Children’s Social Behavior in Relation to Participation in Mixed-Age or Same-Age Classrooms

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Abstract

Research on the social and cognitive effects of grouping children in mixed-age (where there is an age span of at least 2 years among children) versus same-age classrooms is gaining increasing interest among practitioners and researchers. The present investigation used a teacher rating scale, based on research into the correlates of children’s social skillfulness and acceptance by other children, to assess children’s social behavior in mixed- and same-age classrooms. Confounding variables such as the child’s age and sex, the teacher’s educational level, and classroom practices were statistically controlled. Further, a pretest of teacher ratings of kindergarten children who were later assigned to either a mixed- or same-age first-grade classroom showed no preexisting behavioral differences. Findings suggested a significant positive effect on children’s prosocial behavior as a result of participation in a mixed-age classroom context. In addition, fewer children appeared to experience social isolation in mixed-age classrooms than in same-age classrooms. Aggressive behaviors were significantly less likely to be noted by teachers in mixed-age than in same-age classrooms. Follow-up ratings were taken of third-grade children, all of whom were by then enrolled in same-age classrooms. Children who had previously participated in mixed-age classrooms continued to be rated as significantly less aggressive and significantly more prosocial by their third-grade teachers. No differences were found in friendship patterns between children previously enrolled in same-age versus mixed-age classrooms.

Keywords: Mixed Age Grouping, Social Behavior, Elementary School Children
Introduction

The United States has become increasingly concerned about the effectiveness of its primary and secondary educational system (Kagan, 1990). Societal trends that have impacted education include growing numbers of women entering the work force, decreasing nuclear and extended family size, and increased family mobility (Coleman, 1987). Such changes have contributed to a reduction from times past in children’s informal access to children of differing ages. In contrast to a historical pattern of children developing within an age-varied social system, many children today spend a majority of their time in an age-segregated milieu (Bronfenbrenner, 1970; Katz, Evangelou, & Hartman, 1990; McClellan, 1994). The results of this pattern of segregation are thought to contribute to a declining social support system and compromised development of children’s social skills.

Coleman (1987) suggests the need for a significant institutional and societal response to support functions traditionally filled by the family, such as the development of feelings of belonging and community, emotional and social bonding, and nurturance. Increasingly, the school has been viewed as one of the most effective and efficient contexts to address children’s academic, affective, and social needs before these needs reach crisis proportions (Bronfenbrenner, 1970; Coleman, 1987; Parker & Asher, 1987). A growing body of research explores the influence of educational contexts on children’s development. While interest has focused on the impact of the classroom environment on children’s attitude toward school, cognitive growth, and academic development, less direct attention has been given to the relationship between classroom context (including the structure and content of children’s peer relationships) and social development during the elementary years.

One approach explored by theoreticians and researchers for encouraging children’s social skill development is mixed-age education. In mixed-age education, children of at least a 2-year age span and diverse ability levels are grouped in a single classroom and are encouraged to share experiences involving intellectual, academic, and social skills (Goodlad & Anderson, 1987; Katz, Evangelou, & Hartman, 1990; McClellan, 1994). Consistency over time in relationships among teachers, children, and parents is viewed as one of the most significant strengths of the mixed-age approach because it encourages greater depth in children’s social, academic, and intellectual development. The concept of the classroom as a "family" is encouraged, leading to expansion of the roles of nurturing and commitment on the part of
both students and teacher (Feng, 1994; Hallion, 1994; Marshak, 1994).

The potential social implications of the mixed-age concept of education are strongly supported by Parker and Asher’s (1987) review of the literature demonstrating the importance of peers in children’s social development, and by Maccoby’s (1992) study of reciprocity theory, which demonstrates the positive effect on child behavior of sustained close relationships between children and caregivers. Furthermore, research that has followed children over a 15-year period (Schweinhart, Weikart, & Larner, 1986) suggests that high-quality early childhood programs that foster children’s social development in low-income communities contribute to a reduction in remedial education, depression, unemployment, illegitimate pregnancies, and criminal behavior as children grow into adulthood.

The adequate implementation of a mixed-age approach to education extends beyond simply mixing children of different ages together. A positive working model of a mixed-age classroom allows for the development of social skills as the teacher encourages cross-age interactions through tutoring and shared discovery. Social competence develops for older children out of their roles as teachers and nurturers, and for younger children out their opportunity to observe and model the behavior of their older classmates (Katz, Evangelou, & Hartman, 1990; Ridgway & Lawton, 1965).

We will look briefly at (1) the history of graded and mixed-age education; (2) the importance of children’s social development to their overall development, including cognitive development; (3) particular domains of social functioning, including friendship, social, and aggressive behavior, in relationship to participation in mixed-age or same-age groups; (4) the potential mixed-age grouping may hold for educational reform; and (5) some of the issues and questions surrounding the validity of past research on mixed-age grouping.

