GENDER CONTEXT OF SCHOOLING AND LEVELS OF STRESS AMONG EARLY ADOLESCENT PUPILS

HERMAN BRUTSAERT
MIEKE VAN HOUTTE
Ghent University

In present analysis, an attempt is made to identify perceived social support mechanisms through which the gender composition of the school may influence pupils' stress responses. Use was made of data from 68 academically oriented secondary schools in Flanders, Belgium. Of these schools, 25 were mixed-sex schools and 43 were single-sex schools (21 girls' and 22 boys' schools). Respondents (3,370 girls and 3,057 boys) were 3rd-year students, ages 14 and 15. A multilevel analysis (Hierarchical Linear Modeling) was performed adjusting for parental socioeconomic status (SES), parental support, academic performance, curriculum enrollment, school mean SES, sense of belonging in school, and quality of teacher-pupil relationships. Results show that early adolescent girls in single-sex schools experience lower levels of stress than coeducational schoolgirls do and that this effect is largely accounted for by sense of belonging.

Keywords: *single sex schooling; gender; stress*

Systematic research on the relative effectiveness of single-sex schools versus coeducation was started in the 1970s, when the education system was becoming progressively coeducational in most developed countries. At present, a considerable number of studies are available covering a broad range of topics, such as academic achievement, subject choice polarization, sex-role stereotyping, sexism, school satisfaction, self-esteem, and locus of control (for reviews, see American Association of University Women, 1998; Elwood & Gipps, 1999; Mael, 1998; Moore, Piper, & Schaefer, 1993). Although as yet there is no conclusive evidence to indicate which is better, single-sex or coeducational schooling, a reasonable number of studies from different countries suggest that attendance at the former may have some academic and social advantages, particularly for early adolescent girls (Brutsaert, 1999; Cairns, 1990; Granleese & Joseph, 1993; Jackson & Smith, 2000; Kreienbaum, 1995; Lawrie & Brown, 1992; Lee & Bryk, 1986; Riordan, 1990; Shmurak,

EDUCATION AND URBAN SOCIETY, Vol. 37 No. 1, November 2004 58-73
DOI: 10.1177/0013124504268070

1998; Stables, 1990; Streitmatter, 1999; Trickett, Trickett, Castro, & Schnaffner, 1982; Wong, Lam, & Ho, 2002).

Curiously, in spite of an ever-expanding volume of research literature in this field, to date, virtually no attention has been paid to the differential effects of single-sex and mixed secondary school settings on pupils' stress levels (one exception being Hannan, Smyth, McCullagh, O'Leary, & McMahon, 1996). Yet the study of contextual schooling factors and their influence on stress outcomes may provide a clear reflecting surface for identifying problematic aspects of the schooling environment.

In this article, we seek to examine the importance of the gender context of schooling as a potential source of psychosocial stress. In particular, we explore whether and if so, how school type may affect the gendered stress patterns of early adolescents. To address this issue, special attention is given to social processes that may clarify the link between the schooling context and the outcome variable. Actually, the research on coeducation is especially lacking in understanding what specific aspects of the gender context of schooling encourage positive or negative developments among their pupils.

BACKGROUND

Early adolescence implies a transition into biological maturity on one hand and the drawing of sharper lines between the roles of girls and boys on the other hand. Independent and reciprocal influences between both processes result in gender intensification, including a greater need for peer group acceptance among girls and a more intensive achievement drive among boys (Bush, 1987; Petersen, 1980; Simmons & Blyth, 1987). At the same time, early adolescence is, particularly for girls, generally characterized as a time of heightened vulnerability resulting from a convergence of biopsychosocial demands. This manifests itself by the onset of anxiety and a sudden drop in self-esteem (American Association of University Women, 1995; Compas & Wagner, 1991; Keel, Fulkerson, & Leon, 1997; Larson & Ham, 1993; Rutter, 1986; Simmons, Burgeson, Carlton-Ford, & Blyth, 1987; Thorne, 1993).

Focusing on girls' greater need for acceptance and their increasing concern with relationships, it can be indicated that female friendships intensify and take on deeper meanings during adolescence (Brown & Gilligan, 1992; Eder, 1985; Maccoby, 1990). Moreover, it appears that girls tend to expect and receive more of a commitment and empathic understanding from their friends and that they experience a stronger sense of social connectedness than boys do (Berndt, 1982; Brown, Way, & Duff, 1999; Clark & Bittle, 1992;

Nolen-Hoeksema & Rusting, 1999). However, though supportive friendships have been shown to protect against environmental stressors and provide stress relief (Brown & Gilligan, 1992; Compas, Slavin, Wagner, & Vannatta, 1986; Thoits, 1982), it is equally indicated that girls' greater personal investment in relationships, their feeling responsible for the quality of a relationship, and their concern with regard to acceptance by peers place them at risk for experiencing interpersonal events as stressful (Bjorkqvist, 1994; Bush & Simmons, 1987; Compas et al., 1986; Wagner & Compas, 1990). Girls' vulnerability to interpersonal stress was found to be heightened even further by their concern for the needs of others and their involvement in friends' problems (Gilligan, 1982; Gore, Aseltine, & Colton, 1992; Schieman & Turner, 2001; Wagner & Compas, 1990). In brief, early adolescent girls are more likely to experience higher levels of support from friends but at the same time, tend to respond more negatively to interpersonal stressors than boys do.

