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Social Capital and Academic Achievement in Arkansas

A dissertation submitted in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy in Public Policy

by

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Abstract

The purpose of this study is to demonstrate a more comprehensive understanding of the impact that a child's broader context has upon his or her academic outcomes, and presumably, life. Using Bronfenbrenner's theory of human development, this study examines the extent to which social capital and student achievement are correlated and whether an infusion of funding for schools that presumably lack social and economic capital might predict academic achievement in schools from economically depressed regions. Findings indicate that some aspects of social capital and funding initiatives have a demonstrated impact on student achievement but there is not a correlation with student achievement and per pupil funding. Additionally, indexed measures of social capital were found to have limitations, though some determinants of social capital index were more effective in predicting student achievement than others. This study suggests that there may be malleable community factors that could be leveraged to improve academic achievement that warrant additional research.

Keywords: social capital, academic achievement

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Dedication

This dissertation is dedicated to the leaders, parents, students, and teachers of Prism North America who have stretched the boundaries of the definition of community.

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Chapter 1: Introduction

Statement of the Problem

The notion of a free system of public education is a nearly universally supported value in American society in both practice and philosophy, but satisfaction with the current system is at an all-time low (Diffey and Steffes, 2017; Phi Delta Kappa, 2018). The enduring legacy of major historical reforms since the inception of what is now known as the public school system is three broad and often conflicting goals that include civic virtue or democratic engagement, economic productivity, and social mobility or equality (Labaree, 1997; Gamoran, 2007; Mitchell, Shippis, & Crowson, 2018). Though there are numerous—and often conflicting—visions of what public education should achieve, there is a general sense that the institution has been unsuccessful in reaching any of these respective goals.

Recent headlines related to academic declines during the pandemic confirmed what many already suspected: academic achievement is at an all-time low after students suffered a huge blow during the pandemic (Hess, 2022; Tavernise & Mervosh, 2022; West, 2022). Though the difference observed between 2019 and 2022 is historical in nature since it is the single-largest decline observed in the history of quantifiable test results, the reality is that schools were already on a trajectory of decline even before the pandemic and discrepancies between individuals of different ethnic and socio-economic backgrounds were already growing prior to the pandemic (Tavernise & Mervosh, 2022).

Responsibility for not only improving lagging academic achievement, but also meeting the multi-faceted needs associated with child development are increasingly being placed on schools. Both the blame and burden of improving academic achievement, academic attainment, nourishment, and a variety of social, emotional, and career goals of students has shifted to

schools. This is particularly true in communities where family and community life lack essential indicators of health (Hoffman & Miller 2020; Rundle et al, 2022; Armitage & Nellums, 2020).

With the exception of a recent revival of parent input into specific curricular concepts, there is a marked diminishing or reduction in expectation of parents and communities to play a role in students' academic outcomes. In recent education reform proposals, schools have increasingly shouldered exclusive responsibility for ensuring all students achieve equitable outcomes (Gamoran, 2007; Koretz, 2007). Recent accountability-based reforms have called for changes to school structures, school funding, teacher quality, and curriculum in efforts to improve individual student outcomes (Gamoran, 2007; Howell, 2017; Koretz, 2017). Such well-intentioned calls for reform—while potentially useful at some level—may restrict the available options for truly achieving the aims of public education only to those options that directly involve the school.

The reliance on schools to shoulder the burden of a comprehensive list of children's developmental needs is demonstrated in the response to school closures during natural and public health disasters in recent years. Over the last five years there have been significant weather events and public health events that have resulted in school closures. Policymakers and public stakeholders expressed as much concern that students would lose access to food, nutrition, mental health support, and physical safety during these closures as they were concerned that students would lose access to high-quality academic instruction (Hess, 2020; Kinsey et al, 2021; Morrison, 2022).

Though the responsibilities of educators have grown well beyond the instruction of reading, writing, and arithmetic, the metrics by which they success is measured are still primarily academic in nature. The last 50 years of education reform has seen a focus on a standardized

system of measurement that focuses largely on math and literacy scores (Howell, 2015; Koretz, 2017). The increasing emphasis on standardized test scores occurred alongside a concurrent shift of diminishing emphasis on the role of the local community in educational outcomes (Labaree, 1997; Putnam, 1995, 2000).

In practice and rhetoric, our current model of improving student-level outcomes and strengthening schools largely ignores the variables that are linked to student-level educational outcomes—such as household and community (Petrilli & Wright, 2005; Hart & Risley, 1995; Putnam, 1995,2005; Gamoran, 2007). Instead, the current reforms and approaches of addressing these broad and ambiguously defined goals of public education are focused on educating “better” (through a wide-ranging approaches to improving instructional quality), educating earlier (through preschool), or educating longer (through summer and after school programs) (Hanushek, 2010; Alexander, Entwisle, Olson, 2003; Barnett & Escobar, 1987; Howell, 2017; Petrilli & Wright, 2016; Putnam, 1995, 2000).

While not without merit, these approaches and the metrics used to measure their success, are incapable of accounting for the broader influences and contributions to mobility and economic productivity—such as the family and the community in which a student is raised—and are in many ways unrelated to the broader goals of public education—namely civic virtue or democratic equality (Labaree, 2007). Large-scale reforms focused on the context in which children are developed (including community and family) have been ignored, under-estimated, or placed under the broader responsibility of schools. However, there is substantial evidence to indicate that community-level factors have strong predictive power in student outcomes (Gamoran, 2007; Howell, 2017; Koretz, 2017; Petrilli & Wright, 2016; Putnam, 2000).

Theoretical or Conceptual Framework

Human beings are dynamically shaped by the contexts in which they develop. More so than other species, humans are “active producers of their own development” by influencing the physical and cultural environments around them (Bronfenbrenner, 2005, p. xxvii). Recognition of the nature of humans and the changes in the contexts in which they are raised—and more importantly, the implications of these changes on children—is of great importance for both policy and practice related to the development of children, communities, and families (Bronfenbrenner, 2005).

Bronfenbrenner (1979) has been a forerunner in recognizing the importance of events and conditions in the broader context in which an individual develops. His bioecological theory of human development—defined as the “phenomenon of continuity and change in the biopsychological conditions both as individuals and groups...over the life course across successive generations and through historical time, both past and present (Bronfenbrenner, 2005, p.3; Bronfenbrenner, 2001).”

Bronfenbrenner (1979) identified four environmental levels that impacted an individual’s development: the microsystem, the mesosystem, the exosystem, and the macrosystem. The microsystem represents the immediate environment: a child’s classroom, playground, neighborhood, religious institution (Bronfenbrenner, 1979; Onwuegbuzie, Frels, Collins, 2013). Bronfenbrenner (1979) identified this level as the “pattern of activities, roles, and interpersonal relationships experienced by the developing person in a given setting with particular, physical, and material characteristics (p. 22).

The mesosystem, or the 2nd level in Bronfenbrenner’s theory, was defined (1979) as the interrelations among two or more settings in which the developing person participates (p. 25).

For an adult, these settings might include their work and their home. School, home, and peer groups might form the mesosystem for a child (Bronfenbrenner, 1979). Thus the mesosystem refers to the nature of the relationships between various contexts in which the individual interfaces (Bronfenbrenner, 1979; Onwuegbuzie, Frels, Collins, 2013).

The 3rd level of Bronfenbrenner's ecological systems—the exosystem—refers to “one or more settings that do not involve the developing person as an active participant, but in which events occur that affect or are affected by what happens in the setting containing the developing person” (Bronfenbrenner, 1979, p. 25).

The final level Bronfenbrenner (1979) includes in his theory is the macrosystem which includes the larger cultural and societal contexts which might include intangible concepts such as societal belief systems, cultural norms, ideologies, identity, and values as well as quantifiable concepts such as policies and laws, racial, ethnic and political heritages.

Much of the attention given to improving the academic outcomes of children have been microscopically focused on relationships between student academic achievement and various factors inside the microsystem: family, school, and peer dynamics. The education reforms of the latter part of the 20th century resulted in annual summative assessments of academic knowledge. These exams increasingly played a role in state accountability systems for schools. The near universal availability of individual student assessment data lent itself to a simple, straightforward outcome measurement that would help policymakers understand the complexities of student achievement. Not only did student assessment data become more widely used in policymaking, but also in research. Student assessment data has increasingly been used as measures of not only students' capacity to read, write, and do math, but as a proxy for student outcomes and school success in both academic research and policymaking. We've learned that student achievement is

linked to the resources available to a student both at home and at school in terms of finances, educational attainment, and various measures of school and teacher quality (Greenwald, Hedges, & Laine, 2016; Jensen, 2019; Lauren & Gaddis, 2013; Lee, Loeb, Lubeck, 1998; Petrilli & Wright, 2016).

Though the data and these outcomes clearly hold value, its use in research has formed what Bronfenbrenner described as “piecemeal analysis, fixed in time and space, of isolated aspects” (1944, p. 75; Cairns & Cairns, 1995). Bronfenbrenner (1944, 1979) argued that without understanding both the individual and the social groups to which the individual belonged any interpretation of such data would be insufficient and misleading since the elements of social status and structure are interdependent (Cairns & Cairns, 1995). The focus on factors in the microsystem category can unintentionally divorce student achievement from the social networks in which the students exist. Communities, family structures, personal relationships, and factors occurring in the macrosystem all plausibly impact student achievement (Bronfenbrenner, 2005; Cairns & Cairns, 1995).

Statement of Purpose

The purpose of this study is to demonstrate a more comprehensive understanding of the impact that a child’s broader context has upon his or her academic outcomes, and presumably, life. Specifically, the study will use a social capital index to better understand how factors in the mesosystem, exosystem, and macrosystem impact relative academic achievement. Social capital, academic achievement, and various measures of school- and community- financial data will be utilized to understand the unique interplay school funding, community strength, and public policy has had on student achievement in Arkansas. The study will identify whether a link exists between social capital and student academic outcomes within a given year and across years.

Research Questions

To that end, the following research questions will be asked:

1. Does social capital in a specific county predict future social capital within that county?
2. Is there a correlation between student achievement and social capital at the county level with the same year? In other words, does social capital in a specific community predict student achievement?
3. Do policy initiatives intended to mitigate socio-economic disparities between schools have a greater impact on student achievement than existing social capital?

Significance of the Study

Since academic achievement is linked to life outcomes for students, there is great importance in ensuring that every tool that can be used to improve such outcomes is fully leveraged and that the full context of influencing factors is understood. The goal of identifying these factors is to provide a more comprehensive set of public policy tools and objectives by which challenges associated with upward mobility for children could be realized and challenges to an upward trajectory could be mitigated.

Additionally, though there is a substantial amount of literature related to social capital and academic attainment, there is very little about social capital and academic achievement. This will add to the scholarly literature pertaining to student achievement and the factors that exist outside of the school walls that may be associated with student achievement.

Definition of Terms

Throughout this dissertation, several terms are used frequently. For clarity, these terms have been defined as they are understood in academic literature and as they are used in this dissertation.

Academic achievement-“learned proficiency in basic skills and content knowledge” (McCoy et al, 2005).

Academic or Educational attainment-the highest level of schooling completed or the “status of learning that has been achieved” (VandenBos, 2007).

Social capital- social networks and norms of reciprocity and trustworthiness that arise of social trust, social bonds, and collective contribution of friends, family members, and networks (Keely, 2007; Putnam, 2009).

Educational efficiency: the acquisition of marketable skills through the process of obtaining an education (Labaree, 1997; Kline, 2017).

Social Mobility-the advancement of the individual that typically occurs through the accumulation of educational credentials (Labaree, 1997; Kline, 2017). -

Democratic equality-the idea that schools should equally prepare all students to be moral and competent citizens in order to have a well-informed public capable of participating in a democracy (Labaree, 2007; Kline, 2017).

Chapter 2: Literature Review

The intent of this dissertation is to better understand the correlations between community, family, civic life and academic achievement. Specifically, this dissertation examines the relationship between social capital and academic achievement. In order to understand the connections between these two concepts it is important to first define academic achievement, its importance in understanding other outcomes associated with child development, as well as define social capital and the various components of social capital. Once defined, an examination of prior research involving academic achievement and social capital illuminates the need for additional research into this topic.

