

Social support, sense of community in school, and self-efficacy as resources during early adolescence: an integrative model

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Abstract Influences of different sources of social support (from parents and friends), school sense of community, and self-efficacy on psychosocial well being (as measured by self-reported life satisfaction and psychological symptoms) in early adolescence were investigated in an integrative model. The model was tested using structural equation modeling. Multi-group comparisons were used to estimate differences between sex and age groups. The survey sample was composed of 7,097 students in Northern Italy (51.4% male) divided into three age cohorts (equivalent to 6th, 8th, and 10th grades with median ages of 11, 13, and 15). Findings obtained using SEM were consistent with self-efficacy and school sense of community mediating effects of social support on psychosocial adjustment. The multi-group comparison indicates a need for more complex developmental models and more research on

how changing forms of support interact with each other as their effects also change during this important stage of the life. Implications for primary prevention and cross-cultural comparisons are discussed.

Keywords School sense of community · Social support · Self-efficacy · Adolescent development · Adjustment · Gender · Cohort differences · Well-being · HBSC · Health behavior of school-aged children

Positive self-perceptions (e.g., self-efficacy) and supportive relationships with others (social support) have each been conceptualized as resources that promote successful adaptation during adolescence (Bandura, Pastorelli, Barbaranelli, & Caprara, 1999; Compas, Hiden, & Gerhardt, 1995; Juang & Silbereisen, 1999; Sandler & Twohey, 1998; Saunders, Davis, Williams, & Williams, 2004). Early adolescence is a developmental period characterized by a challenging array of biological, cognitive, and social changes during which the interconnection between self-efficacy, family and peer experiences are important (Bandura, Barbaranelli, Caprara, & Pastorelli, 2001). Indeed, there is probably no other stage of development when this interface is more salient for youth (Franco & Levitt, 1998).

Favorable views of oneself and one's abilities, as an internal asset, appear also to be valuable in helping young adolescents to avoid emotional difficulties (e.g., Bandura, 1997; DuBois, Burk-Braxton, Swenson, Tevendale, & Hardesty, 2002a; Jenkins, Goodness, & Buhrmester, 2002). Similar benefits are apparent for the wide-ranging types of external support that youth might receive at this age, from tangible assistance to

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the opportunity to simply have others listen to and validate one's feelings (Cauce, Mason, Gonzales, Hiraga, & Liu, 1996; Moran & DuBois, 2002).

During adolescence, besides family and peers, the school plays a central role in the life of youths. The social climate of this setting (e.g., in terms of inclusiveness and support) is an important condition influencing both the extent of “social capital”—the number and quality of informal social resources to which the individual can turn when problems arise—and the likelihood that a student will make use of those network ties (Cartland, Ruch-Ross, & Henry, 2003). In fact, students' sense of community or belongingness in the school setting is linked to important motivational, attitudinal, and behavioral factors that are associated with psychosocial well-being and adjustment (Bateman, 2002; Battistich & Hom, 1997; Pretty, Andrewes, & Collett, 1994).

Despite the extensive literature on the effects of social support and self-worth on the adjustment of adolescents, relatively little research has compared different age groups. Furthermore, many of the studies that were more developmentally oriented (McFarlane, Bellissimo, & Norma, 1995; Moran & DuBois, 2002), failed to include arguably the most important setting at that age—i.e., school. When the school context has been included (DuBois et al., 2002b), its particular social support role has not been clearly distinguished from that of other important contexts (i.e., family and peers).

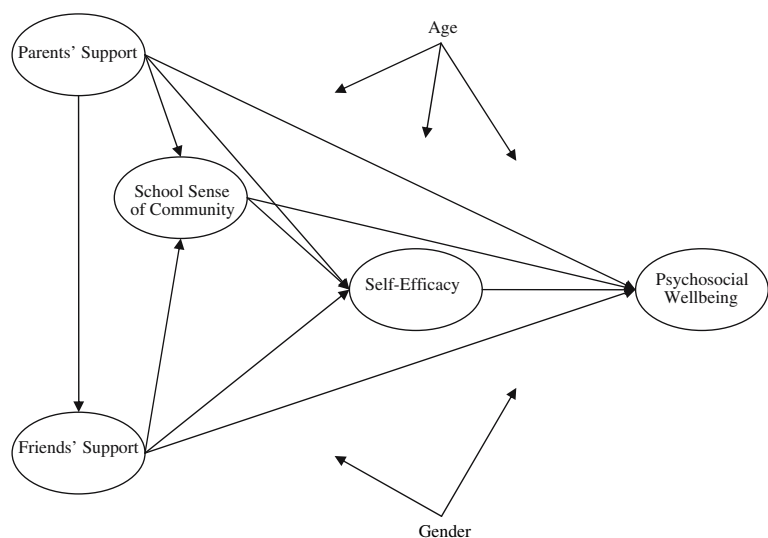
The framework guiding the present study comes from Bronfenbrenner's ecological systems theory (Bronfenbrenner, 1979) that conceptualized how personal and social/environmental contexts interact in facilitating (or hindering) developmental outcomes.

Bronfenbrenner's model posits the child at the center of multiple, interrelated levels of social systems. The conceptual framework used to guide the present research rests on several key assumptions or hypotheses (see Fig. 1). These include the ideas that: (a) different sources of support may play different roles in predicting psychosocial well-being directly or through their effects on self-efficacy; (b) sense of community in the school may have both a direct effect on self-efficacy and well being (satisfying a fundamental need to belong) and a mediating effect as it may also be related to social support from parents and friends; and (c) sex differences and age-related shifts may occur in the relations among these variables as youths progress through this transitional developmental stage.