From a sociological perspective, evidently, special attention is to be directed to the question of how interpersonal stress may be affected by environmental forces. In fact, where the schooling domain is concerned, there is a substantial amount of evidential material indicating that the gender composition of the school forms an environmental risk factor for girls' well-being. Thus, research has called attention to the possible adverse effects of gendered social practices in coeducational school settings, such as differential expectations and treatment by teachers, disproportional numbers of classroom interactions involving boys, power asymmetries, and the fact that girls are more explicitly expected to balance the contradiction of maintaining their (stereotypic) gender identity with achievement (Delamont, 1990; Lee, Marks, & Byrd, 1994; Lees, 1993; Mahony, 1985; Sadker & Sadker, 1994; Shaw, 1995; Shmurak, 1998). Furthermore, it has been shown that girls' more cooperative interaction style puts them at greater risk for experiencing uneasiness as it tends to clash with the more competitive and domineering style of their male peers (Canada & Pringle, 1995; Maccoby, 1990; Murphy, 1999; Nolen-Hoeksema & Girgus, 1994). Also, heterosexual concerns, presumably being more explicitly prevalent in coeducational schools, have been documented as being more stressful for girls (Compas & Wagner, 1991; D. Epstein & Johnson, 1998; Hird, 2000).

Yet when examining the effects attributable to environmental conditions, it is, following the stress process model, of particular importance to identify interpersonal resources that may help in the adjustment to situations that upset the adaptive capacity of the individual (i.e., resources that may be assumed to moderate the effects of contextual stressors; Mirowsky & Ross, 1989; Pearlin, 1989; Thoits, 1995).

Particularly prominent in stress research are the social psychological factors usually addressed under the label *perceived social support* or *sense of belonging* (Lin & Peek, 1999; Pearlin, Lieberman, & Mullan, 1981; Thoits, 1995; Turner, 1999). Indeed, considerable research has shown that social bonding functions as a protector and stress-reducing mechanism (Pearlin, 1989; Turner, 1983; Turner & Turner, 1999). Thus, when considering the gender composition of the school as a potential stressor for early adolescent girls, it could be expected that sense of belonging, being a key feature of school membership, lowers their vulnerability to anxiety and therefore accounts for the influence of the school context. Taking into account the potentially moderating role of this social psychological factor would be all the more appropriate for present analysis as there is some evidence that girls experience more affiliation and a greater sense of communal feeling in same-sex settings than in coeducational settings (Brutsaert & Van Houtte, 2002; Maccoby, 1990; Shmurak, 1998). In a similar vein, the relational factor *perceived quality of the teacher-pupil interaction* could be expected to moderate a potential school-type effect on stress outcomes as the teachers' support and the pupils' positive attitudes toward them may, to some extent at least, offset anxiety (Sanders & Jordan, 2000). Actually, girls might be less likely to hold positive attitudes toward their teachers in coeducational school settings because of their awareness of the teachers' gender bias in favor of male students (Abraham, 1995; Kreienbaum, 1995; Lockheed & Klein, 1985).

In addition to both these school contextual support processes, a comparative analysis of coeducational and single-sex schools should also contend with some attributes that pertain to home background resources, such as parental socioeconomic status (SES) and parental support. With regard to the impact of SES, there is some evidence indicating that lower-class adolescents tend to be more vulnerable to stress than middle-class adolescents (Gore et al., 1992; Rutter, 1979). As for the importance of the quality of the parent-child relationship, it is generally assumed that perceived parental support buffers the influence of environmental stressors (Dubow & Tisak, 1989; Wertlieb, Weigel, & Feldstein, 1987). This aspect of the home climate should be even more important for girls as it has been noted that tension related to a growing desire for autonomy from parental influence leads adolescent girls to generate more conflict and anxiety within the parent-child relationship (Gore et al., 1992; Rudolph & Hammen, 1999). Furthermore, as pupils' stress levels are likely to be influenced by educational achievement pressure, it would seem appropriate to include the factors *grades* and *curriculum enrollment* into the analysis. With regard to the possible role of the socioeconomic context of the schools, finally, it should be noted that single-sex education, until recently the common type of schooling in Belgium, never had

elitist connotations. In fact, it is only since the mid 1980s that an increasing proportion of Catholic secondary schools, which constitute the major school sector (± 70%) and are publicly funded, turned coeducational. Still, because there may be some variations across schools, it was decided to adjust for the SES composition of the school as well.

In sum, it will be examined whether, *ceteris paribus*, the gender composition of schools exerts an influence on students' stress levels and whether, as hypothesized, this potential relationship can be explained by social support mechanisms, such as sense of belonging in school and quality of teacher-pupil interaction.

