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Patterns of Age Mixing and Gender Mixing Among Children and Adolescents at an Ungraded Democratic School

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The frequencies of age mixing and gender mixing were observed among students, age 4 to 19, at an ungraded, democratically structured school where the students move about freely and direct their own activities. Age mixing (across a span of at least 24 months) was more frequent for the 12- to 15-year-olds than for the 8- to 11- or 16- to 19-year-olds and was less frequent for conversations than for activities (mostly play) other than conversation. Gender mixing was less frequent for the 8- to 11-year-olds than for any other age group and was more frequent for conversations than for other activities. For students observed with companions of both sexes, the mean age difference from opposite sex companions was greater than that from same-sex companions. The results are discussed in relation to ideas about the possible developmental functions of such mixing.

We have taken advantage of an opportunity to observe young people, ages 4 to 19, at an ungraded, democratically structured school at which students are free all day to choose their own activities and companions. Our purpose, for this study, was to identify patterns of age mixing and gender mixing under conditions designed to maximize free choice. In particular, the aim was to identify relationships of freely chosen age mixing and gender mixing to (a) the student's age, (b) the type of activity (conversation or play) in which the participants were involved, and (c) each other.

Age mixing is a subject of considerable interest to psychologists and educators. Researchers have observed extensive age mixing in children's play and work in non-Western communities that lack age-graded schools (Draper, 1976; Whiting & Edwards, 1988) and more age mixing in out-of-school settings than in school in North America (Ellis, Rogoff, & Cromer, 1981; Montemayor & Van Komen, 1980). Research and theory suggest, moreover, that cross-age interactions among young people may serve

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valuable educational functions (Bailey, Burchinal, & McWilliam, 1993; Blakemore, 1990; Gray & Chanoff, 1984; Greenberg, 1974/1992a; Pratt, 1986; Stright & French, 1988; Vygotsky, 1933/1978). The younger participants may be able to engage in more complex activities in such interactions than they could with age mates and benefit from the exposure to more advanced skills and knowledge, and the older participants may benefit from the opportunity to practice leadership and nurturance and to consolidate their own skills and knowledge through demonstration and explanation.

If age mixing serves useful developmental functions, we might expect that young people would freely choose to interact with older and younger companions even when same-age companions are available. To date, researchers have had little opportunity to study freely chosen age mixing among young people beyond preschool age. Studies in school settings are constrained by the narrow range in the ages of potential companions (e.g., Allen, 1989), and studies in other settings are constrained by the difficulty of observing older children and adolescents in such settings, and by the difficulty of distinguishing freely chosen age mixing from that dictated by a lack of available same-age companions or by adult assignment to tasks such as caregiving (e.g., Ellis et al., 1981; Whiting & Edwards, 1988). In discussing their crosscultural observations of age mixing, Whiting and Edwards point out, "Our data do not tell us, however, the degree to which the choice of social partners . . . is based on children's own choices versus assignment to settings by adults" (p. 278).

A purpose of the present study was to look for patterns relating self-chosen age mixing to the student's own age and to the type of activity (conversation or play) on which the interaction centered. If age mixing serves useful developmental functions, it may do so at some ages more than at others, and age-related changes in the tendency to choose older or younger companions may provide clues as to those functions. If age mixing is motivated in part by the older person's desire to exert leadership and the younger person's desire to learn new skills or to partake in more complex activities, then we might expect more age mixing in play than in conversations. No previous research of which we are aware has examined freely chosen age mixing as a function of the young person's age or as a function of the type of activity.

Self-chosen gender mixing (and segregation) has been more thoroughly studied than self-chosen age mixing in school-age children and adolescents. In many different settings and in all cultures studied to date, researchers have observed a strong tendency for children to segregate themselves by sex, which reaches a peak in the age range of about 8 to 11 years (Criswell, 1939; Gottman, 1986; Hartup, 1983; Maccoby &

Jacklin, 1987; Shrum, Cheek, & Hunter,1988; Whiting & Edwards, 1988). At least in contemporary North America, children's tendency to segregate by sex appears to be greater in their self-directed activities than in activities directed or supervised by adults (Berk & Lewis, 1977; Maccoby, 1990). Maccoby (1988, 1990) has summarized research suggesting that gender segregation stems at least partly from boys' and girls' differing play styles and differing ways of influencing one another during play. In particular, she has found that girls tend to withdraw from mixed-sex play when they find that boys dominate the activity and do not respond to the girls' requests for change. More recently, Bukowski, Gauze, Hoza, and Newcomb (1993) found a correlation between children's preference for same-sex companions and their self-reported play styles. If children's tendency to segregate by sex is based in part on different play preferences and styles, then we might expect less gender mixing in play than in conversations. We are aware of no previous studies comparing the degree of gender mixing in conversations with that in other activities.

