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Abstract

Adolescent Mental Health and Psychological Sense of Community:

Contemporaneous and Longitudinal Associations

Natasha R. Gushue

June, 1996

The primary purpose of the current study was to determine the nature of the relationship between adolescent mental health (loneliness, happiness, subjective well-being, and self-esteem) and psychological sense of community (PSC). Specifically, the study of adolescent siblings over two years sought to determine the directional nature of this relationship. This study extends previous correlational research examining the associations among PSC and mental health in adolescents, by examining these associations both contemporaneously and longitudinally. The results from structural equation modelling indicated that, contemporaneously, PSC in the school environment is associated with loneliness, subjective well-being, and self-esteem in adolescents. The finding that PSC was associated with self-esteem is an important new discovery in research on PSC and mental health in adolescents. Longitudinal results suggested that PSC and mental health are both predictors and outcomes of each other. Mixed results were obtained for the analysis of developmental differences for these variables for older and younger sibling dyads. The results are discussed in terms of their implications for program development within the school and community environments.

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Adolescence is the period of transition from childhood to adulthood. This transition is characterized by physical, psychological, and social changes. Early adolescence involves such developmental issues as a changing physical appearance, acceptance by peers, and sexuality, while developmental issues in late adolescence involve sexuality, independence, and career options (Richman, Clark, & Brown, 1985). Psychologically, an adolescent's mental health, such as loneliness, subjective well-being, and self-esteem can be affected by these changes. Loneliness reflects emotional distress, psychological pain, and unhappiness (Ostrov & Offer, 1978; Young, 1979). Subjective well-being reflects 'psychological health', happiness and life-satisfaction (Davidson & Cotter, 1991; Diener, 1984). Finally, self-esteem is an overall judgement an individual makes with respect to their worth as a person (Harter, 1986, 1987; Rosenberg, 1979). Low self-esteem is associated with emotional distress (Kaplan & Pokorny, 1969; Rosenberg & Simmons, 1972), while high self-esteem is associated with rewarding life experiences (Elliott, 1986). Ideally, for positive adolescent mental health, low levels of loneliness, along with high levels of subjective well-being and self-esteem are desirable.

All of these developmental changes (physical, psychological, and social) take place within the context of the family, the school, and the neighbourhood. Healthy adolescent development depends on both the adolescent and the environment (Friedman, 1989). That is, because all adolescent development takes place within an environmental context, it is important to understand how individuals perceive their

environments. Psychological sense of community is the perception an individual has of their environment. When individuals feel a 'sense of community', they feel that they belong in their community, that their needs are being fulfilled in the community, that they exert some influence in the activities of the community, and that they are emotionally connected with other community members (McMillan & Chavis, 1986). As such, adolescent mental health and adolescent environments may be related.

An interesting perspective on the study of the relationship between psychological sense of community and mental health in adolescents, is that the adolescent participants in the current study are siblings. The environment can exert an influence to make two siblings in the same family as different from each other as if they were from different families (Daniels, et al., 1985, Daniels & Plomin, 1985; Goldsmith, 1993; Plomin & Daniels, 1987). Additionally, whether or not there are actual differences present in siblings' environment, siblings may perceive there to be differences (Daniels et al., 1985; Goldsmith, 1993). Therefore, the perception of the environment by two siblings in the same family adds an interesting twist to the study of psychological sense of community and adolescent mental health.

The purpose of the present research is to examine the intricate nature of the relationships that exist between adolescent mental health and psychological sense of community (PSC). This study examines adolescent sibling dyads over a two-year period with respect to adolescent loneliness, subjective well-being, self-esteem, and sense of belonging in school and neighbourhood environments. The main objective of the study is to determine the influential nature of this relationship. What is the

direction of influence among these variables? Previous research has indicated that the direction of influence is from psychological sense of community to the indices of mental health. However, it is possible that the indices of mental health exert an influence on psychological sense of community. Further, the examination of siblings provides an opportunity to examine the developmental nature of this relationship and its implications for intervention and program development

Definition and Theory of the Indices of Mental Health

Definitions and theories of adolescent loneliness, subjective well-being and self-esteem will be reviewed to establish a clearer understanding of these indices of adolescent mental health. Adolescent loneliness and self-esteem have been extensively reviewed in the psychological literature, whereas less work has been done with adolescent well-being.