METHOD

SAMPLE AND DATA

For this comparative analysis, use was made of a large scale database developed as part of a research project concerning the effects of the gender organization of the school on a number of academic and developmental criterion variables. Considering the nature of the research question, a quantitative approach was deemed appropriate. The data were collected in 68 Flemish secondary schools, randomly selected (within three gender contexts) and offering similar academically oriented curricula (see below). All of the selected schools belong to the major (i.e., Catholic) school sector, which comprises a total of 288 academic-type secondary institutions. These schools are located in urban areas, as Flanders is largely urbanized anyhow and secondary schooling has of old been established in cities. At the time of the data collection (school year 1995-1996), a sufficient number (about 30%) of single-sex secondary schools remained to yield reliable comparable data. Twenty-five schools were mixed, and 43 were single sex (21 girls' and 22 boys' schools). State schools could not be included in the analysis as at the time of the study, they had all gone coeducational. Respondents, 2,228 girls and 1,972 boys for the separate-sex schools and 1,142 girls and 1,085 boys for the coeducational schools, were 3rd-year pupils, ages 14 and 15. The mean size of either type of school does not significantly differ and amounts to 665 pupils for the mixed schools, 749 for the girls' schools, and 707 for the boys' schools.

The data were collected by means of written class-administered (anonymous) questionnaires mostly consisting of categorical questions and scales

of the Likert type (Brutsaert, 2001). All of the children in attendance participated in the survey. A research assistant remained in the classroom during the form-filling process, which took about 50 minutes, to clarify the meaning of certain items and questions when necessary.

MEASUREMENT

The analysis involves the test of three models. The first model assesses the independent effect of mixedness, net of the SES composition of the school, pupils' socioeconomic background, academic performance (GPA), curriculum enrollment, and perceived parental support. The second and third models, respectively, add the relational aspects of school life, sense of belonging in school and teacher-pupil interaction to the initial model.

Coeducation relates, in the case of the descriptive analysis, to the school situation in which at least 24% of the pupils are of one sex and at most 76% of the other sex. As for the multivariate analysis, it was decided to quantify this contextual variable by computing the percentage of girls at school. Evidently, these percentages vary between 0% (at all-boys' schools) and 100% (at all-girls' schools). The selected coeducational schools already had become mixed before our cohort of respondents started secondary school (school year 1993-1994).

School SES pertains to the social composition of the student population and was obtained by aggregating pupils' SES scores and calculating a mean for each school.

Parental SES was measured in terms of the fathers' occupational status. Use was made of a scale of occupational rank covering the following status levels: (a) 1 = *semiskilled and unskilled manual workers*; (b) 2 = *skilled manual workers*; (c) 3 = *lower grade technicians and foremen*; (d) 4 = *clerical, sales, and rank-and-file service workers*; (e) 5 = *small traders and farmers*; (f) 6 = *self-employed artisans and small proprietors with employees*; (g) 7 = *lower grade professionals, administrators, and managers*; and (h) 8 = *higher grade professionals, administrators, managers, and large proprietors*. A pupil whose father was unemployed at the time of the data collection was asked to supply his or her father's past occupation.

Academic performance is operationally expressed by the respondents' self-reported GPA of the preceding school year. No formal check on the validity of this measure could be made as anonymity of the respondents was guaranteed.

Curriculum enrollment pertains to the formal study program in which respondents are enrolled. For 3rd-year pupils, the following standardized

curricula, of varying demanding nature, are offered: (a) a less rigid program with an emphasis on modern languages, economics, and humanities; (b) a curriculum encompassing these same courses in addition to an emphasis on mathematics; (c) a program putting special emphasis on the study of languages, classic (Latin and Greek) as well as modern; and (d) the most demanding curriculum emphasizing the classic languages as well as mathematics. These curricula are clear cut, but all of them, to a varying degree, encompass biology, physics, mathematics, Dutch, French, English, religion, history, geography, physical education, and arts. Students allocated to one particular track remain grouped for all courses.

Parental support refers to a respondent's perception of the extent to which he or she is stimulated and esteemed as a person by his or her parents. This aspect of the quality of the home environment was measured by means of a 4-point Likert-type scale (0 = *never* and 3 = *always*) consisting of 9 items, such as the following: My parents (or father or mother) trust me; my parents do encourage me whenever I am making plans; often, when I am busy, one of my parents will come and meddle; and my parents are really proud of my accomplishments. Cronbach's alpha produced a coefficient of .75. The item-total correlations varied between .23 and .53.

Sense of belonging in school refers to the extent to which pupils feel connected to the social context of the school and perceive themselves as being integrated in the class and school community. This mediational variable was measured by means of a 2-point Likert-type scale (0 = *no* and 1 = *yes*) consisting of 13 items, such as the following: In this school, you have to fend for yourself; there are cliques in our class; and in case of trouble, there are always other pupils you can count on. The reliability coefficient (alpha) for this scale was .73. The item-total correlations varied between .18 and .52.