Developmental patterns in social support and self-efficacy during early adolescence

Prior theory and research have established well the importance of both social support and self-efficacy in facilitating adjustment during adolescence (Bandura, 1997; Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003; Bradley & Corwyn, 2001; McFarlane et al., 1995). Regarding self-efficacy, Bandura (1997) noted, “Individuals play a proactive role in their adaptation rather than simply undergoing happenings in (the environment)... The success with which the risks of challenges of adolescence are managed depends, in no small measure, on the strength of personal efficacy” (p. 178). To that, Bradley and Corwyn (2001) respond: “What does this proposition signify for individuals making the transition to

Fig. 1 Conceptual framework for relations of social support, school sense of community and self-efficacy to psychosocial well-being during early adolescence



adolescence as regards their use of the environment?” (p. 166). They suggest that efficacy beliefs may moderate adolescents’ responses to their environments as well as mediate the relation between the environment and adolescent development. Bandura, according to Schiaffino and Revenson (1992), also contends that self-efficacy beliefs mediate the relationship between what the environment affords adolescents by way of incentives and demands and the level of success they attain. In that sense, adolescents with a stronger sense of personal efficacy will be more attentive to opportunities afforded by the environment, and they will be more motivated to take advantage of those opportunities in their pursuit of personal goals. Additionally, individuals with a strong sense of personal efficacy will be less dependent on what specific environments afford or demand, trusting that they have the capacity to bring about desired goals on their own.

As a time of transition, early adolescence engenders substantial concerns about one’s self-regulatory capacities and one’s ability to control what happens at home, among peers, at school, and in the community. It is a time for reformulating personal efficacy beliefs and a time of exercising beliefs about one’s agency toward newly emerging goals (Eccles & Midgley, 1989). As the environment begins to afford new opportunities and make new demands, adolescents must construct new approaches for dealing with those opportunities and demands. According to Bandura (1997), if the environment provides conditions supportive of positive efficacy beliefs, then adaptive functioning in early adolescence is more readily achieved. This suggests that differing sources of social support and self-efficacy, and their patterning across salient contexts of early adolescent development, are an important consideration independent of the overall levels of availability of either type of resource (Bronfenbrenner, 1979; Magnusson, 1995). Of particular importance in this regard may be the degree of adaptive balance that is reflected in various sources of social support and influences on self-efficacy, including peers, family members (especially parents), and significant adult figures (e.g., teachers).

Moreover, adolescents may be sensitive to the interconnections between family, peer, and school experiences (Roberts et al., 2000). Theory has long implicated not only family (especially parental) and peer contexts but also their interplay as potentially powerful actors in self-perception development, which is of paramount importance during adolescence (Sullivan, 1953).

School sense of community as a mediator of social support effects

Reflecting on this general picture, it is clear that we are missing an important setting in the life of early adolescents. In fact, during this stage of the life cycle, the school plays an important role in facilitating or inhibiting successful adolescent development (Cartland et al., 2003; Roeser, Midgley, & Urdan, 1996; Schaps & Solomon, 2003). Schools potentially can provide early adolescents with opportunities to develop their intellectual capacities, to experience a sense of competence and belonging, and to interact with supportive, non-parental adults, all significant factors related to psychosocial well-being. For instance, at a time when adolescents are known to be sensitive about how they appear to others, and are particularly in need of supportive relationships with adults outside the home, the quality of relationships with teachers is less than optimal for most adolescents (Midgley, Feldlaufer, & Eccles, 1989). Several studies (Bateman, 1998; Battistich, Solomon, Kim, Watson, & Schaps, 1995; Eccles et al., 1993; Galliher, Rostosky, & Hughes, 2004; Osterman, 2000; Pretty et al., 1994) suggest that school environments that are perceived as supportive, caring, and emphasizing individual effort and improvement are related to a more adaptive pattern of cognition, affect, and behavior than are school environments that are perceived as less supportive and emphasizing relative ability and competition.

The concept of *school sense of community* has been used by many researchers to describe the psychological aspects of school settings and groups that satisfy the need for belonging and support (e.g., Bateman, 2002). Several definitions and models of sense of community have been developed (for a review see Fisher, Sonn, & Bishop, 2002). Many researchers have borrowed, in part or in full, from McMillan and Chavis’ (1986) definition of a psychological sense of community, which includes four dimensions. Three of those dimensions (feelings of membership and identification, shared emotional connection, and needs fulfillment) have been recognized as integral in developmental theories of sense of community (Cartland et al., 2003; Chipuer & Pretty, 1999). The fourth dimension (mutual influence), although clearly important to people’s sense of well-being and related to some degree to the other dimensions, has generated both methodological and theoretical concerns. Even among adults, however, different studies have concluded that the definition proposed by McMillan and Chavis is overly broad (Fisher & Sonn, 2002; Perkins & Long, 2002). In particular, we share concerns about the content validity of

including the influence dimension, which overlaps with other important constructs, such as self-efficacy/locus of control, collective efficacy, and empowerment. We prefer McMillan and Chavis' (1986) simpler and more coherent statement that sense of community is "a feeling that members have of belonging and being important to each other, and a shared faith that members' needs will be met by the commitment to be together" (p. 9).

Although the relationship between school sense of community and psychosocial adjustment seems to be very important, students often do not have positive attitudes toward school. Couple this with evidence that sense of community tends to decrease with age (Battistich et al., 1995), and there is a danger that by not attending more closely to enhancing school sense of community, we may be missing a valuable opportunity to help students to develop both social resources and internal strengths (e.g., self-efficacy) to cope with all sorts of problems, small and large.

