Classroom Structure and Student Achievement:

A Theory and Case Study

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Senior Thesis

Submitted in partial fulfillment of the
requirements for the Degree of
Bachelor of Arts
In Sociology
at Haverford College

Advisor: Mark Gould

April 22, 2011

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Acknowledgments

Thank you, first and foremost, to Mrs. Hollander, Mr. Burnham, their students, and the administrators of the Middleton and Orchardville school districts, without whose assistance and flexibility I would never have been able to undertake this project.

Thanks to Professors Anat Yom-Tov and Lisa McCormick for providing insightful comments and criticisms throughout the year. Thanks also to Professor McCormick for acting as the first responder to a mid-semester thesis breakdown.

Thanks to Laurie Allen for helping me navigate the U.S. Census Bureau website.

Thanks to Lucas Fuentes, my fellow sociology major, teammate, and good friend, for never hesitating to share his thoughts about our theses and his views on education generally. Even when I was too grumpy and stressed out to admit it, I always enjoyed our conversations and often benefited from them.

Thank you, most of all, to Mark, both for pointing me toward this topic during his Class, Race, and Education seminar back in 2009 and for providing invaluable feedback and unconditional support as I grappled with it this year.

Abstract

Over the preceding decade, elementary school students in the Middleton and Orchardville school districts performed comparably on the mathematics section of the yearly state-administered standardized test. During the same period, however, secondary school students from the same two districts consistently performed disparately on the same section of the same test. After reviewing and rejecting the prevailing perspectives on inequality in student achievement, I propose that the divergence in test scores results from a lack of cooperative learning in Middleton secondary schools. I construct a theory of the necessary and sufficient conditions for the successful implementation of cooperative curricula in a classroom, hypothesizing that at least one of these conditions is absent in Middleton. Data collected during participant observation research, though not representative of the two districts, suggest that cooperative learning is more prevalent in Orchardville.

INTRODUCTION

Research Problem and Question

Between the academic years ending in 2002 and 2010, elementary school students in two neighboring suburban school districts performed comparably on the mathematics section of the yearly state-administered standardized test.[1] The proportion of elementary school students that scored in the "advanced" and "proficient" classifications (nearly always above 85 percent of test takers) during this period does not differ significantly between the two districts. Figures 1 represents this comparability graphically.

During the same period, however, middle and high school students from the same two districts consistently performed disparately on the same section of the same test. A divergence in district test performances emerges in 6th grade and continues through 11th grade, the last year of testing, creating a notable "achievement gap" between middle and high school students in the two districts. Most of this divergence occurs from declining test scores in one district between 6th and 11th grade; scores remain relatively stable in the other district during this period. Hereafter, I will refer to the school district where test scores decline as Middleton and the school district where test scores remain stable as Orchardville.[2] The proportion of middle and high school students that scored in the "advanced" and "proficient" classifications between 2002 and 2010 differs significantly between the two districts. Figures 2 – 4 represent this disparity graphically.

In this thesis, I attempt to answer the following research question: what causes the sudden and steady divergence in achievement between Middleton and Orchardville secondary school students? Assuming constant enrollment in both districts, the divergence reveals an abrupt and

[1] I retrieved all data on test scores, student enrollment, and school expenditures in Middleton and Orchardville from the state's Department of Education website. To protect the anonymity of the two districts, I present all of these data here without providing a citation.

[2] The use of pseudonyms protects the anonymity of the students and teachers who I observed during my fieldwork.

permanent transformation.[3] Between the ages of 9 and 11, students in both districts appear equally capable in terms of a common measure of student ability; by the age of 14, the very same students appear more or less capable, depending on their school district, in terms of the same measure. At some point early in middle school, something happens, or fails to happen, to the students of Middleton that causes their academic performance to decline. Whatever happens in Middleton either does not occur, or occurs without the same effect, in Orchardville.

Outline of Approach

In chapter one, I situate my research question within the dominant sociological and educational perspectives on student achievement. These perspectives differ in whether they posit a student's home, neighborhood, or school as the primary determinant of achievement. In chapter two, I show that these perspectives do not illuminate the case of Middleton and Orchardville. Most of the literature on home, neighborhood, and school effects presume substantial differences in either school resources or the socioeconomic composition of students' homes and neighborhoods. Using census data I show that, relative to the populations of the state and nearest city, the populations of Middleton and Orchardville occupy high-status occupations and are well educated. Subsequently, I consider another plausible explanation for the test score divergence, which holds that the difference in student achievement is proportional to differences in school resources or socioeconomic composition. I then address the possibility of a selection bias explanation by presenting enrollment data from Middleton and Orchardville. These data show that enrollment remains constant between elementary and high school in both districts. Finally, having accounted for differences school resources, students' socioeconomic backgrounds, and

[3] A plausible explanation for the diverging scores is that the strongest Middleton students leave the district after 5th grade, perhaps for parochial or private middle and high schools. If this is the case, the divergence in test scores is the result of selection bias. The assumption of constant enrollment ignores this possibility and therefore requires empirical verification. Later on I will present enrollment data suggesting that it is safe to assume constant enrollment in both districts.

the possibility of selection bias, I propose that the divergence in test scores results from differences in classroom structure between Middleton and Orchardville secondary schools. More specifically, I predict that cooperative learning occurs frequently in Orchardville secondary school classrooms, but very infrequently in Middleton secondary school classrooms and both Orchardville and Middleton elementary school classrooms. To establish the pertinence of this prediction, I conclude the chapter with a brief review of the psychology literature on the relationship between social interaction and cognitive development. This literature finds that cooperative interactions among children facilitate the development of their rational capacities.

Chapters three, four, and five constitute the core of this thesis. In chapter three, I construct a theoretical argument about the necessary and sufficient conditions for a classroom structure that promotes cooperative interactions among students and between students and their teacher (i.e., a *cooperative* classroom). After outlining relevant theoretical concepts, I contend that the necessary and sufficient conditions for cooperative learning are (1) a school curriculum that includes cooperative peer-group activities and (2) a teacher who institutionalizes rational-egalitarian values in the classroom. I then reformulate my prediction from the previous chapter in terms of this theory: cooperative interactions occur in Orchardville secondary school classrooms because both conditions are present; cooperative interactions do not occur in Middleton secondary school classrooms and Orchardville and Middleton elementary school classrooms because at least one condition is absent.

In chapters four and five, I present field research conducted in two classrooms, one from each district. These data lend initial support to the argument constructed in chapter three. Cooperative learning occurs in the Orchardville classroom only. While both classrooms use curricula that include cooperative peer-group activities, only the Orchardville teacher

institutionalizes rational-egalitarian values. After a brief review of my theory and findings, I conclude with some simple propositions for future research and policy.

I. LITERATURE REVIEW

Delivering the unanimous and landmark opinion of the Supreme Court on *Brown v. Board of Education*, Chief Justice Earl Warren posited a conception of equal educational opportunity dependent on both the inputs to and outcomes of schooling. In contrast to the logic of *Plessy v. Ferguson*, which held racially segregated schools to be equal so long as they possessed equivalent resources, Warren argued that equal schools must also affect children in a uniform way. “Our decision,” Warren wrote, “cannot turn merely on a comparison of these tangible factors in the Negro and white schools involved in each of these cases. We must look instead to the *effect* of segregation itself on public education” (347 U.S. 483 [1954]; emphasis added). To validate this conception of equality, Warren cited research on the negative psychological effect of segregation on black children. This research found that segregation produces in black children a “feeling of inferiority as to their status in the community that may affect their hearts and minds in a way unlikely ever to be undone.” In the court’s view, even if racially segregated schools were equal in “tangible” terms, the distinct negative impact of segregation on black children made the policy unconstitutional, as it amounted to a deprivation of equal protection for black children.

Ever since 1954, therefore, evidence that school characteristics influence student cognitive development has had significant legal weight. Among social scientists, however, the strength of this influence remains a matter of debate. At least since the 1960s, sociologists, psychologists, and economists have sought to meter the respective impacts of three variables on cognitive development in children. These variables are not operational definitions of abstract concepts, as in the typical sense of the term, but broad categories that seem to encompass every determinant of achievement. Although they receive different names throughout the literature, the

variables may, without loss of meaning, be generally called neighborhood effects, home effects, and school effects. In general, studies of neighborhood effects measure a relationship between achievement and some measure of the quality of the community in which a student lives; studies of home effects measure a relationship between achievement and certain aspects of a student’s household and relationship with her parents; and studies on school effects measure a relationship between achievement and school-specific factors like student-teacher ratio and per-pupil expenditure.

The Coleman Report and Contemporary Variants

The dominant sociological perspective holds that neighborhood and home effects outweigh school effects in determining student achievement. The exhaustive work of Coleman et al. (1966) provides the foundation of this viewpoint. Most notably, they found that the greatest portion of the variance in student achievement comes from variations in achievement among students in the same schools, while only a small portion comes from variations in achievement across schools. At a general level, this result suggests that differences in school-specific factors have less of an impact on student achievement than some other variable(s). Moreover, Coleman et al. showed that the percent of variance in achievement attributable to school differences does not change as students proceed through grades. Not only do factors beyond school quality account for most of the variance in achievement, therefore, but schools seem equally ineffective in minimizing the effect of these exogenous factors over time.

Instead of school effects, Coleman et al. attributed the greatest portion of variance in achievement to eight “student background factors”: urbanism of neighborhood, parents’ level of education, structural integrity of the home, smallness of family, items in home, reading material in home, parents’ interest in student’s education, and parents’ educational desires for their

children. Coleman et al. estimated that these factors account for most of the variance in student achievement, including 10 to 30 percent of the variance explained by school-to-school differences, depending on student grade level and race. These findings lead to a rather disheartening conclusion about the extent to which schools independently affect achievement and thereby promote educational equality:

> Taking all these results together, one implication stands out above all: that schools bring little influence to bear on a child’s achievement that is independent of his background and general social context; and that this very lack of an independent effect means that the inequalities imposed upon children by their home, neighborhood, and peer environment are carried along to become the inequalities with which they confront adult life at the end of school. For equality of educational opportunity through the schools must imply a strong effect of schools that is independent of the child’s immediate social environment, and that strong independent effect is not present in American schools (P. 325).

Coleman et al. offer two important findings, therefore, one negative and one positive. While their negative finding that differences across schools do not account for much of the variance in achievement is strong and striking, their failure to separate home effects from neighborhood effects weakens their positive finding that student background factors *do* account for much of the variance in achievement. In their analysis, it remains uncertain whether background factors related to the home, such as parents’ level of education, or background factors related to the neighborhood, such as urbanism of community, have more explanatory power.

More recent literature seeks to remove this uncertainty. The typical study of neighborhood effects controls for home effects, usually with data on parents’ educational attainment, income, occupation, and marital status, in order measure the relationship between achievement and the socioeconomic characteristics of a student’s neighborhood. These characteristics often include the occupational status and income of neighborhood residents, proportion of two-parent households, racial and ethnic composition, safety, and the neighborhood unemployment rate. Following this template, Brooks-Gunn et al. (1993) find a

statistically significant relationship between the fraction of families in a child’s neighborhood with incomes above $30,000 and the child’s score on an IQ test. Extrapolating from this finding, they suggest that a one standard deviation increase in the fraction of families with incomes above $30,000 corresponds to a five-point increase in child intelligence. Similarly, Ainsworth (2002) establishes a significant relationship between the proportion of “high-status” residents in a student’s neighborhood and the student’s performance on a standardized test. Net of differences in family background and school quality, Ainsworth finds, students living in a neighborhood where the proportion of high status residents is one standard deviation above the mean score 3.65 points higher on the test than students living in a neighborhood where the proportion of high-status residents is one standard deviation below the mean. Using data from Scotland, Garner and Raudenbush (1991) construct a linear model showing that two otherwise identical students may perform disparately on national secondary school exams if they come from different levels of “neighborhood deprivation.” Sampson, Sharkley, and Raudenbush (2008) find that living in a neighborhood with high rates of welfare receipt, poverty, unemployment, and female-headed households reduces black children’s IQ by at least four points, or 25 percent of a standard deviation. Growing up in a neighborhood of “concentrated disadvantage,” they estimate, is equivalent to missing a year or more of school.

Neighborhood Mechanisms

Of course, a measurement of the magnitude of an effect does not explain why the effect occurs. While most studies of neighborhood effects estimate the strength of the relationship between neighborhoods and student outcomes, they ignore or briefly speculate on the important question of why the relationship exists at all. As Jencks and Mayer (1990) put it, the literature on neighborhood effect “relies on a ‘black box’ model…that makes no assumptions about how

social composition influences individual behavior. Models of this kind try to answer the question, How much would an individual’s behavior change if he or she moved from a low-SES to a high-SES neighborhood….They do not purport to explain *why* moving has an effect” (p. 115). The purpose of social scientific theory is to answer the latter question by specifying the mechanism by which neighborhood effects operate. Taken together, the relevant theoretical work posits two mechanisms that can mediate between neighborhoods and children’s academic outcomes: peer group, indigenous adults. Whether these mechanisms positively or negatively affect student achievement depends on the neighborhood in question and the theory employed.

Theories that identify peer groups as the primary neighborhood mechanism divide into two categories: contagion (or epidemic) theory and relative deprivation theory. Contagion theory holds that children tend to behave in the same way as their peers. A child is more or less likely to work hard in school, for example, depending on whether she regularly interacts with children who also work hard in school. The child with studious friends is more likely to work hard in school than the child who hangs out with slackers. By this logic, if children from socially and economically stable neighborhoods tend to perform better in school than children from unstable, poor neighborhoods, it is because children from stable neighborhoods more frequently interact with other children committed to academic success. Contagion theory neither explains why peer groups in different neighborhoods exhibit different behaviors nor analyzes individual susceptibility to peer group influences; it only maintains that “among individuals of any given susceptibility, the likelihood of antisocial or self-destructive behavior,” or any type of behavior, “increases with exposure to others who engage in similar behavior” (Jencks and Mayer 1990:114).

Most theories that specify “indigenous adults” (i.e., adults other than a child’s parents who reside and work in the child’s community) as the primary mediating mechanism between neighborhood characteristics and student achievement fall under the rubric of collective socialization. Collective socialization theory holds that children come to understand the role of education in life by observing the adults of their communities. Children who see a clear link between their adult neighbors’ levels of education and socioeconomic position will give more priority to their schoolwork than children who do not see this link. Wilson (1987) uses collective socialization theory to explain the prevalence of school dropouts (and other aberrant behaviors) in the most impoverished areas of American inner cities. He argues that the mass out-migration of stable middle- and working-class families from these areas during the 1970s and 1980s left the remaining “truly disadvantaged” residents with no “mainstream role models that help keep alive the perception that education is meaningful” (p. 56). Whereas “a perceptive ghetto youngster in a neighborhood that includes a good number of working and professional families…can also see a connection between education and meaningful employment,” the same youngster living in the “social isolation” of concentrated poverty, where “the relationship between schooling and postschool employment takes on different meaning,” will not see this connection (pp. 56, 57). With no sense that education provides a path to a better life, inner city children see no reason to strive for academic success. According to collective socialization theory, therefore, if children from stable, affluent neighborhoods tend to perform better in school than children from unstable, poor neighborhoods, it is because children from stable, affluent neighborhoods have regular contact with adults who exemplify the payoff of high educational achievement.