Teacher-pupil relationship relates to the extent to which pupils hold positive or negative attitudes toward their teachers. This variable was operationalized by means of a 5-point Likert-type scale (0 = *absolutely do not agree* and 4 = *totally agree*) consisting of 7 items. Items such as the following were used: We've got quite a number of enthusiastic teachers in this school; too many teachers do not really care; and most teachers do their very best. Cronbach's alpha produced a coefficient of .81. The item-total correlations varied between .45 and .62.

Stress was operationalized by means of a scale (0 = *never* and 2 = *very often*) consisting of 10 items asking the respondents to estimate the frequency (three response categories) with which they suffer from such symptoms as sleeplessness, unhappiness, crying spells, fearfulness, queasiness, tension, and nervousness. This scale has an alpha reliability of .73.

FINDINGS

Before turning to the multivariate analyses, we present the mean values and standard deviations of stress for girls and boys within each type of school (see Table 1). Concerning school type, it can be noted that early adolescent girls in coeducational schools do indeed report higher levels of stress (*t* test; $p < .01$). Comparisons for boys do not reveal any statistically significant differences. Consistent with prevailing research regarding the differential vulnerabilities between girls and boys in developing stress, it can also be derived from these summary statistics that the former reported significantly higher levels of stress than the latter did ($p < .001$).

The question, of course, is whether the school-type effect holds when we adjust for a number of crucial variables. The analytical approach to investigating this effect involves the use of Hierarchical Linear Modeling (HLM), a method specifically designed to analyze school effects. This type of multilevel analysis allows us to estimate individual-level and school-level effects simultaneously by positing a set of relationships at both the pupil's level and the aggregate level between schools. For the present analysis, use was made of the "two-level HLM" statistical program (Bryk, Raudenbush, & Congdon, 1996). Following previous research, the analyses are carried out separately for girls and for boys (see Table 2).

The results of this more rigorous analysis concerning the school-type effect are consistent with the earlier descriptive data. Looking at the coefficient pertaining to the gender context of the school in Equation 1 of Table 2, it can be noted that for girls, it retains its statistical significance ($p = .02$). It thus appears that even after equating the schools on the selected pupil and school-level factors, girls in these single-sex schools do experience lower levels of stress than the coeducational schoolgirls. For boys, after similar adjustments, once more, no school-type effect can be discerned. That the gender context of the school operates as a stressor solely for girls provides support for the existing evidence that within a coeducational setting, gendered practices and social psychological processes that govern peer group relations may increase girls' vulnerability (see above). Incidentally, no such school-type effect on stress outcomes was reported in the previously mentioned study by Hannan et al. (1996).

Contrary to expectations, pupils' socioeconomic background is not related to the outcome variable. However, the SES composition of the school does affect girls', but not boys', stress levels ($p < .001$). Of course, one can only speculate as to why a higher social class mix in school would reduce girls' vulnerability to distress and why this pattern does not hold the same effect for

TABLE 1
Means and Standard Deviations of Stress by Mixedness and Sex

	Girl				*Boy*			
	Coeducation		*Single Sex*		*Coeducation*		*Single Sex*	
	M	SD	M	SD	M	SD	M	SD
Stress	7.71	3.22	7.40*	3.12	5.58	2.99	5.64	2.95

*$p < .01$

boys. Conceivably, a higher SES school implies a form of a normative climate that better meets girls' needs for structure and for rules that govern interpersonal relations.

Turning to the academic achievement measures, it can be seen that curriculum position negatively affects girls' stress levels ($p = .03$). That is, high achieving girls, in terms of being enrolled in a more selective study program, tend to manifest fewer stress symptoms than girls from curricula that though still academically oriented, are less exacting. This finding suggests that given a "tournament mobility regime", the lower achieving girls' anxiety may increase as a result of descending successively to less demanding study programs and of the concomitant decrease of confidence in their own abilities. Thus, in an academically oriented secondary school, a less competitive curriculum may function as a source of stress because girls occupying a higher curricular status position serve as a frame of reference for self-evaluation. It should be noted though that the statistical significance of the coefficient pertaining to curriculum enrollment is slightly reduced, to the .09 probability level, after controlling for sense of belonging in school (see Equation 2) but not when adjusting for quality of teacher-pupil interactions (see Equation 3). In other words, the negative effect of the curriculum position is partially moderated by the girls' feeling of connectedness with the school community. For boys, neither GPA nor curriculum enrollment appears to affect stress levels, a finding that might be accounted for by the fact that boys, in contrast to girls, tend to attribute their academic failings to external causes (Stetsenko, Little, Gordeeva, Grasshof, & Oettingen, 2000).

As predicted, parental support very strongly affects stress levels ($p < .001$). This result reinforces the importance of the notion that being valued by one's parents and feeling their encouragement and support is of prime importance for a child's well-being.