Loneliness

Adolescence is a developmental period characterized by feelings of alienation, loneliness, solitude, and distress (Woodward, 1988). During adolescence loneliness is believed to be widespread and intense (Brennan, 1982, Weiss, 1973, Woodward, 1988; Woodward & Frank, 1988) This is attributed to the adolescent developmental tasks that meet needs for peer interaction and consensual validation and to the desire for psychological belonging (Ostrov & Offer, 1980, Peplau & Perlman, 1982) One of the primary tasks in adolescence is the development of an autonomous self, which ultimately involves both physical and psychological separation from parents. As adolescents turn away from parents and assert their independence, loneliness often

arises from the individual's failure to adequately meet needs for intimacy and peer relationships. The very process of separation and individuation during identity formation always threatens to produce loneliness, since individuals are placing themselves at risk of moving away and isolating themselves from others in their quest for autonomy (Ostrov & Offer, 1978).

While loneliness is a prevalent and distressing problem for many people (Bradburn, 1969), this concept is very difficult to define. Loneliness has been defined as an enduring condition of emotional distress, which results when individuals feel misunderstood or rejected by others (Rook, 1984; as cited in Brage, Meredith, & Woodward, 1993). Additionally, the lack of other people with whom to participate in desirable social activities which fulfil needs for social integration and intimacy also defines loneliness. One popular conceptualization of loneliness states that when individuals become dissatisfied with both the quality and quantity of their social and emotional relationships, the unpleasant psychological state of loneliness results (Kaiser & Berndt, 1985; Peplau & Perlman, 1979; Young, 1981). Loneliness is characterized by helplessness and psychological pain (Ostrov & Offer, 1978), anger, unhappiness, self-disappointment, and pessimism (Young, 1979). Further, lonely individuals experience alienation from others, exclusion from membership in a desired group, feelings of unattractiveness and unacceptability to others, and constriction in that they are unable to express their thoughts and feelings to others (Young, 1981).

There are two types of loneliness, namely the loneliness from emotional isolation and the loneliness from social isolation which can occur separately or

simultaneously (Weiss, 1973). Loneliness from emotional isolation is a response to lack of intimate attachments and relationships. This often occurs once individuals reach adolescence, as this is the time when parental relationships lose priority to same and opposite-sex peers (Weiss, 1973). Social isolation loneliness is a response to the absence of meaningful friendships. As one enters adolescence, social participation becomes more critical than it was during childhood. In adolescence, identity formation occurs, and ironically, self-definition is achieved through group membership (Weiss, 1973). Both these types of loneliness may be predominant in early adolescence and diminish during the transition to late adolescence. By late adolescence, most teenagers have firmly established peer relationships as attachment figures over their parents, thus reducing the risk of emotional isolation loneliness. At this time as well, most teens have begun to crystallize their identity through group interaction, thus reducing the risk of social isolation loneliness (Weiss, 1973). If either or both of these tasks (establishment of peer relationships and identity formation) are not met by late adolescence, the risk of loneliness is still high.

A popular theoretical approach to loneliness cites an individual's personal inadequacies as being key components in the development of loneliness (Goswick & Jones, 1982; Inderbitzen-Pisaruk, Clark, & Solano, 1992; Moore & Schultz, 1983). This theory of loneliness from a social skills and individual personality perspective, stresses the role of the individual in contributing to his/her own loneliness. Personal inadequacies, such as a failure to self-disclose, are viewed as contributing to an adolescent's failure to learn the appropriate social skills and obtain supportive social

networks that fend off loneliness. In contrast to this theory, loneliness may be a reflection of a community's failure to provide individuals with a sense of community, specifically membership and integration components (Felton & Shinn, 1992). This theory, involving the role of the community, is a systems-level approach to loneliness, as opposed to the social skills and individual personality approach. The appraisal of the physical and social environment is important in adolescent loneliness (Boldero & Moore, 1990). Characteristics (ie. availability of interpersonal resources) of the adolescent environment can impact on the experience of loneliness (Woodward & Frank, 1988). An adolescent's school (ie. teachers, extracurricular activities) and neighbourhood (ie. sporting, cultural activities) environments may be potential sources for exposure to and development of the necessary social skills and supportive interpersonal contacts that may fend off loneliness (Pretty, Andrewes & Collett, 1994). However, unless adolescents feel that they belong in their communities they may not respond to the opportunities and resources that may prevent loneliness.