An additional purpose of this study was to examine the relation between gender mixing and age mixing. Previous studies have revealed more gender mixing in mixed-age classrooms than in age-segregated classrooms (Field, 1982; Roopnarine & Bright, 1993; Smith & Inder, 1990). Such results might indicate that children choose cross-sex interactions with others who are older or younger than themselves over cross-sex interactions with age mates, but to date that hypothesis has not been tested directly. In the studies just cited, the age differences of opposite-sex and same-sex partners were not compared, but rather the total amount of gender mixing in the two types of classrooms was compared. Perhaps increased gender mixing in the age-mixed settings was due to a general reduction in the psychological and social factors that inhibit cross-sex interactions, regardless of age, rather than due to a specific preference for cross-sex partners who are different from oneself in age.

The specific questions about self-chosen age- and gender-mixing addressed in the present study can be summarized as follows: (a) Does the extent of age mixing vary systematically as a function of the young person's age? (b) Do young people engage in mixed-age interactions more in play than in conversations? (c) Does the relation between gender mixing and age that has been found in other settings (specifically the reduced gender mixing in children of 8 to 11 years old) hold true in the setting that we studied? (d) Do young people engage in mixed-gender interactions more in conversations than in play? (e) Is the average age discrepancy of opposite-sex companions greater than that of same-sex companions?

RESEARCH SETTING AND OBSERVATIONAL METHODS

The School

The data for the present study were collected at the Sudbury Valley School (SVS), an alternative, ungraded day school in Framingham, Massachusetts. The school has been in continuous operation since 1968, and within the past decade at least a dozen other schools have been founded that are explicitly modeled after SVS, some in the United States and some in other countries. The school's philosophy has been described extensively elsewhere (Greenberg, 1991, 1974/1992b) and two follow-up studies have documented the experiences and recollections of the graduates (Gray & Chanoff, 1986; Greenberg & Sadofsky, 1992).

The special value of SVS for the present study lies in the complete freedom of association that the school permits. The school operates as a participatory democracy. All school rules and policy decisions are made by the School Meeting, at which each student and staff member, regardless of age, has one vote. The rules are enforced by a Judicial Committee composed of school members selected by lot each month in such a way as to include representation of each broad age range. The educational philosophy is one of nonintervention. The school has ample resources to aid education—books, equipment, access to experts—but does not require anyone to use them. Classes in various subjects are offered as interest arises, but no one is required or particularly encouraged to join a class and many students join none. In short, except for the occasional required stint on the Judicial Committee, students are free to do as they please, and associate with whom they please, as long as they do not interfere with the rights of others in ways that violate school rules. At any given time of the school day, groups of students can be found engaged in various activities: talking, playing games, roughhousing, reading together, programming a computer, or constructing something in the kitchen, art room, or workshop.

The Population Studied

The school's admissions policy is nonselective; essentially everyone, 4 years of age or older, who applies and can pay the modest tuition is accepted. As a deliberate matter of policy, the school refrains from keeping records about students or their families. However, based upon the previously mentioned surveys of former students and upon our informal knowledge of the present students, we can report the following with confidence: The great majority of SVS students are white, middle-class suburbanites. The majority have at least one college-educated parent.

Most attended a public school for one or more years before enrolling at SVS; almost none attended another private school. Those who came from another school commonly express displeasure at the constraints on their activities imposed at that school and express a desire to make their own choices. Some report that they were performing poorly academically in the former school, but at least an equal number report that they were performing well or very well. Approximately 65% to 75% of the school's graduates have gone on to higher education, and the great majority, whether or not they pursued higher education, have entered careers that require high skill and/or intellectual ability (Gray & Chanoff, 1986; Greenberg & Sadofsky, 1992). In sum, the student population at SVS can be characterized as a relatively privileged group who are oriented toward self-determination and who typically go on to be quite successful by traditional indices of higher education and career. All of the 135 students (58 females and 77 males) enrolled at SVS at the time of the study were potential participants. They ranged in age from 4 to 19 years.