The need for belonging, social support, and acceptance takes on special prominence, particularly during early adolescence, when young people begin to consider seriously who they are and wish to be, with whom they belong, and where they intend to invest their energies and stake their future (Goodenow, 1993). Because this period involves exploring aspects of personal identity separate from parents and family, adolescents come to devote more time, thought, and emotional energy to non-familial peers (e.g., friends) and other significant adult figures (e.g., teachers), and to the contexts in which they interact with those outside the family (e.g., school; Pretty, 2002). During early adolescent development, the sense of personal acceptance and having a valued place in different social contexts makes students' sense of community in their schools and classes an especially important concern for educators, school counselors and psychologists, and for the development of prevention programs.

Moreover, although some risk or protective factors (e.g., genetics, family structure) are not amenable to school-based interventions, a child's sense of self and support network are clearly amenable to intervention. For example, it may not be possible to make a harried and overworked parent more attentive and supportive, but it may be possible to link an adolescent with a regular group activity or another supportive adult (Schaps & Solomon, 2003).

In general, research shows that teacher and classmate support have a stronger and more direct influence on school experiences and engagement than does parental support (Osterman, 2000; Ryan, Stiller, & Lynch, 1994; Wentzel, 1997). On the other hand, there

is evidence (Vieno, Perkins, Smith, & Santinello, 2005; Wentzel, 1998) that shows how social support and sense of security with parents and friends contribute to school engagement primarily through their effect on students' relationships with teachers and classmates. The possibility that sense of community may mediate the relationship between social support and self-efficacy (which, in turn, are so important to psychosocial well-being) thus has a great deal of theoretical appeal and support, but has not been clearly established empirically (see Schaps & Solomon, 2003), and is even less well understood in early adolescence.

Aim and hypotheses

The main aim of the present study is to test the theoretical model proposed (Fig. 1), comparing three age groups and comparing sex differences.

Based on theories and studies on the roles of social support and self-worth perceptions in stress and coping (DuBois et al., 2002a, 2002b; Timko, Moos, & Michelson, 1993), we hypothesized both a direct effect of social support (from parents and friends) on self-efficacy and psychosocial well-being and an indirect effect mediated by school sense of community. According to prior research (see Vieno et al., 2005), we expect support from parents and friends to be related to school sense of community, which in turn we hypothesize, should be related to both self-efficacy and psychosocial well-being.

Comparing three ages groups, we expect a progressive shift of importance of the two main sources of support: in early adolescence parents play a dominant role that decreases with age (Steinberg & Morris, 2000) as peer support's role in self-efficacy and psychosocial well-being increases through adolescence.

Moreover, due to important cognitive changes (e.g., abstraction capacity) and greater independence from parents during early adolescent development (Larson, 1997), we expect a progressive increase in the relationship between self-efficacy and psychosocial well-being (Bandura, 1997).

Regarding sex differences, research suggests that support of parents is more strongly related to self-esteem for girls and support of friends for boys (Saunders et al., 2004). Moreover, we expect external supports (from parents, friends, and school sense of community) to be more closely related to psychosocial well being for girls and internal resources (self-efficacy) to be more important for boys (Bandura, 1995).

Finally, we expect sense of community in school to be positively related to self-efficacy and well-being, but comparing three ages groups, we hypothesize that the

relationship will decrease with age (Battistich et al., 1995). Based on Moore and Bolero (1991), we expect the relationship between school sense of community and both self-efficacy and well being to be stronger for girls than for boys.

Methods

Setting and sampling

The data used are from a research project in the Veneto region of Northeast Italy, which is part of the “Health Behavior in School-aged Children” (HBSC) project, a trans-national study carried out in collaboration with the World Health Organization (Aarø, Wold, Kannas, & Rimpelä, 1986). The national and international samples include no data on several aspects of interest of this paper, such as parental bonding and self-efficacy. Therefore, only the Veneto regional data have been used for this study.

With our focus on adolescent sense of community in schools, it is important to understand certain aspects of the Italian school system. Students in Italian schools stay in the same class setting, and with the same class peer group and teacher, throughout the elementary school grades, changing only with changes of school (from elementary to middle school through, which typically occurs at age 11). Students and teacher also stay together for all the middle school years, and at least, the first 2 years of secondary school.

The study includes the three grade levels in which 11-, 13-, and 15-year-olds are concentrated (corresponding to the 6th, 8th, and 10th grades in the United States, or 1st and 3rd grade of Italian middle school, and 2nd grade of Italian secondary school). Participants were chosen in a three-stage procedure that maximized the likelihood of drawing a representative sample of children. First, 218 out of 582 middle schools and high schools were randomly selected from the Regional School Office’s data base. Only 13 (6% of) schools sampled declined to participate. Then, in each of the sampled schools one or two classes (for each grade) were selected randomly. Finally, all students in the sampled classes were invited to participate in the study.

The sample drawn consisted of 233 classes in 96 middle schools, and 141 classes in 109 high schools (breakdown by age and gender below).

Parental consent for participation in the research was obtained before the survey for the students who completed the questionnaire (98.7% of the total sample). The participants responded to the questionnaires

during the regular school day, and were assured of the confidentiality of their answers. A portion ($n = 650$) of the original sample did not participate in the survey because of sickness (490), refusal (99), or disability (61). Classroom teachers administered the questionnaires, after completing two hours of training.

The surveys of 111 students were excluded due to excessive missing data or other problems (e.g., no gender indicated).

