. A. (2010). *Educating emergent bilinguals: Policies, programs, and practices for English language learners*. New York, NY: Teachers College Press.
- Garcia, E., Lawton, K., & Diniz de Figueiredo, E. H. (2010). *Assessment of young English language learners in Arizona: Questioning the validity of the state measure of English proficiency*. Los Angeles, CA: Civil Rights Project/Proyecto Derechos Civiles.

- Garcia, O., & Menken, K. (2006). The English of Latinos from a plurilingual transcultural angle: Implications for assessment and schools. In S. J. Nero (Ed.), *Dialects, Englishes, creoles, and education* (pp. 167-183). New York, NY: Taylor & Francis Publishing.
- Garrett, J. (2004). *A simple and usable (although incomplete) ethical theory based on the ethics of W. D. Ross*. Retrieved from <http://people.wku.edu/jan.garrett/ethics/rossethc.htm>
- Gawronski, B. (2012). Back to the future of dissonance theory: Cognitive consistency as a core motive. *Social Cognition, 30*(6), 652-668.
- Genesee, F., Lindholm-Leary, K., Saunders, W., & Christian, D. (2005). English language learners in US schools: An overview of research findings. *Journal of Education for Students Placed at Risk, 10*(4), 363-385.
- Gillespie, L. N. (2009). The Fourth Wave of Educational Finance Litigation: Pursuing a Federal Right to an Adequate Education. *Cornell Law Review, 95*(5), 989-1020.
- Ginsburg, A., Moskowitz, J., & Rosenthal, A. S. (1981). A school-based analysis of inter- and intradistrict resource allocation. *Journal of Education Finance, 6*(4), 440-455.
- Goals 2000 Public Law 103-227 § 108 Statute 125 (1994).
- Goertz, M. E., & Natriello, G. (1999). Court-mandated school finance reform: What do the new dollars buy. In H. F. Ladd, R. Chalk, & J. S. Hansen (Eds.), *Equity and Adequacy in education finance issues and perspectives* (pp. 99-135). Washington, DC: National Academy Press
- Grawe, K. (2007). *Neuropsychotherapy: How the neurosciences inform effective psychotherapy*. New York, NY: Routledge Publishing.
- Greenberg, J. (1987). A taxonomy of organizational justice theories. *Academy of Management review, 12*(1), 9-22.
- Greenberg, J., & Tyler, T. R. (1987). Why procedural justice in organizations? *Social Justice Research, 1*(2), 127-142.
- Greenwald, R., Hedges, L. V., and Laine, R. D. (1996). The effect of school resources on student achievement. *Review of Educational Research, 66*(3), 361-396.
- Guthrie, J. W, Kleindorfer, G., Levin, H. H., & Stout, R. (1971). *Schools and Inequality*. Cambridge, MA: Massachusetts Institute of Technology Press.

- Haas, E. (2005). The Equal Educational Opportunity Act 30 years later: Time to revisit appropriate action for assisting English language learners. *Journal of Law & Education*, 34(3), 361-394.
- Hadderman, M. (1999). *Equity and adequacy in educational finance*. Eugene, OR: ERIC Clearinghouse on Educational Management
- Hanushek, E. A. (1981). Throwing money at schools. *Journal of Policy Analysis and Management*, 1(1), 19-41.
- Hanushek, E. A. (1986). The economics of schooling: Production and efficiency in public schools. *Journal of Economic Literature*, 24(3), 1141-1177.
- Hanushek, E. A. (1989). The impact of differential expenditures on school performance. *Educational researcher*, 18(4), 45-62.
- Hanushek, E. A. (1991). When school finance reform may not be good policy. *Harvard Journal on Legislation*, 28(2), 423-456.
- Hanushek, E. A. (1997). Assessing the effects of school resources on student performance: An update. *Educational Evaluation and Policy Analysis*, 19(2), 141-164.
- Hanushek, E. A. (1999). Some findings from an independent investigation of the Tennessee STAR experiment and from other investigations of class size effects. *Educational Evaluation and Policy Analysis*, 21(2), 143-163.
- Hanushek, E. A., & Kain, J. F. (1972). On the value of equality of educational opportunity as a guide to public policy. In F. Mosteller & D. P. Moynihan (Eds.), *On equality of educational opportunity* (pp. 116-145). New York, NY: Random House Publishing.
- Hanushek, E. A., Kain, J. F., & Rivkin, S. G. (1999). *Do higher salaries buy better teachers?* Cambridge, MA: National Bureau of Economic Research.
- Hanushek, E. A., Lindseth, A. A., & Rebell, M. A. (2009). Many Schools Are Still Inadequate: Now What? *Education Next*, 9(4), 39.
- Haycock, K. (1998). Good teaching matters: How well-qualified teachers can close the gap. *Thinking K-16*, 3(2), 1-16.
- Haycock, K. (2001). Closing the achievement gap. *Educational Leadership*, 58(6), 6-11.

- Hedges, L. V., Laine, R. D., & Greenwald, R. (1994). An exchange: Part I: Does money matter? A meta-analysis of studies of the effects of differential school inputs on student outcomes. *Educational Researcher*, 23(3), 5-14.
- Heise, M. (1994). State constitutional litigation, educational finance, and legal impact: An empirical analysis. *University of Cincinnati Law Review*, 63(1), 1735-1765.
- Heise, M. (1995). State constitutions, school finance litigation, and the third wave: From equity to adequacy. *Temple Law Review*, 68(1), 1151-1176.
- Heise, M. (1998). Equal educational opportunity, hollow victories, and the demise of school finance equity theory: An empirical perspective and alternative explanation. *Georgia Law Review*, 32(1), 543-581.
- Hertert, L. (1993). *Resource allocation patterns in public education: an analysis of school-level equity in California* (Unpublished Dissertation). Stanford University, Palo Alto, CA.
- Hertert, L. (1995). Does equal funding for districts mean equal funding for classroom students? In L. O. Picus and J. L. Wattenbarger (Eds.), *Where does the money go? Resource allocation in elementary and secondary schools* (pp. 71-84). Thousand Oaks, CA: Corwin Press.
- Hoffman, D., & Rex, T. (2009). *Education funding in Arizona: Constitutional requirement and the empirical record*. Tempe, AZ: Center for Competitiveness and Prosperity Research.
- Hogan, T. M., Peters, D. M., & Mackin, K. (2010). Education and the Arizona Constitution. *Phoenix Law Review*, 3(1), 99-113.
- Horsford, S. D., & Sampson, C. (2013). High-ELL-growth states: Expanding funding equity and opportunity for English language learners. *Voices in Urban Education*, 37(1), 47-54.
- Hoshino-Browne, E. (2012). Cultural variations in motivation for cognitive consistency: Influences of self-systems on cognitive dissonance. *Social and Personality Psychology Compass*, 6(2), 126-141.
- Houck, E. A. (2010). Teacher quality and school resegregation: A resource allocation case study. *Leadership and Policy in Schools*, 9(1), 49-77.
- Houck, E. A. (2011). Intradistrict resource allocation: Key findings and policy implications. *Education and Urban Society*, 43(3), 271-295.

- Hoxby, C. M. (1998). *The effects of class size and composition on student achievement: New evidence from natural population variation*. Eugene, OR: National Bureau of Economic Research.
- Hyman, J. (2013). *Does money matter in the long run? Effects of school spending on educational attainment*. Ann Arbor, MA: Department of Economics University of Michigan.
- Iatarola, P. & Rubenstein, R. (2007). New stakes and standards, same ol' spending? Evidence from New York City high schools. *Education Finance and Policy*, 2(1), 74-99.
- Iatarola, P. & Stiefel, L. (2003). Intradistrict equity of public education resources and performance. *Economics of Education Review*, 22(1). 69-78.
- Iddings, A. C. D., Combs, M. C., & Moll, L. (2012). In the arid zone drying out educational resources for English language learners through policy and practice. *Urban Education*, 47(2), 495-514.
- Jackson, C. K., Johnson, R. C., & Persico, C. (2015). Boosting educational attainment and adult earnings. *Education Next*, 15(4), 69-75.
- Janis, I. L., & Mann, L. (1977). *Decision making: A psychological analysis of conflict, choice, and commitment*. New York, NY: Free Press.
- Jencks, C. (1980). Structural versus individual explanations of inequality: Where do we go from here? *Contemporary Sociology*, 9(6), 762-767.
- Jimenez-Castellanos, O. (2008). *Beyond equality, equity and adequacy: Intra-district resource allocation's impact on school achievement* (Unpublished Dissertation). Claremont Graduate College, Claremont, CA.
- Jimenez-Castellanos, O. (2010). Relationship between educational resources and school achievement: A mixed method intra-district analysis. *The Urban Review*, 42(4), 351-371.
- Jiménez-Castellanos, O. (2017). English language learner education finance scholarship: An introduction to the special issue. *Education Policy Analysis Archives*, 25(14), 1-13.
- Jimenez-Castellanos, O., Combs, M. C., Martinez, D., & Gomez, L. (2013). *English language learners: What's at stake for Arizona?* Phoenix, AZ: The Morrison Institute for Public Policy.

- Jimenez-Castellanos, O., & García, E. (2017). Intersection of language, class, ethnicity, and policy: Toward disrupting inequality for English language learners. *Review of Research in Education*, 41(1), 428-452.
- Jimenez-Castellanos, O., & Martinez, D. (2015). Arizona. *Journal of Education Finance*, 41(2), 202-205.
- Jimenez-Castellanos, O., & Martinez, D. (2017). Arizona. *Journal of Education Finance*, 42(3), 253-255.
- Jimenez-Castellanos, O., & Okhremtchouk, I. (2013). K-12 categorical entitlement funding for English language learners in California: An intradistrict case study. *Educational Considerations*, 40(2), 27-33.
- Jiménez-Castellanos, O., & Rodríguez, J. L. (2009). Intradistrict resource reallocation for Latino English language learners: An exploratory multiple case study approach. *Bilingual Research Journal*, 32(3), 298-316.
- Jimenez-Silva, M., Gomez, L., & Cisneros, J. (2014). Examining Arizona's policy response post Flores v. Arizona in educating K–12 English language learners. *Journal of Latinos and Education*, 13(3), 181-195.
- Kahn, G. (1987). *Natural semantics*. Presented at STACS 87, 4th Annual Symposium on Theoretical Aspects of Computer Science. Passau, DE: Springer Publishing.
- Kahneman, D. (2003). Maps of bounded rationality: Psychology for behavioral economics. *American Economic Review*, 93(5), 1449-1475.
- Kahneman, D., & Tversky, A. (1972). Subjective probability: A judgment of representativeness. *Cognitive psychology*, 3(3), 430-454.
- Kahneman, D., & Tversky, A. (1979). Prospect Theory: An Analysis of Decisions Under Risk. *Econometrica*, 47(2), 263-291.
- Kahneman, D., Slovic, P., Tversky, A. (1982). *Judgment under uncertainty: Heuristics and biases*. New York, NY: Cambridge University Press.
- Kant, I. (1795). *On perpetual peace*. Ontario, CA: Broadview Press.
- Knoepfel, R. C. (2007). Resource adequacy, equity, and the right to learn: Access to high-quality teachers in Kentucky. *Journal of Education Finance*, 32(4), 422-442.
- Kozol, J. (2005). *The shame of the nation: The restoration of apartheid schooling in America*. New York, NY: Broadway Books.