Data Collection

The data were collected by a double-blind procedure, by which neither the students nor the observer were aware of the specific purposes of the study. The students were aware that we were making observations at the school "in order to learn about what students do at SVS," but they were otherwise uninformed of the purposes.[1] The observations were made by the second author (JF), who was in the midst of a long-term ethnographic study of age-mixed social interactions at the school at the time the present study was begun. His understanding was that the present study would provide objective data on amount of age mixing to supplement his qualitative descriptions. He did not realize until after the data were collected that they would be analyzed to assess gender mixing as well as age mixing, or that age mixing and gender mixing would be compared for students of different ages and for different types of activities. These were not foci of his ethnographic study and he had formed no hypotheses about them.

By the time the present study began, JF had already spent 52 days observing at the school using a method of reactive participation similar to that described by Corsaro (1991). He did not initiate conversations,

[1] This study was approved by the School Meeting, which is the legal governing body of the school and consists of the entire community of students and staff, through a procedure that involved a review of our methods and general goals by the Public Relations committee of the school.

except as needed to avoid appearing aloof or unfriendly, but did respond honestly to students' questions directed to him and took part in conversations initiated by students with him. He allowed students to control the interactions involving him, but at the same time strove to minimize those interactions so as to reduce the degree to which his presence would influence activities. He learned the names of all the students and became able to move about the school with students relatively oblivious to his presence. JF was himself 25 years old at the time and sufficiently youthful in appearance that he could be judged by an outsider to be a student.

To collect the data for the present study, JF toured the school on 12 different days between October 25 and December 16, 1993. On 10 days one tour was made, and on the other 2 days two were made 4 hours apart. On each tour he noted the names and apparent activity of each group of two to seven students who were clearly interacting with one another. He made each observation from sufficient distance to avoid disrupting the activity, but close enough to see and hear the students clearly, and he observed each group only as long as was necessary, up to 5 min, to determined which students were clearly interacting as a group and to determine the nature of the activity in which they were engaged. He wrote these down, inconspicuously, immediately after leaving each interaction site. Each tour took him through the two buildings and around the 10-acre campus that make up the school's physical plant. He did not look into rooms designated for quiet activities, as that could not be done without disrupting the activities within. The observations were made only in the more public areas of the school. Each tour included a visit to the school's art room, computer room, play room, music room, kitchen, social rooms, and all parts of the outdoor campus. Interactions that involved a staff member or other nonstudent participant were excluded from the analyses, as were interactions that involved siblings. Our interest was in the freely chosen associations among children and adolescents who knew each other well but did not have the special ties and obligations that may occur between siblings.

Students were identified as members of the same group if and only if they were clearly involved with one another, reciprocally, in conversation or some other activity. Generally this was an easy judgment to make. In most cases (accounting for 85 of the 130 groups), the interacting students were the only individuals in a given room or area of the outdoor campus. In 18 instances, two groups were seen in the same room, and in three instances three groups were seen. In each of these multigroup instances, the cues of proximity, body orientation, direction of conversation, and type of activity (such as a game engaged in) made

the groups distinct. Anyone who was near an interacting group but not clearly engaged with the group in a reciprocal manner was judged as not in the group. A student who was observing others in an activity was judged as part of the group only if back and forth conversation occurred between that individual and at least one of the group members. A group's activity was recorded as "conversation" if talking was the only discernible activity; otherwise the type of game or project that the interactants were engaged in was briefly described.

Because JF was the only potential observer for our study to whom the students had been sufficiently habituated to permit observations without disrupting activities, we did not assess observer reliability at the time the study was conducted. The data were quite objective, however; and because the observer was blind to the specific purposes of the study, any errors would be unlikely to take the form of bias. Slightly more than 2 years after the data were collected, in response to suggestions made by reviewers of a draft of this report, we tested the reliability of the observational method. To do that, we described the observational procedure to an SVS staff member, using essentially the same words as those above, and then he accompanied JF on tours of the school and recorded his observations independently of JF until 20 different groups (by JF's count) had been observed. Comparison of the two sets of notes revealed complete agreement as to group membership and activity category for 19 of the 20 groups. The only discrepancy lay in one set of four students who were seen by JF as a group involved in conversation and by the staff member as four separate individuals rather than a group. The data from the reliability check were not included in the analysis described next.