Participants

The questionnaire was completed by a total of 7,097 students. The average age of each of the three age groups is: 11.69 years ($N = 2,249$); 13.74 years ($N = 2,246$); and 15.85 years ($N = 2,602$). The 11- and 13-year-old cohorts were in middle schools and the 15-year-olds were in high schools. The sample consists of 3,650 boys (51.4%) and 3,447 girls (48.6%).

Measures

Data were collected in May 2002, through a self-report questionnaire, devised in 2001–2002 by the HBSC research team in charge of the larger, international study of adolescents’ health behaviors. Only data related to perceived family support, perceived friends’ support, sense of community in the school, self-efficacy, and psychosocial well-being, and demographic characteristics were analyzed for the present study.

Perceived parents’ support. Perceived parents’ support was assessed by two different indicators (bonding and time spent with parents): *Bonding* was measured by a four-item scale (asked separately for each parent) assessing the warmth of relations between adolescents and parents (part of the Parental Bonding Inventory, Parker, Tupling, & Brown, 1979). Items included: “My mother/father” (1) “Helps me as much as I need”; (2) “Is loving”; (3) “Understands my problems and worries”; (4) “Makes me feel better when I am upset”. Responses were rated on a three-point scale (1 = almost always; 2 = sometimes; 3 = never). Alpha reliability for the eight-item scale was .84. Responses were averaged for the measure of parental bonding. *Time spent with parents* was measured by an eight-item scale (from the Twenty-07 Study; Sweeting, West, & Richards, 1998). The scale items included: “How often do you and your parents do each of these things: (1) watch TV or videos together; (2) play indoor games together; (3) eat a meal together; (4) go for a walk together; (5) go places together; (6) visit a friend or a relative together; (7) play sports together; (8) sit and

talk about things together”. Responses were rated on a five-point scale (1 = never to 5 = every day). Alpha reliability for the eight-item scale was .81. Responses were averaged for the measure of time spent with parents.

Perceived friends’ support. Perceived friends’ support was assessed by three different indicators (ease of communication, number of friends, and time spent with friends): *Ease of communication* with friends was measured by a three-item scale (Settretobulte & Warren, 2001). Items included: “How easy is it to talk to the following persons about things that really bother you: (1) best friend; (2) friend(s) of the same sex; (3) friend(s) of the opposite sex”. Responses were rated on a four-point scale (1 = very easy to 4 = very difficult). All items were reverse coded. Alpha reliability for the three-item scale was .71. Responses were averaged for the measure of ease of communication with friends. *Number of friends* was measured by two items characterizing the size of the informal social network of peers, by sex (Settretobulte & Warren, 2001): “At present, how many close male/female friends do you have?” Responses were rated on a four-point scale (1 = none to 4 = three or more). The two indicators were correlated $r = .35$ ($p < .001$). Responses were averaged for the measure of number of friends. *Time spent with friends* was measured by two items (Settretobulte & Warren, 2001): (1) “How many days a week do you usually spend time with friends right after school?” (2) “How many evenings per week do you usually spend out with your friends?” Responses to the first item were rated on a seven-point scale (from 0 to 6 days) and the second were rated on an eight-point scale (from 0 to 7). The two indicators were correlated $r = .36$ ($p < .001$). Responses were averaged for the measure of time spent with friends.

Self-efficacy. Students’ self-efficacy was assessed by a six-item scale (part of the General Self-Efficacy Scale; Schwartzer, 1992). Items included: “(1) I can always manage to solve difficult problems if I try hard enough; (2) Thanks to my resourcefulness, I can handle unforeseen situations; (3) I can remain calm when facing difficulties because I can rely on my coping abilities; (4) When I’m confronted with a problem, I can find several solutions; (5) If I am in trouble, I can think of a good solution; (7) I can handle whatever comes my way.” Responses were rated on a five-point scale (1 = completely disagree to 5 = completely agree). Alpha reliability for the six-item scale was .74. Responses were averaged for the measure of self-efficacy.

Sense of community in the school. Students’ sense of community in the school was assessed by a six-item

scale (Samdal, Wold, & Torsheim, 1998) that generally reflects three of the four dimensions in the McMillan and Chavis (1986) framework: membership (items 1 and 2), shared emotional connection (items 3 and 4), and fulfillment of needs (items 5 and 6). (We prefer to view the fourth dimension, group influence, as a separate, but related construct,¹ which is closer to concepts of collective efficacy, or empowerment.) The scale items include: “(1) I feel I belong at this school; (2) Other students accept me as I am; (3) Our school is a nice place to be; (4) The students in my class enjoy being together; (5) Most of the students in my class are kind and helpful; (6) When I need extra help, I can get it from my teacher.” Responses were rated on a five-point scale (1 = strongly disagree to 5 = strongly agree). The alpha reliability for the six-item overall scale was .71 and all the items loaded on one factor in a principal components analysis, but in order to evaluate the distinct contribution of each of the three dimensions to the latent construct of sense of community in the school, we decide to use the separate subscales.

Psychosocial well-being. Psychosocial well-being was assessed by two different indicators (life satisfaction and psychological complaints): *Life satisfaction* was measured by one item (Cantril, 1965): “Here is a picture of a ladder. The top of the ladder ‘10’ is the best possible life for you and the bottom ‘0’ is the worst possible life for you. In general, where on the ladder do you feel you stand at the moment?” Responses were rated on an 11-point scale (0–10). *Psychological complaints* are a non-clinical measure of mental health composed of a five-item scale (part of the HBSC Symptom Checklist; Haugland & Wold, 2001). The scale items include: “In the last 6 months, how often have you had the following? (1) Feeling low; (2) Irritability or bad temper; (3) Feeling nervous; (4) Difficulties in getting to sleep; (5) Feeling dizzy.” Responses were rated on a five-point scale (1 = rarely or never to 5 = about every day). Alpha reliability for the eight-item scale was .72. Responses were averaged for the measure of psychological complaints.