- Kozol, J., (1991). *Savage Inequalities: Children in America's Schools*. New York, NY: Harper Perennial.
- Krashen, S. D. (1999). *Condemned without a trial: Bogus arguments against bilingual education*. Portsmouth, NH: Heinemann Publishing.
- Kruglanski, A. W., & Shteynberg, G. (2012). Cognitive consistency as means to an end: How subjective logic affords knowledge. In B. Gawronski & F. Strack (Eds.), *Cognitive consistency: A fundamental principle in social cognition* (pp. 245-264). New York, NY: Guilford Press.
- Ladd, H. F. (2008). Reflections on equity, adequacy, and weighted student funding. *Education Finance and Policy*, 3(4), 402-423.
- Ladd, H. F., Chalk, R., & Hansen, J. S. (1999). *Equity and adequacy in education finance: Issues and perspectives*. Washington, DC: National Academy Press.
- Ladson-Billings, G. (1998). Just what is critical race theory and what's it doing in a nice field like education? *International Journal of Qualitative Studies in Education*, 11(1), 7-24.
- Ladson-Billings, G. (2006). From the achievement gap to the education debt: Understanding achievement in US schools. *Educational researcher*, 35(7), 3-12.
- Ladson-Billings, G., & Tate IV, W. F., (2016). Toward a critical race theory of education. In A. D. Dixson, C. K. Rousseau Anderson, & J. K. Donnor (Eds.) *Critical race theory in education* (pp. 10-31). New York, NY: Routledge Publishing.
- Lafortune, J., Rothstein, J., & Schanzenbach, D. W. (2018). School finance reform and the distribution of student achievement. *American Economic Journal: Applied Economics*, 10(2), 1-26.
- Lankford, H., Loeb, S. & Wyckoff, J. (2002). Teacher sorting and the plight of urban schools: A descriptive analysis. *Educational Evaluation and Policy Analysis*. 24(1). 37–62.
- Lau v. Nichols, 414 U.S. 563 (1974).
- Leachman, M., Albares, N., Masterson, K., & Wallace, M. (2015). *Most states have cut school funding, and some continue cutting*. Washington, DC: Center on Budget and Policy Priorities.
- Lee, J. (2002). Racial and ethnic achievement gap trends: Reversing the progress toward equity? *Educational researcher*, 31(1), 3-12.

- Lee, R. D., Johnson, R. W., & Joyce, P. G. (2004). *Public budgeting systems*. Burlington, VA: Jones & Bartlett Learning.
- Leflar, R. A. (1966). Conflicts law: More on choice-influencing considerations. *California Law Review*, *54*(4), 1584-1598.
- LeGrand, J. (1991). Quasi-markets and social policy. *The Economic Journal*, *101*(408), 1256-1267.
- Lind, E. A., & Tyler, T. R. (1988). *The social psychology of procedural justice*. Berlin, DE: Springer Publishing.
- Lillie, K. E. (2016). The lost generation: Students of Arizona's structured English immersion. *International Journal of Bilingual Education and Bilingualism*, *19*(4), 408-425.
- Lillie, K. E., Markos, A., Estrella, A., Nguyen, T., Trifiro, A., Arias, M. B.,...Perez, K. (2010). *Policy in practice: The implementation of structured English immersion in Arizona*. Los Angeles, CA: Civil Rights Project/Proyecto Derechos Civiles.
- Mann, D. (1975). *Policy decision-making in education: An introduction to calculation and control*. New York, NY: Teachers College Press.
- Marsh, J. A., Pane, J. F., & Hamilton, L. S. (2006). *Making sense of data-driven decision making in education*. Santa Monica, CA: RAND Corporation.
- Martinez, D. G., Begay, V. H., & Jimenez-Castellanos, O. (2018). Understanding Navajo K-12 public school finance in Arizona through tribal critical theory. *Teachers College Record*, *121*(5).
- Mellers, B. A. (1982). Equity judgment: A revision of Aristotelian views. *Journal of Experimental Psychology: General*, *111*(2), 242.
- Miles, K. H., & Roza, M. (2006). Understanding student-weighted allocation as a means to greater school resource equity. *Peabody Journal of Education*, *81*(3), 39-62.
- Miller, D. (1979). *Social justice*. Oxford, UK: Oxford University Press.
- Miller, D. (1980). Social justice and the principle of need. In M. Freeman & D. Robertson (Eds.) *The frontiers of political theory. Essays in a revitalized discipline* (pp. 173-197). Basingstoke, UK: Palgrave Macmillan Publishing.
- Miller, L. & Rubenstein, R. (2008). Examining the nature and magnitude of intradistrict resource disparities in mid-size school districts. *Public Budgeting and Finance*, *28*(4), 26-51.

- Miller, L. J., Roza, M., & Swartz, C. (2004). *A cost allocation model for shared district resources: A means for comparing spending across schools*. Seattle, WA: Center on Reinventing Public Education.
- Minorini, P., & Sugarman, S. (1999). School finance litigation in the name of educational equity: Its evolution, impact and future. In H. F. Ladd, R. Chalk, & J. S. Hansen (Eds.), *Equity and adequacy in education finance issues and perspectives* (pp. 33-71). Washington, DC: National Academy Press.
- Minow, M. (1984). Some thoughts on dispute resolution and civil procedure. *Journal of Legal Education*, 34(2), 284-297.
- Mitchell, G., Tetlock, P. E., Mellers, B. A., & Ordonez, L. D. (1993). Judgments of social justice: Compromises between equality and efficiency. *Journal of Personality and Social Psychology*, 65(4), 629.
- Monk, D. & Hussain, S. (2000). Structural influences on the internal allocation of school district resources: Evidence from New York State. *Educational Evaluation and Policy Analysis*, 22(1). 1-26.
- Monroe, A. D. (1979). Consistency between public preferences and national policy decisions. *American Politics Quarterly*, 7(1), 3-19.
- Musgrave, R. A. (1990). Horizontal equity, once more. *National Tax Journal*, 43(2), 113-122.
- McFarland, J., Hussar, B., de Brey, C., Snyder, T., Wang, X., Wilkinson-Flicker, S.,...Hinz, S. (2017). *The condition of education 2017*. Washington, DC: U.S. Department of Education, National Center for Education Statistics. Retrieved from <https://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2017144>.
- Nieto, S. (2015). *The light in their eyes: Creating multicultural learning communities*. New York, NY: Teachers College Press.
- National Center for Education Statistics. (n.d.). *Elementary and secondary information system common core of data* [data file]. Retrieved from <http://nces.ed.gov/ccd/elsi/tableGenerator.aspx>.
- No Child Left Behind Act (NCLB) of 2001, Public Law 20 U.S.C. § 6319 (2002).
- Odden, A. (1983). *School finance reform in the states: 1983*. Denver, CO: Education Commission of the states. Retrieved from <https://eric.ed.gov/?id=ED235589>.
- Odden, A. (2000). New and better forms of teacher compensation are possible. *Phi Delta Kappan*, 81(5), 361.

- Odden, A. (2003). Equity and adequacy in school finance today. *Phi Delta Kappan*, 85(2), 120-125.
- Odden, A., & Archibald, S. (2000). *A case study of resource reallocation to reduce class size, enhance teacher planning time, and strengthen literacy: Clayton elementary school*. Madison, WI: Consortium for Policy Research in Education.
- Odden, A., Archibald, S., Ferminick, M., & Gross, B. (2003). Defining school-level expenditure structures that reflect educational strategies. *Journal of Education Finance*, 28(3), 323-356.
- Odden, A., & Picus, L. O. (2008). *School finance: A policy perspective*. New York, NY: McGraw-Hill Education.
- Olsen, L. (2014). *Meeting the unique needs of longterm English language learners: A guide for educators*. Washington, DC: National Education Association.
- Okhremtchouk, I. S. (2011). *Disjointed continuity: Classification practices for language minority students and implications: A case study* (Unpublished Dissertation). University of California at Davis, Davis, CA.
- O'Leary, A. O., Romero, A. J., Cabrera, N. L., & Rascon, M. (2012). Assault on ethnic studies. In O. Santa Anna & C. Gonzalez de Bustamante (Eds.), *Arizona firestorm: Global realities, national media and provincial politics* (pp. 97–120). Lanham, MD: Rowman & Littlefield.
- Orfield, G., Losen, D., Wald, J., & Swanson, C. B. (2004). *Losing our future: How minority youth are being left behind by the graduation rate crisis*. Cambridge, MA: The Civil Rights Project at Harvard University. Contributors: Urban Institute, Advocates for Children of New York, and The Civil Society Institute
- Owens, J. D. (1972). The distribution of educational resources in large American cities. *Journal of Human Resources*, 7(1), 26–38.
- Owens, T. and Maiden, J. (1999). A comparison of interschool and inter-district funding equity in Florida. *Journal of Education Finance*, 24(4), 503- 518.
- Padilla, F. M. (1985). *Latino ethnic consciousness: The case of Mexican Americans and Puerto Ricans in Chicago*. Notre Dame, IN; University of Notre Dame Press.
- Paris, D. (2012). Culturally sustaining pedagogy: A needed change in stance, terminology, and practice. *Educational Researcher*, 41(3), 93-97.
- Papke, L. E. (2005). The effects of spending on test pass rates: Evidence from Michigan. *Journal of Public Economics*, 89(6), 821-839.

- Paquette, J. (2005). Public funding for “private” education: The equity challenge of enhanced choice. *American Journal of Education*, 111(4), 568-595.
- Picus, L. O. (1999). Site-based management: A nuts and bolts approach for school administrators. In M. Goertz, & A. Odden (Eds.), *School-based financing* (pp. ?). Thousand Oaks, CA: Corwin Press.
- Portes, P. R. (2005). *Dismantling educational inequality: A cultural-historical approach to closing the achievement gap*. New York, NY: Peter Lang Publishing Group.
- Powers, J. M., Fischman, G. E., & Berliner, D. C. (2016). Making the visible invisible: Willful ignorance of poverty and social inequalities in the research-policy nexus. *Review of Research in Education*, 40(1), 744-776.
- Rapley, T. (2008). Distributed decision making: the anatomy of decisions-in-action. *Sociology of Health & Illness*, 30(3), 429-444.
- Rawls, J. (1971). *A theory of justice*. Cambridge, MA: Harvard University Press.
- Razfar, A., & Rumenapp, J. C. (2012). Language ideologies in English learner classrooms: Critical reflections and the role of explicit awareness. *Language Awareness*, 21(4), 347-368.
- Reardon, S. F. (2011). The widening academic achievement gap between the rich and the poor: New evidence and possible explanations. In R. Murnane & G. Duncan (Eds.), *Whither opportunity? Rising inequality and the uncertain life chances of low-income children* (pp. 91-116). New York, NY: New York: Russell Sage Foundation Press.
- Rebell, M. A. (2007). Professional rigor, public engagement and judicial review: A proposal for enhancing the validity of education adequacy studies. *Teachers College Record*, 109(6), 1303-1373.
- Rebell, M. A. (2008). Equal opportunity and the courts. *Phi Delta Kappan*, 89(6), 432-439.
- Rebell, M. A., & Metzler, J. (2002). Rapid response, radical reform: The story of school finance litigation in Vermont. *Journal of Law and Education*, 31(2), 167-189
- Reschovsky, A., & Imazeki, J. (1997). The development of school finance formulas to guarantee the provision of adequate education to low-income students. In W. Fowler (Ed.), *Does money matter?* Washington, DC: Education Finance Statistical Center (EFSC) at the U.S. Department of Education, National Center for Education Statistics (NCES).