Data Analysis Procedures and Results

A total of 130 interacting groups were observed that met the criteria of the study (included students only and no siblings). Of these, 59 were dyads, 29 were groups of three, 24 were groups of four, and 18 were groups of five through seven. Of the 130 groups, 57% encompassed an age span (oldest person's age minus youngest) of 24 months or more, 25% encompassed a span of 48 months or more, and 7% a span of 72 months or more. In addition, 30% of the groups were mixed sex (contained at least one male and one female), 28% were all female, and 42% were all male. A total of 108 different students (48 females and 60 males) were observed in the 130 groups. The 27 enrolled students who were not seen were mainly older students who were frequently off campus or in quiet rooms, where we did not observe. The number of differ-

Table 1. Age Mixing, Gender Mixing, and Type of Activity as Functions of Student's Age

	Student's Age (Years)				
	4–7	*8–11*	*12–15*	*16–19*	*Inferential statistic*[a]
Number of students observed[b]	17	27	33	31	
Mean group size	3.6	3.5	3.9	3.6	$F = 0.85$, $p = .469$
Mean age difference (months)[c]	30	20	26	22	$F = 1.89$, $p = .135$
Median % cross-age[c, d]	17	13	43	26	$H = 10.69$, $p = .014$
Median % cross-sex[c]	25	0	25	22	$H = 17.92$, $p = .0005$
Median % conversational	33	14	71	80	$H = 23.46$, $p = .0001$

[a] Each F derives from a one-way analysis of variance ($df = 3$), and each H from a Kruskal-Wallis analysis of variance by ranks ($df = 3$). [b] The number of females and males, respectively, for each of the four age groups from youngest to oldest was: 6 & 11; 14 & 13; 16 & 17; and 12 & 19. [c] Calculations are based on the weighted mean scores for each student, described in the text. [d] An age difference of 24 months or more is classed as cross-age.

ent groups in which individual students were observed ranged from 1 to 10, with a mean of 3.7.

The description of each group's activity was coded into one of two categories: *conversational*, when conversation was recorded as the only discernible activity, and *other*, when the record described any activity other than or in addition to conversation. Activity was inadvertently not recorded for 4 of the 130 groups, and those 4 were excluded from all statistical analyses involving activity. Of the remaining 126 groups, 65 were conversational and 61 were other. Further breakdown of the *other* category produced categories too small to be useful for statistical analysis, but most in that category were involved in formal or informal play. More specifically, of the 61 groups classed as *other*, 29 were involved in indoor games with formal rules (board games, card games, computer games, and formalized role-playing games), 3 in outdoor games with formal rules (four square, soccer), 17 in informal play (sociodramatic, rough-and-tumble, interactive use of playground equipment), and 12 in a mutual project (constructing something, reading, or playing musical instruments together).

For each of the 108 observed students, separately for each group in which the student was observed, we determined (a) the mean absolute difference in age (in months) between that student and the other members of the group, (b) the percentage of other group members who were at least 24 months older or younger than that student, and (c) the per-

centage of other group members who were not the same sex as that student. We then averaged each of these scores across the set of groups in which the student was observed, to produce, for each student, an *age difference* score, a *percent cross-age* score, and a *percent cross-sex* score. The use of 24 months as the arbitrary minimal age difference for a cross-age interaction is a convention borrowed from Ellis et al. (1981). For each student a *percent conversational* score was calculated also, based on the ratio of the number of conversational groups to total groups in which the student was observed.

Relation of Student's Age to Age Mixing, Gender Mixing, and Type of Activity

To determine if any of these scores vary with the student's age, the 108 students were divided into four age categories: 4 to 7, 8 to 11, 12 to 15, and 16 to 19 years. The number of females and males in each category and the comparisons of scores across the categories are shown in Table 1. Means and the parametric one-way analysis of variance were used to compare the age difference scores, but medians and the non-parametric Kruskal-Wallis analysis of variance were used to compare the percentage scores, which were quite skewed. An alpha level of .05 is the criterion for significance throughout this paper, and all tests are two-tailed except where otherwise noted.

As can be seen in the table, each of the three percentage scores varies significantly with age. Followup comparisons between pairs of age groups, using the Mann-Whitney U test, revealed: (a) The 12- to 15-year-olds have significantly elevated *percent cross-age* scores compared to the 8- to 11-year-olds, $z = 3.20$, $p = .001$, and the 16- to 19-year-olds, $z = 2.15$, $p = .031$. (b) The 8- to 11-year-olds have significantly reduced *percent cross-sex* scores compared to the 4- to 7-year-olds, $z = 2.82$, $p = .005$, the 12- to 15-year-olds, $z = 3.71$, $p = .0002$, and the 16- to 19-year-olds, $z = 3.63$, $p = .0003$. (c) The 8- to 11-year-olds have significantly lowered *percent conversational* scores compared to the 12- to 15-year-olds, $z = 4.01$, $p = .0001$, and the 16- to 19-year-olds, $z = 3.89$, $p = .0001$. (d) The 4- to 7-year-olds also have significantly reduced *percent conversational* scores compared to the 12- to 15-year-olds, $z = 2.19$, $p = .028$, and the 16- to 19-year-olds, $z = 2.53$, $p = .011$. As can also be seen in the table, the *age difference scores* did not differ significantly in the overall comparison among the four groups, which may be due to several instances of extreme scores among the ages 4 to 7 and 16 to 19. The higher age-difference score for the 12- to 15-year-olds com-