Review of the Literature

A History and Contemporary Definition of Mixed-Age Education

Mixed-age education has its roots in the one-room schoolhouse of the 19th century (Goodlad & Anderson, 1987; Katz, Evangelou, & Hartman, 1990; Theilheimer, 1993). Like today’s mixed-age classrooms, older children often tutored younger children. The classroom functioned much like a family in that close relationships developed, and children were both protected and nurtured. Classmates worked together with a blend of cooperation and competition, and students experienced a degree of flexibility in learning.
The establishment of graded education, where children of the same age were grouped homogeneously by classrooms, developed simultaneously with America’s industrial revolution during the middle to end of the 19th century (Konner, 1975). Horace Mann, secretary of the Massachusetts Board of Education, introduced the concept following a trip to Prussia where he saw such a system in operation (Hallion, 1994). Using the organizational structure of the factory as a model, children were grouped by age to make the delivery of information cost-and time-efficient. To heighten schools’ efficiency, children were tracked and labeled by finer and finer delineations of ability. The development of graded textbooks also contributed to the institution of graded education.

Although there was an early cry from a variety of disciplines around the turn of the century regarding the ineffectiveness of the stereotyped pattern of the graded school in dealing with the needs of the individual as a learner, return to the concept of mixed-age grouping of children for educational purposes did not receive much notice until the 1959 publication of Goodlad and Anderson’s (1987), The Nongraded Elementary School (Gaustad, 1992; Katz, Evangelou, & Hartman, 1990). The intent of this model was to move education beyond the lock-step standardized curriculum methods previously employed by shifting the goal of instructional planning from the needs of the group to the needs of the individual child.

Stimulated by the outcomes of nongraded instruction as reported by Goodlad and Anderson, and in response to the political and social climate of the time that emphasized individuality as opposed to conformity and homogeneity, the 1960s and 1970s witnessed an open education movement that embraced modern principles of nongraded education (Devaney, 1974; Goodlad & Anderson, 1987). Many classrooms were modeled after the design of the British Infant Schools. However, this first wave of experimentation with mixed-age education lacked the support and understanding of both school administration and parents. Furthermore, early efforts at implementation lacked a consistent mixed-age model and were, therefore, hampered by inadequate curriculum and staff development (Gaustad, 1992; Hallion, 1994).

The current classroom model for mixed-age education differs in definition from what was previously attempted. The mixed-age class is not a combination class where children of two grade levels are placed in one classroom but treated as two distinct subgroups (Surbeck, 1992). Rather, the contemporary model promotes integration of instruction across grade levels, with students having the opportunity to choose their own level of study.
Children are encouraged to participate in cross-age interactions, taking on roles of leadership and peer tutoring. The teacher’s role is to provide leadership, support, and scaffolding, rather than to adopt a laissez-faire approach, as was often the case in nongraded classrooms of the 1960s and 1970s (Greenberg, 1992; Theilheimer, 1993). The teacher is actively involved in helping each student follow an individual study plan, minimizing the possibility of a student receiving inappropriate instruction because of lack of attention.

Recognizing the need for consistent implementation of the mixed-age classroom for the purpose of studying the effects of the model, Nye et al. (1995) provide the following definition:

...the practice of grouping children of more than one age and ability level (usually three age levels) together with a goal of maximizing teaching practices involving interaction, experiential learning, and fluid, flexible small group participation among children so that they experience a continuous progression of learning (cognitive and social) in keeping with their individual rate of knowledge and skill acquisition within an environment which prohibits artificial and arbitrary points which benchmark failure such as retention during the primary years. (p. 3)

**The Importance of Social Development**

Significant results in both the academic and affective domains favoring mixed-age classes have been demonstrated by a number of researchers (Anderson & Pavan, 1993; Marshak, 1994; McClellan, 1991; Miller, 1991; Nye et al., 1995; Pratt, 1986). Particularly noteworthy is Anderson and Pavan’s review of 37 studies, which demonstrates improvement in test scores on standardized tests and improved attitudes toward school for students in mixed-age classes and especially for "blacks, boys, underachievers and students of low socioeconomic status" (p. 50). Of approximately 18 studies that looked specifically at low-income populations and mixed-age grouping, mixed-age emerges as a structure that, overall, promotes higher achievement scores, stronger social development, better self-concepts, and more positive attitudes toward school (Anderson & Pavan, 1993). Results are more pronounced the longer students are involved in mixed-age programs.
Theoreticians and researchers suggest that there is evidence that the growing child’s social interaction is important in the development of his or her cognitive abilities (Rogoff, 1990; Tizard, 1986; Vygotsky, 1978). In an extensive review of current research on brain development, Caine and Caine (1991) conclude that "emotions and cognition cannot be separated" (p. 66). Indeed, social cognition may lay the foundation for cognition in general within both the development of the individual person and the genetic heritage of the species (Chance & Mead, 1953; Humphrey, 1976; Jolly, 1966; Tizard, 1986). If this is the case, we might look at mixed-age groups as providing the child with a rich and complex social environment that contributes to both greater social facility and greater cognitive competence.