Analytic approach

Structural equation modeling (Jöreskog & Sörbom, 1996), implemented by the program LISREL (8.50),

¹ Chipuer and Pretty (1999), Long and Perkins (2003), and others have failed to empirically confirm the McMillan and Chavis (1986) factor structure. Chipuer and Pretty found that, across samples of both adolescents and adults, the Influence items of the Sense of Community Index load on multiple factors and those factors accounted for the lowest portion of common variance in the total SCI scale.

was used to test the adaptability of our data to the model proposed.

Following Cudeck and Brown (1983), we use a *cross-validation* strategy in which the model is developed using a calibration data sample and then confirmed using an independent validation sample. For this reason, two independent samples were chosen according to sex and grade to maximize the likelihood of drawing randomly two representative subsamples of children. To test the proposed model, the first analyses were conducted on the first subsample (the fully saturated model on the *calibration sample*), and then re-tested on the *validation sample* (Jöreskog & Sörbom, 1996). This is the most common approach found in the literature, and is considered the best method for testing new theoretical models (e.g., Yuan, Marshall, & Weston, 2002).

We considered the following indices as indicators of the model’s overall goodness of fit: Chi square (χ^2) is used as a test of the null-hypothesis (whether the data fits the model or not). However, reliance on the χ^2 has been criticized, especially in the case of large samples (more than 200; Jöreskog & Sörbom, 1996; Saris, 1982). For that reason, we also used the Goodness of Fit Index (GFI), the Adjusted Goodness of Fit Index (AGFI), the Comparative Fit Index (CFI), and Non-Normed Fit Index (NNFI)—with values ranging from 0 (a poor fit) to 1 (a perfect fit). Finally, we also used the Root Mean Squared Error of Approximation (RMSEA), which is considered good when lower than .06 (Hu & Bentler, 1999).

Finally, to test the model on the different groups (sex and age groups) the *multi-group* approach (Jöreskog & Sörbom, 1996; see for example Byrne, 1989) was used. The analyses were performed on five samples, derived according to sex and grade, from the calibration sample. This analysis allows estimating the fit of the model and the parameters simultaneously on different sub-groups. In particular, the hypothesis of the invariance of the covariance matrix and the hypothesis of the form invariance (same dimensions, and same patterns of fixed, free, and constrained values in all matrices) on different groups tested the fit and parameters of the model comparing boys and girls and among different age groups.

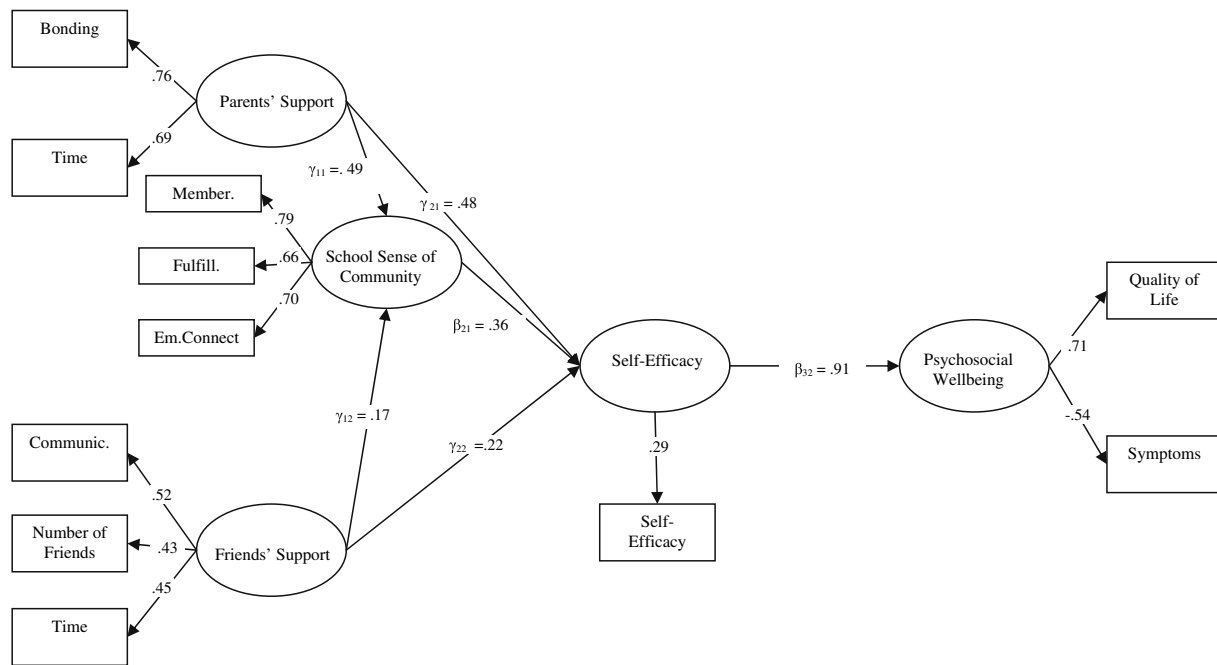
Results

Preliminary analyses. Descriptive statistics and bivariate correlations among variables for the total sample are shown in Table 1. In general, all the correlations are in the expected direction. The three indicators of sense of community are moderately intercorrelated (.48–.56), indicating that they can be combined into a coherent mono-factorial index (see Measures), but each subscale also contributes unique information about students’ feelings of school-related community or support. The intercorrelations among the two indicators of psychosocial well-being (*r*) and all the rest of the variables range from low (.01) to moderate (.33).