Academic Achievement

Academic success can be conceptualized in two different ways: academic achievement and academic attainment. Academic achievement is characterized by performance on age-specific norms. Thus a student in the second grade who does well on standardized exams would be categorized as high achieving (academically). Academic attainment, on the other hand, has to do with the certification of completion of different and successive levels of academic milestones such as a high school diploma, Bachelor's degree, or doctoral degree. In this sense, a high-performing second-grade student would still not have a high-level of academic attainment as completion of an elementary school grade isn't considered a high-level of certification. Conversely, a lower-performing doctoral student would still be considered to have a high level of academic attainment as a doctoral degree would be a terminal degree in most fields.

Both academic achievement and academic attainment are correlated to different levels of success—most concretely—economic success. There are significant economic returns to educational attainment (Tamborini, Kim, Sakamoto, 2015). Postsecondary educational

attainment carries a disproportionate amount of credit in the significant and notable difference in economic outcomes correlated with advanced levels of education (Tamborini, Kim, Sakamota, 2015; Bhuller et al 2014; Cooke, 2003). Such trends can be linked to the fact that a college degree is a prerequisite for numerous higher paying jobs. However, academic success in elementary school is not inconsequential. Academic achievement in the early years of school is a predictor of academic achievement in latter years of school (Chall, 2000; Murnane & Levy, 1996).

Academic achievement is positively correlated to a whole host of things that are considered by society-at-large as “good” and inversely correlated to factors that are considered disadvantageous. Specifically, low academic achievement is linked to juvenile crime, teen pregnancy, and imprisonment (Chall, 2000; Chetty et al, 2011; Watts, 2020).

Academic achievement encompasses performance in academic subjects as well as critical thinking and other competencies such as written and oral communication (Lindholm-Leary & Borsato, 2006). These expansive competencies are challenging to measure at a large-scale and thus standardized assessments of achievement are typically utilized as a proxy for an objective measure of academic achievement (Chall, 2000; Lindholm-Leary & Borsato, 2006; Levine, 1976; Hartlage & Steele, 1976). These standardized assessments include both national assessments (such as the NAEP, SAT-10, and ACT) state-developed standardized assessments.

While debates exist about the relative importance placed on standardized assessments and the policies shaped by standardized assessments, they are generally accepted as a proxy for academic achievement (Gronlund, 1996; Watts, 2020). As such, numerous studies have been conducted using both state- and national- level data to better understand the predictive power of academic achievement as well as the factors linked to higher or lower achievement as measured

by standardized test scores (Watts, 2020; Gronlund, 1996; Hartlage & Steele, 1977; Levine, 1976).

Academic Achievement and the Microsystem and Mesosystem

Because of the benefits for both individual children—and our society at large—much of the research related to boosting academic achievement has been related to understanding the influences that would fall within Bronfenbrenner’s microsystem—the student, the student’s household or family, the school, and the student’s neighborhood—or the mesosystem—which includes the immediate relationships developed in these contexts.

There are individual student level factors that are correlated with student achievement. Relative level of ability or disability is—not surprisingly—linked to student achievement (Langberg, 2011). Individual goal orientation, personality (Tetzner, Becker, & Brandt, 2019), disposition, physical fitness, (Coe, Peterson, & Blair, 2013) and other non-cognitive factors are linked to student achievement. Individual mental health is linked to subsequent and current academic achievement (Langberg, 2011; Guzman et al, 2011).

Though important and statistically significant factors in terms of academic achievement and attainment, individual traits such as personality, goal orientation, and disposition or temperament are difficult to address from a policy perspective as these characteristics are highly individualized and not subject to broad scales policies. However, because schools are expected to provide a free and appropriate education for all students—and in so doing presumably improve the academic achievement of all students—much work has been done to identify strategies and practices that schools can employ to improve student academic achievement.

At a school-based level there are a number of factors that have been considered including leadership strategies and school culture efforts. Though not without merit, these are somewhat

ambiguously defined and even moreso challenging to measure. Nonetheless, efforts have demonstrated that schools, their structure, their climate, and curriculum can impact student learning (MacNeil, Prater, & Busch, 2009).

Despite the importance of school leadership, there are no school level factors as important as the classroom. Classroom culture and quality has been repeatedly shown to be more important than school level quality. Since not every locale is able to recruit and retain high quality educators, and given the fact that experience is a factor associated with becoming a high-quality educator, efforts have been made to isolate curricular impacts. The hope is that in the absence of high-quality or experienced teachers, students can still have a meaningful academic experience. Indeed, there have been some learning gains associated with the utilization of scripted curriculum—albeit those learning gains are limited to standardized measures of student achievement that are not known for measuring critical thinking skills.

Though much effort has been made to isolate impact on student achievement and attainment to school-level factors, students walk into the classroom on their first day of school with a host of factors that have predictive power on whether and how they will walk out on their last day of school. From the region where a child is raised to the historical educational experiences of the individuals who live in the house with a child, there are a number of environmental factors that hold some predictive power on the academic outcomes a student will experience.

As evidenced by previously stated research, students entering the school system are not blank slates. The family and the community in which they live are powerfully connected to their success in school and should be part of the considerations related to whether our schools are effective and how they can be improved. The specific student-level factors are those factors that

hold predictive power for student achievement. There are other factors, however, that also predict student success including parental education levels, childrearing strategies (Lareau et al, 2002; 2003; Sampson, 2002) gender, executive skills, and non-cognitive factors such as personality traits (Harder, O'Reilly and Tobias, 2018; Lareau et al, 2002). Many of these, however, are also linked to income.

By the time a child from a low-income family arrives at Kindergarten on the first day of school, they have heard three million fewer words than their wealthier peers (Hart & Risely, 2013). This—along with other environmental factors—results in significant differences in students on the day they begin their experiences in America's compulsory system of education. Low-income students not only enter school with lower cognitive skills than their wealthier peers, but they are also more likely to enter lower-resourced schools (Lee & Burkam, 2002).

Household income is a salient factor that persists throughout a child's educational experience and is linked to test scores in 3rd grade, drop-out rates in 9th, and college completion rates (Lee & Burkam, 2002; Jensen 2009; Petrilli & Wright, 2016; Engle & Vincent, 2008). Low-income children are more likely to be enrolled in schools with other low-income students as early as infancy. The concentration of poverty in a given school or classroom has an adverse impact on student learning at every age level (Lee et al, 1998; Lauen & Gaddis, 2013).

It does not take too grand of a leap in logic to understand why poverty within a home would adversely impact academic achievement. Material resources available to low-income parents are more limited than their more advantaged peers. Poverty is often linked to lower education levels. Low-income parents may have fewer academic resources to pull on that would enable them to support their students. A larger portion of the available resources—both material and intangible—are utilized to meet needs associated with survival and thus there is limited

additional resources—and possibly capacity—to give to provide academic support within the home.

Academic Achievement and the Mesosystem and Exosystem

There is no doubt that a student's immediate environment and the relationships that exist within these environments have a significant impact on student outcomes, there are factors that are a step removed from the immediacy of a child's interactions at a school, home, and with their neighbors that are correlated to student achievement. Much of research related to these dynamics tends to highlight what happens when crucial resources—financial resources being the most obvious and easily measured—are missing from a child's life (Putnam, 2000).

The multi-faceted impact that poverty has on student welfare was demonstrated in research conducted by Chetty et al (2014). Chetty et al (2014) examined the impact that neighborhoods have on outcomes associated with intergenerational mobility. Their findings indicate that upward mobility is linked to personal wealth, but more importantly community wealth and health have significant implications for understanding the complex dynamics between student welfare and student achievement. Chetty's (2014) findings highlight how economically segregated America's communities are. Because schools are residentially zoned, the concentration of poverty within a school is nearly always a direct function of the concentration of poverty in the community that directly surrounds the school. Indeed researchers have identified links between academic achievement and various community level factors—including poverty. The concentration of poverty within a classroom is highly correlated to academic achievement from a very early age (Lee, Loeb, & Lubeck, 1998). Thus simply the isolation of low-income families in communities of almost exclusively low-income households would presumably impact student achievement.

It is important to understand the nature of this connection. As previously mentioned, poverty is rarely experienced in isolation of other circumstances—including household and community factors that likely negatively impact other aspects of a child’s life. Likewise, the impact of poverty does not stop in its influence on academic achievement. Poverty and low academic achievement are part of a set of factors that often travel together and negatively impact student outcomes including academic achievement, academic attainment, and upward social mobility.

It is important to understand these complex interactions as our aspirations for improving student outcomes are not limited to improving performance on a test of academic achievement, but instead is a general goal toward upward social mobility. The correlation between upward mobility and academic achievement and attainment has been validated, but the complex array of factors that influence this movement has recently become clearer in research.

The correlation between community welfare and student achievement are not limited to factors related to wealth. There are numerous components related to community strength and stability that are linked to student welfare. Civic engagement, church membership, and the presence of intact homes in one’s community are all correlated to a child’s capacity to move upward (Chetty et al, 2014). Both household wealth and academic achievement are important factors to identify and examine. But a thorough examination of both the causal factors linked to these factors and the capacity for these factors to change between generations requires a more thorough examination of the circumstances in which children, families, and school are situated.

Indeed, there is evidence social capital—social networks of connections and the benefits that arise from them—may play a role in bridging inequalities that result from environmental differences (Putnam, 2000). Studies of social capital have demonstrated its capacity to shape

individual academic decisions (Butler & Muir, 2017), to build a sense of identity within neighborhoods that might mitigate national and regional trends, (Forrest & Kearns, 2001), and to create a social structure and culture of academic achievement amongst immigrant groups (Zhou & Kim, 2006). Social capital has been identified as a causal factor in school quality within regions with extreme fractionalization in Sub-Saharan Africa (Hollard & Sene, 2016). These studies indicate social capital may be a tool that for achievement in spite of environmental disadvantages.

Social capital

Though the concept of social capital emerges in literature related to education by Dewey (1900) and Hanifan (1916), social capital was formally introduced by Bourdieu (1986) and popularized by Coleman (1988, 1990) and Putnam (1995, 2000) as a measure of development that extends beyond economic benefits. In his book *Bowling Alone*, Putnam defined social capital as “social networks and the norms of reciprocity and trustworthiness that arise from them” (Putnam, 2000, p. 19; Hawes, Rocha, and Meier, 2012). All definitions of social capital infer benefits to the individual involved in the network, the networks themselves, and society at large as a result of engagement in the networks (Carradore, 2018). Put simply, social capital is the combination of trust in others and involvement in social activities (Huang, van der Brink, and Groot, 2009).

In his landmark work on social capital, Putnam (2000) emphasizes both the private and public—or individual and collective—benefits of social capital. An individual’s personal connections benefit his or her own interests. But the cumulative connections within a well-connected society has “spillover” benefits for all members of society as a norm of generalized reciprocity is developed (Putnam, 2000). Thus the social connections within a given society

creates a society that is more efficient, one that moves at greater ease, and facilitates a more cooperative and mutually beneficial community for all (Putnam, 2000). Putnam's (2000) definition of social capital is broken down into five components: political participation, civic participation, religious participation, informal social affairs such as connections in the workplace, and social trust.

Political participation in the form of voting is an important measure to monitor because it can be perceived as a proxy for other forms of civic social engagement (Putnam, 2000). There are a number of measures that are correlated to the action of voting including political engagement, charitable giving, volunteerism, and participation in forms of civic engagement such as attendance at school board meetings and community forums (Putnam, 2000). Thus withdrawal from voting is not primarily a sign of disengagement from the single action of voting, but potentially a sign of broader withdrawal from community life and potentially a sign that individuals do not perceive efficacy of their actions.

Civic participation—or the voluntary organization of individuals in community, church, or work-based associations—has been a notable feature of American life since Tocqueville first observed American democracy in the early 19th century (Tocqueville, 1838; Putnam, 2000). Though formal membership does not necessarily equate to participation in a manner that would necessarily build social capital in a community, it is a useful measure of the level of civic duty in a community. The more local the activities associated with a civic group are, the more likely it is to build social capital (Putnam, 2000).