Social behaviors of prominent interest to researchers because of their impact on developmental outcomes (Parker & Asher, 1987) include friendship patterns, prosocial behavior, and aggressive behavior. In the following section, we will discuss the role that each of these behavioral subsets plays in children’s development. We will also discuss research exploring the relationship of mixed- and same-age grouping to friendship, prosocial, and aggressive behaviors.

### Friendship, Prosocial, and Aggressive Behaviors

Research by Bloom (Goodlad & Anderson, 1987) suggests that the quality of young children’s social competence accurately predicts academic as well as social competence in later grades. Social rejection in childhood decreases children’s opportunities to achieve social competence (Parker & Asher, 1987) and is increasingly considered a serious problem that adults often fail to acknowledge or correct (Olweus, 1989). A study by Asher, Hymel & Renshaw (1984) revealed that unpopular children are significantly more likely to report episodes of loneliness than popular children. Additional research suggests that children experience greater social isolation (Adams, 1953; Zerby, 1961) in same-age than in mixed-age classrooms. Classes that are highly unidimensional, a construct frequently associated with same-age grouping, are reported to have more social "stars" (Rosenholtz & Simpson, 1984) but also more rejected and/or neglected children.

How well a child is liked by other children, or the child’s "sociometric status," has been identified as one of the most accurate ways of selecting children who might be at risk for a variety of serious problems later in their lives (Parker & Asher, 1987). Neglected or withdrawn children have been shown to display significantly greater increases in prosocial behavior when paired with younger peers than when paired with same-age peers (Furman, Rahe, & Hartup, 1979). With the added practice and confidence these children gain, their social skillfulness may increase and lead to greater
acceptance by children of all ages.

Prosocial behaviors include helping, sharing, cooperating, and caring for or taking responsibility for another (Radke-Yarrow, Zahn-Waxler, & Chapman, 1983). The capacity for prosocial behavior has been shown to increase with age in cultures where children are given opportunities and expected to help in the care of younger children (Whiting & Whiting, 1975). The provision of opportunity for prosocial action makes mixed-age groups highly pertinent. While it is not suggested that same-age mates do not behave prosocially toward one another, there is some evidence that younger children are more likely to elicit prosocial behavior from children than are same-age mates. The physical appearance or "babyness" of young children may make them more likely to evoke caregiving behaviors from children older than themselves. Furthermore, children are more likely to direct their assistance seeking or dependent behavior toward older rather than same-age or younger children (Whiting & Whiting, 1975). These two conditions may make it likely that prosocial behavior will emerge more frequently in mixed-age classrooms than in same-age classrooms. Finally, because of the classroom structure, teachers in mixed-age classes are more likely to ask children to help one another than teachers in same-age classrooms.

Children who are aggressive and disruptive are often disliked and avoided by other children (Dodge, 1983; Hartup & Moore, 1990). Over time, aggressive children tend to associate more frequently with other aggressive children, thus reinforcing and solidifying an aggressive behavioral pattern (Ladd, 1983). Because aggressiveness and social rejection in childhood are the most consistent predictors of later life difficulties (Parker & Asher, 1987), conditions that vary in the extent to which they foster or reduce aggressive and disruptive behavior bear careful examination. Indicators that same-age classrooms may be related to higher levels of physical and verbal aggression than mixed-age classrooms may be of particular importance.

Bronfenbrenner (1970) argues that the concentration of same-age peers is a major factor in the extremely high incidence of aggressive, antisocial, and destructive acts in United States society. On the other hand, individuals who are familiar with one another are more likely to avoid aggression and respond positively to one another than are individuals unfamiliar with one another (Marler, 1976; Sherman, 1980). Because children in mixed-age classrooms live together in the same classroom for 2 or more years, it is likely that mixed-age groups may promote prosocial behavior in children, and concomitantly reduce aggression. Thus, the mixed-age classroom may help children who are or who are aggressive and/or disruptive before formal intervention becomes necessary.
Furthermore, it may be that the mixed-age setting is more likely than a same-age setting to avoid the polarization of teacher and students by facilitating an atmosphere of shared responsibility for classroom order. Research supporting this hypothesis is provided by Lougee and Graziano (1985) who observed that children given the opportunity to provide leadership for younger children in rule enforcement not only assisted the teacher in reminding younger students of classroom procedures but also tended to improve in their own behavior.