Table 1 Means, standard deviations, and correlations among variables

Variables	1	2	3	4	5	6	7	8	9	10	11
<i>Perceived parents’ support</i>											
1. Bonding	–										
2. Time	.51**	–									
<i>Perceived friends’ support</i>											
3. Communication	-.03*	.01	–								
4. Number of friends	.08**	.14**	.21**	–							
5. Time	-.08**	.02	.24**	.18**	–						
<i>SSOC</i>											
6. Membership	.30**	.24**	.11**	.17**	.04*	–					
7. Fulfillment of needs	.26**	.24**	.08**	.17**	.01	.51**	–				
8. Emotional connection	.26**	.27**	.01	.11**	.08*	.56**	.48**	–			
<i>Self-perception</i>											
9. Self-efficacy	.24**	.20**	.01	.12**	.01	.26**	.21**	.21**	–		
<i>Psychosocial well-being</i>											
10. Life satisfaction	.33**	.30**	.07*	.14**	.05*	.30**	.25**	.24**	.33**	–	
11. Psych. Symptoms	-.24**	-.20**	-.01	-.12**	-.01	-.26**	-.21**	-.21**	-.22**	-.38**	–
M	2.43	3.01	3.88	3.22	2.09	3.63	3.61	3.71	3.57	7.42	2.43
SD	.46	.68	.77	.84	1.46	.82	.77	.78	.60	1.80	.87

* *p* < .05; ** *p* < .01



$$\chi^2 (38) = 204.44 (p < .001), \text{GFI} = .98, \text{AGFI} = .96, \text{CFI} = .96, \text{NNFI} = .95, \text{RMSEA} = .05$$

Fig. 2 Structural equation model conducted on the *Validation Sample*

Testing the theoretical model. Analyses began with the fully saturated model (Fig. 1) in which all paths among the variables were assessed. Four path coefficients, from perceived parents' support to perceived friends' support, and from both those variables and school sense of community to psychosocial well-being were not significant. Those paths were singularly deleted and the fit controlled: in each case data fit the model better when those relations are removed. Figure 2 represents the empirical estimation on the *calibration sample* of the theoretical model proposed (standardized paths are reported).

The resulting model produced these fit indices: $\chi^2 (38) = 204.44 (p < .001)$, GFI = .98, AGFI = .96, CFI = .96, NNFI = .95, RMSEA = .05. The χ^2 result suggests the model fit may not be very good, although one must bear in mind the limitation of χ^2 with large samples. Observing the remaining indices, it is possible to conclude that the model produces an adequate fit. The squared multiple correlations for structural equation are: $R^2_{\eta_1} = .30$, $R^2_{\eta_2} = .73$, $R^2_{\eta_3} = .58$. Thus, 30% of the variance in school sense of community, 73% of self-perception, and 58% of variance in psychosocial well-being is accounted for in the model.

In addition to the direct relationships presented in Fig. 2, there are some indirect relationships (not included in Fig. 2) to consider. Perceived parents' and friends' support each have a modest indirect relation-

ship with self-efficacy through sense of community (.18, $p < .01$, and .06, $p < .01$, respectively), and a more substantial relationship with psychosocial well being through self-efficacy (.60, $p < .01$ and .26, $p < .01$). Furthermore, school sense of community has an indirect relationship with psychosocial well being through its relationship with self-efficacy (.33, $p < .01$).

The retesting of the model on the *validation sample* demonstrated an adequate fit: $\chi^2 (38) = 438.09 (p < .001)$, GFI = .98, AGFI = .96, CFI = .97, NNFI = .95, RMSEA = .05. This result further validates the statistical goodness of fit of the model hypothesized.

An alternative model testing the reverse causal direction, where the more highly functioning youth simply perceive themselves as more efficacious, their school as more welcoming, and their parents and friends as more supportive was also supported but did not fit the data as well as (all the indices were worse than) the proposed model: $\chi^2 (37) = 238.82 (p < .001)$, GFI = .96, AGFI = .94, CFI = .95, NNFI = .94, RMSEA = .06.²

After evaluating the overall fit in the two samples, the model was tested separately in the different sub-groups (Table 2): males and females, and the three

² All analyses are available upon request from the corresponding author.

Table 2 Fit index for different sub-groups (sex, age group)

Sub-groups	Fit index							
	χ^2	df	<i>p</i>	RMSEA	GFI	AGFI	CFI	NNFI
Males	93.86	38	<.001	.04	.98	.96	.97	.96
Females	151.76	38	<.001	.06	.97	.94	.95	.92
11-year-old	112.62	38	<.001	.06	.96	.92	.94	.92
13-year-old	81.29	38	<.001	.05	.97	.95	.97	.95
15-year-old	101.33	38	<.001	.05	.97	.95	.96	.93

Table 3 Multigroup invariance test for sex and age group

Sub-groups	Fit index					
	χ^2	df	<i>p</i>	RMSEA	CFI	NNFI
<i>Sex</i>						
$H_0: \Sigma_m = \Sigma_f$	146.66	66	<.001	.04	.98	.97
$H_0: k_m = k_f$	245.53	76	<.001	.06	.96	.94
<i>Age group</i>						
$H_0: \Sigma_{11} = \Sigma_{13} = \Sigma_{15}$	266.63	132	<.001	.05	.97	.96
$H_0: k_{11} = k_{13} = k_{15}$	295.24	114	<.001	.06	.95	.93

Σ = covariance matrices; *k* = forms

cohorts (11-, 13-, and 15-year-olds). All the fit statistics indicate that the model produces adequate fit in all subsamples and confirm the hypothesized relationships among variables across all the subgroups and the consistency and robustness of the model.