pared to the 8- to 11-year-olds is significant when just those two groups are compared, $t(58) = 2.04$, $p = .045$.

Relation of Student's Sex to Age Mixing, Gender Mixing, and Type of Activity

The amount of neither age mixing nor gender mixing differed significantly as a function of the student's sex. The mean age difference score is 20 months for the females and 23 months for the males, $t(106) = 0.30$, $p = .763$; the median percent cross-age score is 29% for the females and 33% for the males, $z = 0.02$, $p = .983$; and the median percent cross-sex score is 19% for the females and 9% for the males, $z = 1.35$, $p = .179$. The only significant sex difference lies in the percentage of activities classed as conversations, the median of which is 69% for the females and 50% for the males, $z = 2.09$, $p = .037$. This difference is in the same direction for each of the four age categories except the youngest, and is largest and most significant for the 12- to 15-year-olds, where the median is 90% for the females and 50% for the males, $z = 2.95$, $p = .003$.

Relation of Age Mixing to Gender Mixing

Sixty-five of the students were observed with at least one opposite-sex companion and at least one same-sex companion. To test the hypothesis that age mixing was greater for the former than the latter, the overall age difference score for these 65 students was divided into two components: a *cross-sex age difference* score and a *same-sex age difference* score. These scores are the weighted means of the absolute difference in age between the student and each cross-sex companion, or same-sex companion, respectively, with whom the student was observed. The weighting factor for each age difference was the reciprocal of the total number of companions (including both sexes) in the interacting group, that is, $1/(n - 1)$, where n is group size. The assumption behind the weighting is that the intensity of an interaction that a student has with any one companion is inversely proportional to the number of other companions involved in the interaction. This assumption is precisely the same as that which led us to use groups, rather than individual companions, as the units across which to average in determining each student's mean age difference score for all companions combined. Thus, in the cross-sex age difference calculation, a girl's interaction with a particular boy weighed half as much if one other companion was involved, or one third as much if two other companions were involved, compared to the situation in which he was her only companion. The

Table 2. Age Mixing and Gender Mixing as Functions of Type of Group Activity

	Activity Type		
	Conversational	*Other*	*Inferential statistic*[a]
Mean age difference (months)[b]	23	28	$t = 1.78$, $p = .080$
Median % cross-age[b, c]	33	48	$z = 2.41$, $p = .016$
Median % cross-sex[b]	23	0	$z = 2.86$, $p = .004$

Note. All statistics are based on the 59 students who were observed in at least one *conversational* and one *other* group. [a] The t derives from a paired t test ($df = 58$) and each z derives from a Wilcoxen signed-ranks test. [b] Calculations are based on the weighted mean scores for each student, described in the text. [c] An age difference of 24 months or more is classed as cross-age.

weighted mean in each case is the sum of the weighted absolute age differences divided by the sum of the weights.

As predicted, the cross-sex age differences were on average greater than the same-sex age differences. The mean of the former is 30 months, the mean of the latter is 21 months, and the difference is statistically significant, $t\ (64) = 2.35$, one-tailed $p = .011$. This difference is in the same direction and about equally large for each of the four age groups except the 16- to 19-year-olds (whose means were 16 months for cross-sex and 18 months for same-sex companions).

To determine which sex was more often the older participant in such interactions, every pair of cross-sex, cross-age interactants observed in the study was identified. Each pair was counted once, regardless of the number of times the pair was observed together, and, as always, 24 months was the cross-age criterion. Of the 55 such pairs identified, the male was the older member in 35 cases. This number is marginally significantly greater than the 27.5 that would be expected if the chance value were 50% of the pairs, $\chi^2 = 4.09$, $p = .043$. This result should be interpreted cautiously, however, as the actual chance value, based on random assortment, would be greater than 50% because the median age of the males in the student population was somewhat greater than that of the females (165 months compared to 158 months).