**Mixed-Age Education as a Vehicle for Educational Reform**

According to William Miller (1995) of the Washtenaw Intermediate School District of Ann Arbor, Michigan, "Educators have merely accepted the age-graded organizational structure as a way of doing things within the system of public education. As our society has changed, so must our schools" (p. 3). In the face of the lack of success in widespread implementation of alternative educational contexts, the "factory" model of education remains the predominant educational model in America’s schools (Cuban, 1989). However, there is increasing evidence that this model is inconsistent with a wealth of recent research on the developing human brain (Caine & Caine, 1991; Huttenlocher, 1990; Kandel & Hawkins, 1992; Squire, 1992) and the kinds of educational strategies that bring about optimal learning and development. Ample research (see Ames, 1992; Johnson, Johnson, Johnson-Holubee, & Roy, 1984; Johnson, 1991; McClellan, 1994) demonstrates that children think more, learn more, remember more, take greater pleasure in learning, spend more time on task, and are more productive in classes that emphasize learning in well-implemented cooperative groups rather than in individualistic or competitive structures. Recent empirical findings demonstrate academic gains for students participating in mixed-age classrooms (Nye et al., 1995). This research supports the supposition that children’s opportunities to interact with more advanced and less advanced peers strengthen their cognitive skills, including, it is likely, social cognition. Additional support for the benefits of the mixed-age classroom is generated by research demonstrating that behaviors elicited in younger children when relating to children older than themselves include more mature and cognitively complex play (Goldman, 1981; Mounts & Roopnarine, 1987; Howes & Farver, 1987). These younger children also exhibit less reliance on adults and greater reliance on their peers for help in caretaking and problem-solving situations (Goldman, 1981; Ridgway & Lawton, 1965; Reuter & Yunik, 1973).

In conclusion, it appears from previous research that mixed-age grouping may be one aspect of a classroom environment that enhances the development of social and cognitive abilities (Piaget, 1977; Tizard, 1986;
Refining Our Knowledge of the Effects of Mixed-Age Grouping

Predominant social/emotional effects of educational contexts (including mixed- or same-age grouping) that have been considered by researchers are children’s attitude toward school and self-concept development. While no adverse social effects have been demonstrated in previous research, conflicting or inconclusive results on the influence of mixed-age structure on classroom behavior (Sundell, 1994; Veenman, 1995) suggest the need for more refined and definitive investigations, particularly delineating what constitutes the "mixed-age classroom." Veenman (1995), for example, notes that of the 11 studies meeting his criteria for inclusion in a meta-analysis directed at the cognitive effects of mixed-age versus same-age grouping, only two studies presented evidence of initial comparability of the experimental and control groups. Further research is needed to more specifically determine both the nature and impact of the mixed-age classroom.

In the following sections, we explore the potential of mixed-age versus same-age grouping for predicting children’s prosocial, friendship-making, and aggressive behaviors. Our intent is to establish greater control over the many variables that may confound attempts to investigate the apparent differences between classrooms that have a mixture of ages and classrooms that are grouped according to an age span no greater than 1 year. Our investigation should not, therefore, be considered an exploration of multiage or mixed-age grouping as a broad philosophy that includes such approaches as cooperative groups, interest centers, and opportunities for child-directed projects. Rather, our exploration of mixed-age grouping is along the more narrow lines of what precise contribution the mixing of ages itself makes to children’s social development. We have taken several steps to tease out differences in the power of mixed-age versus same-age classrooms in predicting children’s aggressive, prosocial, and friendship behaviors.

First, we performed a pretest on kindergarten children who were all enrolled in same-age groups to detect potential initial differences that might account for later differences in social behavior at first through fifth grade. Second, we took steps to insure that the schools participating in the study were similar in their philosophic and procedural approach to children’s education, regardless of whether children were enrolled in mixed-age or same-age classrooms. Third, using multiple regression data analysis, we controlled statistically for the many child, teacher, and classroom variables that might confound the validity of mixed-age versus same-age classroom in predicting children’s social behavior. In so doing, we hoped to identity if, and to what
extent, mixed-age grouping, versus child, teacher, and classroom characteristics, makes a unique contribution to the creation of a classroom milieu that supports children’s social development.

Methods

Data were collected regarding children’s prosocial, aggressive, and friendship behaviors, as predicted by a variety of classroom variables, using a teacher rating scale that included 27 items rated on a continuum of 1 to 4 (1 = never and 4 = usually). The most central concern of this investigation was children’s prosocial, friendship, and aggressive behaviors as related to their participation in a same- or mixed-age classroom. Because the scale for all items runs in the same direction, results must be interpreted carefully. For example, item number 4, "Has friends in class," runs from Never (1) to Very Often (4). However, item 6, "Physically aggressive with other children," also runs in the same direction, from Never (1) to Very Often (4). Therefore, the direction of the effect size is critical to interpreting the results of the findings.