After evaluating the overall fit of the model in the total sample and the different subsamples, multigroup comparisons were used to examine the extent to which this model is consistent, in terms of covariance matrices (Σ) and forms (dimensions, and patterns of fixed, free, and constrained values; *k*), across groups (Table 3).

All the fit indices presented indicate significant statistical differences in the covariance matrices and forms between males and females and across the different age cohorts. It is therefore important to analyze and compare the structural parameters of the model in the different subgroups. Table 4³ presents all the parameters included in the model and the *R*² for each of the endogenous variables. Non-significant paths are not reported in the table.

The indirect relationship between sense of community in school and psychosocial well-being is confirmed across the subsamples of males and females (.23, *p* < .05 and .20, *p* < .05), and in the 11- and 15-year-old cohort (.29, *p* < .01 and .13, *p* < .05).

³ Total sample has been reduced from 7,097 to 5,206 because of missing data on one or more variables included in the analyses.

Some of the findings from the comparison of parameters across subgroups are of particular interest. As expected, perceived friends' support is more related to school sense of community (γ_{12}) in males than females for whom this relationship is not significant. Comparing 11- and 15-year-olds, our results suggest that this relationship tends to decrease with age. On the other hand, the relationship between perceived parents' support and school sense of community (γ_{11}) is more stable across sex and age groups.

The relationship between perceived family support and self-efficacy (γ_{21}) is clear for both sexes and across age groups. Also the relationship of perceived friends' support to self-efficacy (γ_{22}) is not significantly different for boys than for girls. The magnitude of this relationship was greater for 13-year-olds than for 11-year-olds, however.

Sense of community in the school seems to be equally related to self-efficacy (β_{21}) among the three cohorts and its effect is similar for boys and girls. Finally, self-efficacy seems to play a central role in psychosocial well-being for both males and females, and for all three cohorts.

Discussion

Summary of results

The present study substantially validates the theoretical model proposed in which family and friends' support both are related to school sense of community among early adolescents and their self-efficacy, which in turn is strongly related to psychosocial well-being, as suggested by DuBois et al. (2002a, 2002b). School sense of community also is significantly related to self-efficacy. The goodness of fit of the structural equation model is confirmed by the analyses conducted on the entire sample and several subsamples, by sex and across three age cohorts. There are several variations within subsamples, however, that are also consistent with hypothesized sex and cohort differences.

Table 4 Standardized and unstandardized structural parameters and confidence intervals of the relationships among latent constructs and R^2 for sex and age groups

	n	Parameters	γ_{11}	γ_{12}	γ_{21}	γ_{22}	β_{21}	β_{32}	$R^2_{\eta_1}$	$R^2_{\eta_2}$	$R^2_{\eta_3}$
Calibration sample	1,499	Standardized	.51	.20	.56	.41	.25	.76	.30	.73	.58
		Unstandardized	.96	.43	.51	.43	.12	3.45			
		Conf. Interval	(.81–1.10)	(.22–.64)	(.39–.62)	(.27–.58)	(.08–.17)	(2.90–4.00)			
Validation sample	3,707	Standardized	.49	.17	.48	.22	.36	.91	.27	.61	.83
		Unstandardized	.93	.31	.42	.18	.17	3.83			
		Conf. Interval	(.85–1.01)	(.21–.40)	(.36–.48)	(.13–.24)	(.14–.20)	(3.46–4.20)			
<i>Sub-group</i>											
<i>Sex</i>											
Male	737	Standardized	.53	.22	.51	.33	.31	.76	.33	.68	.58
		Unstandardized	1.08	.51	.45	.33	.13	3.30			
		Conf. Interval	(.85–1.30)	(.24–.78)	(.30–.60)	(.16–.50)	(.06–.20)	(2.54–4.06)			
Female	762	Standardized	.47	ns	.58	.39	.28	.72	.23	.74	.52
		Unstandardized	.83		.46	.50	.13	3.92			
		Conf. Interval	(.63–1.03)		(.32–.59)	(.21–.79)	(.07–.19)	(3.01–4.83)			
<i>Age group</i>											
11-year-old	447	Standardized	.43	.46	.56	ns	.44	ns	.40	.92	.44
		Unstandardized	.96	.70	.62		.22				
		Conf. Interval	(.63–1.29)	(.38–1.01)	(.34–.91)		(.09–.35)				
13-year-old	476	Standardized	.42	.27	.47	.48	.20	.93	.25	.61	.88
		Unstandardized	.83	.57	.33	.37	.07	4.99			
		Conf. Interval	(.56–1.11)	(.18–.96)	(.18–.48)	(.14–.60)	(.02–.14)	(3.29–6.69)			
15-year-old	576	Standardized	.42	ns	.57	.43	.18	.71	.19	.64	.51
		Unstandardized	.68		.49	.51	.10	2.86			
		Conf. Interval	(.49–.88)		(.32–.66)	(.22–.80)	(.02–.17)	(2.08–3.64)			

ns = non-significant paths

Limitations and strengths

The present data have several notable strengths and limitations. The principal limitation is that a sample from a region in Northeastern Italy may not be generalizable to adolescents and schools in other parts of the world where the culture, structure, and style of education may be very different. Second, the present cross-sectional design did not allow us to determine the stability of the effects of students' sense of community on different aspects of their adjustment over time. Therefore, we cannot tell whether age group differences reflect cohort effects or developmental changes. Longitudinal (including experimental and other panel) studies of social support and sense of community in the school are needed to determine the causal relationships with psychosocial well-being. As the fit obtained from the alternative model was only slightly less than the proposed model, the design of the study did not allow us to clearly determine the direction of the relationships among variables. It is possible that adolescents who experience more well-being simply tend to feel more self-efficacious and to perceive more parental, peer, and school-related support.