A major point of this analysis involves examining the potential role of the interpersonal resources of school life in offsetting a negative school-type effect. In regard to the first mediational factor, sense of belonging in school, it can be clearly seen that for girls, the coefficient pertaining to gender

TABLE 2

Multilevel Analysis Assessing the Effect of Mixedness on Stress With Adjustments for Socioeconomic Status (SES), GPA, Curriculum Enrollment, Parental Support, SES Composition of the School, Sense of Belonging in School, and Teacher-Pupil Relationship

	Girl						*Boy*					
	Equation 1		*Equation 2*		*Equation 3*		*Equation 1*		*Equation 2*		*Equation 3*	
	γ	SE	γ	SE	γ	SE	γ	SE	γ	SE	γ	SE
Intercept[a]	7.687*	.078	7.660*	.081	7.674*	.081	5.603*	.087	5.625*	.081	5.599*	.083
School mixedness	–.006**	.002	–.003	.002	–.005**	.002	.003	.003	.003	.003	.003	.003
School SES	–.586*	.127	–.580*	.106	–.582*	.105	.152	.142	.134	.112	.131	.117
Individual SES	–.040	.030	–.034	.024	–.043	.026	–.005	.033	–.006	.028	–.012	.029
GPA	–.013	.009	–.008	.007	–.012	.007	.0001	.009	.002	.007	.0004	.007
Curriculum enrollment	–.159**	.073	–.125	.073	–.172**	.072	–.069	.060	–.065	.039	–.071	.042
Parental support	–.240*	.018	–.195*	.017	–.223*	.018	–.171*	.016	–.118*	.015	–.141*	.017
Sense of belonging			–.348*	.028				–.349*	.023			
Teacher-pupil relationship					–.052*	.011					–.063*	.010

a. Average level of stress for pupils with average scores for the considered individual features in schools with average scores for the considered school features.
*p <.001. **p < .05.

composition of the school does lose its statistical significance (see Equation 2). This suggests that feeling integrated in the school community does function as a buffer against the stress-inducing processes of a coeducational environment. A segregated schooling environment, then, might be socially more desirable and beneficial for girls because of the fact that by virtue of a presumably higher level of cohesiveness, it provides better opportunities for meeting their need for group acceptance.

In regard to the second potential mediating factor, quality of the teacher-pupil interaction, it can be seen that contrary to our expectation, the association between the gender context of the school and stress among girls is largely unaffected by its inclusion (see Equation 3). Thus, the negative impact of being in a coeducational school is not lessened through positive relationships with teachers. Yet it appears that the quality of the teacher-pupil relationship is a very strong predictor of girls' as well as boys' stress levels ($p < .001$). Teachers, being key figures in developing a positive school climate, obviously play a critical role in relieving strain and pressure. It is interesting that separate analyses (not presented here) indicate that whether one is attending either a coeducational or a single-sex school does not seem to have, *ceteris paribus*, an observable effect on the perception of the quality of teacher-pupil relationships.

CONCLUSION

The analysis presented in this article aimed to provide a clearer picture of how and why coeducation may affect early adolescent girls' stress levels and therefore likely their sense of well-being. The focus was, more specifically, on identifying process variables that relate to the school context and that foster positive developments among their pupils. Drawing on stress process theories and research concerning gender differences in the social processes that influence stress levels, it was hypothesized that among girls, the gender context of schooling may exert its effects through social support mechanisms.

Consistent with our initial prediction, it was found that early adolescent girls' stress is to some extent conditioned by differences in the gender context of schooling. Specifically, it is indicated by the data that girls in single-sex schools show substantially lower levels of stress than their coeducational counterparts. This school-type effect persisted when other potential sources of stress, at both the individual level and school level, were taken into account. Thus, it would appear that gendered practices and social processes

governing peer group relations in coeducational schools do indeed increase girls' vulnerability.

Our findings further support the hypothesis that the association between the gender composition of the school and stress may be largely accounted for by girls' sense of connectedness to the social context of the school. Following our line of reasoning concerning early adolescent girls' greater need for acceptance and security in interpersonal relations, apparently, girls who perceive themselves as being well integrated in school are more likely to show lower stress levels regardless of the gender context of the school. In other words, the negative effects associated with the coeducational schooling environment are lowered under conditions of higher perceived social support. Girls' schools, then, may offer a protective environment not only because social risk factors are less prevalent but also on account of the quality of the interaction processes, the fostering of supportive ties, and the fact that the need for acceptance is accommodated to a larger extent. In addition, it has been pointed out that social support indicates that one is trusted, esteemed, valued, wanted, and also able to count on others (J. L. Epstein & Karweit, 1983; Thoits, 1995; Turner, 1999). In sum, the social structure of girls' schools governs the social psychological processes that may provide a basis for solidarity and hence, for girls' psychological well-being.

Considering that a socially supportive schooling environment fosters academic motivation and acceptance of educational values (Goodenow, 1993; Goodenow & Grady, 1993; Roeser, Midgley, & Urdan, 1996), these data also suggest that sex-segregated education would be all the more important during early adolescence as girls' confidence in their achievements tends to decline at this stage (Klein, 1988; Orenstein, 1994; Simmons & Blyth, 1987). This being the case, one would expect girls' schools to be able to better ensure equality of educational opportunity than mixed-sex schools. As a matter of fact, on the basis of data concerning this same research population, it has been demonstrated that single-sex schools tend to produce higher achievement in girls than coeducational schools do (Brutsaert, 2001).