Subjects

First- through fifth-grade children were recruited from two suburban, middle-class elementary schools (Schools A and B) in the greater Chicago area, and from two schools (Schools C and D) serving the Milwaukee inner-city population. School A functions primarily as a mixed-age classroom model (grades 1–3 and grades 4 and 5) with self-contained kindergartens and a limited number of single-grade classes offered at each grade level. School B offers primarily single-grade classes (grades K–8), with three mixed-age classes offered for children in the first- and second-grade age range. School C is comprised primarily of mixed-age classes (with the exception of kindergarten). School D offers primarily same-age classes (grades K–5). Schools A and B are very similar in the demographic make-up of their population, which includes middle- to upper-middle-class households. Nonminority students in Schools C and D combined make up approximately 12% of the student population. Minority children comprised approximately 14% of the children in Schools A and B. Fifty-one percent of the children in the study were male, and 49% were female; 65% of the children were middle-class, and 35% were from low-income families as defined by their participation in the federal lunch program.

A total of 566 subjects remained when incomplete information on students was eliminated from 29 classrooms included in the study. The mixed-age condition included a total of 275 children. Same-age classes included 391 children. Not included in these numbers is a pretest we conducted with 159
kindergarten students (all enrolled in same-age classes) whose teachers rated them on their social behavior. In addition, 203 third-grade students (all of whom were then enrolled in same-age classes) were rated by their teachers in a posttest approximately 1 year after their participation for at least 1 year in a mixed-age or same-age classroom.

**Instrument**

*Teacher Rating Scale.* Ladd and Profilet (1996) note that investigators tend to gather information about children’s social behavior in several different ways, including measurement of children’s sociometric status, observations, and teacher rating scales. Different approaches provide both methodological advantages and disadvantages in obtaining accurate information about children’s social behavior. Teacher ratings, particularly of younger children, have been found to be reliable indicators of children’s social skill development (Hartup, 1983). The teacher rating form used in the current research is an outgrowth of a teacher rating tool originally developed by Asher and Renshaw (S. R. Asher, personal communication, 1988) and refinements that grew out of research regarding children’s social skill development and acceptance by peers (Coie & Dodge, 1983). The rating scale used in the current study broadened the areas of social skills previously rated. For example, a question that had not been addressed by either Asher and Renshaw or McClellan (1991) was the willingness of children to include less popular children in their play or friendship groups.

While there are disadvantages to the use of teacher ratings as a means of gaining information about children’s social behavior, not the least of which is the lack of uniformity in judgment from one class to the next, there are also some advantages to this form of assessment (McClellan, 1991). For example, teacher ratings may be a particularly valuable approach to the assessment of children’s aggressive behavior, because aggression occurs rarely in classrooms and is therefore difficult to substantiate using observational techniques (Hartup, 1983; Winsler, 1993). In addition, Coie and Dodge (1988) point out that teacher ratings may be more closely related to accurate assessment of qualitative aspects of children’s behavior (how empathetic or helpful a child may generally be with other children, for example) than are peer or observer assessments.

Finally, while studies using experimental models offer ideal control of the conditions affecting the dependent variable of interest, ecological validity is often low. That is, it is conceivable that results may be statistically significant under experimental conditions but lacking in predictive value when examined in actual social or other environments where the impact and interplay of a multitude of variables are usually much more complex.
Teacher rating scales were completed by 29 teachers, who rated 566 students enrolled in their mixed-age or same-age classroom. Consistent with the importance of creating instruments that do not lead teachers or other evaluators to pick up on a researcher’s expectations and respond to questions in a patterned manner (Ladd & Profilet, 1996), not all of the items included in the teacher rating instrument were central to the issues explored in the current investigation. In addition, items of interest were distributed throughout the rating scale rather than grouped with areas of similar interest.

Of interest were children’s friendship behavior, prosocial behavior, and aggressive behavior. Subscales were developed around the variables of interest from the 27-item teacher rating scale: (1) a prosocial subscale (standardized reliability alpha = .88) included seven questions about the teacher’s observations of each child’s willingness to include children who are often excluded in play groups, nurturing behavior toward other children, and cooperative behavior; (2) a friendship behavior scale (standardized alpha = .92) included four questions about the teacher’s observations of each child’s inclusion in play and work groups and how well the child is liked and accepted by other children; (3) a verbal and physical aggression behavior scale (standardized alpha = .86) included three questions about the teacher’s observation of each child’s verbal and physical aggression toward other children, as well as the degree to which they are perceived by their teachers as disruptive to the play and work of other children.