Home Effects and Language

The typical study of home effects holds that parent-child interactions have the greatest impact on the child’s cognitive development. Most of these studies focus on language use. Although Sampson et al. “leave for future research to investigate potential mediating mechanisms,” they readily posit that have limited access to “academic English” and “speech communication in varied public contexts” (p. 845). Similarly, Lareau (2002) distinguishes middle-class families from working- and lower-class families in terms of language use in the home. Whereas middle-class parents and children “often engage in conversation that promotes reasoning and negotiation” and middle-class parents encourage their children to “develop and practice verbal skills, including how to summarize, clarify, and amplify information,” lower- and working-class families do not have extended verbal discussions that “cultivate conversation by asking the children questions or by drawing them out” (pp. 756, 758). Hart and Risely (1995) find that the vocabulary of 3 year-old children whose parents work in professional occupations is twice as large as the vocabulary of 3 year-olds whose parents receive welfare.

These studies recapitulate the earlier work of Bernstein (1971), who finds that middle- and working-class children speak with “elaborated codes” and “restricted codes,” defined “in terms of the probability of predicting for any one speaker which syntactic elements will be used to organize meaning” (p. 76). Middle-class children, who speak with an elaborated code, “will select from a relatively extensive range of alternatives and therefore the probability of predicting the pattern of organizing elements is considerably reduced,” whereas working-class children speak with a restricted code, such that “the number of these alternatives is often severely limited and the probability of predicting the pattern is greatly increased” (pp. 76-77). Bernstein posits that the development of a child’s speech code occurs primarily through communication with the

mother. More pertinently, he argues that schooling both requires and promotes the use of an elaborated speech code. In Bernstein’s view, the dislocation between the restricted speech code of the working-class and the language used in school makes it difficult for the working-class child to communicate with his teacher. This difficulty inhibits the working-class child’s opportunity for academic success and may cause him to develop a negative attitude toward school.

School Effects

Finally, studies of home effects emphasize the importance of school resources and inputs for student achievement. These resources usually include per-pupil expenditure, teacher/pupil ratio, teachers’ years of experience, teachers’ level of education, and number of the books in the school library. In their review of the school effects literature, Greenwald, Hedges, and Laine (1996) find that these resources are all positively related to student achievement.

II. THE IMPACT OF CLASSROOM STRUCTURE

Class, Race, and School Resources in Orchardville and Middleton

The literature reviewed above views student achievement as a function of neighborhood and family contexts and school resources. From this viewpoint, variation in student achievement across school districts must come from differences in the socioeconomic and demographic composition of the neighborhoods that the districts serve. Most of the literature on neighborhood and home effects focuses on the educational consequences of living in vastly disparate socioeconomic and demographic contexts, such as an impoverished, mostly minority urban neighborhood and a wealthy, mostly white suburban neighborhood. Prior to the more specific questions of the relative strengths of neighborhood and home effects and the mechanisms by which these effects operate, this literature begins with the idea that differential student outcomes result from stark socioeconomic inequality.

This perspective fails to explain the divergence in test scores between Middleton and Orchardville for the simple reason that the populations of the two school districts are well educated and work in high occupational positions. Figures 5 – 8 compare Middleton and Orchardville, along with their state and nearby city, in terms of income, occupation, race, educational attainment, and poverty status. These figures make it clear that the residents of both Middleton and Orchardville are wealthier, less impoverished, better educated, and in higher occupational statuses than those of the nearest city and the rest of the state. Given the relatively high levels of education and occupational status in Middleton and Orchardville, the divergence in test scores probably does not result from a difference in, to use terms from the neighborhood effects literature, the “concentrated disadvantage” or percentage “high status” residents between the two districts. Unlike the truly disadvantaged children of the socially isolated inner-city

ghetto, children in Middleton and Orchardville likely have ample access to positive adult role models and peer-groups. Similarly, given the relatively high levels of educational attainment in the two districts, the divergence probably does not result from differences in language use.

However, Figures 5 – 8 also reveal that small yet certain socioeconomic differences do exist between Middleton and Orchardville. Though both districts are wealthy and well educated in the grand scheme, the percentages of residents with postgraduate and professional degrees and of residents who work in management and professional occupations are higher in Orchardville. Sixty-five percent of employed Orchardville residents work in professional and management occupations, slightly more than the 54 percent of Middleton residents. Similarly, 42 percent of Orchardville residents hold a masters, professional, or doctorate degree, while 25 percent of Middleton residents hold a masters degree or higher. In terms of home effects, a more plausible explanation of the divergence in test scores holds that the difference in student achievement between the two districts is proportional to the differences in occupation and education. From this perspective, a difference in home effects between the two districts, though much smaller than the same difference between both districts and the nearest city, can explain the divergence in test scores. This explanation might draw on Kohn’s ([1969] 1989), distinction between social classes in terms of values and orientations. Members of the working- and lower-middle class, he finds, value behaviors that fall under the promote “conformity,” whereas members of the upper-middle and upper-classes value behaviors that promote “self-direction.” Conformity involves “following the dictates of authority, focusing on external consequences to the exclusion of internal processes, being intolerant of nonconformity and dissent, being distrustful of others, having moral standards that strongly emphasize obedience to the letter of the law,” while self-direction includes “acting on the basis of one’s own judgment, attending to internal dynamics as

well as external consequences, being open-minded, being trustful of others, holding personally responsible moral standards” (p. 189). Kohn speculates that working- and lower-middle class parents impart conformist values to their children, leaving them inadequately prepared to adapt to new situations and challenges. On the other hand, the self-direction that upper-middle and upper-class parents foster prepares their children for “meeting the new and problematic” and teaches them “to develop their analytic and their empathic abilities” (p. 200). By taking the slightly lower percentages of Middleton residents in high occupations and with postgraduate degrees to indicate a greater emphasis on conformity among Middleton parents, the decline in student achievement can be interpreted as a home effect.

Alternatively, the differences in occupational status and educational attainment between Middleton and Orchardville may indicate a school effect. While Kohn presumes that education is a determinant of self-directed values and orientations (see pp. 187-191), others argue that schools teach students from higher and lower social classes differently so as to reproduce the class structures necessary for the maintenance of a capitalist economy. As Bowels (1971) argues, “Differences in the internal structure of schools themselves and in the content of schooling reflect the differences in the social class compositions in student bodies. The social relations of the educational process ordinarily mirror the social relations of the work roles into which most students are likely to move” (p. 14). Bowles and Gintis (1976) take the same position. In this view, the divergence in test scores between Middleton and Orchardville reflects school structures that prepare students from the respective districts for working- and upper-middle class occupations. In addition, a sizable difference in school resources adds plausibility to a school effect explanation. Though both districts are wealthier than most of the 500 districts statewide,

Orhardville spent $25,713 per pupil in 2008, making it the second richest district in the state, while Middleton spent $14,774 per pupil.

Student Enrollment and Selection Bias

These two preceding explanations also fail to answer the present research question, for they offer no insight into the comparability of scores during elementary school. If Middleton and Orchardville parents respectively promote conformity and self-direction in their children, or if Middleton and Orchardville schools respectively prepare students for working- and upper-middle class occupations, Middleton test scores would likely be lower than Orchardville test scores across all grade levels, and certainly so for 5th grade students. Similarly, the difference per-pupil expenditures, a measure of the resources allocated to the average student, should affect both elementary and secondary school test scores. A school resource explanation would also presume disparate test scores for Middleton and Orchardville 5th graders. No such disparity exists. Since 2002, Middleton 5th graders have performed comparably to, if not better than, Orchadville 5th graders. A satisfactory explanation for the divergence in test scores must account for this initial equality.

If the strongest Middleton students leave the district after elementary school, perhaps for parochial or private secondary schools, while the strongest Orchardville students remain in the district through high school, the divergence in test scores could be the result of an unequal distribution of student ability in the two districts. Enrollment data suggest that the number of students in both districts stays constant between elementary and secondary school, however. Between the academic years beginning in 2004 and 2008, an average of 414 fifth grade students and 444 eighth grade students enrolled in the Middleton school district; between the academic years beginning in 2005 and 2009, an average of 415 sixth graders and 454 ninth graders

enrolled in Middleton schools. In Orchardville, an average of 516 fifth graders and 559 eighth graders enrolled between 2004 and 2008, while an average of 513 sixth graders and 577 ninth graders enrolled between 2005 and 2009. These data do not account for the possibility that the strongest students leave Middleton after elementary school, only to be replaced by an equal number of weaker secondary school students, but such a scenario seems highly unlikely.

School Effects Reconceptualized

Having accounted for differences school resources, students' socioeconomic backgrounds, and the possibility of selection bias, it seems more likely that the divergence in test scores between Orchardville and Middleton results from a difference in the methods of instruction used by the two districts. In the following chapters, I focus on the impact of different classroom structures on student achievement. Here, I establish classroom structure as an important and relevant point of focus.

The structure of any social system comprises the patterns of interaction among the units of the system.[4] A structural analysis "involves the identification of the unit's relational network, its interactions with units at the same level of analysis" (Gould 1987:2). Within the context of a school classroom, all interactions take place in a specific organizational pattern, such that the structure of a classroom reduces to two categories of interaction: those among students and those between students and teacher. In this thesis, as in the sociology of education literature, the term "classroom structure" refers to these interactions, "those enduring, orderly, and patterned relationships between members (student to teacher, teacher...and student to student)" (Lee and Smith 1993:166). To say that classroom structure differs between two school districts means that

[4] When the maintenance of certain interaction patterns is important to the functioning of the system, their violation meets a negative sanction. A teacher who extorts students' lunch money, for example, violates the societal understanding of appropriate student-teacher interaction; if caught, the teacher will surely lose her job.

student-student and student-teacher interactions in the classrooms of one district differ from those interactions in the classrooms of the other district.

Bidwell and Kasarda (1980), for instance, draw a helpful distinction between “lecture-recitation” and “task differentiation” methods of classroom instruction. The two methods differ in the distribution of important school resources to students by the teacher. These resources include instructional time, class materials, and interactions with other students. Although all three are relevant to student achievement, I limit my focus here to student interactions. Lecture-recitation classrooms limit students’ exposure to one another to instances when one student answers or asks a question aloud. In a task-differentiated classroom, by contrast, “freedom of movement during time away from the teacher increases opportunities for interaction with other students during time that is allotted to academic activities” (p. 409). Although lecture-recitation and task-differentiated classrooms differ in the deployment of resources to students, therefore, they also represent distinct classroom structures insofar as they respectively constrain and facilitate student-student interactions.

A wide body of psychological and educational theory and research suggest that this difference in classroom structure is directly relevant to student achievement. Most notably, the work of Perret-Clermont (1980) verifies the relationship between cognitive development and cooperative interaction experimentally. Four of her experiments are particularly relevant here. Results from the first suggest that social interaction between children at different cognitive stages often lead to advances in the cognitive structures of the less developed child. Perret-Clermont’s data show that a 6 year-old child with little to no grasp of liquid conservation will, after 10 minutes of collaborating with two conserving peers on a task that uses the conservation, demonstrate mastery of the concept herself. Results from the second experiment indicate that

non-conserving children master conservation more rapidly during cooperative interaction with conserving peers than with peers of proximate cognitive structure. This leads Perret-Clermont to hypothesize that differences in the size of cognitive effects depend on "the degree to which this cognitive conflict was expressed or acted out as a function of the difference in points of view" (p. 116). The results from her third experiment confirm this hypothesis for interactions between a non-conserving child and a partner with full mastery of conservation, but they also suggest that cognitive conflict causes restructuring in both children, rather than in the non-conserver alone. Results from this experiment show both that all children, whether at disparate or similar levels of cognitive development, benefit from working cooperatively on a task that involves conservation, so long as the must negotiate distinct points of view in order to cooperate effectively. This finding ties the results from Perret-Clermont's experiments together in a single contribution: "a situation of social interaction which requires subjects to coordinate either their actions or their points of view can bring about a modification in their individual cognitive structure" (p. 169). The element of conflict is central to this process: "cognitive conflict created by social interaction is the locus at which the power driving intellectual development is generated" (p. 163).

In light of her results, Perret-Clermont supports cooperative learning as an educational method. "Any educational practice aiming at the individualization of teaching should at the same time be founded on the intensification of social interactions among children, and we have already seen the advantages, in this case, of placing together children of different developmental levels" (p. 189). This position dates at least as far back as John Dewey (1916), who held that cooperative learning is necessary for the maintenance of a democratic society.[5] More recent work investigates whether cooperative learning improves student achievement. This literature began in

[5] For another American pragmatist's discussion of the relationship between cooperation and social development, see Mead [1934] 1967:152-163.

the 1970s with studies of peer tutoring. Dineen, Clark, and Risely (1977) find that students improved their spelling of words on which they either gave or received peer tutoring, but not of words on which they neither gave nor received peer tutoring. In their review of the peer tutoring literature, Cohen, Kulik, and Kulik (1982) conclude that both peer tutors and tutees outperform control students on examinations and developed a more positive attitude toward the material covered in tutoring. Semb, Ellis, and Araujo (1993) find that college students demonstrated long-term retention of material on which they tutored other students.

By the 1990s, the study of peer tutoring broadened into the study of cooperative learning generally. In a review of studies comparing the impacts cooperative and competitive efforts on problem solving, Qin, Johnson, and Johnson (1995) find that students in cooperative teams outperform students who compete individually with their peers in solving various types of problems, especially those that involve non-linguistic concepts. In another review, Springer, Stanne, and Donovan (1999) show that undergraduates who participated in various types of small-group cooperative learning improved their academic achievement and attitude toward courses in science, technology, engineering, and mathematics. Taken together, a long list of studies (Fuchs 2002; Shachar and Sharan 1994; Nichols 1996; Crouch and Mazur 2001), including both randomized experiments and individual analyses, strongly suggest that cooperative learning facilitates improvement for students of all ages and in all subject matters.

III. CONDITIONS FOR COOPERATIVE LEARNING

Given that cooperative interaction stimulates cognitive development in children, the task becomes to characterize and specify the conditions for a classroom structure that encourages cooperative interaction among students. This is a task for sociology. Here, my simple contention is that two conditions are necessary and sufficient for the formation of a cooperative classroom: (1) a teacher who institutionalizes rational-egalitarian values within the classroom, and (2) a curriculum that specifies cooperative learning as a method of instruction. In the absence of either condition—for instance, with a teacher committed to traditional values—a cooperative classroom structure will not occur.

Cooperative Interactions as Rational-Legal Procedures

Theoretical Origins: Weber and Durkheim

Max Weber ([1925] 1968) distinguishes between “lawmaking” and “lawfinding.” The former refers to “the establishment of general norms which in the lawyers’ thought assume the character of rational rules of law” (p. 653). Lawmaking involves a process of “legislation, that is, conscious human lawmaking in conformity with the formal constitutional requirements…of a given society” (p. 753). Lawfinding, on the other hand, is “the ‘application’ of such established norms and legal propositions deduced therefrom by legal thinking, to concrete ‘facts’ which are subsumed under these norms” (p. 653). Weber broadens his definitions of lawmaking and lawfinding into two processes that lead to the rationalization of an entire body of law: (1) “generalization,” or the “reduction of the reasons relevant in the decision of concrete individual cases to one or more ‘principles,’ i.e., legal propositions,” and (2) “sytematization,” or the “integration of all analytically derived legal propositions in such a way that they constitute a logically clear, internally consistent, and, at least in theory, gapless system of rules, under which,

it is implied, all conceivable fact situations must be capable of being logically subsumed” (pp. 655-656). In other words, a rationalized body of law consists of logically related abstract rules that apply to all specific legal questions.