- Reschovsky, A., & Imazeki, J. (2001). Achieving educational adequacy through school finance reform. *Journal of Education Finance*, 26(4), 373-396.
- Rodriguez, C. E. (2000). *Changing race: Latinos, the census, and the history of ethnicity in the United States*. New York, NY: New York University Press.
- Rodriguez, G. M. (2004). Vertical equity in school finance and the potential for increasing school responsiveness to student and staff needs. *Peabody Journal of Education*, 79(3), 7-30.
- Rodriguez, G. M., & Rolle, R. A. (Eds.). (2013). *To what ends and by what means: The social justice implications of contemporary school finance theory and policy*. New York, NY: Routledge Publishing.
- Roellke, C., Green, P., & Zielewski, E. H. (2004). School finance litigation: The promises and limitations of the third wave. *Peabody Journal of Education*, 79(3), 104-133.
- Rohrleitner, M. C. (2013). *Pan-Latinidad*. Oxford, UK: Oxford University Press.
- Rolle, A. (2004). An empirical discussion of public school districts as budget-maximizing agencies. *Journal of Education Finance*, 29(4), 277-297.
- Rolle, A., & Jimenez-Castellanos, O. (2014). An Efficacy Analysis of the Texas School Funding Formula with Particular Attention to English Language Learners. *Journal of Education Finance*, 39(3), 203-221.
- Rolle, A., & Liu, K. (2007). An empirical analysis of horizontal and vertical equity in the public schools of Tennessee, 1994-2003. *Journal of Education Finance*, 32(3), 328-351.
- Roscigno, V. J., & Ainsworth-Darnell, J. W. (1999). Race, cultural capital, and educational resources: Persistent inequalities and achievement returns. *Sociology of Education*, 72(3), 158-178.
- Rose v. Council for Better Education, 790 S.W.2d 186, 60 Ed. Law Rep. 1289 (1989).
- Ross, W. D. (1930). *The right and the good*. Oxford, UK: Clarendon Press.
- Ross, W. D. (1954). *Kant's ethical theory*. Oxford, UK: Oxford University Press.
- Ross, W. D., & Stratton-Lake, P. (2002). *The right and the good*. Oxford, UK: Oxford University Press.
- Rothstein, R. (2001). Investing in family capital. *American School Board Journal*, 188(2), 18-21.

- Rothstein, R. (2004). *Class and schools: Using social, economic, and educational reform to close the achievement gap*. Washington, DC: Economic Policy Institute.
- Roza, M. (2008). *Allocation anatomy: How district policies that deploy resources can support (or undermine) district reform strategies*. Seattle, WA: University of Washington: Center on Reinventing Public Education.
- Roza, M. (2011). *The machinery that drives education-spending decisions inhibits better uses of resources*. Presented at Governance in the Twenty-First Century Conference. Washington, DC: Thomas B. Fordham Institute.
- Roza, M., Guin, K., & Davis, T. (2007). *What is the sum of the parts? How federal, state and district funding streams confound efforts to address different student types. School finance redesign project working paper #9*. Seattle, WA: Center on Reinventing Public Education.
- Roza, M., Hill, P. T., Sclafani, S., & Speakman, S. (2004). *How within-district spending inequities help some schools to fail*. Seattle, WA: Center on Reinventing Public Education.
- Rubenstein, R. (1998). Resource equity in the Chicago Public Schools: A school-level approach. *Journal of Education Finance*, 23(4), 468-489.
- Rubenstein, R., & Miller, L. J. (2005). *Allocating resources within a big city school district: New York City after Campaign for Fiscal Equity v. New York*. Syracuse, NY: Center for Policy Research.
- Rubenstein, R., Schwartz, A. E., & Stiefel, L. (2006). Weighing for adequacy. *Education Week*, 25(44), 33.
- Rubenstein, R., Schwartz, A. E., Stiefel, L., & Amor, H. B. H. (2007). From districts to schools: The distribution of resources across schools in big city school districts. *Economics of Education Review*, 26(5), 532-545.
- Santa Ana, O., & de Bustamante, C. G. (Eds.). (2012). *Arizona firestorm: Global immigration realities, national media, and provincial politics*. Lanham, MD: Rowman & Littlefield Publishers.
- Schwartz, A. E. (1999). School districts and spending in the schools. In W. J. Fowler (Ed.), *Selected papers in school finance, 1997-99* (pp. 55-83). Washington, DC: National Center for Education Statistics.
- Schwartz, A. E., Rubenstein, R., & Stiefel, L. (2009). *Why do some schools get more and others less? An examination of school-level funding in New York City*. New York, NY: Institute of Education and Social Policy.

- Schwartz, A.E. & Stiefel, L. (2004). Immigrants and the distribution of resources within an urban school district. *Educational Evaluation and Policy Analysis*, 26(4), 303-328.
- Serrano v. Priest (5 Cal.3d 584 (1971)) (Serrano I)
- Shanske, D. (2005). Four theses: Preliminary to an appeal to equity. *Stanford Law Review*, 57(6), 2053-2085.
- Sherwin, E. (2000). Restitution and equity: An analysis of the principle of unjust enrichment. *Texas Law Review*, 79(1), 2083-2113.
- Spring, J. (1998). *Education and the rise of the global economy*. New York, NY: Routledge Publishing.
- Stanton-Salazar, R. (1997). A social capital framework for understanding the socialization of racial minority children and youths. *Harvard Educational Review*, 67(1), 1-41.
- Stiefel, L., Rubenstein, R., & Berne, R. (1998). Intra-district equity in four large cities: Data, methods and results. *Journal of Education Finance*, 23(4), 447-467.
- Summers, A. A. and Wolfe, B. L. (1976). Intra-district distribution of school inputs to the disadvantaged: Evidence for the courts. *The Journal of Human Resources*, 11(3), 328-342.
- Talbert-Johnson, C. (2004). Structural inequities and the achievement gap in urban schools. *Education and Urban Society*, 37(1), 22-36.
- The Education Trust (2005). *California's hidden teacher-spending gap: How state and district budgeting practices shortchange poor and minority students and their schools*. Oakland, CA: Author.
- The Education Trust (2008). *Their fair share: How Texas-sized gaps in teacher quality shortchange poor and minority students*. Oakland, CA: Author.
- Theil, H. (1967). *Economics and information theory*. Amsterdam, NE: Elsevier (North Holland Publishing Company).
- Thibaut, J. W., & Walker, L. (1975). *Procedural justice: A psychological analysis*. New York, NY: Routledge Publishing (Lawrence Erlbaum Associates).
- Thibaut, J., & Walker, L. (1978). A theory of procedure. *California Law Review*, 66(3), 541-566.

- Thomas B. Fordham Institute (2006). *Fund the child: Tackling inequity and antiquity in school finance*. Washington, DC: Author.
- Thomas B. Fordham Institute (2008). *Fund the child: Bringing equity, autonomy and portability to Ohio school finance how sound an investment*. Washington, DC: Author.
- Thompson, D. C., Crampton, F. E., & Wood, R. C. (2012). *Money and schools. Eye on education*. New York, NY: Routledge Publishing.
- Thro, W. E. (1994). Judicial analysis during the third wave of school finance litigation: The Massachusetts decision as a model. *Boston College Law Review*, 35(3), 597-617.
- Toutkoushian, R. K., & Michael, R. S. (2007). An alternative approach to measuring horizontal and vertical equity in school funding. *Journal of Education Finance*, 32(4), 395-421.
- Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive psychology*, 5(2), 207-232.
- Tversky, A., & Kahneman, D. (1974). Judgment under uncertainty: Heuristics and biases. *Science*, 185(4157), 1124-1131.
- Tversky, A., & Kahneman, D. (1991). Loss aversion in riskless choice: A reference-dependent model. *The Quarterly Journal of Economics*, 106(4), 1039-1061.
- Tversky, A., & Kahneman, D. (1992). Advances in prospect theory: Cumulative representation of uncertainty. *Journal of Risk and uncertainty*, 5(4), 297-323.
- Tyler, T. R. (1989). The psychology of procedural justice: A test of the group-value model. *Journal of Personality and Social Psychology*, 57(5), 830-838.
- Tyler, T. R. (2006). *Why people obey the law*. New Haven, CT: Yale University Press.
- United State Constitutional Amendment XIV, § 1. See supra note 10 for the relevant amendment language.
- United States Census Bureau (n.d.). *School districts data* [data file]. Retrieved from <https://www.census.gov/did/www/schooldistricts/data/>
- United States Department of Education, National Center for Education Statistics (2016). Elementary and secondary information system. *Common Core of Data*. Retrieved from <http://nces.ed.gov/ccd/elsi/tableGenerator.aspx>

- United States Commission on Civil Rights (2018). *Public education funding inequity in an era of increasing concentration of poverty and resegregation*. Washington, DC: Author.
- Valdez, C. R., Padilla, B., & Valentine, J. L. (2013). Consequences of Arizona's immigration policy on social capital among Mexican mothers with unauthorized immigration status. *Hispanic Journal of Behavioral Sciences*, 35(3), 303-322.
- Van Meter, D. S., & Van Horn, C. E. (1975). The policy implementation process a conceptual framework. *Administration & Society*, 6(4), 445-488.
- Verri, G. J., & França, A. (2013). Xenophobic and racist legislations. *UFRGSMUN/UFRGS Model United Nations Journal*, 1(1), 264-285.
- Verstegen, D. A. (1998). Judicial analysis during the new wave of school finance litigation: The new adequacy in education. *Journal of Education Finance*, 24(1), 51-68.
- Vesely, R. S., & Crampton, F. E. (2004). An assessment of vertical equity in four states: Addressing risk factors in education funding formulas. *Journal of Education Finance*, 30(2), 111-122.
- Vincent, C. (Ed.). (2003). *Social justice, education and identity*. New York, NY: Routledge Publishing.
- Wallace, S. J. (2014). Papers please: State-level anti-immigrant legislation in the wake of Arizona's SB 1070. *Political Science Quarterly*, 129(2), 261-291.
- Walster, E., & Walster, G. W. (1975). Equity and social justice. *Journal of Social Issues*, 31(3), 21-43.
- White, O., & Gates, B. L. (1974). Statistical theory and equity in the delivery of social services. *Public Administration Review*, 34(1), 43-51.
- Wittkopf, S., Robinson, M., Janczy, A., & Hunter, M. (2014). *Segregation of opportunity: Education funding a longitudinal study of Wisconsin education funding*. Madison, WI: Forward Institute.
- Wrapp, H. E. (1967). *Good managers don't make policy decisions*. Chicago, IL: Graduate School of Business, University of Chicago.
- Wright, W. E. (2005). English language learners left behind in Arizona: The nullification of accommodations in the intersection of federal and state policies. *Bilingual Research Journal*, 29(1), 1-29.

- Yosso, T. J. (2005). Whose culture has capital? A critical race theory discussion of community cultural wealth. *Race Ethnicity and Education*, 8(1), 69-91.
- Young, H. P. (1985). *Cost allocation: Methods, principles, applications*. Amsterdam, NE: Elsevier (North Holland Publishing Company).
- Young, H. P. (1995). *Equity: In theory and practice*. Princeton, NJ: Princeton University Press.
- Younts, C. W., & Mueller, C. W. (2001). Justice processes: Specifying the mediating role of perceptions of distributive justice. *American Sociological Review*, 66(1), 125-145.

APPENDIX A
ANALYTIC TABLES

Table A1

Total and Percent of ELLs Currently Enrolled in the U.S.

Year	Number of public school students participating in programs for English language learners	Total number of public school students participating in U.S. education	Percent of students participating in programs for English language learners
ELL 1998-99	2,637,507	46,538,585	5.67
ELL 1999-00	2,936,282	46,857,149	6.27
ELL 2000-01	3,377,294	47,203,539	7.15
ELL 2001-02	3,760,438	47,664,934	7.89
ELL 2002-03	4,029,340	48,183,086	8.36
ELL 2003-04	3,829,284	48,540,215	7.89
ELL 2004-05	3,905,814	48,795,465	8.00
ELL 2005-06	4,223,115	49,113,298	8.60
ELL 2006-07	2,146,195	49,315,842	4.35
ELL 2007-08	2,129,505	49,290,559	4.32
ELL 2008-09	3,926,788	49,265,572	7.97
ELL 2009-10	4,723,852	49,360,982	9.57
ELL 2010-11	2,981,610	49,484,181	6.03
ELL 2011-12	4,472,563	49,521,669	9.03
ELL 2012-13	4,240,092	49,771,118	8.52
ELL 2013-14	4,452,104	50,044,522	8.90

Note. National Center for Education Statistics, Common Core of Data.