Religious engagement has measurable benefits for both the religiously observant and the community surrounding individual faith communities. There is a correlation between being a regular worshipper and participating in other forms of civic involvement such as voting, jury

service, community projects, talking with neighbors and giving to charity (Putnam, 2000; American National Election Study, 1996). Religious participation is a powerful predictor of daily interactions (Putnam, 2000). Faith-based organizations often provide institutional support for community support service and are particularly important to social capital and community life in African American communities (Putnam, 2000).

Both formal connections—such as those found in workplaces and in work-related organizations—and informal connections—such as having dinner at a friend’s house—are an important component of social capital. Solidarity with others is a precondition for economic collaboration and a mechanism for mutual assistance and shared expertise (Putnam, 2000).

In his extensive work on the subject, Putnam (2000) demonstrates how there has been a generational decline—or a decline that is visible only across different age groups—in each of these five components of social capital. The latter part of the 20th century saw a trend toward a consistent decline in political participation. Nearly every form of political engagement at the community level—from petition signing to running for public office—declined according to a Roper poll measuring such activity from 1973 to 1994 (Paxton, 1999; Putnam, 2000). Collective forms of public engagement—such as participating in committees—declined at a much steeper rate than more than expressive forms of engagement such as making a post on social media or writing a letter (Putnam, 2000; Roper Social and Political Trends, 1994).

Though membership in civic groups have continued to grow, active participation in face-to-face organizations has demonstrated a similar decline to that of political participation (Putnam, 2000). Similarly, religious affiliation has been relatively stable (though seeing a decline in recent history), the engagement in activities most closely related to social capital has declined. Both church attendance and membership in church related activities have declined. The types of

church activities that do occur are often more internally focused toward members and families out reaching toward communities (Putnam, 2000; Roper Social and Political Trends).

Though informal connections have not experienced as steep a decline as participation in formal civic groups, it has still followed the same downward trend as nearly all other interactions. In the immediate circle, families eat dinner together less, friends go out with friends less, and there's less participation in games or outings at each other's homes than there was 50 years ago (Putnam, 2000). Measures of trust demonstrate that though people believe they can trust close friends, they are less likely to believe that people in general are trustworthy (Putnam, 2000).

Social Capital, Education, and Prior Research

This study is concerned with how this decline in social capital translates to child development in the public schools. Some of the earliest references to social capital documented were recorded in the context of education. In 1916, L.J Hanifan, then state supervisor of rural schools in West Virginia prefaced a report on school achievement within his region with these comments on social capital (in Farr, 2004):

“In the use of the phrase social capital I make no reference to the usual acceptance of the term capital, except in a figurative sense. I do not refer to real estate, or to personal property or to cold cash, but rather to that in life which tends to make these tangible substances count for most in the daily lives of a people, namely, goodwill, fellowship, mutual sympathy and social intercourse among a group of individuals and families who make up a social unit, the rural community, whose logical center is the school. In community building as in business organization and expansion there must be an accumulation of capital before constructive work can be done.”

Hanifan (1916) noted that in rural communities there was a near “total lack of social capital” and both immigrant and segregated black schools, the inequalities of wealth and other industrial developments, would not become good citizens without a “helping hand” (Hanifan,

1916, in Farr, 2004). Hanifan (1916) acknowledged the challenges associated with building a strong school in communities where societal inequalities—in the form of systemic discrimination or industrial modernization—were concentrated.

Dewey, one of the most recognized visionaries of modern education and its relationship to social efficiency, also emphasized the role of the community in the vision he set forth for the public education system. In *The Elementary School Record*, Dewey (1900) criticized the individualistic and repetitive (or robotic) approach toward education and claimed that an individual's mind is “a function of social life”. The popularity of his work propelled the concept of social capital forward as the idea that societal strength counts as a form of capital (Farr, 2004). As a result of Dewey's work, the idea that schools needed to be re-envisioned as centers of community and social life became popularized (Farr, 2004).

Consequently, racial inequity within school systems became a focal point of Dewey's efforts. Since we are all “members of [one] race”, as Dewey noted, we have a responsibility to “utilize all of the individual capital that is being born into it”. Thus, Dewey positioned educational equity for all races not only as an issue of justice and morality, but of national development and thus, a national responsibility. In *The Elementary School Record*, Dewey uses the term “social capital” for the first time and moves the concept forward throughout his writings and advocacy (Dewey, 1900 in Farr, 2004). In this way, Dewey, too, connected social capital to achieving the broader aims of education.

Given its use in discussions of education philosophy, one would assume a significant body linking social capital to education already exists. Indeed, education is one of the most important determinants of social capital (Putnam 1995; 2000). Researchers have found years of schooling to be the most important correlate of social capital variables (Glaeser, Laibson,

Scheinkman, and Scouter; Huang et al, 2009). Individuals with a college degree are more likely to engage in voluntary works, show a higher trust in other people, and tend to join social organizations and participate in group activities more frequently (Putnam, 2000; Alesina and La Ferrara, 2000).

Though education is a predictor—in fact, it is the most significant predictor—of many outcomes associated with social capital, a national trend toward monumental increases in educational attainment has not translated to a similar increase in social capital (Putnam, 1995; 2000; Helliwell & Putnam, 2007). Numerous researchers have attempted to explain this inconsistency (Dee, 2004; Milligan, Moretti, and Oreopolus, 2004; Helliwell & Putnam, 2007) by examining the relative impact of education. In other words, if education is increasing for all, does an increase in education actually result in a positive impact? The findings of this research have had mixed results, but have focused primarily on education as a determinant of social capital, not social capital as factor in educational achievement and attainment.

There are several limitations with the existing body of research related to education and social capital. First, the majority of this research on social capital and education is focused on higher education (academic attainment) rather than K-12 education (academic achievement). Furthermore, much of the research on social capital and educational attainment has been conducted at an individual level and asks narrowly focused questions such as how does an increase in one's own educational achievement impact social participation.

Much of the research on social capital and K-12 academic achievement focuses more narrowly on relationships that exist within the microsystem: how social capital—as measured by relational dynamics with parents and teachers—impacts youth aspirations in rural communities (Byun, Meece, Irvin, & Hutchins, 2012), how social capital produced by relationships with

parents, teachers, and peers has a significant impact on student achievement (Huang, 2008), and how the social capital of teachers impacts student achievement (Daly, Moolenaar, Liou, 2014). Interventions designed to improve social capital in the form of relationships through an after school intervention did not improve student achievement (Gamoran, Miller, Fiel, Valentine, 2021). Much of the research surrounding student achievement and social capital has relied on the use of the National Educational Longitudinal Study of 1988 which relies on data from a national survey of the high school class of 1992 from just before going into high school (Gamoran et al, 2021).

Though valuable, most studies narrowly focus on relationships within a student's immediate relational orbits as the sole measure of social capital and focus on terminal outcomes—academic attainment—rather than the formative measures of academic achievement—to measure academic success. Such studies may be beneficial for practitioners who seek to design interventions to improve student outcomes. However, such interventions are challenging to operationalize from a policy perspective. This study seeks to better understand the interplay of social capital and the formative aspects of student achievement to understand the systemic dynamics surrounding the process of reaching greater levels of academic attainment thus providing policymakers with a better perspective of the extent to which the mesosphere and exosphere—or the realm over which they have more capacity to impact—has on student achievement.

This study examines those systemic issues by studying two unique dynamics associated with social capital. First, as the dependent variable student achievement on norm-referenced data (the formative outcome) rather than student attainment (the terminal outcome) is utilized. Second it pulls back from the microsystem and mesosystem of the student's immediate environment and

instead examines the extent to which broader community factors influence student achievement by using county-level measures of social capital as the independent variable. Finally, the study examines whether statewide shifts in public policy that dramatically impacted school-based funding inequities had a greater impact on student achievement than social capital in an effort to understand the relative importance of economic interventions to bridge inequities in communities versus social interventions in communities.

Chapter 3: Methods

The purpose of this study is to identify the connection between social capital and the academic achievement of the students. By focusing on aspects of the students' broader context, this study seeks to develop a broader understanding of how systemic factors in a child's mesosystem and exosystem—both currently and historically—impact student achievement. This study focuses on students in the state of Arkansas and examines the differential weight that social capital and school funding hold in student achievement. The study utilizes county-level social capital data, school-based student achievement data, and district level financial data to answer the research questions.

Research Questions

1. Does social capital in a specific county predict future social capital within that county? In other words, is there a cumulative advantage of social capital?
2. Is there a correlation between student achievement and social capital at a county level with the same year? In other words, does social capital in a specific community predict student achievement?
3. Do policy initiatives intended to mitigate socio-economic disparities have a greater impact on student achievement than existing social capital within a community?

Study Design

These questions will be answered quantitatively using both a correlational research design and causal-comparative or quasi-experimental research design. The first two questions will be answered separately using a correlational research design. The final question will be answered as part of a quasi-experimental research design.

In an attempt, to avoid the “piecemeal” analysis Bronfenbrenner (1944) referred to, the first research question will attempt to better understand developmental changes across time. Is social capital correlated to prior social capital. There is a general understanding of the Matthew effect (Merton, 1968) in which accumulated advantage drives future success (Merton, 1968). So called the Matthew effect due to the story in the book of Matthew where Jesus declares—essentially—that the rich will get richer, and the poor will get poorer. In order to understand whether the Matthew effect is in play with social capital—or whether the social capital of a preceding generation predicts future social capital—a regression analysis will be conducted. Specifically, this analysis will measure whether county level indexed measures of social capital in 1997 predicts county-level indexed measures of social capital in 2005, 2009, and 2014. Doing so will provide a more comprehensive understanding of change across time within various communities.

A regression analysis will be conducted to assess whether there is a correlation between student achievement and current social capital within a community. County-level indexed measures of social capital will serve as the independent variable and student achievement will serve as a dependent variable—controlling for school level poverty and per-pupil spending.

The second component of this study is a causal-comparative/quasi-experimental research design. In an attempt to better understand the relative weight social capital and school funding play in predicting student achievement, a multiple regression analysis will be conducted to assess the comparative influence of several independent variables including: county-level indexed measures of social capital and per-student expenditures. Importantly, this study will compare students in schools who received more than 51% (or the majority) of their school funding in 2005 (the first year of implementation of the legislation that resulted from the Lakeview case)

from state funds intended to offset the difference between what could be raised locally and those who were able to generate the minimum per-pupil expenditure with only a minority of state funding. A multiple regression analysis will be run for the years 2008-09 with social capital and school funding being the independent variables and student achievement being the dependent variable. By looking at two distinct time periods, this allows the analysis to take into account changes across time.

For all of the regression analyses, a Poverty Index will be utilized as a control. The poverty index is an indicator that better represents the true nature of poverty that exists within a district than simply the percentage of free- and reduced-lunch eligible students by giving greater weight to students in greater need by giving additional weight for students who are income eligible for free lunches (Office for Education Policy, 2015). According to the Office for Education Policy (2015), the poverty index is calculated using the formula below where the number of free-lunch eligible students are multiplied by two. The sum of this number and the number of reduced-lunch eligible students are divided by the total number students within a school to form an index that runs from 0 to 2.

$$Poverty\ Index = \frac{(No.\ Free\ Students \times 2) + No.\ Reduced\ Students}{Total\ Enrollment}$$

Study Context and Intervention

This study focuses on students and communities in Arkansas from 1997-2014 who attended Arkansas public schools. Arkansas belongs to the vernacular region known as the American south. By many measures, children in the state of Arkansas face significant challenges—many of which are linked to persistent, generational cycles of poverty (Kids Count Report, 2022). Arkansas’s median household income is the second-lowest in the US and has an

overall child poverty rate of 22% (Kids Count Report, 2022). Over half of the students in Arkansas (63.64% in 2022) are eligible for the Federal Free- and Reduced- Lunch program (Arkansas Department of Education). Given this poverty rate, it is not surprising that there are some notable gaps in student achievement. Only thirty-one percent of Arkansas' 4th grade students are proficient in reading and only 27% of Arkansas' 8th grade students perform at a proficient level in mathematics (Kids Count Report, 2022).