Weber states that the distinction between lawmaking and lawfinding, and thus the possibility of a rationalized body of law, does not exist in situations of “irrational adjudication,” where “lawfinding is not conceived as an application of general norms to concrete cases” (p. 654). In this case, the lawmaking and lawfinding may be “*formally* irrational when one applies…means which cannot be controlled by the intellect, for instance when recourse is had to oracles or substitutes therefore,” or “*substantively* irrational…to the extent that decision is influenced by concrete factors of the particular case evaluated upon ethical, emotional, or political basis rather than by general norms” (p. 656). Two points are crucial here. First, Weber understands rationality as the capacities to construct a consistent body of rules and to apply those rules systematically and objectively to specific empirical cases. In his view, all other methods of legal practice are irrational. Second, he believes that these capacities develop and exist only in certain politico-legal contexts.

What contexts, in that case? Weber’s mention of the formal constitutional requirements involved in lawmaking relates to Emile Durkheim’s ([1893] 1997) notion of organic solidarity, the form of social solidarity necessary for the integration of differentiated units within a complex social system. If organic solidarity is to develop, Durkheim argues, these differentiated units must interact according to a mutually recognized set of rules. He highlights contractual relationships as an area where organic solidarity is necessary to maintain social order. Though he sees that the need for contracts arises from complementary interests of actors within a social within a social system, Durkheim does not believe, as utilitarian theorists like Spencer do, that

the validity of a contract depends solely on consent of the contracting parties to its specific terms. Beyond this consent, a contract must be undertaken according to procedural rules specified by the relevant body of law. Accordance with these procedures ensures the fulfillment of terms that, though not stipulated formally, are nonetheless essential to the validity of a contract. Durkheim distinguishes between the contractual and non-contractual aspects of a valid contract in the following passage:

> For in a contract not everything is contractual. The only undertakings worthy of the name are those that are desired by individuals, whose sole origin is this free act of the will. Conversely, any obligation that has not been agreed by both sides is not in any way contractual. Wherever a contract exists, it is submitted to a regulatory force that is imposed by society and not by individuals (P. 158).

This regulatory force is the set of legal rules to which any valid contract must adhere. Society enforces them and “only bestows obligatory force upon contracts that…are in conformity with the rules of law” (p. 71).

Durkheim understands that justifying procedures vary across social systems and historical periods. In modern social systems, organic solidarity “denies any binding power to undertakings entered into by one incapacitated mentally,” for instance, and renders “invalid those agreements where the contracting parties are too unequally placed,” where “one of the contracting parties is placed too absolutely at the mercy of the other” (pp. 159, 319, 320). This is to say that a justified contract entails both the consent of all contracting parties and that all parties possess equal influence in drawing the terms of the contract. A contract drawn through a procedure that does not fulfill these two non-contractual conditions is invalid. Hereafter, I will refer to this type of procedure, which requires the consent of and guarantees equal opportunity to contracting parties, as *rational-legal*.

In past historical periods, however, sacred rituals sufficed to justify an outcome. Durkheim writes, “For the contract to exist a necessary and sufficient condition was that certain

ceremonies should have been carried out, certain words pronounced, and the nature of the undertakings entered into was determined not by the intentions of the parties, but by the formulas employed. The consensual contract only appears at a comparatively recent date” (p. 319). Elsewhere, he makes the same point another way: “The juridical formula is only a substitute for sacred formalities and rites. When certain definite words, arranged in definite sequence, possess a moral influence which is lost if they are different or merely pronounced in a different sequence, we can be certain that they possess…a sacred significance” ([1957] 2001:182). Hereafter, I will refer to any procedures based in criteria other than mutual consent and equal opportunity as *non-rational*.

In Weber’s terms, rational-legal procedures are the specific type of constitutional requirements definitive of a politico-legal order in which the rationalization (i.e., generalization plus systematization) of law is possible. In a context of non-rational procedures—for instance, when laws are made and applied according to cultural practices—the distinction between lawmaking and lawfinding disappears and adjudication is irrational.

Piaget

Jean Piaget’s ([1932] 1997) discussion of moral judgment makes the preceding discussion directly relevant to cognitive development in children. Following Durkheim’s argument in *The Division of Labor*, Piaget shows that children’s sense of morality changes with the complexity of their social environment. Drawing on observations of children between the ages of 4 and 13 playing the game of marbles, Piaget argues that the typical child’s orientation to a shared set of rules develops along two dimensions simultaneously: *practice*, the extent to which children codify and share rules; and *consciousness*, which refers to children’s understanding of the origin of rules and their authority. Although children may practice a rule

before becoming conscious of it, they do not routinize a practice until they perceive it as a moral mandate. Each stage of consciousness is therefore a necessary condition for the procession from one stage of practice to the next.[6] I will focus solely on the second and third stages of consciousness and the third and fourth stages of practice, as these are the most relevant to the forthcoming argument.[7]

In the second stage of consciousness, a child's moral judgment exists as an unwavering worship of his parents and older siblings. For children in the early stages of moral development, "rules are regarded as sacred and untouchable, emanating from adults and lasting forever. Every suggested alteration strikes the child as a transgression" (p. 28). At this point, the child harbors an "almost mystical respect for rules: rules are eternal, due to the authority of parents…and even an almighty God" and "refuses to alter these rules and claims that any modification, even if accepted by general opinion, would be wrong" (pp. 54, 61). In more conceptual terms, this stage of moral judgment involves the development of mechanical solidarity rooted in traditional values. At home and in the classroom, the child's conception of the desirable derives directly from his interpretation of the actions of adults. Consequently, when children and adults fill

[6] See Gould (1987:Ch. 8), who integrates Piaget's stages of consciousness and practice into a single, seven-stage model of development. "Thus the stages in this model from one to seven are ordered in terms of a hierarchically inclusive progression. I intend this to be a scientific, not a value judgment. It is only necessary to demonstrate that the earlier stages, in social structure and process, are capable of genesis within the latter, but not vice versa" (p. 347).

[7] The practice of rules begins with a purely motor and individual stage, when the child first becomes acquainted with the context to which the rules apply. At this stage, the child, unaware that a system of rules exists, behaves according only to preferred motor habits, playing with the marbles as she pleases. During the second stage of practice, a younger (2 – 5 years) child "follows" rules by imitating observed examples of behavior that conform to them, but rules do not yet facilitate interaction among children. Children behave egocentrically at this stage, even when in close physical proximity to peers. In the first stage of consciousness, which overlaps with all of stage one and part of stage two of practice, children may view rules as potential modifications to their motor and egocentric behavior, but not as obligations. At this stage, "rules are not yet coercive in character, either because they are purely motor, or else (at the beginning of the egocentric stage) because they are received, as it were, unconsciously, and as interesting examples, rather than as obligatory realities" (Piaget [1932] 1997:28).

different role positions within the same collectivity, the social structure of the collectivity is hierarchical.

Once children reach the second stage of consciousness, they proceed to the third stage of practice. Cooperative interactions do occur among children at this stage of moral judgment, but only rudimentarily. In the specific context of Piaget’s study, children at this stage understand winning as besting their peers and “begin to concern themselves with the question of mutual control and of unification of rules” (p. 28). Nonetheless, “ideas about the rules in general are still rather vague. In other words, children…who belong to the same class at school and are therefore constantly playing with each other give, when they are questioned separately, disparate and often entirely contradictory accounts of the rules observed in playing marbles” (p. 28). Although children engage one another as competitors, they neither create new rules nor modify existing rules in order to increase cooperative play. If a child employs a new rule, he does so unwittingly and “imagines, as soon as he is in possession of a new rule, that he has merely rediscovered a rule that was already in existence” (p. 57). More typically, children reject proposed innovations to the rules as transgressions to the moral code handed down by adults. At this stage, then, children still use non-rational procedures, rooted in tradition, to regulate their interactions with peers.

As the child ages, however, he finds that he must negotiate his understanding of how to play marbles with that of other children if he wishes to participate in group games. In the face of an increasingly broad and differentiated social world, children come to respect whatever rules by which they and their peers agree to play. This marks the third stage of consciousness. Now, “a rule is looked upon as a law due to mutual consent, which you must respect if you want to be loyal but which it is permissible to alter on the condition of listing general opinion on your side”

(p. 28). These rules may deviate from those previously demonstrated by adults and older siblings. In the development of the child’s moral judgment, respect for the dogma of a theocratic gerontocracy gives way to respect for the democratically-legislated decisions of his peer group. Piaget conceptualizes this stage as marking the distinction between constitutive and constituted rules (p. 98). Constitutive rules, akin to Durkheim’s noncontracutal elements of contract, are the (democratic) procedural norms through which valid constituted rules, the actual rules of play, are legislated. Innovations to the standard set of rules no longer constitute transgressions, but any attempt to impose new rules without use of the accepted procedure meets rejection. “There are no more breaches of opinion, in the sense that to desire to change the laws is to sin against them. Only…no one has the right to introduce innovation except by legal channels…There may therefore be breaches but they are of procedure only: procedure alone is obligatory” (p. 71). In broader conceptual terms, this stage of morality involves the development of organic solidarity rooted in rational-legal procedures.

This change in moral judgment causes a change in the nature of interactions among children, the shift from the third to fourth stage of practice. Whereas children in the previous stage cooperated incipiently, without a shared set of rules, and refused to alter or create rules, they now seek to codify all potential variations on the rules as a systematized whole. “Interest seems to have shifted its ground since the last stage. Not only do these children seek to cooperate…but also—and this is undoubtedly something new—they seem to take a peculiar pleasure in anticipating all possible cases and in codifying them” (pp. 49-50). Egocentrism and adult constraint disappear for good at this stage, replaced by cooperative interaction among autonomous individuals.

While this analysis focuses primarily on the development of moral judgment within children, it also has important implications for the study of cognitive growth. Piaget distinguishes between stages of moral development in terms of the rational capacities that children demonstrate at each stage. Although the incipiently cooperative child does apply general rules of play to specific game situations, he lacks “a conscious realization of the rules of reasoning which will enable him to apply them to any case whatsoever, including purely hypothetical cases (mere assumptions)” (p. 47). The capacity to systematically apply abstract rules to concrete situations does not emerge in children until the latter stage of moral development, when become interested in rules for their own sake and play becomes fully cooperative.

Piaget also observes that morally developed children possess the capacity to create new ways of playing marbles that meet established standards of fairness and creativity. He refers to these standards as “the spirit of the game,” which demand that “everything must be eliminated that would compromise…reciprocity (inequalities due to chance, excessive individual differences in skill or muscular power, etc.)” (p. 73). For Piaget, the spirit of the game is a schema to which any game recognizable and permissible as “marbles” must adhere. Children who understand the spirit of the game can operate creatively and logically within its parameters, distinguishing between “fair” and “unfair” versions of marbles and designing new versions that reward skill and provide an equal chance of success to all players. This creative and logical capacity, distinct from the capacity to use abstract rules in specific situations, also emerges in children as they develop more frequently interact cooperatively with their peers.

If moral development correlates with the development of cognitive capacities, the two processes must share a common determinant. Piaget posits cooperative peer group interactions as

the primary explanatory factor in these processes. He argues that these interactions cause children to negotiate and synthesize their understandings of moral and analytical rules with those of their peers. By learning to see things from various perspectives, children both expand and deepen their grasp of rules and develop a tolerance and appreciation for different points of view.

> Our earlier studies led us to the conclusion that the norms of reason, the source of the logic of relations, can only develop in and through cooperation. Whether cooperation is an effect or a cause of reason, or both, reason requires cooperation in so far as being rational consists of 'situating oneself' so as to submit the individual to the universal. Mutual respect therefore appears to us as the necessary condition of autonomy under its double aspect, intellectual and moral. From the intellectual point of view, it frees the child from the opinions that have been imposed upon him while it favours inner consistency and reciprocal control. From the moral point of view, it replaces the norms of authority by that norm immanent in action and in consciousness themselves, the norm of reciprocity in sympathy (P. 107).[8]

This interpretation, substantiated by Perret-Clermont's experimental research, supports the proposition that students who attend schools with cooperative classrooms should outperform comparably able students who attend schools with non-cooperative (i.e., lecture-recitation, hierarchical) classrooms.[9] In a cooperative classroom, the rational-legal procedures definitive of the third stage of consciousness and fourth stage of practice promote the development of creative and rational capacities in children. In a hierarchical classroom, the non-rational procedures definitive of second stage of consciousness and third stage of practice stifle the development of these capacities.

[8] This analysis suggests that moral and cognitive development occur concurrently as cooperative interactions become more prevalent in a child's life. In terms of Piaget's own stage sequential model, however, this is incorrect. Recall that a stage of practice does not obtain fully until the child achieves the corresponding stage of consciousness. A child will not engage in the cooperative interactions charateristic of the fourth stage of practice, which facilitate cognitive growth, unless his moral judgment has reached the third stage of consciousness. In this sense, moral development must precede cognitive development.

[9] Not surprisingly, Piaget was a strong proponent of cooperative learning (see Perret-Clermont 1980:19-20).

Legitimizing Cooperative Norms

Components of Social Structure

Having conceptualized the student-student interactions characteristic of a cooperative and hierarchical classrooms as non-rational and rational-legal procedures, and presuming that cooperative classrooms better facilitate cognitive development, the question becomes how to institutionalize cooperative, rational-legal procedures in the classroom setting. In general terms, this is a question about social structure. All social structures consist of four components: values, norms, collectivities, and roles. As the most general, least specific, component, values regulate the three remaining components of social structure. Generally, values define and delimit the set of desirable behaviors and outcomes for a social system. For Smelser (1962), values “state in general terms the desirable end states which act as a guide to human endeavor” (p. 25). For Parsons (1969), values are “the conceptions of the desirable *type of society* held by members of the society and applied to the particular society of which they are members” (p. 441).

In Durkheim’s ([1893] 1997) terms, mechanical solidarity generates commitment to the collective conscience (*conscience collective*), the “totality of beliefs and sentiments common to the average members of a society” (pp. 38-39). As this definition indicates, commitment to the collective conscience is, in the ideal case, shared and internalized by all members of a social system. Although he uses the terms “beliefs” and “sentiments” in his definition, Durkheim seems to have in mind what others refer to as values. These conceptions of values resemble Durkheim’s conception of the collective conscience as that which binds individuals to “the society that they form by coming together” (p. 60).

When internalized by an actor, values demand observance as moral obligations; in this case, conformity to them is not necessarily attributable to reason or calculation of private utility.

For Durkheim, mechanical solidarity maintains social stability by unifying the members of the social order under the values constitutive of collective conscience. He argues that mechanical solidarity is more prevalent in simple, homogenous social systems with a minimal division of labor. Mechanical solidarity, “deriving from resemblances” among members of the social system, unites them under their shared image what their society ought to be (p. 61).

One level below values, norms are “generalized patterns of expectation for differentiated units within a system” (Parsons 1967:9). In other words, norms define how distinct units within a social system must behave if they are to conform to the greater values of the system; distinct norms correspond to distinct units. “Norms, then, are more *specific* than general values, for they specify certain regulatory principles which are necessary if these values are to be realized. They are the ways in which the value patterns of the common culture of a social system are integrated in the concrete action of its units in their interactions with each other” (Smelser 1962:27). Values regulate norms, while norms reflect values.