Relation of the Group's Activity to Age Mixing and Gender Mixing

Of the students, 59 were observed in at least one conversational group and at least one group classed as other. To test the hypotheses that the amount of age mixing and gender mixing varies with the type of activity, we calculated for these students an age difference score, percent cross-age score, and percent cross-sex score for each of the two types of

groups. Except that the calculations were done separately for the conversational and other groups, the procedure was identical to that described earlier for producing each of these scores for all groups combined.

As can be seen in Table 2, gender mixing and age mixing are opposite to one another in their relationship to type of activity. The percent cross-sex scores are significantly (and markedly) higher for conversations than for other activities, and the percent cross-age scores are significantly (though not as markedly) lower for conversations than for other activities. A breakdown of these data by age group revealed that the percent cross-sex scores are greater for conversations than for other activities for each of the four age groups, and that the percent cross-age scores are less for conversations than for other activities for each age group except the 4- to 7-year-olds.

DISCUSSION

These results suggest the following answers to the five questions about freely chosen age mixing and gender mixing that were posed in the introduction to this paper: (a) Age mixing is sharply higher in early adolescence (ages 12 to 15) compared to middle childhood (ages 8 to 11). (b) Age mixing is more frequent in play than in conversations. (c) Gender mixing is least frequent in middle childhood (ages 8 to 11) at SVS, just as has been found in other settings. (d) Gender mixing is more frequent in conversations than in play. (e) Opposite-sex companions are, on average, more age discrepant than are same-sex companions. In what follows we discuss possible implications of each of these findings.

Heightened Age Mixing in Early Adolescence

Our observation of sharply higher age mixing in early adolescence (ages 12 to 15) compared to middle childhood (ages 8 to 11) is apparently novel. No other researchers of whom we are aware have compared the extent of age mixing across this age range within the same study. The higher mixing cannot be attributed to restrictions imposed by the availability of near-age students in the school. In fact, as shown in Table 1, the 12- to 15-year-olds had a greater number of potential near-age companions at school than did the 8- to 11-year-olds, so if the results were due to availability we would have found less age mixing, not more, for the 12- to 15-year-olds.

How might the heightened age mixing for the 12- to 15-year-olds be explained? Perhaps some people in this age range are at a transition, psychologically, between childhood and adolescence, and so they move

back and forth between younger and older companions. It also may be that differences in maturation rate lead some to find peers primarily among the younger children and others to find them primarily among the older adolescents. Of the 31 students in this age range who were observed in cross-age interactions (with 24 months difference as the cross-age criterion), 14 interacted across age in both directions, 8 interacted across age with younger children only, and 9 interacted across age with older adolescents only. The single student in this group who manifested the highest number of cross-age interactions was a 12-year-old boy who was obviously mature both physically and mentally for his age. He was observed in 9 different groups, with a total of 15 different companions, all of whom were older than he and whose median age was 35 months older.

Another possible explanation of the heightened age mixing in the 12- to 15-year-olds draws on the correlation observed between age mixing and gender mixing. Not surprisingly, the 12- to 15-year-olds in our study manifested much more gender mixing than did the 8- to 11-year-olds. Perhaps, as adolescents become interested in the other sex, they at the same time feel inhibited about relationships that could be construed as romantic. A solution to this problem might be to interact with opposite-sex individuals who are also quite different from themselves in age, a solution that would lead to increased age mixing secondarily to increased gender mixing. Consistent with this interpretation, for the 12- to 15-year-olds the mean age difference (37 months) for cross-sex companions was much greater than that for same-sex companions (22 months). The possibility that cross-age interactions with the other sex are part of a transition toward comfortable near-age interactions with the other sex is reinforced by the further difference observed at ages 16 to 19. For that group and only that group, opposite-sex companions were no more age discrepant than were same-sex companions (16 months for the former and 18 for the latter).

Still another potential contributor to the heightened age mixing at early adolescence may be an increased tendency at that age to develop nurturant relationships with the very youngest members of the school, similar to what might be seen between siblings who differ greatly in age. Our ethnographic study of cross-age interactions at the school (to be reported elsewhere) documents a number of close, lasting relationships of this type between adolescents and 4- or 5-year-olds, and some of the observations in the present study included such pairs. In contrast, the 8- to 11-year-olds, who showed the least age mixing in the present study, seemed to be relatively uninterested either in nurturing younger children or in being nurtured by older ones.