The Arkansas legislature has enacted numerous policies in an effort to improve the academic achievement of the students in the state (Newcomb & Ritter, 2012). Standards-based reforms that addressed curricular issues were initiated in the 1990s and fully implemented in the early 2000s with bipartisan support. As a result of the Supreme Court ruling in the *Lakeview vs. Huckabee* lawsuit, the state legislature approved a set of substantial reforms that focused on both an increase in funding and more equitable distribution of funding alongside accountability and assessment reforms (McDonald, Hughes, & Ritter, 2004; Newcomb & Ritter, 2012).

These reforms were implemented statewide, but had a more substantial impact on students in schools that had difficulty obtaining a minimum level of per-pupil funding deemed adequate (Arkansas Bureau of Legislative Research, 2020; Arkansas House Interim Committee on Education, 2022). As a result of *Lakeview*, Arkansas school districts are constitutionally required to have a minimum of 25 mills (known as the Uniform Rate of Tax or URT) dedication to the maintenance and operation of its schools. Revenue generated from the URT is used to partially fund the foundation funding—the “building block of public education funding in the state” (Arkansas Bureau of Legislative Research, 2020). Foundation funding is the minimum amount of education funding required (per-pupil) to fund education in the state and is set at the same rate for every student. State foundation funding is required to bridge the gap between what

districts raise through the URT and the amount of foundation funding set annually per pupil” (Arkansas Bureau of Legislative Research, 2020). In addition to these funds schools may also receive additional funds based on poverty, the presence of special needs, and other extenuating factors. Districts were also allowed to raise funds through local millage campaigns that exceeded the minimum 25 mills for operations, capital outlays or other debts, or special projects (Fiscal and Administrative Services Division, 2021).

The design of this progressive, tiered, funding system was to equalize economic inequities in school funding and generally ensure all schools had adequate funding to educate the children of the state regardless of the funding available in the district or state (McDonald, Hughes, & Ritter, 2004). As a result of the *Lakeview* litigation, school funding began to increase in the early 2000s, but this full implementation of the financial reforms was not fully realized until 2005 (Newcomb & Ritter, 2012).

Through these reforms, nearly every district in Arkansas received additional per pupil funding from the state to reach the minimum amount deemed adequate set by the state—which was higher than most schools had previously experienced. However, some districts received substantially more funds from the state than others since their URT generated much less funds due to lower housing rates or other factors that resulted in a larger deficit between the minimum amount required and the amount raised in the URT. Given the poverty in the state, it is not surprising that over 180 districts in the state required state foundation funding that exceeded half of the funds required to meet the minimum per-pupil expenditure. This created a natural experimental group: schools whose funding was generated primarily from state-based resources and districts who generated the majority of their funds locally. This additional funding had the potential to offset other inequities within the system.

The reforms of the early 2000s included not only financial reforms, but also accountability and assessment reforms. With the additional funding came additional requirements that all students (with the rare exception of those with severe special needs) participated in nationally-norm referenced assessments of student achievement. Thus these reforms resulted in troves of financial and achievement data for all of the public schools in Arkansas. These data form the basis for this study.

Participants

Participants in this study include all students who took nationally norm-referenced assessments throughout the state of Arkansas in 2008-09. Academic achievement scores are reported by school. A county-level index of social capital is included for all counties in the state of Arkansas. District financial data from 2008-09 is reported for all public school districts in the state. As will be discussed later, schools were placed in categories based on 2005-06 financial data—the year that significant reforms were implemented and resulted in a substantial increase in state funding. All but twenty-seven schools in the state of Arkansas were included in this study. The schools removed from the database were either charter schools, schools that consolidated during the time frame between 2005-2008, or the Arkansas School for the Deaf or Arkansas School for the Blind which pull students from across the state rather than a single geographic region. Student enrollment extends beyond a single county in many of these cases and local mills do not fund these schools. Thus these schools did not fit within this model examining county level social capital and school funding.

Table 1 provides descriptive statistics for each of the variables used in the analysis. As can be observed in the table below. Univariate statistics are included for demographic and financial variables, the social capital index and its determinants, as well as student achievement

data. There were a total of 1,011 schools included in the districts that reported school financial data. Of these, two did not include school income data. Only schools which administered an exam in at least one subject were included in this study and they were only included in the analysis if the school reported data for the test or tests included in each separate regression analysis. A total of 1,007 schools reported Reading and Math results, 965 reported language results, and 672 reported science results. These differences are not random. Science was only administered to 5th and 7th grade students. Thus the analysis for achievement on the science subtest omitted schools with only high school students and lower elementary students. Similarly, the Language exam is not given until a student reaches the 3rd grade. Thus all schools with *only* early primary students were removed from the language analysis.

Table 1: Univariate Statistics in Study

	Obs.	Mean	SD	Min	Max
Demographic and Financial Factors					
School Poverty	1,009	1.13	0.413	0.125	2
Pep Pupil Exp.	1,011	\$11,043	2,125.15	\$7,926	\$25,478
Social Capital Index and Individual Determinants of Index					
SC-Index	75	-0.796	0.544	-2.034	.2946
SC-Vote	75	0.493	0.049	0.370	0.599
SC-Response	75	0.633	0.076	0.48	0.77
SC-Association	75	1.254	0.361	0.481	2.241
SC-Nonprofit	75	517.08	758.01	35	2,696
Student Achievement Data					
Science	672	53.219	8.43	31	74
Reading	1,007	46.601	7.47	7	68
Math	1,007	54.67	7.29	27	72
Language	965	36.25	12.21	9	60
School NPR	1,008	43.07	14.03	1	78

Data Sources

For this study, three separate sets of data are required: student achievement data, school finance data, and a county-level measure of social capital. The Office for Education Policy

publishes datasets of descriptive data taken from the publicly available Arkansas Department of Education for both finance and student achievement results. Measures of social capital come from the County-Level Measure of Social Capital dataset developed by Rupasingha, Goetz (2006) and made publicly available by the Penn State Department of Agricultural Economics, Sociology, and Education.

Data Collection

This research relies solely upon existing sources of data and thus no direct data collection will occur.

Student achievement: The student achievement variable is the average Normal Curve Equivalent score of the of the four individual subtests (Reading, Mathematics, Language, and Science) of the Stanford Achievement Test (SAT-10) weighted by the number of students in each school taking each subtest (Office for Education Policy, 2005 and 2014). This initial analysis was conducted by the Office for Education Policy.

Financial data: All incomes and expenses for school districts must be entered into the state's financial management system known as the Arkansas Public School Computer Network (APSCN). From this database, the Arkansas Department of Education annually pulls reports and publishes information. The Office for Education Policy consolidates these reports annually and publishes them as consolidated excel sheets for the purpose of Arkansas education research and analysis. The unit of analysis used in this study was the Per Pupil Total Expenditure for each district which is a specific term defined by the Arkansas Department of Education as being the total expenditures that were used for education purposes in a given year (Office for Education Policy, 2009)

Social capital measures: Using Becker's (1965) allocation of time framework alongside an array of individual and community-level factors to measure participation in social activities as a means of producing a general county-level social capital index. Rupasingha, Goetz, and Freshwater (2006) use county level census data to create an associational variable that includes associations with civic groups, religious organizations, sports clubs, labor unions, and recreational centers. The aggregate of this associational variable is divided by the population. The social capital index was created by principal component analysis using the associational number derived first, with population, voter turnout, response rates, and the number of nonprofit organizations that are not affiliated with an international approach. The first principal component is considered the index of social capital and is broken down by US county.

Data Analysis

For question 1, a linear regression will be conducted using the 2005, 2009, and 2014 numbers for each county as the dependent variable and the 1997 county level measure of social capital as the independent variable. In order to analyze the univariate normality assumption skewness coefficient and kurtosis coefficient and histogram charts will be examined.

For question 2, all districts will be matched to the county in which they are geographically located. A linear regression will be run using the NCE scores for each school as the dependent variable and the social capital index score as the independent variable. In order to analyze the univariate normality assumption skewness coefficient and kurtosis coefficient and histogram charts will be examined.

For the final question, the Final Foundation Funding excluding the URT funds will be divided by the district enrollment as reported by the Department of Education for October 31 annually. This will presumably define the amount of funds provided by the state to bridge the gap

between locally raised dollars in the URT and the minimum requirement of per pupil foundation funding. This number will then be divided by the total per pupil expenditures for the district. This will generate a percentage of per pupil expenditures provided by the state. The districts will then be divided into two groups. Districts with enough local revenue to be the majority provider (or those which received 50% or less in state foundation funding) for their district will be classified as Group 1 or the control group. The districts in which local revenue was insufficient to provide the majority of district funds (51% or greater)—and thus relied on state funds to provide the majority of their education funding—will be categorized as Group 2. A multivariate regression analysis will be used to assess the relationship between the independent variables (state funding and social capital) on the dependent variable (student achievement).

Ethical Considerations

This study utilizes secondary analysis of publicly available datasets for which consent is not required. No identifiable individual private information is released in this study. Therefore, an exemption under category 4 by the University of Arkansas Institutional Review Board (IRB) was granted.

Assumptions, Delimitations, and Limitations

Several assumptions were made in the datasets involved in this research study. First and foremost, the assumption that the Rupasingah, Goetz, and Freshwater (2006) county level measures of social capital is indeed a worthwhile tool. The index has a strong theoretical position, has been used as a valid measure of social capital in other peer-reviewed studies, and Robert Putnam—the most prolific author on social capital—whose theory of social capital was utilized to construct the index has described it as a valuable tool (Bailey, Cao, Kuchler, Stroebel, & Wong, 2018; Borgonvi & Andreiu, 2020; Putnam, 2007; Sherrieb, Norris, & Galea, 2010). For

these reasons, the dataset was assumed to be a reliable measure of social capital for the purposes of this study.

The study is limited in that it is restricted to the state of Arkansas and cannot be generalized to other states. Though the same methods could likely be used for other states, there are unique attributes to the state education funding scheme that allowed this research to be conducted at a point where the mechanism by which schools are funded was uniquely shifted to account for differences in community assets. Though economic and social capital are different, there are correlations between the two—especially in the context of child welfare (Putnam, 2000). Information used in this study is reported in some instances by county, some by school district, and some by school. Though the information is accurately matched, these different units of analysis limit the study as well.

Additionally, a notable delimitation of the study was the decision to determine the percentage of income provided by the state that was required to be considered part of the control group. One goal of the study is to assess the extent to which financial resources explain differences in student achievement as compared to social assets. There is a relationship between bonding social capital and neighborhood income, as well as homeownership and neighborhood stability (Brisson, 2005). Thus, one might logically assume that the inability to generate sufficient local funds to meet minimum requirements for education spending would indicate that a community is likely lacking in social and economic capital. If state subsidies were of greater importance than social assets in a community in explaining student achievement, then that would be valuable information for policymakers in identifying solutions. However, since all districts received state funding, a cutoff amount had to be determined to differentiate districts that received minimal amounts as opposed to those that were reliant upon these subsidies. That cutoff

was determined by the researcher to be the point at which the state funding would account for the majority of funding. Different cutoffs could be argued and would segment districts and students into different groups for the regression analysis which would have a notable impact on the study.

Chapter 4: Results

Hypothesis and Results for Question 1

The first research question assessed whether prior social capital predicted future social capital. The hypothesis for question one is that social capital at one point in time will be positively related to social capital in future time periods. Several linear regressions were conducted, first analyzing social capital from each county in 1997 against the social capital in each of these counties in 2005, and again in 2009 and 2014. Table 2 captures the results of all regression analyses run for question 1. Social capital predicts future social capital at a statistically significant level.

Social capital in 1997 is positively related to social capital in 2005, 2009, 2014. However, the adjusted R-squared diminishes over time. An R-squared of 0.646 (and adjusted R-squared) of 0.641 is observed when regressing 2005 values against 1997 social capital index values and consistently decreases in size until it diminishes in 2014 to an R-squared of 0.35 (adjusted R-squared of 0.352). Though it remains statistically significant across time, the coefficient value and t value also shrink as the distance in time increases from the anchor year 1997. This indicates that though social capital within a community remains positively related, change can and does occur over time. Thus, though statistically stable, there is potential for change that should be of note to policymakers and community leaders alike. The first hypothesis is accepted: social capital at one point in time is positively related to social capital in future time periods.