Reliability. While the reliability of our teacher rating scale has not undergone the same rigorous testing as was done by Ladd and Profilet (1996), a number of steps to insure the reliability and validity of the teacher rating scale and similar to those suggested by Ladd and Profilet were conducted. Inter-rater reliability was measured in previous research (McClellan, 1991) and found to be generally in the .85 to .92 range.

The reliability of the subscales has been remarkably consistent over time, falling generally within one or two points of the following: (1) the prosocial subscale’s internal standardized reliability alpha equaled .88; (2) the friendship behavior scale’s standardized alpha equaled .92; and (3) the verbal and physical aggression standardized alpha equaled .86.

Consistent with past research (Maccoby, 1992), the child’s sex was found to be significantly predictive of social behavior, with females rated as significantly more prosocial and boy’s judged as more aggressive in their social behavior. These results support research by Tanner and Decotis (1995), who found gender differences between boys and girls in attitudes
toward school, with girls demonstrating more positive attitudes toward school and school subjects than boys. Although noting that there is some controversy about the predictive value of gender differences, Ladd and Profilet (1996) suggest that the consistency of their findings of differences between male and female social behavior argues for the validity of the teacher rating form they used to measure children’s social behavior. Consistent with Ladd and Profilet, our research reveals the same strong gender differences (see Table 1) in prosocial and aggressive behavior and, thus, increases our confidence in the validity and reliability of our teacher rating scale.

In addition, because assignment to mixed- or same-age class configuration is most often offered as a choice to parents, a pilot study (Kinsey, 1996) was conducted to investigate possible biases in parent choice. On the basis of questionnaire data, volunteers were selected to participate in a 30-minute semi-structured interview session. Forty-six questionnaires were completed and eight 30-minute interviews were conducted. A two-tailed \( t \)-test was used to analyze questionnaire data. Results from both survey and interview data indicated that there were no significant differences between families who chose mixed-age or same-age classroom placement.

Finally, findings in a pilot study by a trained observer (Kinsey, 1998) were consistent with the teacher ratings of children within their classrooms. That is, levels of aggressive, prosocial, and friendships behaviors as rated by teachers were consistent with observations by a trained observer on the incidents of aggressive, prosocial, and friendship behaviors in selected classrooms.

**Procedures**

*Sample Selection.* Several common parameters were evident in mixed- and same-age classrooms in all four schools: (1) all classes used a whole language/integrated curricular approach to teaching reading, writing, language arts, science, and social studies; (2) all classes used a hands-on approach to teaching mathematics; (3) with the exception of kindergarten and special needs classes, all classes within each school had approximately the same amount of time allotted for instruction by specialists in the areas of art, physical education, computers, music, and library science; (4) within each school, all classes in grades 1–5 had the same structure in length and time of the school day, lunch, and recess; (5) mixed- and same-age classes in Schools A and B are balanced with respect to sex, socioeconomic status, student achievement, and special needs students, while mixed-age classes in School C, and same-age classes in school D, draw students from the same geographic area and are similar in ethnic and socioeconomic composition.
(School C has a 75% minority population, primarily African-American; School D has a 99% African-American population.)

Data Collection. Rating scales were distributed to classroom teachers in the spring of the school year. Teachers were asked to respond to each item from a "gut feeling" rather than to observe each child carefully before responding. The intent of these instructions was to provide consistency in each teacher’s manner of responding and to capture teachers’ uncensored and perhaps more global responses to each student.

Teacher assessments of student behavior were collected anonymously for all students within classrooms. In addition, each teacher completed a teacher information survey that provided information about teacher and classroom characteristics. These teacher surveys were also coded, guaranteeing teachers that their responses would remain anonymous and private. Care was also taken to address issues of concern regarding survey information (Edelbrock, 1983): (1) survey completion was requested during the spring of the school term, allowing ample opportunity for teachers to be familiar with their students; (2) no first-year teachers were included in the study; (3) teachers were provided anonymity in their responses; and (4) all teacher respondents were given similar instructions and time frames within which to complete the surveys.

Data Analysis and Control Variables. Multiple regression analysis was used to acknowledge both the complexity of "real world" classrooms and the difficulty of controlling for or pulling out potentially dozens of confounding variables in preexisting classrooms. These variables include the child’s sex, race, and age; teacher age and years of experience; and classroom parameters such as the number of activities and materials offered on a weekly basis and the frequency of children’s opportunity to work individually or in small groups. The variables we controlled for in our statistical analysis were those that research has shown to be related to children’s social behavior, or variables that anecdotal evidence suggests might bear a significant relationship to children’s social behavior. These variables are listed in Table 1.