It should be noted that present analysis is confined to early adolescents attending academic-type secondary schools. Indeed, the gendered context of social processes that influence pupils' stress levels might be different for older adolescents and girls attending coeducational technical schools in which girls and boys tend to be more or less segregated because of different vocational choices. Also, even though a quantitative approach does provide insight into the differential school climates, it might, given the complexity of gendered processes and of girls' experiences in school, be appropriate to further illuminate this issue by means of qualitative research.

REFERENCES

Abraham, J. (1995). *Divide and school*. London: Falmer.

American Association of University Women. (1995). *How schools shortchange girls*. Washington, DC: Author.

American Association of University Women. (1998). *Separated by sex: A critical look at single-sex education for girls.* Washington, DC: Author.

Berndt, T. J. (1982). The features and effects of friendships in early adolescence. *Child Development*, *53*, 1447-1460.

Bjorkqvist, K. (1994). Sex differences in physical, verbal, and indirect aggression: A review of recent research. *Sex Roles*, *30*, 177-188.

Brown, L., & Gilligan, C. (1992). *Meeting at the crossroads: Women's psychology and girls' development*. Cambridge, MA: Harvard University Press.

Brown, L., Way, N., & Duff, J. (1999). The others in my I: Adolescent girls' friendships and peer relations. In N. G. Johnson, M. C. Roberts, & J. Worell (Eds.), *Beyond appearance: A new look at adolescent girls* (pp. 205-225). Washington, DC: American Psychological Association.

Brutsaert, H. (1999). Coeducation and gender identity formation: A comparative analysis of secondary schools in Belgium. *British Journal of Sociology of Education*, *20*, 343-353.

Brutsaert, H. (2001). *Co-educatie. Studiekansen en kwaliteit van het schoolleven* [Coeducation. Educational opportunities and quality of school life]. Leuven/Apeldoorn, the Netherlands: Garant.

Brutsaert, H., & Van Houtte, M. (2002). Girls' and boys' sense of belonging in single-sex versus co-educational schools. *Research in Education*, *68*, 48-56.

Bryk, A., Raudenbush, S., & Congdon, R. (1996). *Hierarchical linear and nonlinear modeling with the HLM/2L and HLM/3L programs*. Chicago: Scientific Software International.

Bush, D. M. (1987). The impact of family and school on adolescent girls' aspirations and expectations: The public-private split and the reproduction of gender inequality. In J. Figueira-McDonough & R. Sarri (Eds.), *The trapped woman* (pp. 258-295). London: Sage.

Bush, D. M., & Simmons, R. (1987). Gender and coping with the entry into early adolescence. In R. Barnett, L. Biener, & G. Baruch (Eds.), *Gender and stress* (pp. 185-217). New York: Free Press.

Cairns, E. (1990). The relationship between adolescent perceived self-competence and attendance at single-sex secondary school. *British Journal of Educational Psychology*, *60*, 207-211.

Canada, K., & Pringle, R. (1995). The role of gender in college classroom interactions: A social context approach. *Sociology of Education*, *68*, 161-186.

Clark, M. L., & Bittle, M. L. (1992). Friendship expectations and the evaluation of present friendships in middle childhood and early adolescence. *Child Study Journal*, *22*, 115-135.

Compas, B. E., Slavin, L. A., Wagner, B. M., & Vannatta, K. (1986). Relationship of life events and social support with psychological dysfunction among adolescents. *Journal of Youth and Adolescence*, *15*, 205-221.

Compas, B. E., & Wagner, B. M. (1991). Psychosocial stress during adolescence: Intrapersonal and interpersonal processes. In M. E. Colten & S. Gore (Eds.), *Adolescent stress* (pp. 67-85). Hawthorne, NY: Aldine.

Delamont, S. (1990). *Sex roles and the school*. London: Routledge Kegan Paul.

Dubow, E. F., & Tisak, J. (1989). The relation between stressful life events and adjustment in elementary school children: The role of social support and social problem-solving skills. *Child Development*, *60*, 1412-1423.

Eder, D. (1985). The cycle of popularity: Interpersonal relations among female adolescents. *Sociology of Education*, *58*, 154-165.

Elwood, J., & Gipps, C. (1999). *Review of recent research on the achievement of girls in single-sex schools*. London: Institute of Education, University of London.

Epstein, D., & Johnson, R. (1998). *Schooling sexualities*. Buckingham, UK: Open University Press.

Epstein, J. L., & Karweit, N. (Eds.). (1983). *Friends in school: Patterns of selection and influence in secondary schools*. New York: Academic Press.

Gilligan, C. (1982). *In a different voice*. Cambridge, MA: Harvard University Press.