Table 2: Regression of 1997 Social Capital Index and '05 Index, '09 Index, '14 Index

	Coefficient	t	P> t	R-squared	Adj R-squared
			n=75		
SC Index '05	.790	11.53	0.000*	0.6455	0.6407
SC Index '09	.763	8.98	0.000*	0.5248	0.5183
SC Index '14	.632	6.28	0.000*	0.3504	0.3415

Hypothesis and Results for Question 2

The second question examines the extent to which social capital and per pupil funding impact student achievement. The primary hypothesis for the second question is that there will be a positive relationship between social capital and student achievement. There are several factors related to student achievement available for this research: Reading, Language, Mathematics, and Science school level Normal Curve Equivalent (NCE) scores—which are standardized scores used in education. In addition to these 4 subtests, an overall school level National Percentile Rank (NPR) was also available that combined each of these four subtests into one performance measure for the school. NPR is a standardized achievement score that identifies the percentage of students—within the same grade—who performed above or below a particular score on a national level. A regression analysis was conducted using Overall School NPR as the dependent variable and the social capital index for the county, per pupil spending for each respective district, and the school-level poverty index as the independent variable. The results are reported in Table 3. No statistical relationship between per pupil spending and overall school NPR or student achievement was found. There is an inverse relationship between poverty and student achievement that is statistically significant and an inverse relationship between social capital and student achievement that is also statistically significant. As poverty increases by one unit on the poverty index, student achievement drops by roughly -21.783 points in national percentile ranking. Surprisingly, as county social capital increases by one unit, student achievement declines approximately -1.43 points on national percentile ranking.

The primary hypothesis for question two is rejected. Though a statistically significant relationship was found, the relationship between social capital and student achievement as

measured by the overall school NPR was negative. Multicollinearity diagnostics indicate that multicollinearity does not exist.

Table 3: School NPR, Per Pupil Spending, Poverty, and Social Capital

	Coefficient	t	P> t	R-squared	Adj R-squared
School NPR			n=1,008	0.4231	0.4214
Per Pupil Spending	.000	0.55	0.579		
Poverty Index	-21.78	-25.53	0.000*		
Social Capital	-1.43	-2.45	0.015*		

Some of the school level impact could be hidden in the context of an overall school NPR. Therefore, a regression analysis was conducted that assessed the correlation of per pupil spending, social capital index, and school level poverty against each of the subtests for which there is norm-referenced data.

Table 4: Per Pupil Expenditures, Poverty Index, and Social Capital

	Coefficient	t	P> t	R-squared	Adj R-squared
Reading			n=1007	0.4418	0.4402
Per Pupil Expen.	-0.0001	-1.35	0.177		
Poverty Index	-11.64	-26.03	0.000*		
Social Capital	-0.64	-2.10	0.036*		
Language			n= 965	0.1935	0.1910
Per Pupil Expen.	0.000	1.17	0.242		
Poverty Index	-12.89	-14.43	0.000*		
Social Capital	-1.01	-1.65	0.100		
Science			n= 672	0.5485	0.5465
Per Pupil Expen.	0.000	.10	0.920		
Poverty Index	-14.62	-26.38	0.000*		
Social Capital	-1.74	-4.63	0.000*		
Math			n= 1007	.4932	.4917
Per Pupil Expen.	-0.000	-0.71	0.475		
Poverty Index	-11.85	-28.53	0.000*		
Social Capital	-1.26	-4.42	0.000*		

As reported in Table 4, the poverty index is negatively related with every sub-measure of student achievement and it accounts for the greatest portion of the variation within each analysis.

Per pupil spending does not play a statistically significant role in predicting student achievement.

Social capital is a statistically significant factor in three out of four of the regressions.

Surprisingly, the social capital index is negatively related to student achievement as measured by each subtest as well. Again, multicollinearity diagnostics indicate that multicollinearity does not exist.

To better understand the unexpected finding that social capital would be inversely related to student achievement, a regression was run on each of the four factors that comprise the social capital index against the overall NPR first, and then each of the four subtests. As reported in Table 5, the strong relationship between poverty and student achievement remains even when the social capital index is broken into the different factors that comprise this measure. The nonprofit component of the social capital index is the only negatively signed statistically significant component related to student achievement. Voter turnout was also significantly related to overall student achievement as measured by NPR. For every one unit of change in voter turnout, student achievement went up 19.91 points.

Table 5: Overall NPR and Components that Comprise Social Capital Index

	Coefficient	t	P> t	R-squared	Adj R-squared
Overall NPR			n=1008	0.4657	0.4625
Per Pupil Expen.	.000	1.17	0.243		
Poverty Index	-22.41	-25.48	0.000*		
SC-Response	-8.48	-1.54	0.124		
SC-Vote	19.91	2.61	0.009*		
SC-Nonprofit	-0.004	-6.89	0.000*		
SC-Associations	-1.00	-0.98	0.328		
cons	65.31	10.54	0.000*		

In Table 6, nonprofits are negatively related to every individual subtest measure of student achievement, as is poverty. There is a positive relationship between voter turnout rates and overall student achievement (as measured by NPR) as well as in every single subtest of

academic achievement except for the Language subtest. Consistent with other analyses, poverty is the most salient factor. Every unit change in the poverty index translates to a 22.41 national percental rank decline in student achievement in a school. Per pupil spending is not significantly related to student achievement in the overall NPR nor on any subtest. Multicollinearity diagnostics indicate that multicollinearity does not exist.

Table 6: Determinants of Subtest Performance and Social Capital Components

	Coefficient	t	P> t	R-squared	Adj R-squared
Reading			n=1007	0.4756	0.4725
Per Pupil Expen.	-.00008	-0.93	0.352		
Poverty Index	-11.36	-24.46	0.000*		
SC-Response	4.87	1.67	0.095		
SC-Vote	16.76	4.15	0.000*		
SC-Nonprofit	-.002	-7.51	0.000*		
SC-Associations	-.48	-0.89	0.375		
cons	51.39	15.69	0.000		
Language			n=965	0.2459	0.2412
Per Pupil Expen.	.000	1.83	0.067		
Poverty Index	-14.63	-15.86	0.000*		
SC-Response	-23.80	-4.10	0.000*		
SC-Vote	-9.05	-1.12	0.264		
SC-Nonprofit	-.002	-3.49	0.001*		
SC-Associations	.57	0.53	0.596		
cons	70.22	10.73	0.000		
Science			n= 672	0.5975	0.5939
Per Pupil Expen.	.000	0.33	0.743		
Poverty Index	-14.27	-25.91	0.000*		
SC-Response	5.16	1.51	0.132		
SC-Vote	15.9	3.30	0.001*		
SC-Nonprofit	-.003	-8.16	0.000*		
SC-Associations	-1.46	-2.25	0.025*		
cons	61.44	15.78	0.000		
Math			n=1007	0.5548	0.5521
Per Pupil Expen.	-.4.18	-0.01	0.996		
Poverty Index	-11.96	-28.69	0.000*		
SC-Response	.18	0.07	0.944		
SC-Vote	13.81	3.81	0.000*		
SC-Nonprofit	-.002	-10.35	0.000*		
SC-Associations	-.81	-1.65	0.098		
cons	63.57	21.62	0.000		

Of note, Reading and Math show greater consistency in p values, R^2 , and outcomes. Science has a stronger R^2 , and Language has a much smaller R^2 . Generally speaking, the Language subtest is an anomaly and most outcomes differed on this test as opposed to the other assessments of student achievement. These differences may be linked to grade level. The Language assessment is not given until children are in the 3rd grade, therefore, schools that only had very young children (K-2 schools) were not included in the specific analysis. Similarly, only fifth and seventh grade students take the science exam, and thus, large number of schools were not included in that analysis. As reported in Table 5, 672 schools are included for the science exam compared to 1,007 for reading and math. Not only were fewer schools included in the sample, but only schools with middle school students. This suggests the relationship between social capital and student achievement differs by age.

Table 7: Summary of Statistically Significant Relationship between Variables

	Overall NPR	Reading NCE	Language NCE	Science NCE	Math NCE
Per Pupil Expend.					
Poverty Index	(-)	(-)	(-)	(-)	(-)
SC-Index	(-)	(-)		(-)	(-)
SC-Response			(-)		
SC-Vote	(+)	(+)		(+)	(+)
SC-Nonprofit	(-)	(-)	(-)	(-)	(-)
SC-Associations				(-)	

Table 7 summarizes the relationships identified in the prior analyses. Those with a statistically significant relationship are identified by whether they have a (+) sign for positive relationships or (-) sign for negative relationships. There was no relationship between per pupil

spending and academic achievement on the overall NPR for student achievement nor in any given subtest. The Poverty Index was significantly related to student achievement on all subtests and on the overall NPR for each school. Student achievement on the Language subtest is an anomaly in many ways. Unlike other subtests, there is a positive relationship between Language achievement and the Census response and associations, but no relationship between voter turnout or the social capital index. A statistically significant positive relationship was identified between voter turnout and student achievement. Conversely, a statistically significant negative relationship between the social capital index and all measures of student achievement—except for the language subtest—was consistently observed. Nonprofits were consistently negatively correlated with student achievement.

Hypothesis and Results for Question 3

The final question in this dissertation uses these same measures, but adds a quasi-experimental component. The third question specifically examines whether the specific policies implemented in the 2005-06 school year might have had an impact on student achievement. The hypothesis for Question 3 is that schools impacted by these policy initiatives to the extent that they received the majority of their funds from state revenue would have greater student achievement than those that only received a minority of their funds from state revenue.

As noted above, in the 2005-06 school year, the legislation that resulted from the *Huckabee vs. Lakeview* lawsuit came into full effect. In this school year every school in the state received more per pupil funding than they had previously been awarded by the state due to a mandated per-pupil amount of funding at every school. All communities were required to (1) enact a uniform rate of taxation locally and (2) devote the first 25 mills raised in property tax to

public education. The difference between the minimum per-pupil amount and the amount raised through the millage would be provided by the state through foundation funding.

As in questions 1 and 2, twenty-seven schools were eliminated from the database as they were either charter schools, schools that consolidated during the time frame between 2005-2008, or the Arkansas School for the Deaf or Arkansas School for the Blind which pull students from across the state. Student enrollment extends beyond a single county in many of these cases and local mills do not fund these schools. Thus these schools did not fit within this model examining county level social capital and school funding.

Seventy-seven school districts (which included 584 schools) were able to generate more than 50.5% of their funding independently through their own millage. One hundred eighty-three districts (which included 427 schools) required more than 50.5% in assistance from state funds to meet the minimum mandated amount of per pupil funding. Schools in category two were those that required most of their funds to be generated by the state. A final regression analysis was conducted with this categorical data forming a quasi-experimental group.

Table 8: Student Achievement, Funding Category, Poverty Index, Social Capital Index

	Coefficient	t	P> t	R-squared	Adj R-squared
Overall NPR			n=1,008	0.4346	0.4324
Category	3.22	4.51	0.000*		
Per Pupil Expend.	0.000	1.21	0.226		
Poverty Index	-21.77	-25.76	0.000*		
SC Index	-0.729	-1.22	0.224		
cons	62.90	29.73	0.000*		

As reported in Table 8, for the most part, the same patterns persist: per pupil spending is insignificant, the social capital index is insignificant, but poverty is a powerful predictor of achievement. What is notable, though is that being a part of the group that received over 50.5% or more of the mandated minimum per-pupil from the state was positively related to student

achievement at a statistically significant level. The hypothesis for question 3 is accepted. Being in the category of schools in districts which received a majority of funds from state sources translated to 3.22 point higher overall NPR compared to category 1 schools. Though relatively small, the relationship is statistically significant.

As reported in Table 9, Only voter turnout, nonprofits in a community, and poverty were statistically significant once the social capital index was separated into the four components that comprise the social capital index. Multicollinearity diagnostics do not indicate the presence of multicollinearity.