Results

In an extensive review of the research, Veenman (1995) notes that most prior studies lack rigor in identifying preexisting similarities or differences in curricular and organizational structures of classrooms. For example, many prior studies do not attempt to account for how much the differences in mixed-age versus same-age classrooms are related to a mixture of ages and how much might be related to other factors often accompanying mixed-age
classrooms such as an emphasis on group work or teacher characteristics. Care was therefore taken in the current investigation to identify schools that were similar in their general orientation. As discussed previously, many additional precautions were taken to clarify the degree to which mixed-age groups contribute uniquely to positive social outcomes among children. These precautions include multiple regression analysis of data to control for other classroom influences such as the teacher’s age or the amount of time children spend working in groups.

Control variables selected were based on variables that have been found to be related to classroom (Oden & Ramsey, 1993), teacher (Nye et al., 1995), individual (Maccoby, 1992), and family characteristics that may be related to children’s social behavior. Supporting the reliability of the current study, those predictive variables found in past research to be associated with child behaviors were, for the most part, consistent with current findings.

The strength of the differences in predictive power between boys and girls suggests that this is an area where it is particularly important to note potential interactive effects between the participation of girls and boys in mixed-age versus same-age groupings. No interaction effects were found, indicating that the mixed-age classroom is equally beneficial to boys and girls in terms of reduced aggression and increased prosocial and friendship/peer acceptance behaviors. No interaction effects were found between grouping condition and socioeconomic status, ethnicity, or class size.

The following results, using two-tailed criteria of significance, argue strongly for a real and substantial difference between the degree to which the mixed-age classroom versus the same-age classroom is associated with positive social behavior among children. In interpreting Table 1, it is important to note that mixed-age was coded 1, and same-age was coded 2. In addition, the dependent variables (child behaviors) rated by the teachers were coded from "Never = 1" to "Very Often = 4" using a Likert scale. Because the scale for all items runs in the same direction, results must be interpreted carefully. For example, item 4, "Has friends in class," runs from Never (1) to Very Often (4). However, item 6, "Physically aggressive with other children," also runs in the same direction, from Never (1) to Very Often (4). Therefore, the direction of the effect size for child behavior scales is critical when interpreting the results of the findings. Predictive variables were coded as noted in the Appendix and are also important when interpreting the relationship between predictive and dependent variables.

**Kindergarten and First- through Fifth-Grade Results**
To test for the possibility that preexisting differences in children’s prosocial, aggressive, or friendship behaviors were already present when they entered school, 159 children were rated by kindergarten teachers. All 159 of these children participated exclusively in same-age kindergartens. At first grade, approximately half of the rated kindergartners went into mixed-age classrooms, and half into same-age classrooms. No preexisting differences were found at the kindergarten level in teacher ratings of children who subsequently participated in same-age or mixed-age classrooms.

Based on statistical differences between social behaviors in mixed-age versus same-age classrooms during grades 1 through 5, a strong argument can be made that mixed-age grouping predicts more positive prosocial and friendship behaviors and less aggressive behavior (see Table 1). Teachers rated children’s behavior in mixed-age classes as significantly more prosocial ($p < .000$) and significantly less aggressive ($p < .000$). Children in mixed-age classrooms were also rated higher in friendship behavior ($p < .01$). The significance of classroom grouping approach (mixed-age versus same-age) is particularly notable when viewed as a variable that educators can influence, as opposed to a predetermined condition such as the child’s gender or socioeconomic status. As Figure 1 indicates, the means for same-age versus mixed-age grouping reveal consistent differences in the social behavior of children participating in same-age versus mixed-age classrooms.

Of the 13 variables noted in Table 1, the three predictive variables that are highly significant across all three dependent variables (friendship behavior, prosocial behavior, and aggressive behavior) are the child’s gender, the class size, and the grouping condition (mixed-age or same-age). The effect sizes for these variables parallel the results of other social science investigations, where multiple, often very subtle, variables exist (see $b$ and $R^2$ in Table 1). The effect sizes of each of the three predominant predictive variables in this study exceed the effect sizes in most of the other individual variables by a solid margin. In prosocial and aggressive behaviors, effect size related to the social behavior of children in mixed-age classrooms (as demonstrated by the change in $R^2$) comes close to equaling the five other classroom variables combined.

**Third-Grade Results**

In third grade, all classes at School B become same-age classes. This school was therefore used to follow up on 203 third-graders. As the third-grade data indicate, social differences related to children’s previous participation in same-age versus mixed-age classes continued even after all children involved in the investigation had moved into same-age classrooms. As noted in Figure 2, children who had formally participated in same-age classes were
rated as significantly more aggressive when compared to children who had participated in mixed-age first- and second-grade classes ($p < .05$). Children who had participated in mixed-age classrooms also continued to be rated as significantly more prosocial by their third-grade teachers ($p = 02$). No significant carryover in differences in friendship behaviors was found at the third-grade level.