Like roles, collectivities are one of the units for which values regulate specific norms of behavior and function. The collectivity “defines and regulates a concrete system of coordinated activity that can at any given time be characterized by the commitments of specifically designated persons, and which can be understood as a specific system of collective goals in a specific situation” (Parson 1967:10) At this level of specificity, a norm is “no longer general, but is made specific in the particular goals, situations, and resources of society” (p. 10). Taking an elementary school classroom as a social system, the student body constitutes the largest collectivity. In this case, the collectivity’s primary goal may be to maximize its academic achievement; the norms that correspond to this goal include attending class five days a week and working diligently on assignments.

Finally, roles “may be thought of as the system of normative expectations for the performance of a participating individual in his capacity as a member of a collectivity” (Parsons 1967:10). An individual may participate in multiple collectivities and may assume multiple roles within a collectivity. The crucial distinction here is between the individual as a role incumbent and the individual as a personality. Social structural analyses deal exclusively with the former, which delimits a set of expectations relevant to the social system, as the smallest unit. A social structural analysis of a school classroom, then, focuses on the behaviors of an individual student, but not on the behaviors of a unique individual.

Traditional and Rational-Egalitarian Values

Rational-legal and non-rational procedures are two different types of norms according to which students interact in their role as students. As norms, they must accord with the values of the classroom. Values specify acceptable procedures, while procedures only reflect dominant values. Values legitimize both outcomes and procedures; legitimate procedures justify outcomes, but they do not justify values (see Parsons 1967:4-10). Gould (1993) illustrates the difference between between values and procedural rules with the following example:

> Imagine a college class: (1) The professor indicates that the order of oral presentations will be set by a vote of the students in the class, where each man will have two votes and each woman one vote. The women would object that the procedure for setting the dates was illegitimate, in violation of the egalitarian values institutionalized within the college. It is conceivable, however, that even with this illegitimate procedure, a legitimate set of decisions might be forthcoming. The decisions would then be legitimate specifications of egalitarian values, even though they were reached within a procedure that could not be so specified. (2) If the professor indicates that the order of oral presentations will be set by a vote of the students in the class, where each student has one vote, this procedure would be legitimate in terms of the college’s egalitarian values. It is conceivable, however, that the outcome would be illegitimate; for example, if a majority in the class were men and they voted that all women would give their presentations prior to all men. Here, while the constitutive, procedural norm is consistent with the college’s collective conscience and therefore legitimate, the constituted norm, the outcome of the procedure, is not legitimate (pp. 206-207).

An outcome legitimate in terms of the collective conscience of a social system need not have procedural legitimacy, just as an outcome reached through legitimate procedures need not accord

with the collective conscience. Borrowing from Durkheim and Weber, Gould conceptualizes mechanical solidarity as *legitimizing* outcomes through the collective conscience and organic solidarity as *justifying* outcomes through procedural rules. A *valid* outcome must be both legitimized by values and justified procedurally.

As distinct norms, rational-legal and non-rational procedures correspond to distinct values. Durkheim did not understand this. In characterizing mechanical solidarity, he suggests that the collective conscience is *always* grounded in tradition and *always* instituted by individual authority figures who, by virtue of their age, embody tradition. He writes:

> What constitutes the strength of the collective states of [conscience] is not only that they are common to the present generation, but particularly that they are for the most part a legacy of generations that have gone before….Thus it is almost entirely a product of the past. But what springs from the past is generally an object of very special respect. A practice to which everyone unanimously conforms is generally an object of very special respect. But if it is also strong because it bears the mark of ancestral approval, one dares even less to depart from it. The authority of the collective [conscience] is therefore made up in large part of the authority of tradition ([1893] 1997:233).

In any social system, this authority emanates from the eldest members, living symbolizations of tradition. “What constitutes the strength of tradition is the character of those who hand it on and inculcate it, that is, the older generation. They are its living expression; they alone have witnessed what our predecessors were wont to do. They are the unique mediator between past and present” (p. 235). When Durkheim discusses the values constitutive of the collective conscience, then, he has a specific type of values in mind, namely, those based in the traditions of the social system. For him, the contemporary conception of the desirable type of society is simply the contemporary understanding of what society was like in “the good ole days.” Similarly, when Durkheim talks about the process by which the collective conscience disseminates throughout a social system, he has a specific process in mind, namely, emulation of the behaviors exhibited by the elder authority figures of the system. Hereafter, I will refer to this

type of values, grounded in tradition and represented by the top rungs of a hierarchical authority structure, as *traditional*.

Traditional values correspond to a specific social structure found in specific places during specific periods. They generate “unilateral respect in the generation of a ‘mystical’ attitude toward authority,” making “rules appear as external laws, sacred because they have been laid down by adults” (Gould 1987:342). The moral rules that derive from these values originate at the top of a hierarchical authority structure, whether ranked by age or social position. Another set of values, by contrast, demand that every actor within a social system have “formally defined equal opportunity within a mutually agreed-upon framework of cooperation and contention” (p. 344). A social system regulated by such values “is typified by contractual relationships between equals and a formal equality pertains in the relations that constitute it” (p. 344). Hereafter, I will refer to these values, based in mutual consent and equal opportunity, as *rational-egalitarian*.

The distinction between traditional and rational-egalitarian values completes the distinction between hierarchical and cooperative classrooms. Rational-egalitarian values regulate the rational-legal procedural norms according to which members of a cooperative classroom interact. In Piaget’s terms, students and their teacher interact according to democratic process definitive of the fourth stage of practice because their moral judgment is in the third stage of consciousness. The teacher’s authority derives from students’ respect for her knowledge of and expertise in mathematics and from her ability to demonstrate that her explanations are useful, rather than from her age or role position. Students do not view their teacher’s explanations as a “revealed truth whose sacred character derives from its divine origin,” but as a “free pronouncement” that “can be modified and adapted to the tendencies of the group,” and they exercise a degree of choice over whether to utilize their teacher’s insights in approaching a

particular problem (Piaget [1932] 1997:70). The teacher does not possess monopoly power over classroom activity. Similarly, while exceptionally capable or assertive students may hold more sway than others, no one student possesses the authority to unilaterally determine the course of her peers’ thought; all students have equal opportunity to offer ideas and suggest answers. For the students, as for the teacher, authority requires both demonstration of competence and the ability to form a consensus around an approach or solution to a problem.

In a hierarchical classroom, on the other hand, traditional values emanate from the teacher, who the students view as a figure of unequivocal, unilateral authority. In Piaget’s terms, students and their teacher interact according to the incipiently cooperative process definitive of the third stage of practice because their moral judgment is in the second stage of consciousness. Students understand teacher instructions as sacred dogma, and they measure their comprehension of material by the extent to which they memorize the algorithmic processes for solving problems that their teacher demonstrates. Any suggested alteration to the teacher’s instructions strikes the students as a transgression. In turn, the teacher’s power over all classroom activity approaches fiat: she dictates everything from the amount of time students allot to a certain activity to which students get to articulate their ideas out loud to whether a student’s ideas are worthy of immediate dismissal or further consideration. Students do not question or challenge their teacher’s prerogatives, and they rely on their teacher, rather than their classmates, for relief from all situations of confusion and uncertainty. Students do not recognize innovation on the teacher’s rules when they occur, for such a change is inconceivable to them. In short, a highly asymmetrical power dynamic between students and teacher arises because students understand their teacher as occupying a position of superior rank in the classroom, whether by virtue of her age or her role position.

At least within this conceptual framework, therefore, it should be clear that a teacher who institutionalizes rational-egalitarian values is a necessary condition for a cooperative classroom. In the absence of this condition, as with a teacher who creates a traditional value system, the cooperative interactions characteristic of a cooperative classroom will not occur. There is, however, another necessary condition not yet specified. In conceptual terms, this is Smelser’s (1962) notion of a facility, or the “means and obstacles which facilitate or hinder the attainment of concrete goals in the role organizational context,” including “the actor’s knowledge of the opportunities and limitations of the environment and, in some cases, his knowledge of his own ability to influence the environment” (p. 28). In addition to a teacher committed to rational-egalitarian values, a cooperative classroom requires a curriculum that provides students with activities and projects on which they can collaborate. In the absence of such a curriculum, students will lack regular opportunities to interact cooperatively with their peers in the formal classroom setting.

This theoretical perspective informs the observation research presented in the next two chapters. Given the comparability of the Middleton and Orchardville school districts in terms of resources, demographics, enrollment figures, and socioeconomic status, and given that cooperative learning improves student academic achievement and orientation, the divergence in test scores between Middleton and Orchardville could be the result of different classroom structures in the two districts. If classrooms are hierarchical in Middleton and cooperative in Orchardville, students in the latter school district should, all else held constant, outperform their peers in the former, as they will more frequently engage in the cognitive conflict that Perret-Clermont identifies as the vital process for intellectual growth. This difference in classroom structure would entail differences in both the dominant values and curricula of the classrooms.

Middleton classroom structures would consist of traditional values and interactions resembling non-rational procedures, whereas Orchardville classroom structures would consist of rational-egalitarian values and interactions resembling rational-legal procedures. In the following chapters, I attempt to determine whether these differences exist.

IV. MIDDLETON

Methodology

My fieldwork was carried out between the months of October 2010 and February 2011 in two classrooms, one in each district. In Middleton, I observed a 3rd grade classroom taught by Mrs. Hollander on 12 occasions. In Orchardville, I observed a 7th grade mathematics classroom taught by Mr. Burnham on six occasions. Both classrooms contain roughly 20 students, all but a small handful of whom are white.

In both classrooms, I sought to remain a passive observer. I never adopted the role of a student teacher or teacher’s aide, for instance. Students in neither classroom ever hesitated to interact with me, but I struck up conversation with them only when I was wanted more information about something that they were working on. Informal interactions with Mrs. Hollander and Mr. Burnham themselves were more frequent, though I did my best never to distract them from the act of teaching, not wanting to disturb the routine and rhythm of daily life in the classrooms. On the rare occasions when Mrs. Hollander or Mr. Burnham would involve me in a lesson or class discussion, I tried to politely deflect the attention. I typically sat or stood in the back of the classroom, out of the students’ line of sight when they sat facing their teacher at the blackboard, and I moved around the classroom to observe the students more closely only when Mrs. Hollander and Mr. Burnham were not lecturing.

Classroom Rituals

Every morning, just past 9:00 a.m., Mrs. Hollander’s students rise from their seats, place their right hands over their hearts, face the American flag hanging in the northwest corner of the room, and say the Pledge of Allegiance. Immediately after uttering the word “all,” they turn to their left and recite, typically with some genuine gusto, their classroom motto, displayed on a

poster above the blackboard. This daily practice is unique to Mrs. Hollander’s classroom and students. As the following excerpt comes from fieldnotes taken on a day when a substitute filled in for Mrs. Hollander.

> The substitute tells the students to stand for the Pledge of Allegiance. After the students and teacher recite the pledge, the students turn to their left and, as is the daily custom, proclaim in unison the motto printed on the poster hanging above the chalkboard: “For success, attitude is as important as important as ability!” The substitute turns with the students but does not say the motto.

At other points in the day, the substitute inadvertently breaks aspects of the students’ routine. Like many elementary school teachers, Mrs. Hollander assigns various classroom tasks to her students. The “class messenger,” for instance, is the student who Mrs. Hollander assigns to deliver the class lunch order to the front office every morning.

> After taking the lunch orders, the substitute requests that a student other than the “class messenger” take the orders down to the front office. A handful of students react simultaneously. All at once, they try to explain to the substitute that the messenger is supposed to deliver the lunch orders. When the substitute insists that the student she originally selected do so, the students’ protest becomes more animated: “But we have a messenger!” they exclaim.

A similar episode occurs less than an hour later, at 10:00 a.m., when students typically have a 10-minute snack break.

> The substitute begins to transition to the next part of the morning’s language arts lesson. When the students ask about their snack time, the substitute says that Mrs. Hollander made no mention of snack in the agenda that she provided. A debate begins, with the students demanding their snack—“we always have snack now when Mrs. Hollander is here!”—and the substitute insisting that she follow the agenda that Mrs. Hollander provided her.

In a commentary on Durkheim’s understanding of ritual, Robert Bellah (2005) remarks, “Collective representations – beliefs – are essential in the process through which society becomes aware of itself, but they arise from and express the homogenous physical movements that constitute ritual, not the other way around” (p. 184). While the daily vocalization of the classroom motto is certainly a ritual, and while it creates among the students an energy akin to the collective effervescence that Durkheim sees in Aboriginal religious gatherings, whether it

actually leads the students to understand themselves as collectively representing the belief that, for success, attitude is as important as ability, is uncertain. What these excerpts more clearly illustrate is the students’ unwavering and unilateral respect for the way that Mrs. Hollander organizes the school day. Though one could explain the students’ protest in the third excerpt as the rational maximization of a preference, the first and second excerpts defy that interpretation. The students may prefer pretzels to continued language arts instruction, but it makes little sense to say that they prefer that a particular student deliver their lunch order. More likely, the students feel that they *must* have their snack at 10:00 and that the messenger *must* deliver the class’s lunch order because that is how the works under Mrs. Hollander. The idea of a school day during which a student other than the messenger delivered the lunch order, snack did not occur at 10:00, and the classroom motto was not recited, strikes the students as transgression in its deviation from Mrs. Hollander’s way of doing things.

Non-Rational Student Norms

Durkheim ([1912] 1995) distinguishes between rituals and moral rules. “The rites can be distinguished from other human practices—for example, moral practice—only by the special nature of their object. Like a rite, a moral rule prescribes ways of behaving to us, but those ways of behaving address objects of a different kind” (p. 34). In this conceptualization, rituals are the “rules of conduct according to which man must conduct himself with sacred things,” whereas moral rules regulate contact with the profane (p. 38). To say that Mrs. Hollander constitutes the sacred, then, means that her students always interact with her through rituals. Although this is true in certain instances, as in the daily statement of the class motto, it is too strong a statement in the general case. Instead, it is enough to say that Mrs. Hollander represents the collective

conscience, the set of values that define desirable behavior impress moral obligations, of the classroom. The following excerpts illustrate this point.

Every Monday at 11:00 a.m., Mrs. Hollander’s third grade students move from their desks to the classroom rug for “class meeting,” a 15-minute period during which students share anecdotes from their weekends before heading off to music class. Mrs. Hollander directs class meeting from a wooden rocking chair, selecting the small handful of students who will get to speak. This excerpt from fieldnotes made during this period.

> This week, Mrs. Hollander uses class meeting to discuss the music teacher’s recent complaints about her students’ behavior. According to the music teacher, the students have been especially bad about calling out without raising their hands. Mrs. Hollander says that she was disappointed to hear this, both because she has emphasized the importance of raising hands to the students before and because she knows, based on their behavior in her classroom, that the students know better than to call out. She informs the students that their poor behavior will cost them party points and that she expects to hear better reports from the music teacher in the future. Mrs. Hollander delivers these messages calmly, without raising her voice. The students listen attentively and quietly. Many look down with somber faces, and none protest or bemoan the deduction in party points.