Table 9: Factors that Comprise Social Capital, Per Pupil Spending, Poverty, and Funding Category

	Coefficient	t	P> t	R-squared	Adj R-squared
Overall NPR			n=1,008	0.4670	0.4632
Category	1.18	1.57	0.117		
Per Pupil Expend.	.000	1.36	0.174		
Poverty Index	-22.29	-25.28	0.000*		
SC-Response	-7.62	-1.38	0.169		
SC-Vote	21.06	2.75	0.006*		
SC-Nonprofit	-0.004	-6.20	0.000*		
SC-Associations	-0.94	-0.92	0.358		
cons	62.77	9.81	0.000		

Chapter 5: Conclusion

The results of this analysis shine light on the sustenance of social capital within communities from decade to decade, the relationship between social capital and the factors that comprise the social capital index on academic achievement of children within those communities, and the relative weight that public policy initiatives can play in mitigating deficits in funding—and to a certain extent—social capital.

Summary of Results

Social capital in one period predicts future capital—though the strength wanes across time indicating that changes in a community’s social capital can occur, but it takes time to do so. The social capital index is related to overall student achievement as well as to most independent subtests. Surprisingly, this relationship was negative toward academic achievement. However, the negative relationship appeared to be primarily the result of a single factor: the number of nonprofits in a community. Other factors—specifically those most closely aligned with the definitions of social capital—had a very notable link to student achievement: namely engagement in civic duties such as voting and to a lesser extent filling out a census form. The number of groups included in the associations portion of the index such as religious, labor, recreational, and social organizations within a community was not statistically significant in most cases.

Finally, with relation to funding, per pupil expenditures consistently demonstrated no relationship to student achievement. As funding went up, student achievement did not necessarily increase—and never in a large or statistically significant manner. However, there is some evidence that the dramatic increase of school funding after the *Lakeview* case had a positive impact on students in that student achievement could be predicted, in part, by whether a school

received most of their funding from the state. Much more detailed analysis would have to be done to really determine the strength of that prediction—which did not hold up when included with the independent components of the social capital index. Nonetheless, this has implications for how we understand school funding and the capacity of public funding to influence academic achievement.

The R^2 values were very strong for the first question, on the weaker side of moderate for the second analysis. The only exception to this was the analysis that included the language and science subtests: the R^2 and adjusted R^2 values for language were weak, but were strong for science. One potential reason for this difference is likely related to the students who were included in these exams—which was different than those included in reading and math. The science exam is given exclusively to middle schoolers (students in the 5th or 7th grade), whereas the language exam is given to all students except for the youngest elementary students. The changes removed not only students, but entire schools from the science analysis as many students are housed in schools that serve a narrow grade-range. The same pattern followed in the third analysis with the R^2 values being on the weaker side of moderate.

These R^2 and adjusted R^2 values indicate that this research is interesting and gives us solid information, but more work would need to be done to have a stronger assumption about the correlation between social capital and academic achievement. Insight about the direction future work should take is described in greater detail in the following section.

Implications of Results

The theoretical framework originally posited that the burden of improving academic achievement had been inordinately placed on the shoulders of schools with little regard for other environmental factors that influence a child's development described in Bronfenbrenner's (1979)

Theory of Bioecological Development. This study attempted to identify factors in the mesosystem, microsystem, macrosystem, and exosystem that might be related to student achievement. The results of this study confirm that there are factors in the microsystem—namely poverty—that have a tremendous impact on student achievement. Furthermore, it indicates that there may be merit in examining other interactions within a student’s community—namely nonprofit interactions, voter turnout, and even grade levels served by the school—to understand the relationship demonstrated between these factors and student achievement. Other factors—census response rates, per pupil expenditures, and associations within a community—somewhat surprisingly, had no impact on student achievement. The final outcomes of this study raise additional questions related to the social capital index and its effectiveness as a tool due to certain omitted factors—namely race—and due to the manner nonprofits are understood in the index. Each of these conclusions is examined in greater detail as an implication of the study.

These analyses confirm that poverty is a consistent and strong predictor of student achievement. There is no other factor in the study to have as consistent or as salient of a relationship with a school’s student achievement as the school’s poverty index. A school-level poverty index is indicative of numerous other factors: overall educational attainment within a community, fiscal and social resources available to support students both at home and within the community, and even the basic needs a child must have met in order to fully develop. It is no surprise that this factor—above all other factors has an important relationship to student achievement.

Though the school’s poverty index is inversely related to student achievement, this study does not indicate that shifting resources to allocate greater funding to students or schools has much of an impact on student achievement. Greater funding did not lead to greater academic

achievement in the cross-section. Per-pupil expenditures are not related to student achievement in any of the models. This validates prior research related to funding reforms in Arkansas. Substantial increases in per pupil funding over the last 20 years have not been matched with a comparative increase in student achievement (Newcomb & Ritter, 2012).

However, there is some indication that receiving a large chunk of state funds might impact student achievement. Even when factoring in poverty levels, schools that received over half of their funding from state sources—presumably those without sufficient community resources to generate sufficient funding—were connected to higher overall student achievement. One possible interpretation of this finding is that schools with greater poverty and fewer community resources benefit from receiving enough funds to reach a threshold in education funding, but those benefits do not continue to accumulate with additional revenue once that threshold is reached. This interplay between state policies and local resources is a good illustration of Bronfenbrenner’s exosystem and the multifaceted nature of how systems influence a child’s development.

One of the most curious findings in this entire study is that social capital is inversely related to student achievement: as one goes up, the other goes down. This finding was consistent with every measure of student achievement with the exception of the language subtest—which was overall an anomaly within the model. In order to better understand this surprising finding, the individual factors that comprised the social capital index were examined.

When the factors associated with social capital were disaggregated, voter turnout was consistently statistically significant and had a large coefficient. It is unlikely that simply having individuals show up to the voting booths on election day would secure higher reading scores; however, the willingness to voluntarily show up and cast a vote is associated with unseen factors

that, when present in greater rates within a community, does impact student achievement.

Furthermore, voter turnout is highly related to income. Wealth may be the unmeasured factor influencing the observed relationship. The correlation matrix, however, did not demonstrate a strong correlation between the school poverty index and voter turnout rates by county.

In addition to these demographic factors, there are a number of hypotheses surrounding the motivational factors associated with voting. Using multi-national data, Blais and Daoust (2020) find an interest in politics, a sense of duty, concern about outcomes, and convenience are the most salient factors in understanding voting patterns. However, research centered on uniquely American voting patterns suggest that social factors such as altruism (Jankowski, 2007), a sense of agency, and even simply the power of habit (Aldrich, Montgomery, Wood, 2010) impact voting patterns.

There is robust documentation that education attainment is linked to voter turnout and that the link may be causal in nature (Sondheimer & Green, 2010). However, there is some evidence to suggest that the impact of education on voting patterns is linked to the social motivations and norms of highly educated Americans to view voting as a civic duty (Hansen & Tyner, 2019). Conversely, there are “voter turnout deserts” that suggest that factors associated with political affiliation, age, and minority status are correlated with lower voter turnout (Barber & Holbein, 2022).

This is not conceptually far removed from the original aims of public education: democratic equality or the idea that schools should equally prepare all students to be moral and competent citizens in order to have a well-informed public capable of participating in a democracy (Labaree, 2007; Kline, 2017). Though that emphasis for schools has diminished over time as socioeconomic mobility and equality have increased in relative importance, these results

demonstrate that civic engagement within a community still hold some importance for student achievement. However, as will be discussed in greater detail later in this chapter, without additional data it would be difficult to tease out whether the role voter turnout plays in this model is simply a function of income or education attainment in the community.

Other notable features of this study are the relative lack of importance of census response rates and community associations on student achievement. Census response rates are not related to student achievement in the same manner that voter turnout is. The logic, however, for census response rates, follows a similar pattern to that of voting. Responding to a census may very well be one of the most altruistic actions of civically engaged individuals. It benefits their communities, but individuals rarely experience the benefits directly or quickly enough to connect the benefit with their effort of responding. Though there are efforts by communities to ensure everyone is counted, there is certainly less cultural weight put on the census than on voting which may explain the lack of statistical significance. Census response rates also vary significantly among some subpopulations due to suspicions related to how that information is used.

With a more relaxed standard for statistical significance ($p < 0.1$), associations would have been positively correlated with student achievement in science and math, but were far from significant in language and reading. This relative lack of importance is surprising. Though it may have other benefits, the presence of opportunities for social activities and associations does not translate to a tangible benefit in outcomes measured by academic achievement assessments. In fact, an argument could be made that associations in a community manifest an opportunity for additional extra-curricular activities such as sports—and thus take away time that could be spent on studying.

One of the most surprising findings of this study is the consistent, negative relationship between nonprofits and student achievement: a higher number of nonprofits in a community is linked to lower student achievement on every single measure of achievement. The nonprofit portion of the social capital index likely accounts for the overall negative relationship found between academic achievement and social capital. As will be discussed in the limitations section of this study, the presence of nonprofits in a community may indicate that there is need within the community rather than that there is strength in the community. For example, if students are academically low performing, they may need additional academic and non-academic supports that could be met by nonprofits. Thus, the presence of these specific nonprofits in these communities indicates a need, rather than a strength. One can conceptually understand how more nonprofits in a community would not necessarily indicate that there is greater social capital. Thus, the number of nonprofits in a community may not be the best way to determine the extent to which a community has social capital. However, that is how this index determines social capital and thus the curious findings of the inverse relationship between social capital and academic achievement could plausibly be a validity issue with the index.

There is a level of circularity implied in this theory: as social capital increases, so does academic achievement. Higher academic achievement leads to higher academic attainment. Higher academic attainment results in greater social capital. There is evidence of this circularity in the findings that social capital in one time period is linked to the social capital within the same community in the future. Social capital begets social capital. However, the findings from this study did not fully support this theory: social capital (and specifically nonprofit measures in the social capital index) was negatively related to academic achievement—though voter turnout was

positively correlated. These curious findings may be an issue with the validity of the index used to measure social capital or other factors in the model.

The circular nature of this theory and the potential endogeneity associated with all tools and factors used to measure both social capital and academic achievement are part of what makes measuring and assessing social capital such a challenge for policymakers and researchers. Though we might all agree implicitly that social capital matters, we also recognize the inherent challenges of generating social capital—particularly where it is lacking. Where social capital exists, it is sustained. Where it does not exist, it is difficult to create. But the fact that the relational strength of social capital from one period to the next fades over time provides some inkling of hope that it is malleable. This, of course, could also be discouraging as it also suggests that a region with strong social capital cannot guarantee its sustenance. However, the statistical significance that persists over time, implies it is hard to impact and would require a significant amount of energy and potentially even generational patience.

Limitations of this Study

The most obvious limitation of this study is whether the index used for social capital is in fact a valid measure of social capital. A county level social capital index could be a powerful instrument for research. However, this particular index appears to overly rely on the number of nonprofits as a factor in social capital despite evidence that interpersonal trust does not lead to an increase in the creation of new nonprofits within a community (Saxton & Benson, 2005). Rupasingah, Goetz, and Freshwater's (2006) county level index links higher levels of non-international nonprofit organizations with an increase in social capital. However, in this study an increase in nonprofits is negatively correlated with student achievement. There is some concern in how the nonprofit factor was included in this index as the communities known in the state as

having strong supports for students and strong schools—such as the Benton and Washington county—had lower social capital according to the county-level index than areas such as Pulaski County and Phillips County where poverty is a legitimate threat to child welfare.

Further quantitative analysis would have to be performed to validate these concerns, but certainly it appears that the value of the index in truly measuring social capital within the community may be limited by the inclusion and weight of the nonprofit sector. As already stated, one conclusion might be that rather than creating social capital, the existence of many nonprofits in a community is evidence of low social capital or the presence of factors that are inversely correlated to social capital. In other words, nonprofits exist because of deficiencies in social capital rather than as a result of the presence of social capital. For example, the presence of a large homeless population would likely be the catalyst for a myriad of nonprofits to support the food, shelter, and medical needs of the homeless. The fact that a community with few homeless individuals would not have the same nonprofits does not indicate that the community has lower social capital—but rather that the community has less need for nonprofit support.