**Discussion**

Oden & Ramsey (1993) note that the usefulness of research into children’s social competence is often compromised because researchers, in an attempt to design carefully controlled studies that eliminate confounding variables through contrived random assignment situations, lose ecological validity. Such research may prove significant and provide a sizable effect size but provide little information about the variable of interest when it is related to dozens of other variables that are at play in a typical classroom, community, and family. We cannot control for or change the numerous genetic and environmental social characteristics that a child brings to the classroom. But we can begin to identify those variables in the classroom—through investigations in real classrooms as well as experimental and observational studies—that have unique as well as cumulative effects on children’s social behavior and development.

We have learned a great deal in the last dozen years about individual differences in children’s social acceptance by peers, but we know far less about the classroom contexts that affect children’s social behavior and acceptance. A large portion of the research that concerns itself with children’s social development has focused on the role of the individual child’s behavior as a major factor in his or her status as accepted, rejected, or neglected by peers (Oden & Ramsey, 1993). Less attention has been paid to the possibility that the kinds of environments that are created for children may affect their social behavior with their peers and may influence levels of rejection or neglect by peers. It may be that environmental factors such as the inclusion of a relatively large number of children of the same age in one group, vying with one another for a place in the classroom community, exacerbates the very social deficits in children that we then attempt to measure and/or ameliorate through individual interventions with children deemed inadequate in social skills.

The presence (Kagan, Reznick, & Gibbons, 1989) and tenacity (Coie & Kupersmidt, 1983) of individual differences in social skills and acceptance, and subsequent effectiveness of social skills training, have been documented and are not disputed. Rather, the issue of interest in this study is what kinds of social environments encourage, in our classroom communities, the
growth and, where necessary, remediation of children’s social skills. Specifically, the question of interest in this study has been whether the way children are grouped (homogeneously or heterogeneously) potentially contributes to children’s social behavior for better or worse.

Although there are clearly limitations to this study, we believe the data and questions raised warrant further study. Specifically, the data suggest that participation in a mixed-age classroom does predict that children’s behavior will be more prosocial, more grounded in friendship and acceptance by peers, and less fraught with aggression than does participation in a same-age classroom.

Although parent and child pretests at kindergarten indicated no significant differences in social behavior, children who participated in first through fifth grades in same-age versus mixed-age groups were not assigned randomly to these groupings; nor were teachers. Various teacher and classroom variables were controlled for statistically to minimize these differences, but the complexity of all that goes into determining whether a teacher will choose to teach in a mixed- or same-age classroom is, in all likelihood, more complex than those variables we were able to control for. Future research might explore the random assignment of teachers (trained in both approaches) to a mixed- or same-age context.

Many other questions have yet to be explored. For example, are there age spans (2, 3, 4 years?) that are most beneficial to the social development of children in a mixed-age classroom (Katz, Evangelou, & Hartman, 1990)? Do children in mixed-age groups need to be taught particular skills for functioning in this kind of environment? Fuchs et al. (1996) offer evidence that children who are specifically trained in facilitating the learning of others (rather than lecturing their younger peers, for example) are more effective in bringing about cognitive growth in the process of helping children solve an intellectual (or presumably social) problem. Many other questions remain to be explored as we attempt to maximize the benefits of the mixed-age classroom among a constellation of complementary approaches to children’s learning.

The carryover of reduced aggression in children who moved from a mixed-age to a same-age experience is interesting because of research that demonstrates that increased aggression is one of the most stable and predictive variables for later life difficulties (Parker & Asher, 1987). In addition to possible long-term consequences, the importance of short-term benefits in classroom variables should not be considered inconsequential. As Forman notes (Reggio Emilia electronic discussion group, September 7, 1996), [information on REGGIO-L can be found in the Reggio Emilia...
long-term effects are not necessarily a reliable measure of the merits of a particular teaching method: "If we refine our attention to the form of improved performance, then we can support methods that render these forms. Every child has a right to be competent within and in terms of the current month. If we pay close attention to the months, the years will take care of themselves."

Mixed-age grouping is not a magic bullet, nor is it a technique we recommend that teachers use without consideration of complementary teaching and learning strategies. Rather, it is an approach that teachers interested in innovation may come to see as part of an evolving sense of the many characteristics (cooperative learning, the Project Approach, learning centers, and a decentralized classroom, for examples) that contribute to educational environments they believe are most beneficial for children’s intellectual, academic, physical, dispositional, social, and emotional development.

References


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This article has been accessed 51,033 times through April 1, 2005.