This excerpt illustrates two important points. First, Mrs. Hollander uses sanctions to punish and reward her students. The “party points” mentioned refer to a simple incentive scheme, invented by Mrs. Hollander, according to which the class receives points for good behavior and loses points for poor behavior. The students earn a party once they accumulates a certain point total. Mrs. Hollander uses party points as a stick and carrot by keeping a running tally of the class’s point total on the blackboard, providing her students with a constant reminder of the consequences of their actions.

Second, and more importantly, although Mrs. Hollander uses sanctions to influence her students’ behavior, she does not rely on them as her primary method of maintaining classroom order. Beyond the party point scheme, Mrs. Hollander successfully maintains her students’ obedience by defining the norms to which they ought to conform. Her reminder to the students

about the importance of raising their hands shows that she expects them to internalize her word as an obligation, a duty that ought to be met. Taken together, the students’ solemn expressions and lack of reaction to the deduction in party points suggest that they feel genuine guilt for having failed to fulfill Mrs. Hollander’s expectation.

Durkheim ([1925] 1961) elucidates the distinction between values and sanctions. In his conception, the actor internalizes values as moral commitments. These commitments preclude calculation of personal benefit. While utilitarian considerations influence most actions, “it is a certain and incontestable fact that an act is not moral, even when it is in agreement with moral rules, if the consideration of adverse consequence has determined it” (p. 30). A moral act, by contrast, occurs solely out of the actor’s sense of duty or obligation. In these terms, conforming to the norm of raising one’s hand constitutes part of the morality of Mrs. Hollander’s classroom. Mrs. Hollander’s students raise their hands out of respect for their moral authority, rather than a calculated strategy to maximize party points. Party points encourage students to raise their hands, but they do not form students’ understanding of the importance of doing so.

Another excerpt taken from a fieldnote taken during class meeting illustrates the nature of Mrs. Hollander’s authority and the norms to which it mandates conformity.

> Mrs. Hollander calls on a student to share her weekend activities with the class, but soon after the student begins to speak, Mrs. Hollander cuts her off to address another student, Timmy, who has been distracting a classmate sitting next to him with jokes. Mrs. Hollander requests that Timmy turn his attention to the discussion. This happens again within minutes, as Timmy persists in his joking. When it happens a third time, Mrs. Hollander separates Timmy from his classmates. “Timmy, please go to your desk,” she says, with a measured tone of voice. Without delay or protest, Timmy stands up and walks over to his desk, where he sits quietly. The rest of the students sitting on the rug, up to now fidgety and chatty, become quiet and return their attention to their classmates’ anecdotes.

As in the previous excerpt, Mrs. Hollander responds to a student’s misbehavior with a negative sanction. Class meeting seems one of the students’ favorite parts of the morning. Nearly every student raises his or her hand with enthusiasm, hoping to be called on to talk about his or her

weekend; many keep their hands raised high while their classmates speak. Dismissing a student from class meeting is therefore a strong sanction, clearly meant to enforce the norm of quiet attentiveness. Perhaps joking around with their peers during class meeting is the students’ primary goal during class meeting, while their secondary goal is to share stories from their weekend. Dismissal from class meeting prevents them from doing either, but they may at least have a chance at the latter if they conform to the norm of quiet attentiveness. From a utilitarian perspective, this makes conformity the rational choice.

Durkheim understands that sanctions enforce conformity with social norms, but he does not see this as their primary function. Instead, he argues, sanctions protect the integrity of the collective conscience. In fact, Durkheim discusses classroom discipline in making this point:

> Thus, the essential function of punishment is…to buttress those consciences which violations of a rule can and must necessarily disturb in their faith—even thought they themselves aren’t aware of it; to show them that this faith continues to be justified; and, to speak more particularly of the school situation, that it is always felt be the teacher from whom the children receive it. Thus, discipline plays an important part in the functions of the morality of the school. Certainly, as we have shown, it is not punishment that gives discipline its authority; but it is punishment that prevents discipline from losing this authority, which infractions, if they went unpunished, would progressively erode ([1925] 1961:167; see also [1893] 1997:63, 240).

The immediacy with which Timmy changes his behavior after his dismissal suggests that more than his preference to participate in class meeting is at play. Were this his only concern, he may have continued to joke with his classmates from his desk, now having nothing to lose by doing so. Instead, he finally represents Mrs. Hollander’s image of a well-behaved student: quiet, attentive, and causing no distraction. This may be out of embarrassment at having been reprimanded in front of his classmates, but it could also be due to a feeling of shame for having violated the norms of the classroom, as defined by Mrs. Hollander. Similarly, Timmy’s peers bring their behavior back in Mrs. Hollander’s expectations after their classmate’s dismissal,

which serves as a reminder of how they must act in their role as students if they are to uphold the morality of the classroom.

The above excerpts reveal the collective conscience of Mrs. Hollander’s classroom as set of traditional values that emanate from Mrs. Hollander. These values define the norms to which good students conform: they raise hands when they wish to speak, refrain from distracting their classmates, and follow Mrs. Hollander’s directions for organizing their desks and solving math problems. The specific norms that these values legitimize are important, but the fact that the values are traditional—that is, handed down from Mrs. Hollander—is also vital.

Standards of Success

Beyond the norms of raised hands, good manners, and no distractions, the most important norm to which Mrs. Hollander’s students feel obligated to conform is to follow their teacher’s directions for completing schoolwork. One student’s comments about his teacher, as captured in the following excerpt, illustrate how Mrs. Hollander defines this norm for her students.

> During today’s language arts activity, in which students write about one of their role models, one student describes Mrs. Hollander in the following terms: “Mrs. Hollander is a good role model for many reasons. First she is organized. She teaches us to organize our desk. Second she helps us if we’re having trouble in math. She answers our questions about decimals and fractions. Third she never yells in class. She tries to correct us without yelling.”

Although the student’s comments about his teacher’s tone of voice provide an image of what makes good manners in his classroom (civility, self-composure), his remarks about her organizational skills and knowledge in mathematics suggest that he understands Mrs. Hollander’s teachings as the only proper approach to schoolwork. A good student, he seems to think, organizes his work according to Mrs. Hollander’s instruction. When it comes to decimals and fractions, good students should likewise organize their thoughts.

For Mrs. Hollander’s students, following directions entails sticking to a procedure but requires little reflection on the significance of their schoolwork. Another excerpt involving the

same child suggests that Mrs. Hollander’s students view her, not only as an authority of all questions relating to schoolwork, but also as their very reason for doing schoolwork at all.

> When I ask one student what the point of “whisper phone” (an activity during which students hold a plastic red phone to their ear and read a book to themselves in a quiet voice) is, he briefly tries to explain before saying, “Let me go ask Mrs. Hollander.” Mrs. Hollander tells the student that “the point is to hear yourself at a regular voice level, even though you’re whispering.” The student returns to his desk and reiterates these exact words to me.

For this student, schoolwork is important because Mrs. Hollander tells him to do it and meaningful for the reasons that Mrs. Hollander gives. He does not have an autonomous sense of the significance of his schoolwork, nor does he experience schoolwork as an activity worth doing in its own right. All motivation to apply himself to his schoolwork derives from the connection between it and Mrs. Hollander.

The concern with adhering to Mrs. Hollander’s directions often supersedes students’ concern for developing mastery of their schoolwork. They see themselves as understanding their schoolwork to the extent that they follow Mrs. Hollander’s directions for completing it and produce work that Mrs. Hollander deems correct. This often leads to their satisfaction with simply repeating and reproducing an analytical point or conclusion that Mrs. Hollander has made during lecture, even when they are supposed to be working (and thinking) independently. The following excerpt illustrates:

> Mrs. Hollander asks students for evidence that characters in a story are scared. She directs students to look for textual evidence in the second and third paragraphs of the story (an adaptation of the Mysterious Giant of Barletta):
>
> > *But one day this peaceful life was over. Word had reached the town that an army of a thousand men was destroying all the towns and cities along the lower Adriatic coast. And this army was heading straight for Barletta.*
> >
> > *The townspeople ran through the streets in panic. No one in Barletta was ready for an army coming to destroy them. They had no generals, no captains, Why, the didn’t even have any soldiers!*
> >
> > *Shouts and screams echoed off the buildings. The night was lit by torches. All the peace and quiet was gone.*
>
> Mrs. Hollander instructs class that the first sentence of the second and third paragraphs is direct evidence that the approaching army frightened the people of Barletta. When one student suggests

> the last sentence of the second paragraph as further evidence, since it explains why the townspeople were scared. Mrs. Hollander explains that it “provides support and is part of the general picture, but is not direct evidence.” Then, another student raises his hand and enthusiastically reiterates Mrs. Hollander’s exact point: “It’s like a support!” he proclaims.

The student who repeats Mrs. Hollander at the end of the excerpt may simply not have been paying attention before he spoke, in which case his comment, though redundant, would represent original thought. Alternatively, this excerpt could reveal the student’s desire to demonstrate his grasp of what constitutes direct textual evidence and, more importantly, his understanding that the best way to prove his grasp is to point to an example of “supporting” textual evidence that Mrs. Hollander has already identified as such. The latter interpretation is, I think, more likely, as Mrs. Hollander’s students tend to pay close attention when their teacher lectures. Invariably, the questions that Mrs. Hollander poses to her class cause many hands to shoot straight into the air. Students sit forward in their seats, making themselves tall in hope of being called on. This suggests that when students repeat a point that Mrs. Hollander has already made, they do so not because they have not heard what she said, but because they want to manifest their comprehension of the material covered in class. In their minds, the best way to do this is to show that they have heard and internalized Mrs. Hollander’s lecture.

Student Interactions and “Cooperative” Curriculum

Moreover, the proceeding two excerpts show that Mrs. Hollander does not need to convince her students that something she says is accurate or important for them to accept it as such; her students understand her lessons as truth from the moment they leave her mouth. They do not interrogate Mrs. Hollander’s lesson or attempt to reconcile it with their own intuitions and understandings. In Piaget’s terms, Mrs. Hollander’s lessons are sacred and everlasting rules. In completing their own schoolwork, therefore, Mrs. Hollander’s students seek to replicate whatever Mrs. Hollander has exemplified in lecture. The norms that Mrs. Hollander defines for

her class, especially those of following directions and not distracting other students, ensure that this effort involves minimal interaction among students. Students conform to these norms at the exclusion of listening to their peers, for example, as the next excerpt shows.

> Mrs. Hollander transitions the class to the next segment of the morning’s language arts lesson. She tells her students that the goal of the lesson is to get them to describe how someone is feeling without stating his or her emotions explicitly. She writes this goal out on the blackboard in her neat script: “We will write a paragraph using ‘show, don’t tell.’” Before the students start writing, Mrs. Hollander prompts them with a few examples of how a writer can show, rather than tell, someone’s emotions. “If you’re dragging your feet, what emotion are you feeling?” she asks. One student says “glum.” Another says “sad.” When Mrs. Hollander asks, “what if you’re teeth are chattering?” one student replies “scared,” and another replies “frightened.” One student says that someone who is red in the face is “angry.” Another says that the person is “mad.” A minute later, two different students use “angry” and “mad,” again, this time to describe someone who with clenched fists.

Here, students do not give their classmates’ contributions a second thought, as they are focus primarily on saying something, anything, that Mrs. Hollander approves. They seek above all to demonstrate their individual understanding of “show, don’t tell,” even at the cost of redundancy.

Even when Mrs. Hollander divides her class into small groups and assigns each group to a separate activity, the students work individually. Mrs. Hollander did this on a handful of occasions during my observations. The follow excerpt describes one of these.

> Mrs. Hollander assigns hers students to work at one of five activities located around the classroom. She informs me that these activities, called “centers,” are new to her curriculum this year and that Middleton district administrators pushed for their implementation. In one activity, located at a table in the southwest corner of the room, students have to make as many words as they can with the letters a, i, c, g, m, n, and p. Three students, each with his or her own set of letter tiles, tries to complete tries to complete this activity on his own. One student finishes first and checks his words against an answer sheet; another student, working more slowly, peaks at the answer sheet before finishing. As Mrs. Hollander passes by the table, she reminds the students there to “work separately, not together.”

Students work on the exact same task at this “center,” but they do so individually. In Mrs. Hollander’s classroom, therefore, only one of the necessary and sufficient conditions for cooperative learning is present. Even with a curriculum that involves small-group work, Mrs. Hollander’s students do not engage in the cooperative interactions that occasion the cognitive

conflict that Perret-Clermont posits as central to intellectual growth. This would require that the students break the norms, defined by their teacher and legitimized by her traditional authority, to which they feel obligated to conform in their role as students. Consequently, cooperative learning does not occur in Mrs. Hollander’s classroom.

V. ORCHARDVILLE

Rational-Egalitarian Classroom Values

Through frequent informal interactions with his students, Mr. Burnham maintains a casual classroom atmosphere. Upon introducing himself, for instance, he is quick to remark that his students refer to him by a contraction of his last name. “The kids call me [Burns]. I’m fine with that.” To take another example, students often stand from their seat, walk to the corner of the classroom, take a hall pass, and leave, presumably for the bathroom, always without asking permission to do so. Two excerpts stand out as particularly illustrative of the relaxed environment of Mr. Burnham’s classroom.

> With 10 minutes left in class, Mr. Burnham indicates to his students that they have completed all of the work that he had planned for that day. He gives the students two options for how they might spend the remaining time: they can get started on their homework, or he can tell them a story. The students enthusiastically select the latter option. “Burnham’s story time!” they proclaim in unison. Mr. Burnham then goes into a recount of his career as a police officer in a city upstate, when he and his fellow officers would race their patrol cars up and down the interstate in the middle of the night.

The next excerpt involves another mathematics teacher, Mr. Fink, who is friendly with Mr. Burnham and occasionally pays impromptu visits to Mr. Burnham’s classroom. The two teachers joke around with each other and Mr. Burnham’s students, as the excerpt show.

> Mr. Burnham’s lecture is interrupted when Mr. Fink pokes his head through the doorway to Mr. Burnham’s classroom. Mr. Burnham motions as if he is about to throw his dry erase marker at his colleague, who quickly removes his head from the doorway and scurries down the hallway. Mr. Burnham remains poised to throw the marker, holding it above his head, and Mr. Fink returns to the doorway Mr. Burnham hurls the marker right at him. Mr. Fink, who is overweight, enters the classroom and begins joking with Mr. Burnham about the length of his belt. He removes his belt and ropes it around his head. Together, Mr. Fink and Mr. Burnham get the students to estimate how many times the length of Mr. Fink’s belt goes into the length of the whiteboard.

In these excerpts, Mr. Burnham uses class time to speak and act as one of his middle school students might. This may not be an intentional teaching strategy on his part, but it influences how his students understand his authority. When Mr. Burnham’s students see their

teacher goof around and hear him tell amusing stories, as they might do with their friends, they come to view him as a more of a peer than a superior. Indeed, Mr. Burnham’s one-on-one interactions with his students, as captured in the following excerpt, often represent interactions between peers:

> Mr. Burnham paces silently around the room, monitoring his students as they work silently on a worksheet about box and whisker plots. As he comes to the back of the class he notices another student, Asher, doodling on his paper. Asher regularly doodles in class. Mr. Burnham engages his student in a brief conversation. “Asher, does doodling help you?” he asks. “I’ve met people like the before.” The student responds, “Yeah, I still listen when I doodle.”