Goodenow, C. (1993). Classroom belonging among early adolescent students: Relationships to motivation and achievement. *Journal of Early Adolescence*, *13*, 21-43.

Goodenow, C., & Grady, K. E. (1993). The relationship of school belonging and friends' values to academic motivation among urban adolescent students. *Journal of Experimental Education*, *62*, 60-71.

Gore, S., Aseltine, R., & Colton, M. (1992). Social structure, life stress and depressive symptoms in a high school–aged population. *Journal of Health and Social Behavior*, *33*, 97-113.

Granleese, J., & Joseph, S. (1993). Self-perception profile of adolescent girls at a single-sex and a mixed-sex school. *Journal of Genetic Psychology*, *154*, 525-530.

Hannan, D. F., Smyth, E., McCullagh, J., O'Leary, R., & McMahon, D. (1996). *Coeducation and gender equality.* Dublin, Ireland: Oak Tree.

Hird, M. J. (2000). An empirical study of adolescent dating aggression in the U.K. *Journal of Adolescence*, *23*, 69-78.

Jackson, C., & Smith, I. A. (2000). Poles apart? An exploration of single-sex and mixed-sex educational environments in Australia and England. *Educational Studies*, *26*, 409-422.

Keel, P. K., Fulkerson, J. A., & Leon, G. R. (1997). Disordered eating precursors in pre- and early adolescent girls and boys. *Journal of Youth and Adolescence*, *26*, 203-216.

Klein, S. (1988). Sex education and gender equity. *Educational Leadership*, *54*, 69-75.

Kreienbaum, M. A. (1995). *Erfahrungsfeld Schule. Koedukation als Kristallisationspunkt* [School climate. Coeducation as a crystallization point]. Weinheim, Germany: Deutscher Studien Verlag.

Larson, R., & Ham, M. (1993). Stress and "storm and stress" in early adolescence: The relationship of negative events with dysphoric affect. *Developmental Psychology*, *29*, 130-140.

Lawrie, L., & Brown, R. (1992). Sex stereotypes, school subject preferences and career aspirations as a function of single/mixed-sex schooling and presence/absence of an opposite sex sibling. *British Journal of Educational Psychology*, *62*, 132-138.

Lee, V., & Bryk, A. (1986). Effects of single-sex secondary schools on student achievement and attitudes. *Journal of Educational Psychology*, *78*, 381-395.

Lee, V., Marks, H., & Byrd, T. (1994). Sexism in single-sex and coeducational independent secondary school classrooms. *Sociology of Education*, *67*, 92-120.

Lees, S. (1993). *Sugar and spice.* New York: Penguin.

Lin, N., & Peek, K. (1999). Social networks and mental health. In A. Horwitz & T. Scheid (Eds.), *Handbook for the study of mental health* (pp. 241-258). UK: Cambridge University Press.

Lockheed, M., & Klein, S. (1985). Sex equity in classroom organization and climate. In S. Klein (Ed.), *Handbook for achieving sex equity through education* (pp. 189-217). Baltimore: Johns Hopkins University Press.

Maccoby, E. E. (1990). Gender and relationships: A developmental account. *American Psychologist*, *45*, 513-520.

Mael, F. A. (1998). Single-sex and coeducational schooling: Relationships to socioemotional and academic development. *Review of Educational Research*, *68*, 101-129.