A second limitation of this study is that despite best efforts to take into account historical public policy initiatives and their relative weight on student achievement, at the end of the day, this analysis is snapshot of one state's social capital and student achievement at one point in time. Expanding the study to multiple years and to multiple locations would provide greater weight to any relationships identified in this study. Furthermore, by looking at school-level data, the power of this study is limited. Acquisition of student-level data would provide more power to any relationships identified. However, this study does demonstrate that such efforts would be worthy and that there is indeed evidence that certain community factors—specifically voter

turnout—are consistently related to student achievement at a significant level. Thus, there may be factors related to voter turnout that could also mitigate the devastating impact of poverty.

A significant challenge to the validity of this index is the omission of race as a factor in the index. This issue particularly highlighted in a state like Arkansas that has several geographic regions that are very racially homogenous. Racial integration has been demonstrated to be particularly important in associational and nonprofit aspects of social capital (Briggs, 2003). Furthermore, the interface between all components of the social capital index—from census response rates to associational activities and nonprofit involvement—differ significantly by race and ethnicity. Failure of the index to account for racial differences in a community should be addressed.

Finally, this study did not—and could not with the data available—take into account the extent to which these outcomes might differ for students of different ages. Perhaps social capital is more important for older students than for younger students. There is some evidence in these results that there may be a difference in relative importance based on age—simply based on the variance observed when evaluating relationships on tests such as science and language that differentially involve elementary and high school students.

A much more effective method of evaluating the impact of social capital on student achievement would be the utilization of individual student data rather than school-based data that could focus more on age, race, and individual household income in addition to other factors. Furthermore, the inclusion of other time periods would have also added value to this study. Without student-level data and additional cross-sections of time, a major criticism of this study is that the data utilized is overly general and thus this study is only capturing the salient differences

that exist between schools already known to be segregated racially and economically due to the nature of residential school-zoning.

Conclusion

Poverty has a destructive impact on students' short- and long- term outcomes. The well-documented impact of poverty on student achievement is visible before a child walks through the door on their first day of Kindergarten through a 3-million word gap between low-income students and their more advantaged peers (Hart & Risley, 2013). Its impact is still visible when high school seniors walk out the door at the end of their K-12 experience and are segregated into different careers and college experiences. Its persistence has been demonstrated in the inability of expensive and comprehensive public policy education reforms to impact achievement of lower income students. The statistical significance of certain aspects associated with social capital that is on par with the strength of poverty should not, therefore, be quickly dismissed despite the quality of the index itself being questioned.

This study does not conclude with statements of great certainty or dogmatic solutions to the challenges that exist within the American system of public education. It does, however, suggest that there may be malleable community factors that could be leveraged to improve academic achievement that warrant additional research. Specifically, the fact that voter turnout was consistently positively related to student achievement is interesting. Education, income, and age are the factors that have the greatest influence on voter turnout. These same characteristics are also meaningful in understanding social capital (Putnam, 2000). It might be interesting to assess the extent to which there are factors that contribute to both social capital and voter turnout that could be leveraged to improve student achievement. Future researchers could consider

incorporating qualitative research in a study on social capital, academic achievement, and voter turnout to tease out whether important factors exist beyond income.

It is likely that the motivational and demographic factors discussed here are all intertwined. It's also likely that demographic factors omitted in this index—namely race and ethnicity—are also related and should be included. Studying social capital is challenging in part because of the difficult task of separating the social and demographic factors that are so strongly correlated with each other. This challenge is certainly not resolved in this study, but areas of future research are highlighted.

This study highlights the need for improved instruments to measure social capital. Certainly nonprofits are important in a community; however, their existence doesn't necessarily indicate that a community has a lot of social capital. Furthermore, their weight in this index appears to have skewed the results in this specific study in a pattern that seems illogical. The weight that nonprofits take in this index should be evaluated.

An optimistic view on the results of this study suggests that there are malleable community factors that could be leveraged to produce better outcomes for student achievement. The fact that voter turnout is consistently linked to student achievement might be evidence to some that human agency might be a factor in improving communities. Specifically, this might be considered evidence of the power of human choice and effort in building better communities: those who are engaged, involved, and dutiful create stronger communities where students can learn. Though the study also acknowledges the powerful influence poverty has on student achievement, perhaps it also points to the steps that could be taken to diminish its power from a community perspective. Improving public education should not be a zero-sum game where we only acknowledge one potential solution to the detriment of including others. Perhaps we could

invest in better solutions to address poverty while simultaneously working to engage individuals in the decisions that impact their communities. Efforts should be made to strengthen engagement and self-efficacy in building productive and engaged communities. Efforts should also be made to identify and address challenges to overcoming generational cycles of poverty and to offer a hand to those who are stuck in this stubborn cycle.

This research project represents a step toward identifying possible ways to address some of the complex issues we face in improving outcomes for the next generation of learners. More than anything, it highlights future research that could be conducted to obtain greater certainty of whether the community does play a role in student achievement or if all factors influencing student achievement are really just a proxy for wealth. Such research is warranted to identify whether the spectrum of possible solutions to the challenges facing our system of public education should at least take into consideration the broader trust and civic engagement of the surrounding community.

References

- Aldrich, J., Montgomery, J., & Wood, W. (2011). Turnout as a habit. *Political Behavior*, 33: 535-563.
- Alesina, A., & La Ferrara, E. (2000). Participation in heterogeneous communities. *Quarterly Journal of Economics*, 115(3): 847-904.
- Alexander, K., Entwisle, D., & Olson, L. (2007). Lasting consequences of the summer learning gap. *American Sociological Review*, 72(2): 167-180.
- American National Election Studies, University of Michigan, & Stanford University. (1996). *ANES 1996 Time Series Study* (ICPSR36824.v2)
- Anne E. Casey Foundation. (2022). Kids Count Data Center. <https://datacenter.kidscount.org>
- Arkansas Bureau of Legislative Research. (2020). Foundation funding and the matrix. *Bureau Brief, Handout E3*.
- Arkansas Department of Education. 2022-23 State Profile. Retrieved on January 16, 2023 at <https://adedata.arkansas.gov/statewide/ReportList/State/StateProfile.aspx>
- Arkansas House Interim Education Committee. (2022). Final report on the legislative hearings for the 2020 educational adequacy study. Volume I.
- Armitage, R., & Nellums, L. (2020). Considering inequalities in the school closure response. *The Lancet*, 8(5): E-644.
- Bailey, M., Cao, R., Kuchler, T., Stroebel, J. & Wong, A. (2018). Social connectedness: measurement, determinants, and effects. *Journal of Economic Perspectives*, 32(3): 259-80.
- Barber, M. & Holbein, J. (2022). 400 million voting records show profound racial and geographic disparities in voter turnout in the United States. *PLoS One*, 17(6), e0268134.
- Barnett, S. & Escobar, C. (1987). The economics of early educational intervention: a review. *Review of Educational Research*, 57, 4: 387-414.
- Becker, G.S. (1965). A theory of the allocation of time. *Economic Journal*, 75: 493-517.
- Becker, G.S. (1974). A theory of social interactions. *Journal of Political Economy*, 82: 1063-1093.
- Bhuller, M., Mogstad, M., Salvanes, K. (2014). Life cycle earnings, education premiums, and internal rates of return (NBER Working Paper No. 20250). Cambridge, MA: National Bureau of Economic Research.

- Borgonovi, F. & Andrieu, E. Bowling together by bowling alone: social capital and COVID-19. *Social Science and Medicine*, 265. <https://doi.org/10.1016/j.socscimed.2020.113501>
- Bourdieu, P. (1983). Forms of capital. In John G. Richardson (Ed.), *Handbook of Theory and Research for the Sociology of Education*, (pp. 241-258). New York: Greenwood Press.
- Bronfenbrenner, U. (1944). A constant frame of reference for sociometric research: part II experiment and inference. *Sociometry*, 7: 40-75.
- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Bronfenbrenner, U. (2001). The bioecological theory of human development. In N.J. Smelser & P.B. Baltes (Eds). *International encyclopedia of the social and behavioral sciences*, (Vol. 10, pp. 6963-6970). New York: Elsevier.
- Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development*. Thousand Oaks, CA: Sage Publications.
- Briggs, X. (2002). Social capital and segregation: race, connections, and inequality in America. KSG Faculty Research Working Papers Series RWP02.
- Brisson, D. & Usher, C. (2005). Bonding social capital in low-income neighborhoods. *Family Relations*, 54, 644-653.
- Butler, R. & Muir, K. (2016). Young people's education biographies: Family relationships, social capital, and belonging. *Journal of Youth Studies*, 20(3): 316-331.
- Byun, Soo-yong, Meece, J. Irvin, M., & Hutchins, B. (2012). The role of social capital in educational aspirations of rural youth. *Rural Sociology*, 77(3): 355-379.
doi: [10.1111/j.1549-0831.2012.00086.x](https://doi.org/10.1111/j.1549-0831.2012.00086.x)
- Cairns, R.B., & Cairns, B.D. (1995). Social ecology over time and space. In Moen, G.H. Elder Jr., & K. Luscher (Eds.), *Examining lives in context: Perspectives on the ecology of human development* (pp. 397-421). Washington, DC: American Psychological Association.
- Carradore, M. (2018). A synthetic indicator method applied to Putnam's social capital indicators: the case of Italy. *Italian Sociological Review*, (8),3, 397-421.
- Coleman, J.S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94: 95-120.
- Coleman, J.S. (1990). *Foundations of social theory*. Cambridge: Harvard University Press.

- Chall, J. (2000). *The Academic achievement challenge: what really works in the classroom?* New York, London: Guilford Press.
- Chetty, R., Hendren, N., Kline, P., and Saez, E. (2014). Where is the land of opportunity? The geography of intergenerational mobility in the United States. *The Quarterly Journal of Economics*, 129(4), 1553-1623.
- Chetty, R., Friedman, J., Hilger, N., Saez, E., Schanzenbach, D., & Yagan, D. (2011). How does your kindergarten classroom affect your earnings? Evidence from Project Star. *The Quarterly Journal of Economics*, 126(4), 1593-1660.
- Coe, D., Peterson, T., & Blair, C., Schutten, M., and Peddie, H. (2013). Physical fitness, academic achievement, and socioeconomic status of school-aged youth. *The Journal of School Health*, 83(7), 500-507 <https://doi.org/10.1111/josh.12058>
- Cooke, T. (2003). Family migration and the relative earnings of husbands and wives. *Annals of the Association of American Geographers*, 93, 341-352.
- Daly, A., Nienke, M., Der-Martirosian, C., & Liou, Y. (2014). Accessing capital resources: investigating the effects of teacher human and social capital on student achievement. *Teachers College Record*, 116(7): 1-42.
- Dee, T. (2004). Are there civic returns to education. *Journal of Public Economics*, 88(9):1697-1720.
- Dewey, J. (1900). *The Elementary School Record*. Chicago: University of Chicago.
- Diffey, L. & Steffes, S. (2017). Age requirements for free and compulsory education. (https://nces.ed.gov/programs/statereform/tab5_1.asp).
- Doerr, J. (2018). *Measure what matters*. Penguin Random House: New York.
- Engle, J. & Vincent, T. (2008). Moving beyond access: college success for low-income, first-generation students. *Pell Institute for the Study of Opportunity in Higher Education*. Retrieved on May 5, 2019 at <https://eric.ed.gov/?id=ED504448>.
- Farr, J. (2004). Social capital: A conceptual history. *Political Theory* (32), 1: 6-33. <https://doi.org/10.1177/0090591703254978>
- Fiscal and Administrative Services Division. (2021). Arkansas School Finance Manual 2021-22. https://dese.ade.arkansas.gov/Files/2021-22_Arkansas_School_Finance_Manual_-_Final_20210927101740.pdf
- Forrest, R. & Kearns, A. (2001). Social cohesion, social capital, and the neighbourhood. *Urban Studies*, 38(12): 2125-2143.