Although this interaction takes place between teacher and student, Mr. Burnham speaks to Asher simply as a curious colleague. Asher is supposed to be working, not doodling, when Mr. Burnham approaches him, but neither he nor his teacher think his doodling deviant or immoral. Mr. Burnham is genuinely interested in Asher’s work habits, and Asher does not feel guilty about not following Mr. Burnham’s directions precisely. Asher views doodling as an activity perfectly appropriate for Mr. Burnham’s classroom, even when his schoolwork sits on the desk in front of him.

Rational-Legal Norms of Lecture and Problem Solving

Beyond his informal interactions with students, however, Mr. Burnham creates a comfortable classroom atmosphere through his teaching style as well. As captured in the following excerpts, Mr. Burnham often encourages his students to explain their approach to a problem aloud for the whole class to hear, even if the approach is erroneous. When a student volunteers an idea or answer to a question, Mr. Burnham considers the student’s thought, whether correct or mistaken, before evaluating it as such.

> Mr. Burnham writes three equations on the board: $9x + 15 = -3x - 1$, $-(8x - 7) = -2(x + 4)$, and $¾\ x - {}^{1}/_{8} = {}^{1}/_{3}\ x + ½$. One by one, he calls on students to solve each of the equations for x verbally, instructing the rest of the class to make sure that they understand their classmate’s reasoning. Before each of the three selected students move from one step in their explanation to the next, Mr. Burnham briefly stops them and recapitulates their reasoning to the rest of the class.

Feeling at ease with their teacher and in his classroom, Mr. Burnham’s students are comfortable explaining their understanding of a problem, because they know that Mr. Burnham will consider it seriously and evaluate it according to a consistent set of criteria. The following excerpt illustrates this point more fully:

This is not to say that Mr. Burnham relies solely on his friendly relationship with his students to keep his students focused. Like Mrs. Hollander, Mr. Burnham uses incentives to maintain order in his classroom. In his case, the academic outcomes associated with good and bad behavior are sufficient to keep his students in line. He often frames the importance of his lecture in terms of success in school, sometimes stating outright that certain material will be covered on an upcoming exam that bears heavily on their grades.

> Mr. Burnham reveals that tomorrow’s test will include three exercises on completing the square. Using an example, he presents an algorithm for solving these problems:
>
> $x^2 + 20x + 80 = 0$
> $x^2 + 20x = -80$
> $x^2 + 20x + 100 = 20$
> $(x + 10)(x + 10) = 20$
> $(x + 10)^2 = 20$
> $\sqrt{(x + 10)^2} = \sqrt{20}$
> $x + 10 = \pm 4.47$
> $x = -5.53, -14.47$
>
> After going over a few more similar examples, Mr. Burnham states, “I’m putting these equations on the board for a reason: because I’m going to give them to you on the test.” This procedure for solving completing the square problems, he says, “is very consistent. It never changes.” When Mr. Burnham finishes his explanation, the students ask to review the bonus material that will be on the test.

Here the students understand the importance of Mr. Burnham’s lecture as a means to their goal of good grades. Nothing in this excerpt suggests that they view what their teacher says as worth knowing for its own sake, and Mr. Burnham does not suggest that they should.

The crucial point, however, is that Mr. Burnham’s students take what their teacher says seriously because he demonstrates to them that, within their understanding of algebra, what he says makes logical sense. Piaget might say that the students accept their teacher’s algebra lesson,

not out of a unilateral respect for it as sacred dogma, but because it accords their view of the “spirit of the game” of algebra. In other words, Mr. Burnham’s lesson fits within his students’ understanding of how algebra should work. Moreover, Mr. Burnham attempts to make his lesson intelligible to every student.

> Mr. Burnham asks students to solves $x(w + l) = A + B$ for x. He gives them a few minutes to work, and then asks a handful of students for their answers. The answers include $x = (w + l)/(A + B)$, $x = (A + B – w – l)/2$, $x = (A + B – l)/w$, and $x = (A + B)/(w + l)$. Mr. Burnham asks his students to vote on which answer they think is correct, then addresses each answer separately, providing an explanation of its flaw, until he comes to the correct [fourth] answer. When one student raises his hand to ask a question but struggles to articulate her confusion, she promptly gets out of his set and approaches whiteboard to amplify his question, pointing to the steps in the solution that she does not understand. Mr. Burnham does not object to the student’s brief appropriation of the whiteboard. He tries to answer the student’s question once the she returns to her seat, but the she remains unsatisfied. “How did you get that answer?” the student asks. “Why did you move A and B over to the other side of the equation?”

The interaction in this excerpt resembles the rudimentary democratic process in terms of which Piaget characterizes his third stage of consciousness. Mr. Burnham’s students do not accept their teacher’s proposition until it resonates with their conception of algebra. Accordingly, Mr. Burnham seeks consensus around his lesson.

Student Interactions and Cooperative Learning

Viewing their teacher as more of a peer than superior, and so feeling at ease in his classroom, Mr. Burnham’s students often interact as they would outside the formal classroom setting. They engage their classmates informally and energetically. Sometimes conversation involves the latest gossip; when it involves class material, it is no less enthusiastic.

> Mr. Burnham lectures on how to create a box and whisker plot, drawing an example on the whiteboard. He takes a question from a student who does not understand what an outlier is and how it is represented visually on the board. Before Mr. Burnham can begin to address the question, a handful of other students seated around the classroom try to explain. They speak over one another in raised voices. Mr. Burnham permits this interaction to last for a minute or two before he retakes control of the class and answers the student’s question.

In this excerpt, Mr. Burnham’s students interact as they would in a less formal setting, interrupting each other without hesitation. In so doing, they see themselves as conforming to,

rather than violating, the norms defined for their role as students, which are not so different from the norms to which they conform as adolescents outside of the classroom, as in the hallway or cafeteria. These norms accord with the relaxed atmosphere that Mr. Burnham fosters. To a considerable degree, therefore, Mr. Burnham integrates the values and norms of his classroom with those of his students’ broader adolescent lives (see Coleman 1961). More conceptually, in a case of lecture or problem solving, the norms represent a rational-legal procedure of justification consistent with the rational-egalitarian values of Mr. Burnham’s classroom.

When Mr. Burnham incorporates cooperative learning practices into his classes, then, his students successfully function cooperatively. At the beginning of the 2010 – 2011 school year, the Orchardville School District implemented a new mathematics curriculum that calls for frequent cooperative work in class, including group tests and exams. The following excerpt describes one of these tests.

> Mr. Burnham informs his students that, as per the Orchardville School District’s new mathematics curriculum, they will take their test in groups today. Test scores will be assigned to each group, rather than to individual students. Mr. Burnham divides the class into groups of 3 or 4, distributes the test, and tells his students to begin. Immediately, the classroom erupts in conversation. Students become animated during the test, leaning over their desks to check their work against their partners’.

Personally, Mr. Burnham thinks the new curriculum ineffective and lacking in rigor. Towards the end of one class period during which students, as per the new curriculum, took a test in groups, rather the individually, Mr. Burnham remarks, “Understand, your test, to me, was a joke.” Later on in the semester, after visiting a district high school to observe how other teachers implemented the new curriculum, Mr. Burnham feels justified eliminating the group tests. “It’s not going to be a completely student-centered room anymore,” he says. “I never liked that idea, anyway. I will use my power to overstep [the curriculum].” For their part, the students have mixed feelings about the new curriculum. When I ask one group of students for their opinion,

they say that they enjoy the new curriculum insofar as it allows them to work with their friends, but they also point to its shortcomings. They complain that it allows weaker students get by in class by simply copying the work of the stronger students (a free rider problem), and that it puts the stronger students at risk of suffering from the mistakes of the weaker students. These complaints aside, however, Mr. Burnham’s students prove capable of working cooperatively prompted to do so. Regardless of their views of the new curriculum, they do not prevent it from working as designed. In Mr. Burnham’s classroom, therefore, both of the necessary and sufficient conditions for cooperation learning are present.

CONCLUSION

Overview

With remarkable cumulative force, half a century of educational and sociological research finds that student achievement depends more on family and neighborhood contexts than school quality. This research began in the 1960s with the work of Coleman et al. (1966), which found that most of the variance in student achievement, both across and within schools, results from differences in student backgrounds. In the 1970s, Jencks et al. (1972) reconfirmed this finding, drawing the startling conclusion that “equalizing the quality of high schools would reduce inequality in student outcomes by one percent or less. Rather, removing the socioeconomic obstacles facing children from disadvantaged homes and neighborhoods should take precedence.

From this perspective, then, the case of the Middleton and Orchardville school districts is a curious one. Relative to the populations of the state and closest city, the populations of the two districts are better-educated and work in higher occupational positions. As expected, students in both districts perform well on the mathematics section of the state-administered standardized test during elementary school. While Orchardville students’ math scores remain high during secondary school, however, Middleton students’ scores decline during this period, such that a notable gap develops between the test scores of middle and high school students who performed comparably in elementary school. It is difficult to explain this trend in terms of home and school effects. Even taking the slightly higher occupational status and educational attainment of the Orchardville population into account, the disparity in student achievement should, from the standpoint of the neighborhood or home effects literature, emerge earlier than 6th grade and

remain constant across grade levels. Instead, the disparity does not emerge until students reach middle school and increases until the students graduate.

Although an extensive literature shows that schools can have an independent effect on achievement (Rutter et al. 1979; Downey, von Hippel, and Hughes 2008), it too offers minimal insight into the causes of *diverging*, rather than consistently disparate, student outcomes. Schools can compensate for the negative home and neighborhood effects that disadvantaged elementary (Downey, von Hippel and Broh 2004) and middle school (Heyns 1976) students face over the summer, for instance. In Middleton, though, this compensative school effect seems to occur only for elementary school students. The hypothesis that home and school effects do not “kick in” for Middleton students until they reach middle school is doubtful. Two alternative explanations are more likely: either Middleton elementary schools successfully overcome neighborhood and home effects, while the district’s secondary schools do not; or Orchardville elementary schools underachieve, given the high levels of educational attainment and occupation of the families that they serve.

A wide body of educational and psychological literature finds that cooperative learning strengthens students’ understanding of school material at all ages and in all areas of study. A greater prevalence of cooperative learning in Orchardville secondary schools than Middleton secondary schools, therefore, could explain the divergence in middle and high school test scores between the two districts. Alternatively, a common lack of cooperative learning in elementary schools in both districts could explain the initial comparability in test scores.

My goal in this thesis was to determine which, if either, of these explanations is correct. The foundational work of Piaget, grounded in the sociological theory of Durkheim, shows that children interact cooperatively as their moral judgment develops. In chapter two, I reformulated

Piaget’s theory in the following conceptual terms: the value system, or collective conscience, of a classroom, as mediated through the teacher, determines the nature of the norms to which children conform in the role as students. Cooperative learning represents a rational-legal procedural norm; as such, it must be legitimized by rational-egalitarian values. In the absence of rational-egalitarian values, students will not interact cooperatively, even in the presence of the requisite curricular facility for cooperative learning.

The ethnographies presented in the third and fourth chapters of this thesis suggest that cooperative interactions occur frequently in Orchardville secondary schools and infrequently in Middleton elementary schools. I found that Mrs. Hollander’s 3rd grade students behave according to the norms of good student behavior defined by their teacher. These norms include following directions carefully and not distracting one another. Mrs. Hollander’s students conform to these norms because they understand their teacher as a figure of traditional authority; everything that their teacher says and does strikes them as sacred. In this hierarchical classroom, therefore, students always work individually, even when Mrs. Hollander divides them into small groups, as they feel obligated to follow their teacher’s instructions without distracting their peers. They see themselves as understanding their school work when the successfully reproduce examples given previously by Mrs. Hollander.

By contrast, I found that Mr. Burnham’s 7th grade students behave according to the social norms of young adolescents. Through informal and good-natured interactions with his students and colleagues, Mr. Burnham maintains a classroom atmosphere similar to that of the more informal social settings of students’ lives, such as the hallway or cafeteria. In this cooperative, students feel comfortable doodling, referring to Mr. Burnham as “Burns,” and, most importantly, interacting with one another. When Mr. Burnham assigns group work, therefore, his students

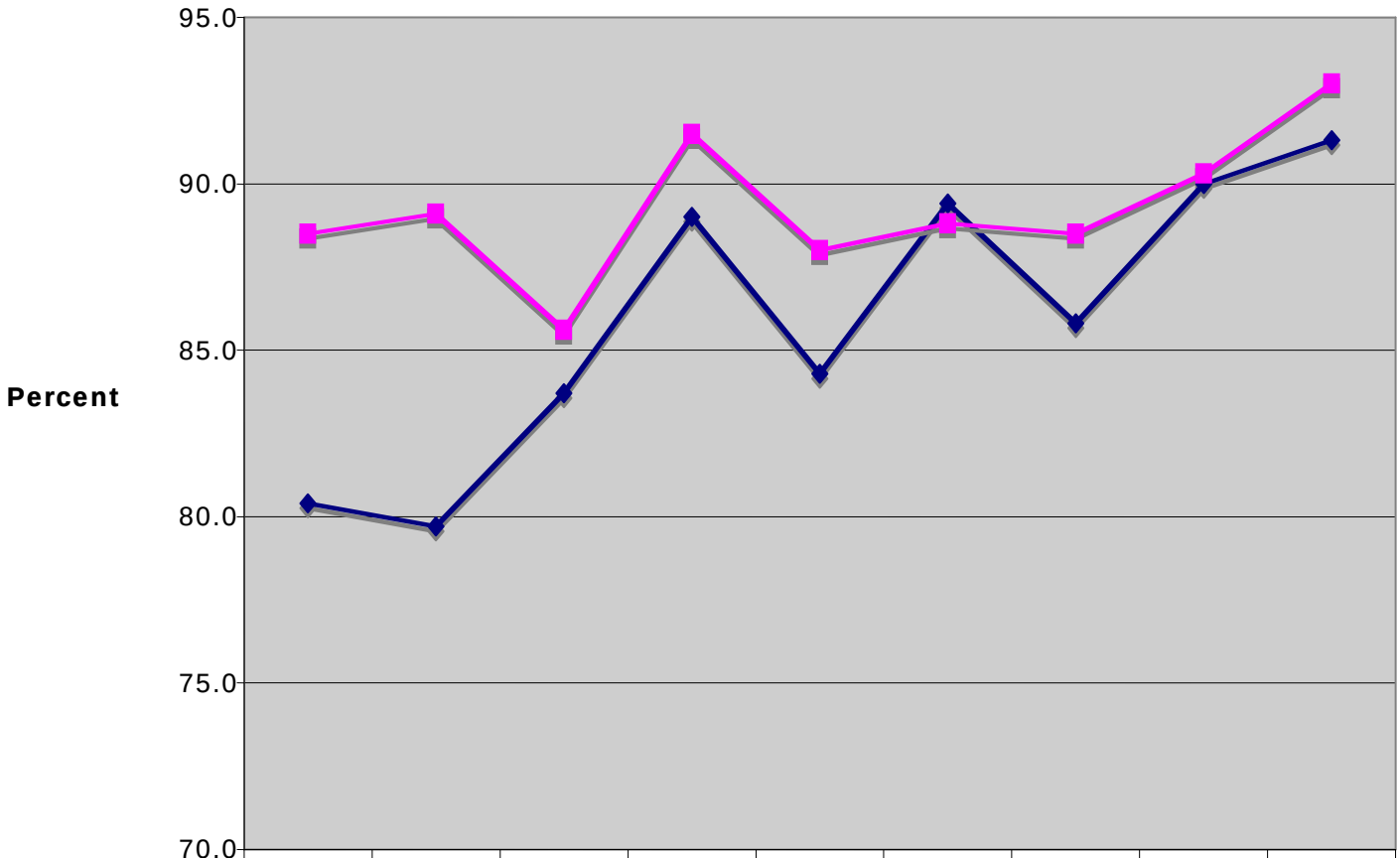
collaborate with enthusiasm. Moreover, when he teaches new material, his students require that he explain it in a way that resonates with their understanding of mathematics. Mr. Burnham readily considers his students’ propositions and ideas, even when incorrect, and often allows his students to vote on the correct solution to a problem. In other words, Mr. Burnham maintains his students respect, not as a figure of traditional authority, but as someone with the knowledge to create new and interesting ways of doing algebra and the ability to explain his innovations.