Mahony, P. (1985). *Schools for the boys? Coeducation reassessed*. London: Hutchinson.
Mirowsky, J., & Ross, C. E. (1989). *Social causes of psychological distress*. Hawthorne, NY: Aldine.
Moore, M., Piper, V., & Schaefer, E. (1993). Single-sex schooling and educational effectiveness: A research overview. In D. K. Hollinger & R. Adamson (Eds.), *Single-sex schooling: Perspectives from practice and research* (pp. 7-68). Washington, DC: U.S. Department of Education.
Murphy, P. (1999). Supporting collaborative learning: A gender dimension. In P. Murphy (Ed.), *Learners, learning and assessment* (pp. 258-276). London: Paul Chapman.
Nolen-Hoeksema, S., & Girgus, J. S. (1994). The emergence of gender differences in depression during adolescence. *Psychological Bulletin*, *115*, 424-443.
Nolen-Hoeksema, S., & Rusting, C. L. (1999). Gender differences in well-being. In D. Kahneman, E. Diener, & N. Schwarz (Eds.), *Well-being: The foundations of hedonic psychology* (pp. 330-350). New York: Russell Sage.
Orenstein, P. (1994). *School girls: Young women, self-esteem, and the confidence gap*. New York: Doubleday.
Pearlin, L. (1989). The sociological study of stress. *Journal of Health and Social Behavior*, *30*, 241-256.
Pearlin, L., Lieberman, E., & Mullan, J. (1981). The stress process. *Journal of Health and Social Behavior*, *22*, 337-356.
Petersen, A. C. (1980). Biopsychosocial processes in the development of sex-related differences. In J. E. Parsons (Ed.), *The psychobiology of sex differences and sex roles* (pp. 31-55). New York: McGraw-Hill.
Riordan, C. (1990). *Girls and boys in school: Together or separate*. New York: Teachers College Press.
Roeser, R. W., Midgley, R. W., & Urdan, T. C. (1996). Perceptions of the school psychological environment and early adolescents' psychological and behavioral functioning in school: The mediating role of goals and belonging. *Journal of Educational Psychology*, *88*, 408-422.
Rudolph, K., & Hammen, C. (1999). Age and gender as determinants of stress exposure, generation, and reactions in youngsters: A transactional perspective. *Child Development*, *70*, 660-677.
Rutter, M. (1979). Protective factors in children's responses to stress and disadvantage. In M. W. Kent & J. E. Rolf (Eds.), *Primary prevention of psychopathology: Social competence in children* (Vol. 3, pp. 49-74). Hanover, NH: University Press of New England.
Rutter, M. (1986). The developmental psychopathology of depression: Issues and perspectives. In M. Rutter, C. Izard, & P. Read (Eds.), *Depression in young people: Developmental and clinical perspectives* (pp. 3-30). New York: Guilford.
Sadker, M., & Sadker, D. (1994). *Failing at fairness*. New York: Scribner.
Sanders, M. G., & Jordan, W. J. (2000). Student-teacher relations and academic achievement in high school. In M. G. Sanders (Ed.), *Schooling students placed at risk: Research, policy, and practice in the education of poor and minority adolescents* (pp. 65-82). London: Lawrence Erlbaum.
Schieman, S., & Turner, H. (2001). "When feeling other people's pain hurts": The influence of psychological resources on the association between self-reported empathy and depressive symptoms. *Social Psychology Quarterly*, *64*, 376-389.
Shaw, J. (1995). *Education, gender and anxiety.* London: Taylor & Francis.
Shmurak, C. B. (1998). *Adolescent girls at single-sex and coeducational schools*. New York: Peter Lang.
Simmons, R. G., & Blyth, D. A. (1987). *Moving into adolescence.* Hawthorne, NY: Aldine.

Simmons, R. G., Burgeson, R., Carlton-Ford, S., & Blyth, D. (1987). The impact of cumulative change in early adolescence. *Child Development*, *58*, 1220-1234.

Stables, A. (1990). Differences between pupils from mixed and single-sex schools in their enjoyment of school subjects and in their attitudes to science and to school. *Educational Review*, *42*, 221-230.

Stetsenko, A., Little, T. D., Gordeeva, T., Grasshof, M., & Oettingen, G. (2000). Gender effects in children's beliefs about school performance: A cross-cultural study. *Child Development*, *71*, 517-527.

Streitmatter, J. L. (1999). *For girls only.* Albany: State University of New York Press.

Thoits, P. A. (1982). Conceptual, methodological and theoretical problems in studying social support as a buffer against life stress. *Journal of Health and Social Behavior*, *23*, 145-159.

Thoits, P. A. (1995). Stress, coping, and social support processes: Where are we? What next? *Journal of Health and Social Behavior*, *36*, 53-79.

Thorne, B. (1993). *Gender play: Girls and boys in school*. New Brunswick, NJ: Rutgers University Press.

Trickett, E. J., Trickett, P. K., Castro, J. J., & Schnaffner, P. (1982). The independent school experience: Aspects of the normative environments of single-sex and coed secondary schools. *Journal of Educational Psychology*, *74*, 374-381.

Turner, R. (1983). Direct, indirect and moderating effects of social support on psychological distress and associated conditions. In H. Kaplan (Ed.), *Psychosocial stress: Trends in theory and research* (pp. 105-155). New York: Academic Press.

Turner, R. (1999). Social support and coping. In A. Horwitz & T. Scheid (Eds.), *Handbook for the study of mental health* (pp. 198-210). Cambridge, UK: Cambridge University Press.

Turner, R., & Turner, J. (1999). Social integration and support. In C. Aneshensel & J. Phelan (Eds.), *Handbook of the sociology of mental health* (pp. 301-319). New York: Kluwer.

Wagner, B. M., & Compas, B. E. (1990). Gender, instrumentality, and expressivity: Moderators of the relation between stress and psychological symptoms during adolescence. *American Journal of Community Psychology*, *18*, 383-406.

Wertlieb, D., Weigel, C., & Feldstein, M. (1987). Stress, social support, and behavior symptoms in middle childhood. *Journal of Clinical Child Psychology*, *16*, 204-211.

Wong, K. C., Lam, Y. R., & Ho, L.M. (2002). The effects of schooling on gender differences. *British Educational Research Journal*, *28*, 827-843.

Herman Brutsaert is a professor in the Department of Sociology, Ghent University, Belgium. His current research interests include school organization and its effects on the attitudinal development of adolescents, single-sex schooling, and issues of gender.

Mieke Van Houtte is a research associate in the Department of Sociology, Ghent University, Belgium. Her current topics of interest include the effects of structural and compositional school features on several outcomes of pupils and teachers.