Table A2

NAEP 4th and 8th Grade Reading

Year	4 th Grade Reading Caucasian	4 th Grade Reading Latino	4 th Grade Reading ELLS	4 th Grade Reading African American	8 th Grade Reading Caucasian	8 th Grade Reading Latino	8 th Grade Reading ELLS	8 th Grade Reading African American
1998	225	193	174	193	270	243	218	244
2002	229	201	183	199	272	247	224	245
2003	229	200	186	198	272	245	222	244
2005	229	203	187	200	271	246	224	243
2007	231	205	188	203	272	247	223	245
2009	230	205	188	205	273	249	219	246
2011	231	206	188	205	274	252	224	249
2013	232	207	187	206	276	256	225	250
2015	232	208	189	206	274	253	223	248

Note. Nations Report Card Database retrieved from <https://www.nationsreportcard.gov>

Table A3

NAEP 4th and 8th Grade Math

Year	4 th Grade Math Caucasian	4 th Grade Math Latino	4 th Grade Math ELLs	4 th Grade Math African American	8 th Grade Math Caucasian	8 th Grade Math Latino	8 th Grade Math ELLs	4 th Grade Math African American
1996	232	207	201	198	281	251	226	240
2000	234	208	199	203	284	253	234	244
2003	243	222	214	216	288	259	242	252
2005	246	226	216	220	289	262	244	255
2007	248	227	217	222	291	265	246	260
2009	248	227	218	222	293	266	243	261
2011	249	229	219	224	293	270	244	262
2013	250	231	219	224	294	272	246	263
2015	248	230	218	224	292	270	246	260

Note. Nations Report Card Database retrieved from <https://www.nationsreportcard.gov>

Table A4

Student Demographics

Year	n	Mean(SD)	Percentage Mean(SD)	Percentage Minimum	Percentage Maximum
Total Number of Students					
2006	205	4185.89(9261.60)			
2009	204	4352.64(9207.96)			
2012	204	4149.66(8744.34)			
2015	203	4160.81(8678.59)			
Students Identifying as African American					
2006	205	199.44(519.87)	24.24(33.98)	0.00	17.00
2009	204	231.14(564.94)	26.52(36.26)	0.00	20.00
2012	204	200.33(484.23)	23.24(35.73)	0.00	21.00
2015	203	197.88(467.08)	23.20(36.15)	0.00	23.00
Students Identifying as Asian					
2006	205	103.76(310.87)	1.07(1.51)	0.00	10.00
2009	204	129.34(377.88)	1.18(1.76)	0.00	12.00
2012	204	108.73(345.39)	0.91(1.48)	0.00	9.00
2015	203	102.99(343.54)	0.84(1.33)	0.00	8.00

Table A4 (cont'd.)

Student Demographics

Year	n	Mean(SD)	Percentage Mean(SD)	Percentage Minimum	Percentage Maximum
Students Identifying as Caucasian					
2006	205	1985.47(5366.82)	45.04(31.70)	0.00	100.00
2009	204	1965.59(5121.60)	41.60(29.48)	0.00	100.00
2012	204	1689.73(4674.19)	38.18(28.32)	0.00	100.00
2015	203	1689.73(4425.44)	36.95(27.86)	0.00	100.00
Students Qualifying for English Language Learner Services					
2006	205	764.64(1776.65)	18.81(17.39)	1.00	75.00
2009	204	557.05(1277.37)	13.39(12.72)	1.00	63.00
2012	204	334.60(774.98)	9.17(9.69)	1.00	50.00
2015	203	285.15(660.16)	8.45(9.42)	1.00	63.00
Students Qualifying for the Federal Free and Reduced Lunch Program					
2006	205	2015.97(4687.92)	61.23(26.46)	2.00	97.00
2009	204	2093.61(4189.86)	54.22(23.11)	1.00	97.00
2012	204	1958.67(4353.13)	55.11(23.48)	2.00	97.00
2015	203	1606.74(4088.63)	54.16(22.91)	1.00	95.00

Table A4 (cont'd.)

Student Demographics

Year	n	Mean(SD)	Percentage Mean(SD)	Percentage Minimum	Percentage Maximum
Students Identifying as Hawaiian and Pacific Islander					
2012	204	10.28(26.97)	0.13(0.55)	0.00	5.00
2015	204	11.05(25.90)	0.12(0.39)	0.00	2.00
Students Qualifying for an Individualized Educational Plan					
2006	205	822.27(1799.79)	20.56(6.47)	8.00	46.00
2009	204	511.51(1077.73)	12.82(4.57)	1.00	50.00
2012	204	511.70(1096.09)	13.46(4.29)	1.00	32.00
2015	203	520.97(1133.46)	13.39(5.37)	4.00	50.00
Students Identifying as Latino					
2006	205	1642.10(3839.14)	34.67(29.28)	0.00	100.00
2009	204	1765.31(3934.72)	34.67(28.57)	0.00	100.00
2012	204	1743.09(3842.76)	36.63(28.89)	0.00	100.00
2015	203	1825.66(3941.76)	37.82(28.78)	0.00	100.00

Table A4 (cont'd.)

Student Demographics

Year	n	Mean(SD)	Percentage Mean(SD)	Percentage Minimum	Percentage Maximum
Students Identifying as Native American					
2006	205	255.12(596.56)	11.41(26.16)	0.00	100.00
2009	204	253.39(573.84)	11.42(26.09)	0.00	100.00
2012	204	233.03(534.26)	11.31(26.09)	0.00	99.00
2015	203	224.16(511.05)	11.45(26.41)	0.00	99.00
Students Identifying as Two or More Races					
2012	204	64.79(177.58)	1.15(1.59)	0.00	14.00
2015	203	101.17(256.91)	1.66(1.88)	0.00	13.00

Table A5

4th and 8th Grade Achievement (Percent Passing)

Year	n	Mean(SD)	Minimum	Maximum
Arizona Instrument to Measure Standards 4 th Grade Reading				
2007	163	61.54(16.40)	13.00	93.00
2009	166	67.17(17.12)	12.00	100.00
2012	163	69.31(15.18)	13.00	97.00
Arizona Instrument to Measure Standards 4 th Grade Math				
2007	163	69.85(15.13)	15.00	100.00
2009	166	68.11(16.40)	20.00	100.00
2012	163	59.68(16.68)	8.00	93.00
Arizona Instrument to Measure Standards 8 th Grade Reading				
2007	163	59.63(16.42)	17.00	91.00
2009	162	64.99(13.85)	26.00	100.00
2012	164	66.68(13.98)	23.00	92.00
Arizona Instrument to Measure Standards 8 th Grade Math				
2007	163	56.95(17.33)	5.05	96.00
2009	162	57.58(16.44)	10.00	94.00
2012	164	51.02(15.47)	7.00	83.00

Table A6 (cont'd.)

4th and 8th Grade Achievement (Percent Passing)

Year	n	Mean(SD)	Minimum	Maximum
<i>AZMerit 4th Grade English</i>				
2015	190	27.22(18.79)	0.00	92.00
<i>AZMerit 4th Grade Math</i>				
2015	190	28.66(18.96)	0.00	83.00
<i>AZMerit 8th Grade English</i>				
2015	186	23.58(15.95)	0.00	70.00
<i>AZMerit 8th Grade Math</i>				
2015	186	23.09(17.13)	0.00	82.00

Table A7

Revenue Per-Pupil

Year	n	Mean(SD)	Minimum	Maximum	Range
Revenue All Sources Per-Pupil					
2006	193	10748.45(3887.19)	5893.28	24204.84	18311.56
2009	202	11851.84(5780.99)	6229.74	40479.83	34250.09
2012	200	11821.81(6601.18)	5292.42	60340.50	55048.08
2015	195	11498.77(5247.43)	3788.21	36792.15	33003.94
Revenue from Federal Sources Per-Pupil					
2006	194	1732.06(1785.61)	0.00	8892.54	8892.54
2009	198	1728.49(2030.68)	0.00	9311.00	9311
2012	194	2088.08(2026.92)	0.00	9181.54	9181.54
2015	190	1754.66(1756.53)	0.00	9373.64	9373.64
Revenue from State Sources Per-Pupil					
2006	194	4598.61(1984.50)	496.26	14773.80	14277.54
2009	200	4544.62(2075.56)	76.13	14823.86	14747.73
2012	200	3449.86(1787.61)	-1973.50	10433.00	12406.5
2015	197	3609.05(1733.37)	0.00	10968.32	10968.32
Revenue from Local Sources Per-Pupil					
2006	193	4199.61(3847.27)	93.69	21401.80	21308.11
2009	200	4881.80(3930.32)	149.55	20415.41	20265.86
2012	197	5154.59(4441.13)	-861.10	21960.58	22821.68
2015	193	4933.11(4244.49)	0.00	20899.62	20899.62

Table A8 (cont'd.)

Revenue Per-Pupil

Year	n	Mean(SD)	Minimum	Maximum	Range
Revenue Funds Designated for Maintenance and Operation Costs Per-Pupil					
2006	193	7071.85(3347.44)	3739.34	20321.77	16582.43
2009	202	7985.91(4624.49)	3259.62	34034.00	30774.38
2012	199	7256.17(4219.86)	3449.33	29640.88	26191.55
2015	196	7322.44(4166.21)	0.00	30203.97	30203.97

Table A9

Expenditure by Category Per-Pupil

Year	n	Mean(SD)	Minimum	Maximum	Range
Total Expenditures Per-Pupil					
2006	193	8436.46(3991.21)	0.00	25599.60	25599.6
2009	202	9879.81(4360.83)	0.00	33619.33	33619.33
2012	199	9657.43(4649.21)	0.00	30619.19	30619.19
2015	196	9760.13(4783.53)	0.00	37042.33	37042.33
Maintenance and Operation Cost Expenditures Per-Pupil					
2006	193	7104.67(3740.10)	39.39	26156.25	26116.86
2009	202	8122.69(4223.19)	4411.61	28664.58	24252.97
2012	199	7426.96(4058.70)	4059.66	27216.48	23156.82
2015	196	7517.51(3955.97)	0.00	25435.56	25435.56
Classroom Instructional Expenditures Per-Pupil					
2006	193	4481.38(2154.09)	0.00	13641.08	13641.08
2009	201	5003.43(1918.19)	0.00	15639.94	15639.94
2012	199	4755.02(2197.19)	0.00	13926.11	13926.11
2015	195	4550.87(1983.45)	0.00	15299.80	15299.8
Expenditures Per-ELL Pupil Designated for English Language Learners					
2006	84	555.68(602.96)	1.13	3154.00	3152.87
2009	72	789.50(825.44)	3.05	4462.00	4458.95
2012	89	1037.92(1282.15)	0.18	4625.58	4625.4
2015	69	918.53(1117.11)	0.90	4468.05	4467.15

Table A10

School District Valuation, Tax Rates, & Median Income

Year	n	Mean(SD)	Minimum	Maximum
Primary Assessed Valuation				
2006	201	1.67e+08(3.23e+08)	0	1.80e+09
2009	198	2.29e+08(4.08e+08)	0	2.30e+09
2012	200	2.28e+08(4.11e+08)	0	2.28e+09
2015	199	1.99e+08(3.61e+08)	0	2.14e+09
Primary Tax Rate				
2006	184	4.15(2.04)	0.55	14.33
2009	185	3.69(1.99)	0.53	12.72
2012	185	3.44(1.76)	0.58	11.1
2015	170	4.029(2.01)	0.50	12.1
Secondary Assessed Valuation				
2006	198	1.78e+08(3.46e+08)	226530	1.96e+09
2009	191	2.57e+08(4.26e+08)	303343	2.48e+09
2012	195	2.37e+08(4.18e+08)	310910	2.29e+09
2015	178	2.17e+08(3.90e+08)	533839	2.24e+09
Secondary Tax Rate				
2006	117	1.49(0.79)	0.23	3.31
2009	126	1.12(0.17)	0.03	3.20
2012	115	1.28(0.77)	0.17	3.15
2015	100	1.48(0.91)	0.11	3.31

Table A11 (cont'd.)