In sum, the patterns of results suggest that, for 12- to 15-year-olds, age mixing may (a) help people who are maturing at different rates find peers whose interests and abilities are like their own, (b) abet gender mixing, with cross-age gender mixing serving as a transition toward near-age gender mixing, and (c) exercise emerging interests in nurturing younger children. These are hypotheses for further study.

More Age Mixing in Play Than in Conversations

The finding of more age mixing in play than in conversations is consistent with the idea that young people typically prefer to converse with their intellectual peers (who are most often similar in age), but nevertheless enjoy and benefit from games and other playful activities with people who differ from themselves in ability (and age). Our more prolonged, ethnographic observations at SVS suggest that age-mixed play is qualitatively different in certain consistent ways from play among age mates, even when the game being played is the same (Feldman, 1996). When students of similar age and ability play a game such as chess (which was one of the most frequently observed games in the present study and in the larger ethnographic study), the principal motive is to win. When students of quite different ages and ability play, however, the motive of each player likely shifts because there is little doubt as to who will win. The older, more skilled player is motivated to make the game interesting, which may entail trying out new, risky strategies, or playing at a lightning-fast pace, or pointing out to the younger player why a particular move would lead to checkmate. The younger player is motivated to hang in as long as possible before checkmate and to learn something in the process. He or she feels no shame in losing to the older person. Thus, although the age-mixed game is less competitive in the sense of reduced concern about winning or losing, it provides unique learning opportunities to both participants.

Informal play, which does not involve winning or losing, may draw mixed-age companions for somewhat different reasons. A teenager might not think of playing with Legos or of making a sandcastle alone or with age mates, but may be inspired to join a 5-year-old in doing so. Regardless of the kind of activity that draws the age-discrepant individuals together, however, once they are together the older participant experiences the opportunity to exercise leadership and nurturance, and the younger participant feels proud to be associated with the older one and experiences new opportunities for learning.

Lower Gender Mixing in Middle Childhood

Our finding of sharply lower gender mixing in the 8- to 11-year-olds, compared to each other age group, corroborates others' reports of marked, self-imposed gender segregation in middle childhood in various cultures and settings (cited in the introduction). This finding cannot be attributed to a difference in the number of potential same-sex and other-sex companions among the 8- to 11-year-olds compared to the other groups. As shown in Table 1, the gender distribution for the ages of 8 to 11 was a nearly even split and was essentially identical to that of ages 12 to 15, who showed the greatest amount of gender mixing.

Based on observations in public school playgrounds and lunch rooms, Thorne (1986, 1993) has emphasized the role of taunting, by the children themselves, in maintaining gender segregation. During the entire course of our observations at SVS, including the lengthy ethnographic study as well as the statistical study reported here, we observed no instances of such taunting. This difference between SVS and other schools may derive from the democratic philosophy that pervades the school community, which emphasizes the rights of individuals to choose their own activities and to associate with whom they please. In fact, school members who interfere with that right by persistent, unwelcome teasing can be "brought up" before the Judicial Committee for breaking a school rule. Still, despite the school's philosophy, despite the rules against interfering with free association, and despite the apparent lack of social sanctions for gender mixing, the 8- to 11-year-olds in our study behaved like 8- to 11-year-olds everywhere; they rarely interacted across gender lines.

Why do children in this age range interact primarily with others of their own sex? A possible clue lies in the observation that the 8- to 11-year-olds were significantly different from the two older groups not only in their reduced gender mixing, but also in their reduced involvement in activities classed as purely conversational. Only 14% of their interactions were conversations, compared to 33% for the 4- to 7-year-olds, 71% for the 12- to 15-year-olds, and 80% for the 16- to 19-year-olds. In every age group, the amount of gender mixing was greater in conversations than in other activities. In fact, when conversations are removed from the data, the difference in gender mixing between the 8- to 11-year-olds and the two older groups disappears. For activities other than conversations, the median percent cross-sex score is 23%, 0%, 0%, and 0%, respectively, for the four age groups. Thus, the lower overall gender mixing of the 8- to 11-year-olds, as compared to the two older groups, may be secondary to their lower involvement in conversations. Taking all the data together, the 8- to 11-year-olds stand out for their

high involvement in activities other than conversations and their marked tendency to segregate themselves by both sex and age. Staff members have since shared with us their impression that the 8- to 11-year-olds are also least inclined to engage themselves with adults at the school. Apparently, under the free choice conditions of SVS, 8- to 11-year-olds are intensely involved in activities beyond conversations, with others who are like themselves in sex and age.