- Gamoran, A. Ed. (2007). Standards-based reform and the poverty gap: Lessons for no child left behind. Washington DC: Brookings.
- Gamoran, A., Miller, H., Fiel, J., & Valentine, J. (2021). Social capital and student achievement: an intervention-based test of theory. *Sociology of Education*, 94(4): 294-315.
- Glaeser, E., Laibson, D., Scheinkman, J., & Soutter, C. (2000). Measuring trust. *Quarterly Journal of Economics*, 115(3): 811-846.
- Greenwald, R, Hedges, L., & Laine, R. The effect of school resources on student achievement. *Review of Educational Research*, 66(3): 361-396.
- Gronlund, Norman E. (1998). *Assessment of student achievement, sixth edition*. Needham Heights, MA: Ally & Bacon Publishing.
- Guzman, M., et al. (2011). Mental health matters in elementary school: first-grade screening predicts fourth grade achievement test scores. *European Child & Adolescent Psychiatry*, 20(8), 401-411. DOI 10.1007/s00787-011-0191-3
- Hansen, E. & Tyner, A. (2019). Educational attainment and social norms of voting. *Political Behavior*. doi: 10.1007/s11109-019-09571-8
- Hanushek, E. (2010). Education production functions: developed country evidence. In: Penelope Peterson, Eva Baker, Barry. McGaw (Editors), *International Encyclopedia of Education*, Volume II. Oxford: Elsevier.
- Harder, B., O'Reilly, C., & Tobias, D. (2018). Intelligence, education, and learning capital and domain impact level of activities as predictors of school achievement. *Journal for the Education of the Gifted*, (41)4: 327-347.
- Hart, B., & Risely, T. (2013). The early catastrophe. *American Educator*, Spring, 4-9.
- Hart, B., & Risley, T. (1995). *Meaningful differences in the everyday experiences of young American children*. Paul H. Brookes Publishing.
- Hawes, D., Rocha, R., and Meier, K. (2012). Social capital in the 50 states: measuring state-level social capital, 1986-2004. *State Politics and Politics Quarterly*, (13), 1: 121-138.
- Helliwell, J., & Putnam, R.D. (2007). Education and social capital. *Eastern Economic Journal*, 33:1-19.
- Hollard, G., & Sene, O. (2016). Social capital and access to primary health care in developing countries: Evidence from Sub-Saharan Africa. *Journal of Health Economics*, 45:1-11.
- Huang, J., van den Brink, H.M., and Groot, W. (2009). A meta-analysis of the effect of education

- on social capital. *Economics of Education Review*, (28), 4: 454-464.
- Huang, L. (2009). Social capital and student achievement in Norwegian secondary schools. *Learning and Individual Differences*, 19: 320-325.
- Hanifan, L.J. (1916). The rural school community center. *Annals of the American Academy of Political and Social Science*, 67, 130-138.
- Hartlage, L., & Steele, C. (1977). WISC and WISC-R correlates of academic achievement. *Evaluation and Assessment*, 14:1, 15-18.
- Hess, A. (2020, March 14). Widespread school closures mean 30 million kids might go without meals. *CNBC*. <https://www.cnbc.com/2020/03/14/widespread-school-closures-mean-30-million-kids-might-go-without-meals.html>
- Hess, R. (2022, October 25). A closer look at NAEP declines: What a leading education researcher finds surprising. *Education Week*.
- Hoffman, J. & Miller, E. (2020). Addressing the consequences of school closure due to COVID-19 on children's physical and mental well-being. *World Medical and Health Policy*, August 2020.
- Howell, W. (2015). Results of President Obama's Race to the Top. *Education Next*, 2015, 15:4.
- Jankowski, R. (2007). Altruism and the decision to vote: explaining and testing high voter turnout. *Rationality and Society*, 19(1): 5-34.
- Jensen, E. (2009). *Teaching with poverty in mind*. ASCD: Alexandria, Virginia.
- Keeley, B. (2007). *Human capital: How what you know shapes your life*. Organization for Economic Cooperation and Development.
- Kinsey, E., Hecht, A., Dunn, C., Levi, R., Read, M., Smith, C., Niesen, P., Seligman, H., & Hager, E. (2021) School Closures During COVID-19: Opportunities for Innovation in Meal Service. *American Journal of Public Health*, 110(11):1635-1643.
- Kline, J. (2017). Morality, cheating, and the purpose of public education. LeHigh University.
- Koretz, D. *The testing charade: Pretending to make schools better*. University of Chicago Press; Chicago.
- Labaree, D. (1997) Public goods, private goods: the American struggle over educational goals. *American Educational Research Journal*, 34(1): 39-81.
- Langberg, J, et al. (2011). Patterns and predictors of adolescent academic achievement and performance in a sample of children with attention deficit/hyperactivity disorder. *Journal*

- of Clinical Child and Adolescent Psychology*, 40(4), 519-31.
doi: 10.1080/15374416.2011.581620
- Lareau, A. (2002). Invisible inequality: social class and childrearing in black and white families. *American Sociological Review*, 67, 5: 747-776
- Lareau, A. *Unequal childhoods: Class, race, and family life*. Berkely: University of California Press, 2003.
- Lauren, D. & Gaddis, M. (2013). Exposure to classroom poverty and test score achievement: contextual effects or selection. *American Journal of Sociology*, 118:4, 943-979.
- Lee, V., Loeb, S., and Lubeck, S. (1998). Contextual effects of prekindergarten classrooms for disadvantaged children on cognitive development: The case of Chapter 1. *Child Development*, 69, 2: 479-494
- Lee, V. & Burkam, D. (2002) Inequality at the starting gate. Economic Policy Institute, Washington D.C.
- Levine, M. (1976) The academic achievement test: Its historical context and social function. *American Psychologist*, 228-238.
- Lindholm-Leary, K. & Borsato, G. (2006). Academic Achievement. In Genesee, F., Lindholm-Leary, K., Christian, D., & Saunders, W. *Educating English language learners: a synthesis of research evidence* (pp. 176-211). Cambridge: University Press.
- MacNeil, A., Prater, D., & Busch, S. (2009). The effects of school culture and climate on student achievement. *International Journal of Leadership in Education* 12(1): 73-84.
DOI: [10.1080/13603120701576241](https://doi.org/10.1080/13603120701576241)
- McCoy, L. (2005). Effect of demographic and personal variables on achievement in eighth-grade algebra. *Journal of Education Research*, 98(3): 131-135.
- McDonald, J., Hughes, M., & Ritter, G. (2004). School finance litigation and adequacy studies. *Law Review*, 27(1).
- Merton, R. (1968). The Matthew effect in science. *Science*, 159(3810): 56-63.
- Milligan, K., Moretti, E., Oreopoulos, P. (2004). Does education improve citizenship? Evidence from the United State and the United Kingdom. *Journal of Public Economics*, 88(9):1667-1695.
- Mitchell, D., Shipp, D., and Crowson, R. Eds. (2018). *Shaping education policy: Power and 201process*, 2nd edition. Rutledge: New York, NY.

- Morrison, N. (2022). School closures may have long-term impact on children's mental health. *Forbes*, January 18, 2022. Retrieved on January 22, 2023 from <https://www.forbes.com/sites/nickmorrison/2022/01/18/school-closures-may-have-long-term-impact-on-childrens-mental-health/?sh=19ac9afc1703>
- Murnane, R. & Levy, F. (1996). *Teaching the new basic skills: principles for educating children to thrive in a changing economy*. New York: Free Press.
- Newcomb, M., & Ritter, G. (2012). Analyzing the 2011 NAEP Results: Where Does Arkansas Stand Now?. *Arkansas Education Reports*. Retrieved from <https://scholarworks.uark.edu/oepreport/36>
- Office for Education Policy. (2001). 2000-2001 Financial Data. <https://oep.uark.edu/data/finances/>
- Office for Education Policy. (2005). 2004-2005 Financial Data. <https://oep.uark.edu/data/finances/>
- Office for Education Policy. (2005). 2004-2005 Norm-Referenced Assessment Data. <https://oep.uark.edu/data/performance-on-state-assessments-act-aspire/>
- Office for Education Policy. (2014). 2014-2015 Norm-Referenced Assessment Data. <https://oep.uark.edu/data/performance-on-state-assessments-act-aspire/>
- Office for Education Policy. (2016). 2015-16 ITBS Exam for Districts Key. <https://oep.uark.edu/data/performance-on-state-assessments-act-aspire/>
- Onwuegbuzie, A., Collins, K., & Frels, R. (2013). Foreword: Using Bronfenbrenner's ecological systems theory to frame quantitative, qualitative, and mixed research. *International Journal of Multiple Research Approaches*, 7(1):2-8.
- Paxton, P. (1999). Is social capital declining in the United States? A multiple indicator assessment. *American Journal of Sociology*, 105: 88-127.
- Phi Delta Kappa. (2018) The 50th Annual PDK Poll of the Public's Attitudes Toward the Public Schools: Teaching: Great respect, dwindling appeal. (2018). *Phi Delta Kappan*, 100(1), NP1 –NP24. <https://doi.org/10.1177/0031721718797117>
- Petrilli, M. & Wright, B. (2016). America's mediocre test scores: education crisis or poverty crisis. *Education Next*, 16:1.
- Putnam, R. (1995). Bowling alone: America's declining social capital. *The Journal of Democracy*, 6(1), 65-78.
- Putnam, R. (2000). *Bowling alone: the collapse and revival of the American community*. New York: Simon & Schuster.

- Putnam, R. (2007). E pluribus unum: diversity and community in the twenty-first century. *Scandinavian Political Studies*, 30(2): 137-174.
- The Roper Organization. (1973). Roper Social and Political Trends Data, 1973-1994 (Version 2) [Dataset]. Cornell University, Ithaca, NY: Roper Center for Public Opinion Research. doi:10.25940/ROPER-31097293
- Rundle, A., Park, Y., Herbstman, J., Kinsey, E., Wang, C. (2020). COVID-19 related school closings and risk of weight gain in children. *Obesity*, 28(6):1008-1009.
- Rupasingha, A., Goetz, S. J., & Freshwater, D. (2006, with updates). The production of social capital in US counties. *Journal of Socio-Economics*, 35, 83–101. doi:10.1016/j.socec.2005.11.001.
- Sampson, W. (2002). *Black student achievement: how much do family and school really matter*. Scarecrow Education.
- Saxton, G. & Benson, M. (2005). Social capital and growth of the nonprofit sector. *Social Science Quarterly*, 86(1): 16-35.
- Sherrieb, K, Norris, F., & Galea, S. Measuring capacities for community resilience. *Social Indicators Research*, 99: 227-247.
- Sondheimer, R. & Green, D. (2010). Using experiments to estimate the effects of education on voter turnout. *American Journal of Political Science*, 54(1): 174-189.
- Tamborini, C. Kim, C., and Sakamoto, A. (2015). Education and lifetime earnings in the United States. *Demography*, 52, 4, 1383-1407.
- Tavernise, S. & Mervosh, S. (Hosts). (2022, November 14). The nation’s ‘report card’ on remote learning. In *The Daily*. New York Times. <https://podcasts.apple.com/us/podcast/the-daily/id1200361736?i=1000586092768>
- Tetzner, J., Becker, M., and Brandt, N. (2019). Personality-achievement associations in adolescence—examining associations across grade levels and learning environments. *Journal of Personality*, 88(2), 356-372. <https://onlinelibrary.wiley.com/doi/10.1111/jopy.12495>
- Tocqueville, Alexis de (1838). *Democracy in America*. G. Dearborn & Co.: New York.
- VandenBos, G. & American Psychological Association. (2007). *APA dictionary of psychology*. Washington D.C.: American Psychological Association.

Watts, T. (2020). Academic achievement and economic attainment: reexamining associations between test scores and long-run earnings. American Educational Research Association. <https://doi.org/10.1177/2332858420928985>

West, M. (2022, October 24). Nation's report card shows steep declines in student learning. *Education Next*.

Zhou, M., & Kim, S. (2006). Community forces, social capital, and educational achievement: The case of supplementary education in the Chinese and Korean immigrant communities. *Harvard* 1-2.