School District Valuation, Tax Rates, & Median Income

Year	n	Mean(SD)	Minimum	Maximum
Median Household Income				
2006	202	41894.16(7347.77)	27600.00	52522.00
2009	199	44067.32(7593.67)	28956.00	56855.00
2012	199	43890.89(6433.81)	32886.00	53312.00
2015	197	46653.56(7658.63)	31072.00	58854.00

Table A12

High-Low Revenue and Expenditure District

Year	District	Total Pop.	Total Pop. 5-17	Total Pop. 5-17 Living in Poverty	%age 5-17 Poverty	Total Number of Students	Per-Pupil	Median HH Income	Primary Tax Rate	Log-Primary Assessed Valuation	Secondary Tax Rate	Log-Secondary Assessed Valuation
All Sources Per-Pupil High Low District												
2006-Low	4379	19766	2516	429	17.05	1941	5893.28	39669	1.97	14.16	0.43	14.57
2006-High	4255	275	84	19	22.62	43	24204.84	52522	14.33	0.38	0.00	0.42
2009-Low	4475	5074	885	188	21.24	39	6229.74	40837	1.23	1.96	0.00	2.90
2009-High	4178	141	10	2	20.00	6	40749.83	43786	5.87	0.20	0.00	0.22
2012-Low	4219	7455	1460	310	21.23	1528	5292.42	41080	0.84	4.03	0.99	4.31
2012-High	4483	175	15	3	33.33	2	60340.50	43397	1.69	0.50	0.00	0.50
2015-Low	4415	462	69	9	13.04	14	3788.21	47107	2.17	0.77	0.00	0.77
2015-High	4255	329	85	42	49.41	116	36792.15	56017	4.92	7.88	0.00	7.96

Table A13 (cont'd.)

High-Low Revenue and Expenditure District

Year	District	Total Pop.	Total Pop.	Total Pop. 5-17 Living in Poverty	%age 5-17 Poverty	Total Number of Students	Per-Pupil	Median HH Income	Primary Tax Rate	Log-Primary Assessed Valuation	Secondary Tax Rate	Log-Secondary Assessed Valuation
2006-Low	4481	4262	566	80	14.13	327	4066.75	40923	4.39	2.65	0.60	2.83
2006-High	4483	169	14	2	14.29	5	25599.60	40923	2.64	0.35	0.00	0.41
2009-Low	4173	3873	577	82	14.21	474	5183.77	43786	4.71	2.89	1.59	3.25
2009-High	4178	141	10	2	20.00	6	33619.33	43786	5.87	0.20	0.00	0.22
2012-Low	4441	48748	10661	1421	13.33	5786	4965.25	50362	3.85	23.61	1.60	24.77
2012-High	4253	128	24	13	54.17	27	30072.63	51442	4.95	0.96	0.00	0.97
2015-Low	4415	462	69	9	13.04	14	684.71	47107	2.17	0.77	0.00	0.77
2015-High	4178	160	22	9	40.91	6	37042.33	43451	4.83	3.48	0.00	3.49

Note: Population information including median income aggregated from the U.S. Census Bureau Small Area Income and Poverty Estimates program (SAIPE).

Total number of students aggregated from the U.S. Department of Education National Center for Education Statistics (NCES). Fiscal capacity, Tax-rate and property value aggregated from the Arizona Department of Education.

Table A14

Horizontal Inequity Measures: Revenue Per Pupil

Year	M&O Revenue Per Pupil	Local Revenue Per Pupil	State Revenue Per Pupil	Federal Revenue Per Pupil	Total Revenue Per Pupil
Gini Ratio					
2006	0.24	0.45	0.23	0.44	0.19
2009	0.26	0.41	0.23	0.50	0.22
2012	0.26	0.44	0.28	0.44	0.25
2015	0.25	0.44	0.26	0.43	0.22
McLoone Index					
2006	0.85	0.58	0.71	0.66	0.86
2009	0.84	0.60	0.71	0.58	0.85
2012	0.88	0.54	0.63	0.61	0.84
2015	0.87	0.53	0.63	0.61	0.83
Coefficient of Variation					
2006	0.47	0.91	0.43	1.03	0.36
2009	0.58	0.80	0.46	1.17	0.49
2012	0.58	0.86	0.52	0.97	0.45
2015	0.57	0.86	0.48	0.99	0.52

Table A15 (cont'd)

Horizontal Inequity Measures: Revenue Per Pupil

Theil Index of Economic Inequality

2006	0.09	0.34	0.09	0.39	0.06
2009	0.09	0.28	0.10	0.45	0.09
2012	0.11	0.31	0.13	0.34	0.11
2015	0.09	0.32	0.11	0.33	0.09

Table A16

Horizontal Inequity Measures: Expenditures Per Pupil

Year	ELL Expenditures Per ELL Pupil	Classroom Instructional Expenditures Per Pupil	M&O Expenditures Per Pupil	Total Expenditures Per Pupil
Gini Ratio				
2006	0.53	0.24	0.25	0.24
2009	0.51	0.18	0.24	0.21
2012	0.61	0.22	0.24	0.23
2015	0.60	0.21	0.24	0.23
McLoone Index				
2006	0.51	0.87	0.86	0.83
2009	0.48	0.87	0.87	0.85
2012	0.35	0.86	0.88	0.84
2015	0.36	0.84	0.88	0.83
Coefficient of Variation				
2006	1.08	0.48	0.53	0.47
2009	1.04	0.38	0.52	0.44
2012	1.22	0.46	0.54	0.48
2015	1.21	0.43	0.52	0.49

Table A17 (cont'd.)

Horizontal Inequity Measures: Expenditures Per Pupil

Year	ELL Expenditures Per ELL Pupil	Classroom Instructional Expenditures Per Pupil	M&O Expenditures Per Pupil	Total Expenditures Per Pupil
<i>Theil Index of Economic Inequality</i>				
2006	0.48	0.08	0.11	0.08
2009	0.45	0.06	0.11	0.08
2012	0.65	0.08	0.12	0.09
2015	0.63	0.07	0.11	0.09

Table A18

Fiscal Capacity Per Pupil and English Language Learner Proportionality

Independent Variable	OLS	Q 0.1	Q 0.2	Q 0.3	Q 0.4	Q 0.5	Q 0.6	Q 0.7	Q 0.8	Q 0.9
2006	5306.53**	1944.72	1391.38	1425.20	1765.97	2404.20*	2448.84	2601.89	4007.49*	6309.49**
Federal Rev. Per Pupil	(1217.57)	(1014.56)	(1029.86)	(1024.72)	(1060.85)	(1214.86)	(1578.90)	(1913.65)	(2156.37)	(2299.16)
2009	5668.03**	2226.48*	2463.71*	2345.49	2730.95	3440.4	4961.76**	5144.44**	4806.56**	2863.19
Federal Rev. Per Pupil	(1340.74)	(1122.57)	(1063.40)	(1449.81)	(1770.41)	(1851.58)	(1704.52)	(1553.44)	(1661.82)	(1775.22)
2012	9314.86**	4096.53**	4122.88**	5120.89**	5936.17**	6027.41**	6109.84**	7735.24*	12474.98**	15047.05**
Federal Rev. Per Pupil	(2193.32)	(1232.62)	(1173.06)	(1343.79)	(1372.23)	(1533.36)	(2126.44)	3455.86)	(4636.58)	(5757.57)
2015	5920.33	429.72	3136.38	2962.36*	3177.30*	3387.93***	4665.99*	4357.98	5735.09	7167.22
Federal Rev. Per Pupil	(3280.38)	(2050.16)	(1758.20)	(1449.35)	(1273.94)	(1283.41)	(1701.05)	(2632.16)	(4644.15)	(9031.91)
2006	-4010.27**	-2874.99**	-2367.63*	-1206.78	-1311.41	-1689.36	-2334.79	-3326.73	-3648.60	-14218.18*
Local Rev. Per Pupil	(1658.02)	(1075.01)	(1038.23)	(1095.41)	(1332.22)	(1939.01)	(2520.23)	(3024.92)	(3922.74)	(7253.79)
2009	-6019.24*	-2429.32	-1989.02	-2735.79	-1698.64	-135.81	-2658.99	-4201.73	-4352.45	-2566.22
Local Rev. Per Pupil	(3078.58)	(1440.59)	(1373.29)	(1756.52)	(2247.58)	(2815.10)	(3658.49)	(4558.41)	(6477.97)	(10871.70)
2012	3257.02	-2444.44	1803.93	1289.51	2801.49	5782.05	9954.70	9069.98	5895.26	-7499.27
Local Rev. Per Pupil	(4090.16)	(4583.67)	(5091.93)	(5495.14)	(5988.35)	(6460.54)	(6265.03)	(6093.79)	(7319.29)	(17975.11)

Table A19 (cont'd.)

Fiscal Capacity Per Pupil and English Language Learner Proportionality

Independent Variable	OLS	Q 0.1	Q 0.2	Q 0.3	Q 0.4	Q 0.5	Q 0.6	Q 0.7	Q 0.8	Q 0.9
2012	3257.02	-2444.44	1803.93	1289.51	2801.49	5782.05	9954.70	9069.98	5895.26	-7499.27
Local Rev. Per Pupil	(4090.16)	(4583.67)	(5091.93)	(5495.14)	(5988.35)	(6460.54)	(6265.03)	(6093.79)	(7319.29)	(17975.11)
2015	-8786.26**	-3248.06	-4561.92	-4484.37	-6070.90	-5257.71	-5844.44	-9902.02	-13345.91	-18579.01
Local Rev. Per Pupil	(3281.32)	(2532.87)	(2482.31)	(2678.16)	(3939.00)	(5537.69)	(7228.58)	(8752.35)	(10771.84)	(18736.03)
2006	3641.19	4575.76	5022.86*	3761.24	4440.64	4270.26	4720.12	2776.21	2328.27	7645.48
Total Exp. Per Pupil	(2112.90)	(4000.03)	(2604.24)	(2508.96)	(2471.37)	(2563.13)	(2819.46)	(3069.75)	(3412.04)	(5068.76)
2009	1249.26	1809.89	2531.38	1962.43	1902.09	3030.90	1503.54	2651.35	3848.63	1961.11
Total Exp. Per Pupil	(2962.93)	(2799.74)	(2212.99)	(2485.56)	(2710.58)	(2948.31)	(3113.94)	(3227.32)	(3434.01)	(4613.94)
2012	20008.75***	4646.23	8908.02**	9116.23*	9442.83	12027.41	19367.69*	25277.13***	27412.76***	27958.81***
Total Exp. Per Pupil	(5245.24)	(2655.94)	(2838.17)	(3753.99)	(5994.09)	(7827.17)	(7948.53)	(7185.97)	(6671.74)	(7355.26)
2015	558.08	835.84	1180.95	1866.80	2077.04	2034.86	1493.93	-741.12	4361.52	476.23
Total Exp. Per Pupil	(3611.25)	(2731.63)	(2466.21)	(2749.53)	(3406.05)	(4440.21)	(5998.09)	(8182.69)	(9998.33)	(11786.44)

Table A12 (cont'd.)