More Gender Mixing in Conversations Than in Play

As just noted, gender mixing was more common in conversations than in playful activities beyond conversations, for every age group. If Maccoby (1990) is correct in suggesting that incompatibilities in interaction style promote gender segregation, our results suggest that the incompatibilities apply less to conversation than to play. It is also possible that conversation is typically more casual than play and requires less planning and coordination, making it easier for the two sexes to come together in the former than the latter. If that is true as applied to gender mixing, however, it is interesting that the same is not true as applied to age mixing. The opposite relationships of gender mixing and age mixing to type of activity indicate that the forces that separate or bring together individuals who differ in sex are not the same as those which separate or bring together individuals who differ in age.

Correlation Between Gender Mixing and Age Mixing

Even though gender mixing was most frequent in conversations and age mixing was most frequent in other activities, we found, overall, a positive relation between gender mixing and age mixing. Opposite-sex companions were significantly more different from each other in age, on average, than were same-sex companions—a result that held for all age groups except the oldest. This finding corroborates the suggestion, from previous research (cited in the introduction), of a positive correlation between age mixing and gender mixing. We already offered, in the discussion of age mixing in early adolescence, one hypothesis as to why young people might choose opposite-sex companions who differ considerably from themselves in age over those who are similar in age: They might feel inhibited about interactions that could be interpreted as romantic. A quite different possibility is that some types of interactions require greater similarity of the partners on all dimensions than do others, and interactions that are flexible enough to accommodate gender differences may also tend to be flexible enough to accommodate age differences.

Limitations of the Study

One's choice of companions in any setting is limited by the distribution of potential companions available. In the present study, the youngest group (ages 4 to 7) and oldest group (ages 16 to 19) were constrained in their opportunity for age mixing by the absence of students younger than 4 or older than 19. These two groups also each contained considerably more males than females (see Table 1), which may have limited the opportunity for gender mixing (a random assortment model predicts more gender mixing when the sexes are equal in number than when they are unequal). The two middle groups (8 to 11 and 12 to 15), however, had ample opportunity to age mix in both directions, and each group contained a nearly equal number of males and females; yet they differed markedly and significantly from each other in all three variables measured in the study (age mixing, gender mixing, and type of activity). We can be more confident that the differences observed between these two age groups derived from differences in their own choices than we can about comparisons involving the 4- to 7-year-olds or 16- to 19-year-olds.

Choice of companions is also affected by community norms and values. The SVS community is permeated by a democratic philosophy that supports the right of free association. As it may take time for new students to become socialized to SVS, concern was raised that the greater age mixing and gender mixing for the adolescents compared to the 8- to 11-year-olds might be due to their longer period of enrollment at the school. The mean months enrolled were 7, 26, 38, and 37, respectively, for the four age groups from youngest to oldest. However, contrary to the hypothesis that the significant differences between age groups in the two kinds of mixing were due to differences in duration of enrollment, no significant correlations were found between months enrolled and the measures of either age mixing or gender mixing within any of the age groups. The Spearman rank order correlation coefficients, respectively, for the four age groups from youngest to oldest for the correlations between months enrolled and the percent cross-age score were .01, .30, .05, and .15; and those for the correlations between months enrolled and the percent cross-sex score were –.08, .09, .04, and .14. The fact that most of these correlations are positive, however, suggests that duration of enrollment may have contributed somewhat to the effects of age that we observed.

It is also the case that SVS students are not a random selection of the school-age population, but rather are people who chose to attend an unusual school and whose parents supported that choice. That selection

factor may very well influence the overall amount of age mixing and gender mixing that we observed, but we see no obvious reason why it would produce the specific patterns of such mixing, within the SVS community, that we observed in this study. For only one of our questions was there sufficient evidence in the research literature to make a clear prediction based on studies conducted elsewhere, and concerning that question the SVS students were like young people everywhere: They were much more likely to segregate themselves by sex in the age range of 8 to 11 than at any other age.

The novel findings of this study—particularly the heightened age mixing in early adolescence compared to middle childhood, the heightened age mixing in play compared to conversations, and the lower gender mixing in play compared to conversations—are novel not because they contradict previous findings, but rather because they have not previously been assessed empirically. They await corroboration or its opposite in future studies, in other settings, with other populations. We also hope that future studies will permit a more fine-grained analysis in varieties of self-chosen playful activities, to determine which types are most or least conducive to age mixing and gender mixing.

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