Implications for Policy and Future Research

Needless to say, no conclusive findings or recommendations should be drawn from a study based on observations of two classrooms. It is clearly unwarranted and inappropriate to attribute the divergence in test scores between Middleton and Orchardville to the distinct teaching styles of Mrs. Hollander and Mr. Burnham. Further research could undertake a more extensive study of the two districts to determine whether the characteristics of Mrs. Hollander’s and Mr. Burnham’s classrooms are representative of all classrooms in Middleton and Orchardville. Given the relative frequencies of cooperative interactions in the two observed classrooms, I predict that future research would reveal that most Orchardville elementary school classrooms are similar in structure to Mrs. Hollander’s classroom, while very few Middleton secondary school classrooms are similar in structure to Mr. Burnham’s classroom. These findings would go further toward identifying cooperative learning as the primary cause of both the initially equality of and subsequent disparity in Middleton and Orchardville test scores. In light of such results, I would recommend restructuring Middleton secondary schools and both Middleton and Orchardville elementary schools to facilitate frequent cooperative interactions among students.

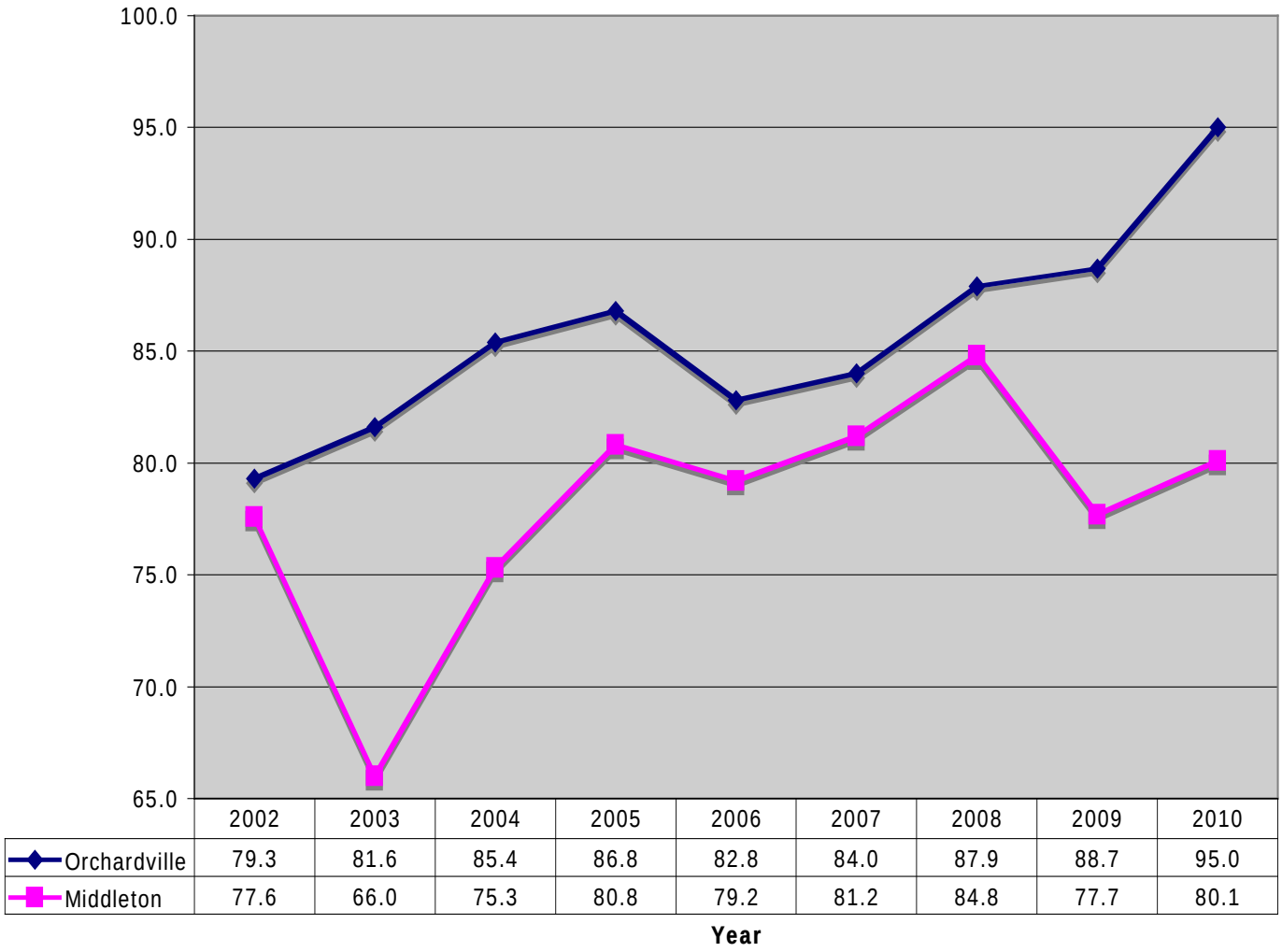
APPENDIX

Figure 1. Percent 5th Grade Above "Basic" in Math on State Test



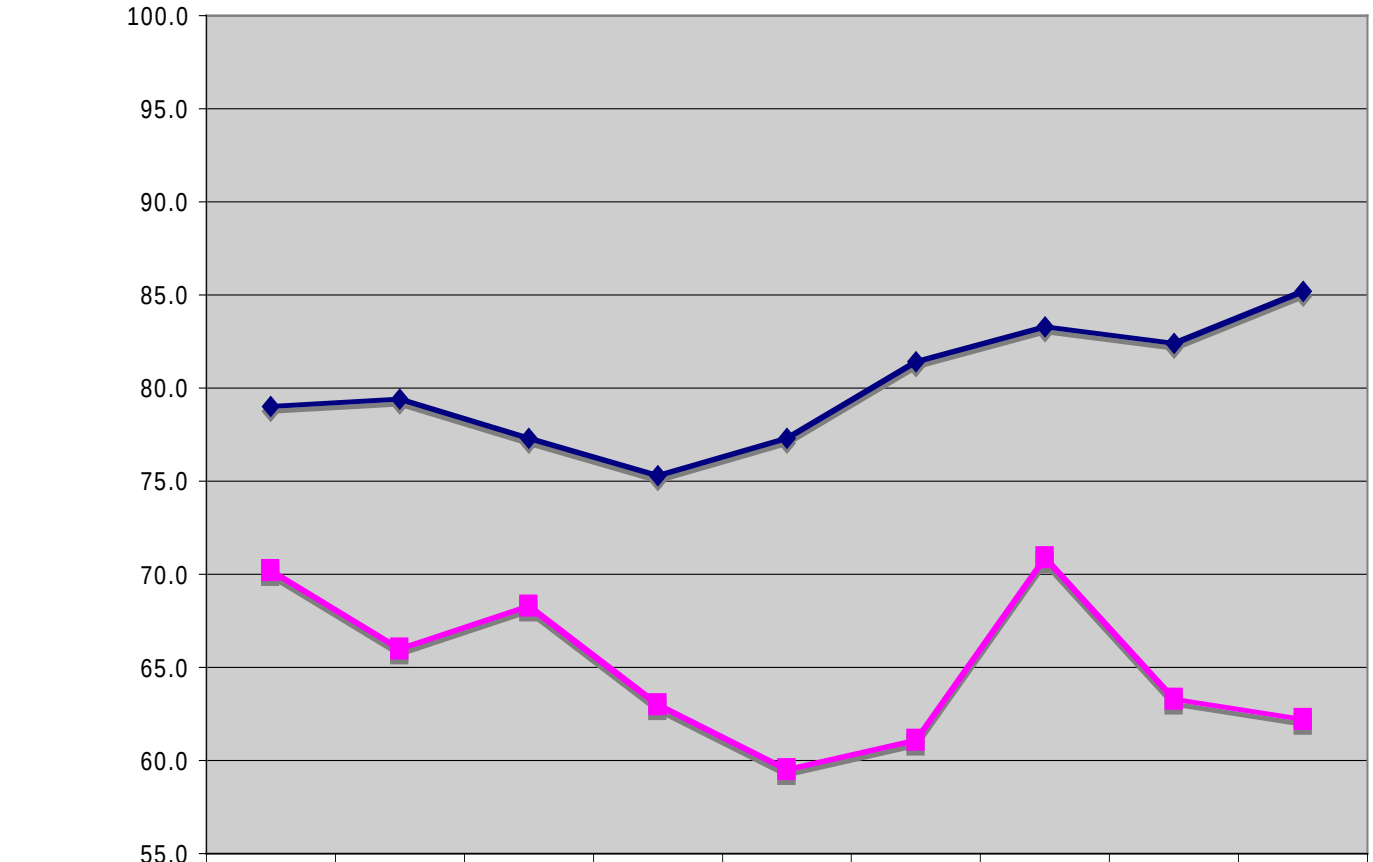
	2002	2003	2004	2005	2006	2007	2008	2009	2010
Orchardville	80.4	79.7	83.7	89.0	84.3	89.4	85.8	90.0	91.3
Middleton	88.5	89.1	85.6	91.5	88.0	88.8	88.5	90.3	93.0

Figure 2. Percent 8th Grade Above "Basic" in Math on State Test



	2002	2003	2004	2005	2006	2007	2008	2009	2010
Orchardville	79.3	81.6	85.4	86.8	82.8	84.0	87.9	88.7	95.0
Middleton	77.6	66.0	75.3	80.8	79.2	81.2	84.8	77.7	80.1

Figure 3. Percent 11th Grade Above "Basic" in Math on State Test



	2002	2003	2004	2005	2006	2007	2008	2009	2010
Orchardville	79.0	79.4	77.3	75.3	77.3	81.4	83.3	82.4	85.2
Middleton	70.2	66.0	68.3	63.0	59.5	61.1	70.9	63.3	62.2

Year

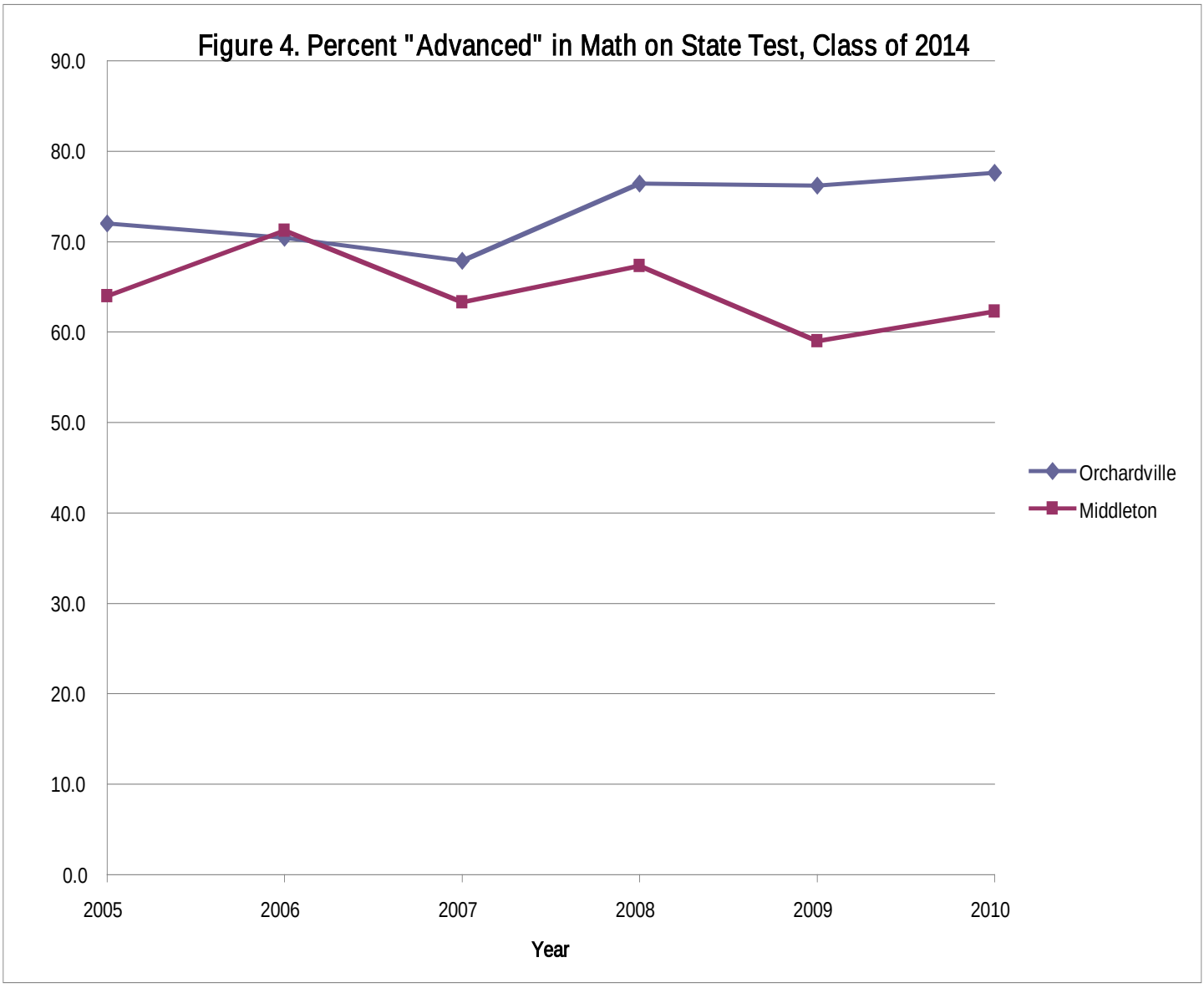
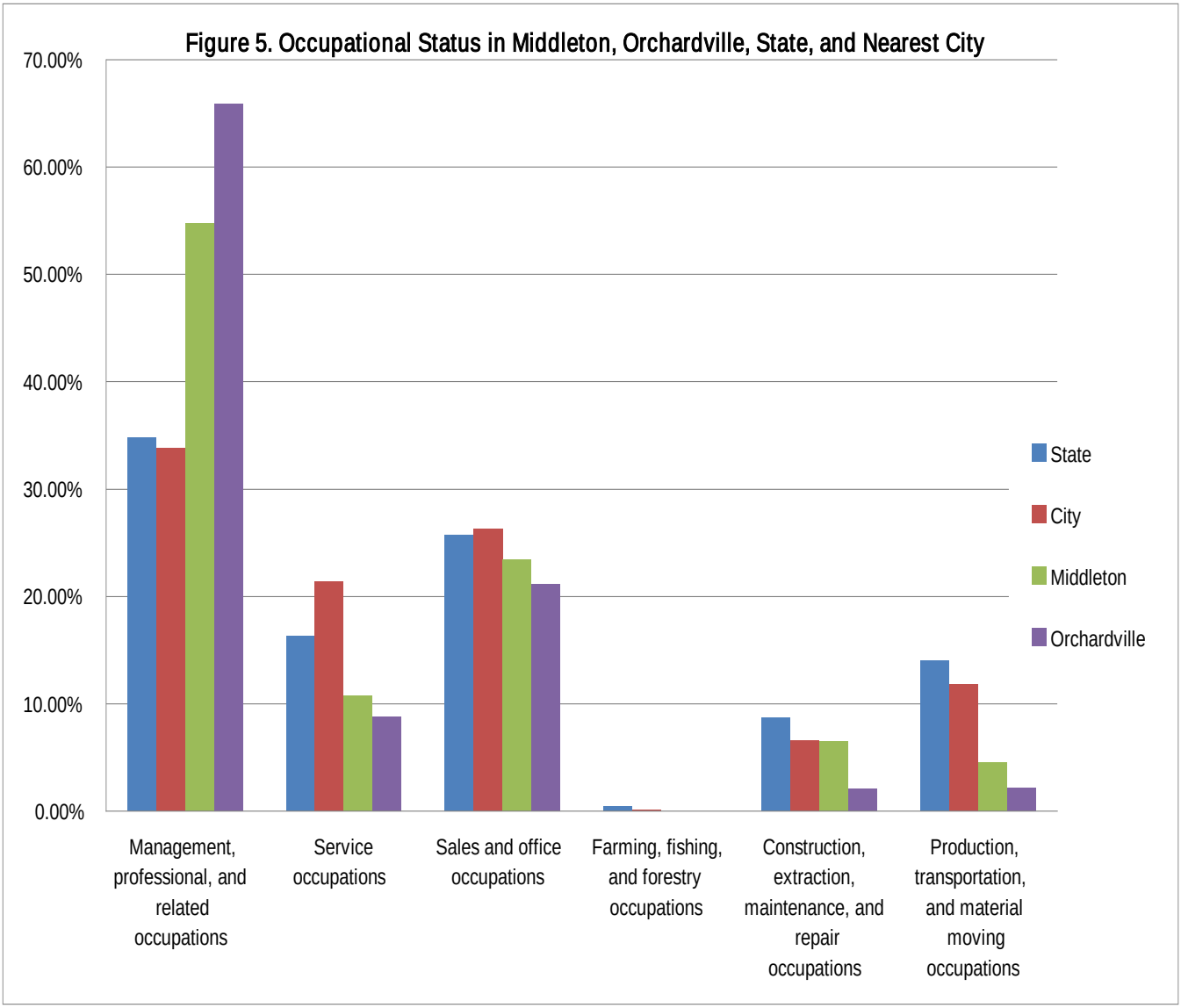