Fiscal Capacity Per Pupil and English Language Learner Proportionality

Independent Variable	OLS	Q 0.1	Q 0.2	Q 0.3	Q 0.4	Q 0.5	Q 0.6	Q 0.7	Q 0.8	Q 0.9
2006	-1154.39*	-1181.62**	-1174.21**	-712.27	-808.42	-706.08	-824.83	-921.28	243.33	-1714.80
ELL Exp. Per Pupil	(577.56)	(425.96)	(436.34)	(501.24)	(563.86)	(615.35)	(769.97)	(1155.58)	(1712.61)	(2308.57)
2009	-3435.34	-971.15	-77.64	12.85	-670.71	-2293.88	-2451.25	-3998.95	-4132.85	-1535.88
ELL Exp. Per Pupil	(1866.92)	(1240.06)	(1472.54)	(1719.53)	(2037.02)	(2263.70)	(2521.38)	(3071.83)	(3797.72)	(4466.07)
2012	-5614.51*	-1409.78	-2103.45	-2953.82	-2296.12	-3017.94	-2646.32	-5279.38	-3696.39	-11842.87
ELL Exp. Per Pupil	(2274.24)	(1529.09)	(1678.76)	(1768.29)	(2022.65)	(2354.12)	(2915.80)	(3632.48)	(5065.26)	(6562.76)
2015	-4243.31*	-612.92	-1095.96	-1808.83	-2055.33	-2670.43	-834.24	-361.35	-7220.27	-10482.48
ELL Exp. Per Pupil	(1923.39)	(1891.55)	(1846.11)	(2012.49)	(2304.34)	(2883.38)	(3651.76)	(4170.93)	(4797.19)	(5412.18)

Note: Regression estimate results from 1,000 bootstrap repetitions and robust standard error reported.

* Statistically significant at the .05 level; **at the .01 level; ***at the .001 level.

APPENDIX B
VARIABLES OF INTEREST

Table B1

Variables of Interest

Measure	Description: Short description of each measure chosen for analysis.
Number of districts	<i>N</i> (sample size) of districts in years 2006, 2009, 2012, 2015
Total Enrollment	A measure of enrollment full-time equivalent student enrollment calculated by adding the number of full-time equivalent students enrolled as of forty-five days after classes begin in the fall semester to the number of full-time equivalent students enrolled as of forty-five days after classes begin in the spring semester.
Total ELL	Total number of students designated ELL.
Total FRLP	Total number of students designated as eligible for the Federal Free and Reduced Lunch Program.
Total IEP	Total number of students designated as requiring an independent educational plan.
Total Native American	Total number of students designated Native American.
Total Asian	Total number of students designated Asian.
Total Latino	Total number of students designated Latino.
Total African American	Total number of students designated African American.
Total Caucasian	Total number of students designated Caucasian.
Total Hawaiian or Pacific Islander	Total number of students designated Hawaiian or Pacific Islander.
Total 2 or more races	Total number of students designated being two or more races.
%FRLP	Percentage of public school district students eligible for free or reduced-price lunch.

Table B1 (cont'd.)

Variables of Interest

Measure	Description: Short description of each measure chosen for analysis.
%ELL	Percentage of public school district students demarcated as English Language Learners.
%IEP	Percentage of public school district students demarcated as requiring an individualized educational plan.
%Caucasian	Percentage of public school district students demarcated as Caucasian
%Latino	Percentage of public school district students demarcated as Latino
%Asian	Percentage of public school district students demarcated as Asian
%Native American	Percentage of public school district students demarcated as Native American
%Two or more Races	Percentage of public school district students demarcated as two or more races
%African American	Percentage of public school district students demarcated as African American
%HI/ Pacific Islander	Percentage of public school district students demarcated as Hawaiian or Pacific Islander
AIMS	<p>Arizona Instrument to Measure Standards for years 2006, 2009, and 2012.</p> <p>AIMS is a standardized test administered by Arizona Department of Education that aligned itself with Arizonas Academic Content Standards.</p> <p>These standards were used from 2006-2014.</p> <p>This measure is broken down into several categories for analysis only percent of passing was used.</p>

Table B1 (cont'd.)

Variables of Interest

Measure	Description: Short description of each measure chosen for analysis.
AZMerit	AZMerit is a statewide achievement test changed from AIMS. Beginning in 2015 these standards are used to measure student achievement This measure is broken down into several categories for analysis only percent of passing was used.
Primary Tax Rate	Used for primary property taxes and cannot exceed the full cash value. Primary property taxes are used to compute the operation and maintenance of school districts, community college districts and the county.
Primary Assessed Valuation	Amount of value physical property built on the land used to calculate primary tax levy.
Secondary Tax Rate	Full cash value, or market value, of the property. Taxes derived for bonds, budget overrides, and special districts such as fire, flood control, street lighting, and other limited purpose districts.
Secondary Assessed Valuation	Amount of value physical property built on the land used to calculate secondary tax levy.
Revenue Per Pupil	Total, Federal, State, Local, Maintenance and Operation (M&O) per pupil.
Expenditures Per Pupil	Expenditures in the following categories; Total expenditures, English language learner budget expenditures per percentage of English language learners, Classroom Instruction, M&O per pupil.

Table B1 (cont'd.)

Variables of Interest

Measure	Description: Short description of each measure chosen for analysis.
Funds Defined	Federal Revenues include all Federal Grants, and Impact Aid.
<i>Source: Arizona State Legislature 2016</i>	<p>State revenues include State Equalization Assistance, Additional State Aid, Certificates of Educational Convenience, State Projects, Classroom Site Fund, Instructional Improvement Fund, and all revenues from the School Facilities Board (SFB).</p> <p>Local revenues include tax levies, interest, tuition, transportation fees, food service, other district services, activity fees, and donations.</p> <p>Combined State and Local, composite that is the addition of State Revenue allocations to Local Revenue allocations.</p> <p>Pursuant to A.R.S. §15-185, the county school superintendent may provide educational services to a charter school located in that county. The value of these services or any actual county revenues shall be recorded as Intermediate Revenues under this category. These revenues may be restricted, unrestricted or “in-kind” services.</p>

Table B1 (cont'd.)

Variables of Interest

Measure	Description: Short description of each measure chosen for analysis.
<p>Funds Defined</p> <p><i>Source: Arizona State Legislature 2016</i></p>	<p>M&O are those funds designated for administration, instruction, instruction support, and operations expenditures for regular programs, special programs, pupil transportation, desegregation, overrides, K3 reading programs, and drop-out prevention. For districts which have sponsored charter schools, this fund data includes payments to the sponsored charter schools and expenditures made on behalf of the sponsored charter schools.</p> <p>CLSF-IFF funds are those funds designated for recording revenues resulting from the passage of Proposition 301 in November, 2000 ((6/10th % sales tax revenues)). IIF are those funds generated by Tribal Gaming compacts with the State of Arizona as a result of Proposition 201, passed by Arizona voters on November 5, 2002.</p> <p>Student success funds are those accounts for legislatively appropriated and other designated student success monies under A.R.S. §15-917—Repealed in FY2015-2016 by Laws 2015, Ch.15, §5</p> <p>Funds for Federal Projects include all federally funded categorical grant programs.</p> <p>Funds for State Projects include all state funded categorical grant programs.</p> <p>Total expenditures the amount of revenue spent in a specific categories, total represents the total amount of expenditures spent in a district.</p>

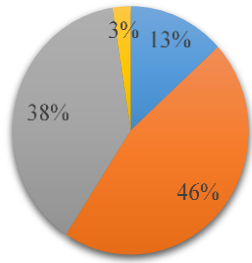
Table B1 (cont'd.)

Variables of Interest

Measure	Description: Short description of each measure chosen for analysis.
Funds Defined	English language learner expenditures per percentage of English language learner students.
<i>Source: Arizona State Legislature 2016</i>	<p>Classroom Instruction expenditures for teacher base pay increases, teacher performance pay, specified maintenance and operations purposes (i.e., class size reduction, teacher compensation increases, teacher development, and dropout prevention programs).</p> <p>Classroom Supplies Expenditures for costs related to instructional supplies (i.e., pencils, paper, and workbooks; instructional software; athletics; co-curricular activities).</p> <p>Administrative expenditures for administrative staff.</p> <p>Student Support Services are those expenditures for student support staff.</p> <p>Other Support Services are those expenditures for other student support services staff.</p>

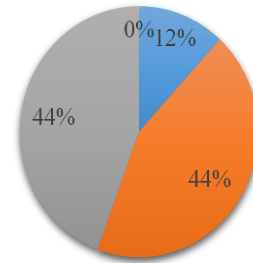
APPENDIX C
ANALYTIC FIGURES

Revenue By Source 2006



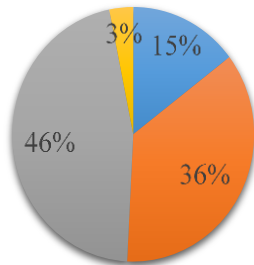
■ Federal Sources ■ State Sources
■ Local Sources ■ Intermediate Sources

Revenue By Source 2009



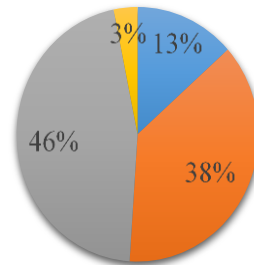
■ Federal Sources ■ State Sources
■ Local Sources ■ Intermediate Sources

Revenue By Source 2012



■ Federal Sources ■ State Sources
■ Local Sources ■ Intermediate Sources

Revenue By Source 2015



■ Federal Sources ■ State Sources
■ Local Sources ■ Intermediate Sources

Figure C1. Total revenue by source

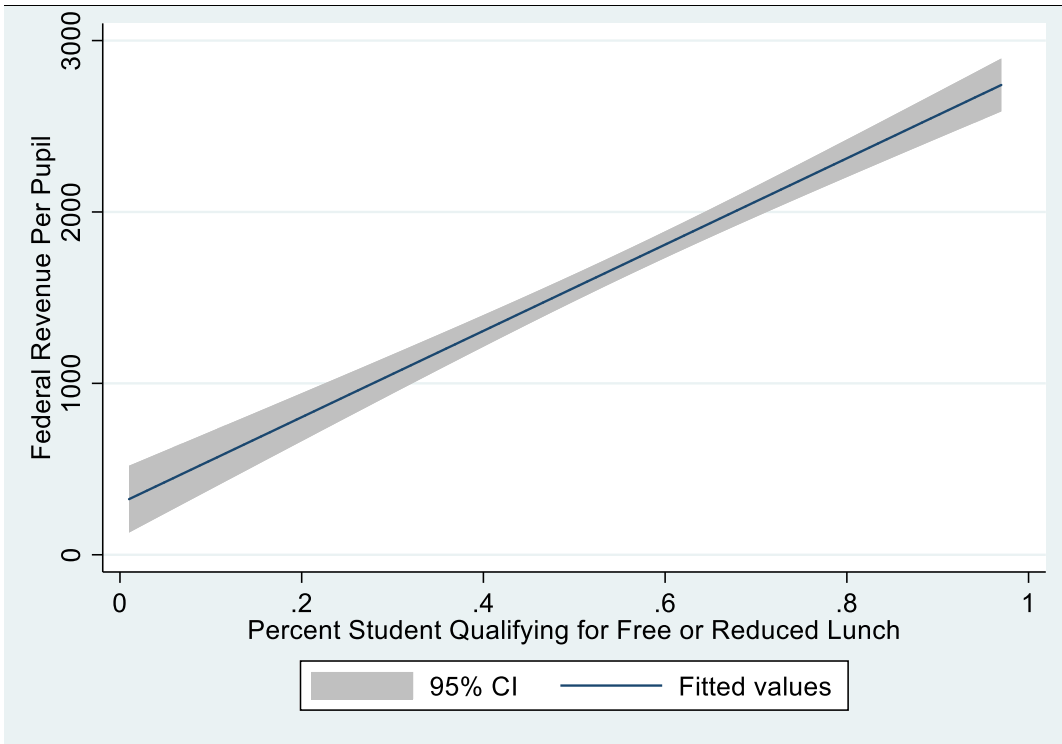


Figure C2. Federal revenue by percent of students qualifying for the Federal Free and Reduced Lunch Program 2006-2016