Another limitation is that only adolescent self-reports were used. Parent, peer, or teacher assessments of support, sense of community, and psychosocial adjustment may vary.

The measurement model for self-efficacy represents another limitation, or at least a complication, and requires some discussion. With a factor loading of .29, the self-efficacy latent construct is only loosely related to (explains only a modest proportion of the variation in) the measured self-efficacy variable, but is closely related to the other latent constructs, especially psychosocial well-being. This raises at least two issues. First, the practical/empirical problem is that the latent variable labeled "self-efficacy" is so closely linked to well-being that it is not clearly distinguishable and usurps the shared variance of the different sources of support (parents, friends, school sense of community) with well-being. Second, an even bigger concern with the self-efficacy latent variable is conceptual—i.e., if it is only loosely based on measured self-efficacy, how to interpret its meaning? It is strongly associated not only with psychosocial well-being, but also with parents' support, peer (friends) support, and school sense of community. It is perhaps most accurately described as a broad construct of intrapersonal and interpersonal resources. The problem with that interpretation is that it tends to cloud the different sources of support with internal resilience and we are left unclear as to what the latent construct really means and what parts of it

most contribute to well-being. Future research should explore variations on this model, e.g., using different self-perception indicators, different locus of control measures (e.g., collective efficacy), and without any mediating variables, which would presumably allow friends' support, parents' support, and sense of community to all have significant independent effects on well-being.

The strengths of the study include the use of standardized measures with a large and representative Italian sample. Because these data are part of a multinational study, they will also permit future cross-cultural research on the topic. Another important strength is the multi-group comparison that allowed us to test the stability of the model by sex and across three different age groups.

Conclusions

Particularly relevant in the model is the mediational role played by the latent construct self-efficacy. This construct seems to mediate all the different forms of support (family, friends and school), confirming what would be expected according to *Self-Worth Theory*, where self-perception plays a central role in mediating the social experience of support in determining psychosocial adaptation (Dubois et al., 2002a, 2002b). Moreover, according to what is proposed by Harter (1999) in relation to self-efficacy, social support is an important source of approval and esteem from others with very important implications for adolescents' well-being.

The relationship between self-efficacy and psychosocial well-being is significant in our data in the 13- and 15-year-old cohorts, but not for 11-year-olds. This result may reflect a developmental trend and seems to confirm that during this transition, in which one begins to question various aspects of self-identity, self-perceptions (e.g., self-efficacy) become an increasingly important intervening factor for positive psychosocial adaptation (Harter, 1999). Thus it appears to be during early adolescence when self-efficacy grows as a fundamental component of well-being (Bandura, 1997).

Family support is strongly related to sense of community in school. Even if this component of school life is mainly determined by teachers and schoolmates, parents still play an important role in facilitating the relationships that adolescents establish outside of the family (Vieno et al., 2005; Wentzel, 1998).

In addition, this study confirms the hypothesized relationship between sense of community in school and adolescents' psychosocial well-being (Osterman, 2000). Sense of community is related to self-efficacy, which

supports the relevance of school experiences in adolescents' self-perceptions.

From an applied perspective, the results of this study are encouraging in that they suggest potential areas for preventive intervention to improve adolescent well-being (increase life satisfaction and decrease psychological symptoms), which has important implications, not only for overall psychosocial adjustment, but also for academic success and even adolescent suicide prevention, which has become a growing concern. Our findings suggest the strong benefits of providing and encouraging activities directed toward enhancement of social support (from both family and friends, or how one may substitute for a lack of the other) and school sense of community (e.g., through collaborative group learning, performance, play, and service activities that promote social bonding and network formation among students and between students and staff) for the development of self-efficacy and ultimately well-being among young adolescents. This approach comports with the recommended strategies for design of successful programs in the prevention literature (Gullotta & Bloom, 2003).

This study also provides some interesting cross-cultural comparisons. Many of the findings are consistent with studies of adolescent development done in the United States (Dubois et al., 2002a, 2002b) and elsewhere, which suggest that during the transition to adolescence, varied social support resources become increasingly important for promoting growth in internal psychological resources (e.g., self-efficacy).

There are cross-cultural differences to also note, however. In this Italian sample, the significant positive relationship between parental social support and self-efficacy is very stable, whereas in U.S. studies, researchers have found that as children age, that relationship declines, which has been explained in terms of the disruptive effects of puberty, school transition, and other aspects of change that characterize this stage of development (Lerner et al., 1996; Simmons & Blyth, 1987). The difference in our study might be explained in terms of different parenting styles in the two countries (Claes, Lacourse, Bouchard, & Perucchini, 2003): although Italian parents tend to be less egalitarian (more permissive with boys), their relations with, and support for, children of both sexes is generally characterized by a warmth and closeness that continues through adolescence. This may reflect both cultural differences (e.g., between Southern and Northern European-influenced societies) and competing demands for youths' and parents' time (e.g., more hours spent with electronic media and longer average work hours in the U.S.). Developmental patterns among

these different, critical social and internal resources clearly deserve further research and comparative analysis in different social contexts and cultures.

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