Figure 4. Percent "Advanced" in Math on State Test, Class of 2014
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
2005
2006
2007
2008
2009
2010
Year
Orchardville
Middleton



Note: Figures 5 – 8 come from data collected by the U.S. Census American Community Survey, 5-year estimates for 2005 – 2009 (see U.S. Bureau of the Census 2009).

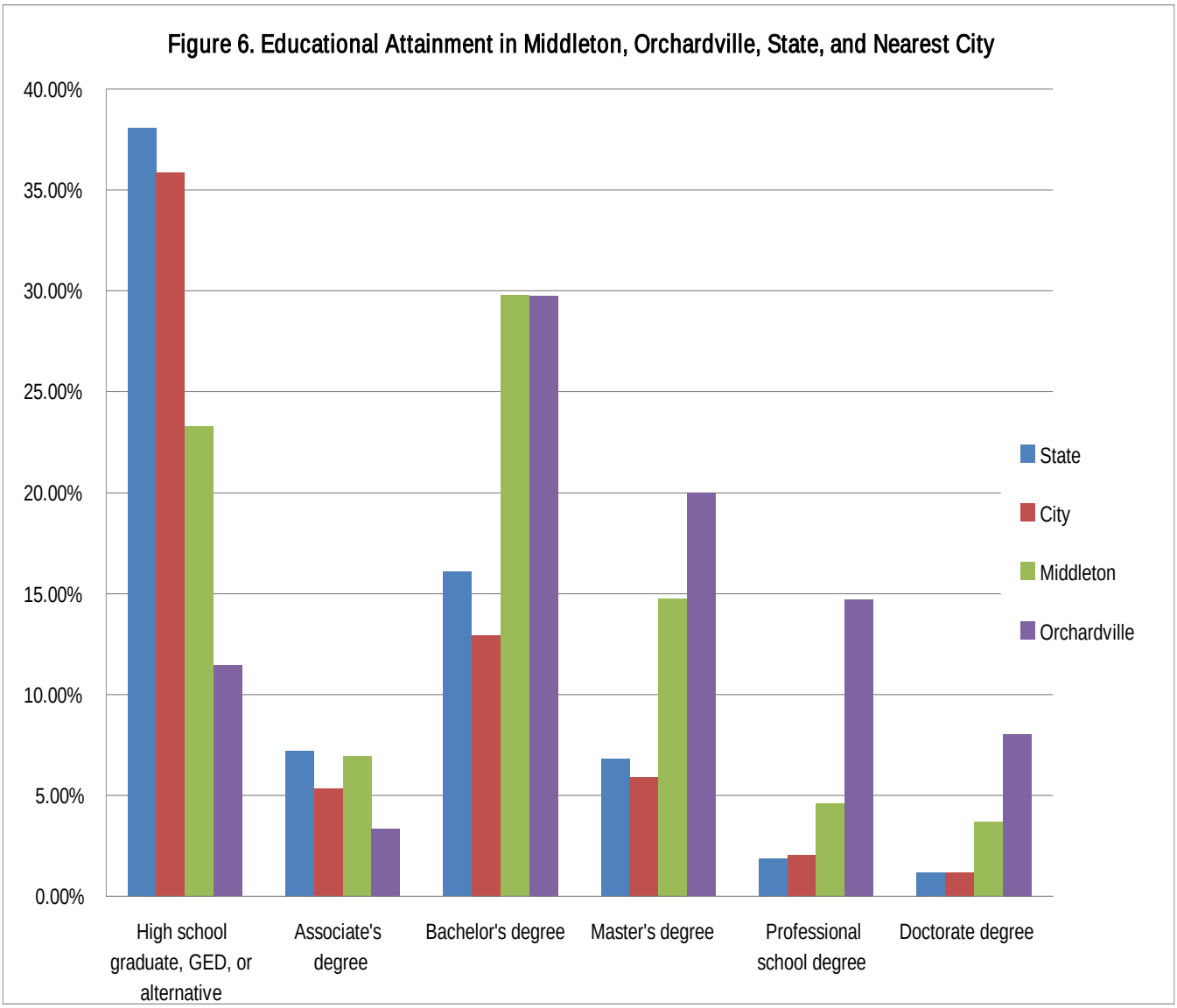


Figure 6. Educational Attainment in Middleton, Orchardville, State, and Nearest City
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
High school graduate, GED, or alternative
Associate's degree
Bachelor's degree
Master's degree
Professional school degree
Doctorate degree
State
City
Middleton
Orchardville

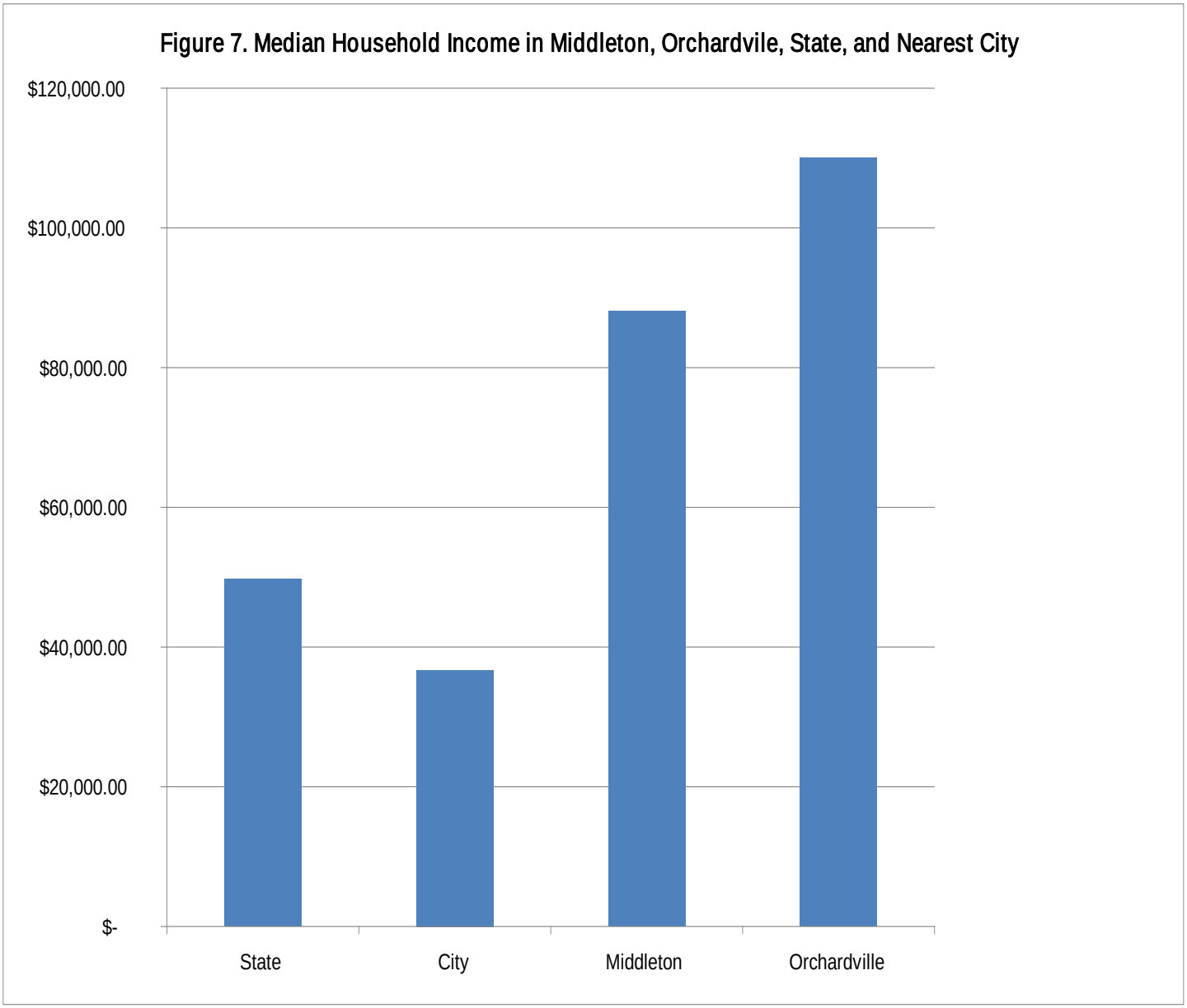


Figure 7. Median Household Income in Middleton, Orchardvile, State, and Nearest City
$120,000.00
$100,000.00
$80,000.00
$60,000.00
$40,000.00
$20,000.00
$-
State
City
Middleton
Orchardville

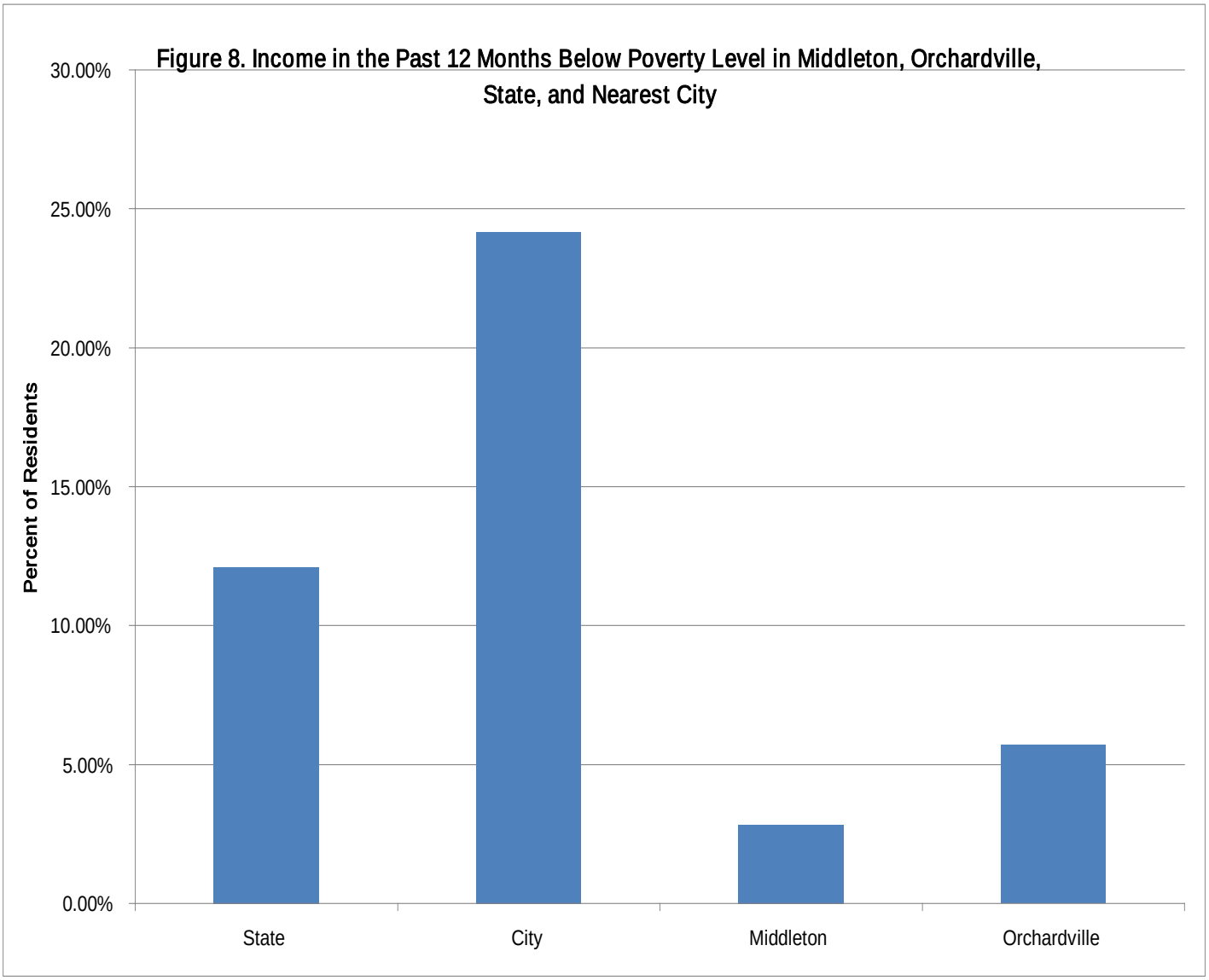


Figure 8. Income in the Past 12 Months Below Poverty Level in Middleton, Orchardville, State, and Nearest City
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
Percent of Residents
State
City
Middleton
Orchardville

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