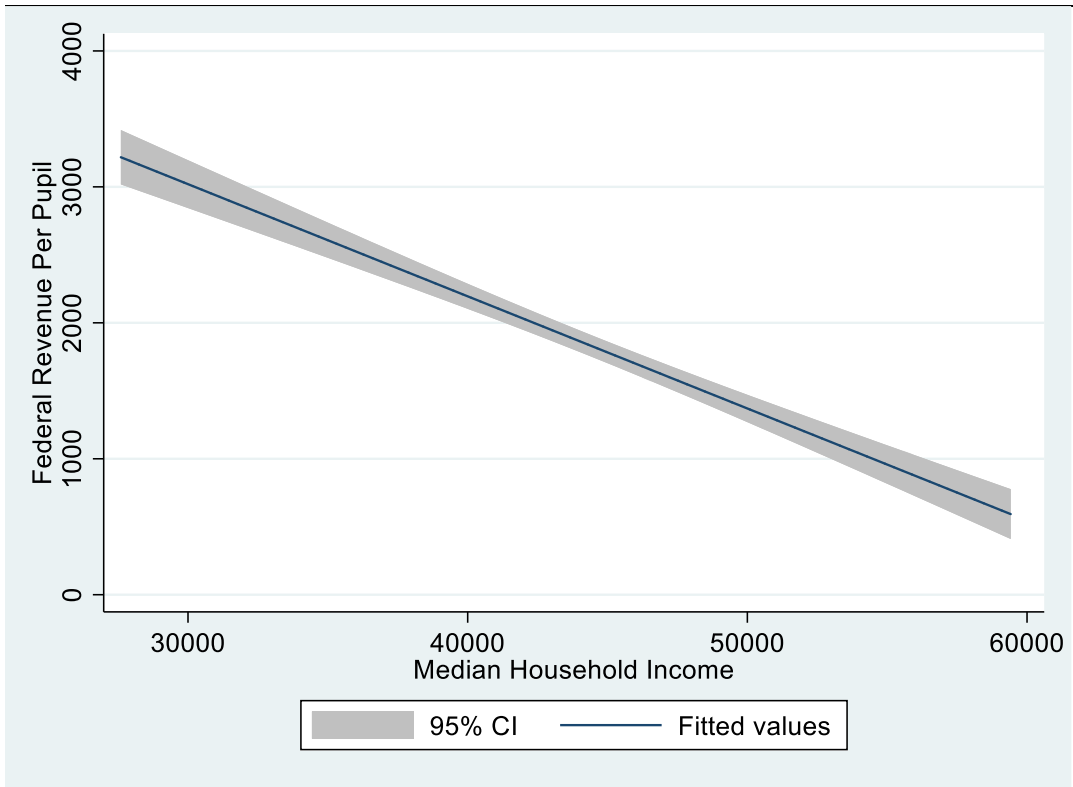


Figure C3. Federal revenue by median household income 2006-2016

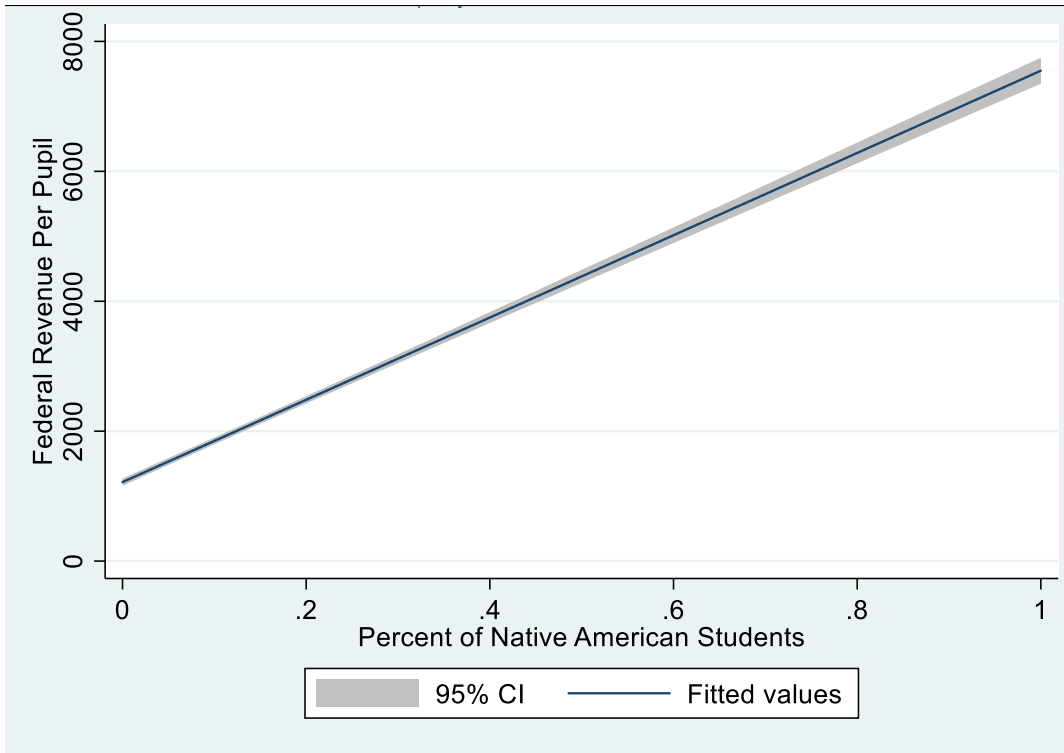


Figure C4. Federal revenue by percent of Native American students 2006-2016

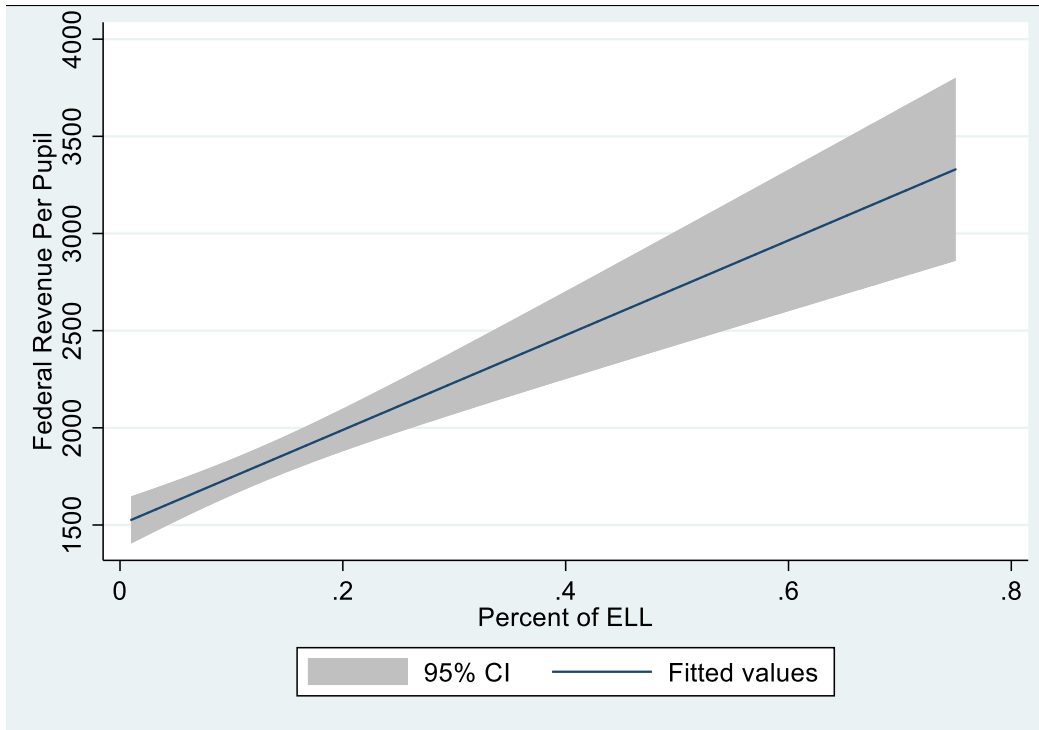


Figure C5. Federal revenue by percent of ELL students 2006-2016

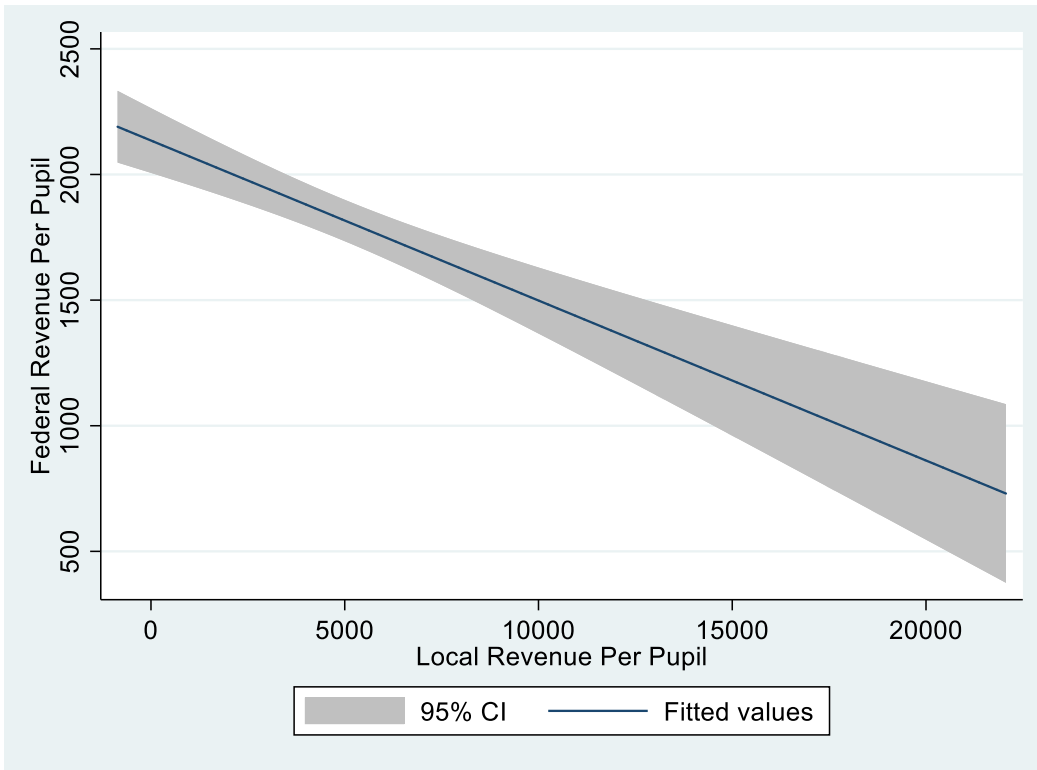


Figure C6. Federal revenue by local revenue per pupil 2006-2016

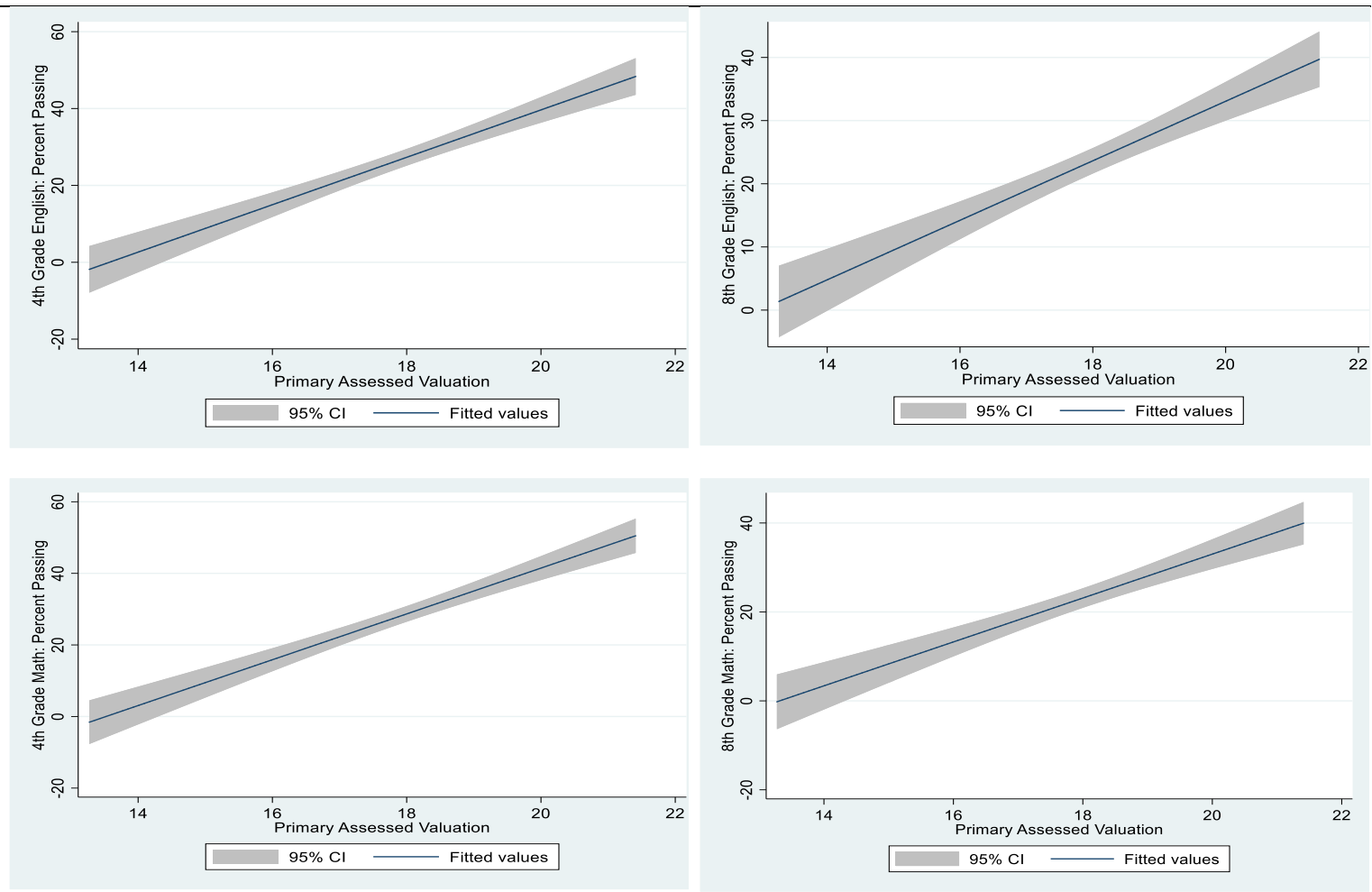


Figure C7. Achievement by property value 2015

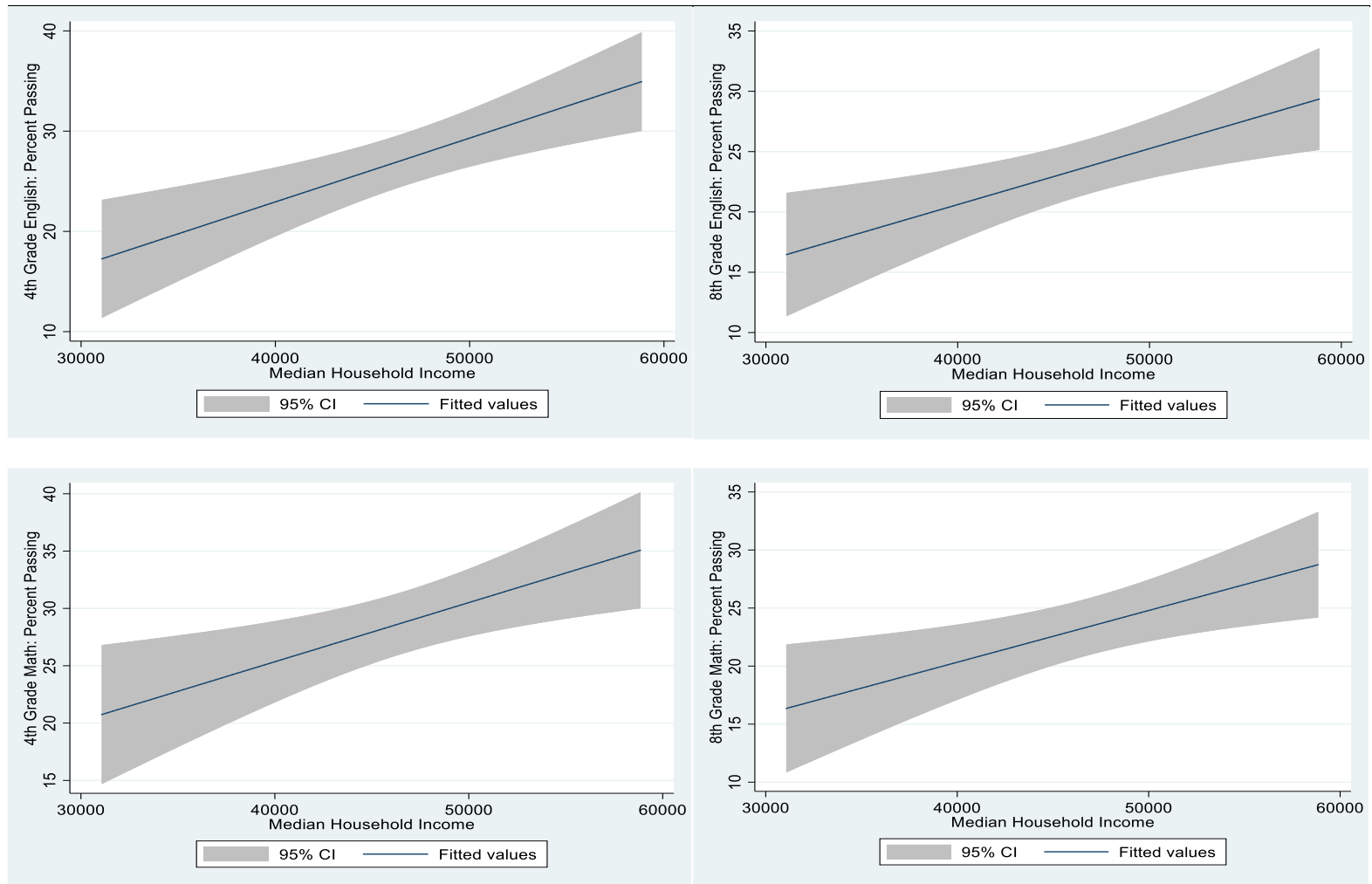


Figure C8. Achievement by median household income 2015

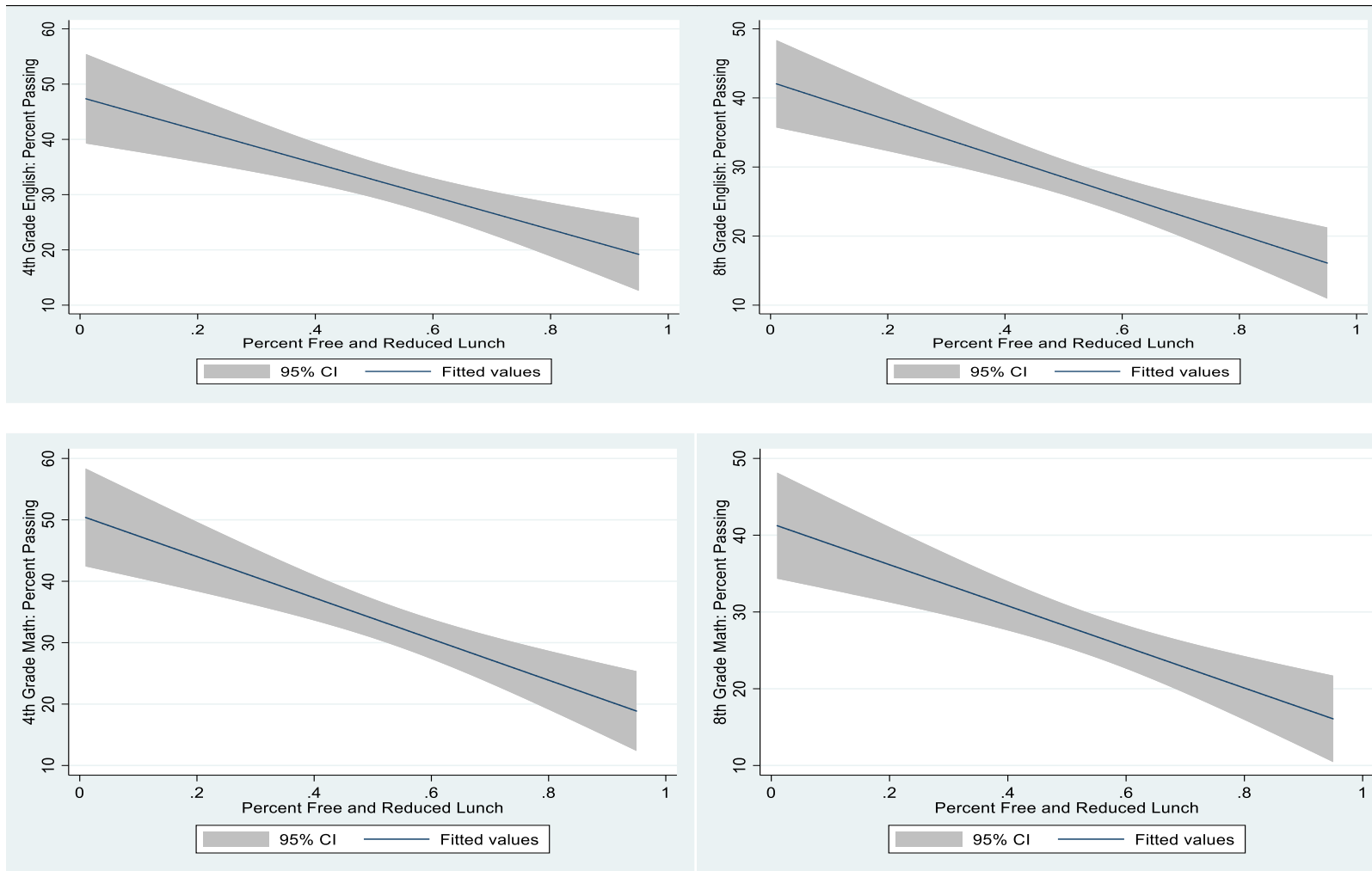


Figure C9. Achievement by percentage of students qualifying for the free and reduced lunch program 2015