Subjective Well-Being (SWB)

The SWB literature addresses how and why people experience their lives in a positive manner (Bradburn, 1969; Bryant & Veroff, 1982; Diener, 1984). Subjective well-being generally refers to psychological health. People high in SWB are generally cheerful and pleasant, with little worry, sadness or guilt; they feel they are quite competent in their daily lives (Davidson & Cotter, 1991). Life satisfaction, happiness, and positive affect are components of, and often synonymous with, SWB (Diener, 1984). Life satisfaction is anything that results in an individual evaluating his/her life

in a positive manner. Life satisfaction is a subjective evaluation; it is up to the individual to define what is the 'good life' (Diener, 1984). Happiness is a pleasant emotional experience, and reflects a greater quantity of positive affect than negative affect (Bradburn, 1969). SWB usually refers to a global assessment of an individual's life, and not just a particular domain. SWB is subjective, as it is within an individual's own experience. It includes the presence of positive events/affects, but not necessarily the absence of negative events/affects (Diener, 1984). Positive affects are emotions and feelings that are pleasurable to the individual. Further, those areas of life that are most immediate to an individual's personal life (ie. work, family, leisure) most influence their SWB (Campbell, Converse & Rodgers, 1976; Diener, 1984). For adolescents, family, neighbourhood, and school life are the most immediate life areas and the ones most likely to influence their SWB. To enhance SWB, one increase positive affects and/or decrease negative affects (Bradburn, 1969). Positive and negative affects are independent of each other; the absence of negative affects does not equal the presence of positive affects (Bradburn, 1969; Bryant & Veroff, 1982).

Self-Esteem

Self-esteem is the self-evaluation of one's attributes and characteristics (Elliott, 1986); an evaluation of one's self-worth (Coopersmith, 1967) and self-acceptance (Rosenberg, 1986; Tashakkori et al., 1990). Evaluations of self-esteem can refer to an individual's perceived competence in specific domains of life (ie. athletic ability, intelligence, appearance). However, global self-esteem, also termed global self-worth, is the overall judgement than an individual makes about his or her worth as a person

(Harter, 1986, 1987, Rosenberg, 1979). This global self-worth is different from the evaluation of competence within a specific setting or domain, as it addresses the evaluation of one's overall life competence.

Self-esteem is an enduring aspect of personality (O'Malley & Bachman, 1983); it forms a person's self-concept. The self-concept is the evaluative self that judges one's competence in a variety of domains. The self-concept is the sum of all domain-specific competency judgements, plus the global judgement of self-worth (Harter, 1987). The judgements that form the self-concept are structured in a hierarchial manner, based on importance, salience and centrality, for both general and specific situations (Tashakkori et al., 1990). For this research, 'self-esteem' refers to global self-esteem/self-worth, and not a domain-specific evaluation.

Self-esteem is considered one of the basic motivational forces behind human behavior. Individuals with high self-esteem strive to maintain it, while those with low self-esteem strive to improve it (Rosenberg, 1979). People with high self-esteem are satisfied with who they are and see no reason to change their self-concept. As well, high self-esteem leads to rewarding life experiences and is valued by its possessors (Elliott, 1986). Conversely, low self-esteem is not desirable and has been associated with emotional distress, particularly depression and anxiety (Kaplan & Pokorny, 1969; Rosenberg & Simmons, 1972). Individuals with low self-esteem are generally unhappy with themselves, feel inadequate and unworthy, and have low self-respect and acceptance. Thus, individuals strive to increase their self-esteem for the benefits it affords (Elliott, 1986).

The formation of self-esteem (or self-concept) is considered the most important developmental task during adolescence (Coopersmith, 1967). During adolescence teens start to identify desired and undesired characteristics and to evaluate the degree to which they possess these traits. Adolescents interact with peers and role models and have many opportunities to evaluate their possession of traits. Adolescents make comparisons with others with respect to their possession of traits such as attractiveness, social skills, and popularity (Tashakkori et al., 1990). During this period, adolescents do not change their evaluation of what characteristics are important; only the degree to which they possess these characteristics. The changes in these beliefs lead to changes in self-esteem (Tashakkori et al., 1990).

Global self-worth emerges in middle childhood and continues through adulthood (Harter, 1987). Harter's theory of global self-worth (self-esteem) was based on the work of James (1892) and Cooley (1902) on self-esteem in adults. James asserted that a person's overall self-esteem was determined from weighting competencies. That is, individuals placed different value or importance on success within each life domain. If the individual's actual competence equalled or bettered one's aspirations for success, then one's self-esteem increased. Conversely, if the actual competence was less than the aspirations, then self-esteem decreased. Thus, adult self-esteem was based on a hierarchy of perceived competence in several areas, plus a hierarchy of success importance in each. The congruence or discrepancy of these two hierarchies resulted in self-esteem (James, 1892). Cooley believed that an individual's concept of self was a reflection of the attitudes held by significant others

toward the individual's self. If significant others had a positive regard for the individual, then that individual's self-concept was positive. However, if the significant others expressed negative regard, the individual's self-concept was negative (Cooley, 1902).

Support was found for both James' and Cooley's theories of self-concept for children and young adolescents (Harter, 1987). Low self-worth children were not able to discount the importance of those domains in which they did not demonstrate competence. That is, those children who did not perform competently in a certain domain were unable to lessen the value they placed on competence in that domain. When they failed to meet their expectation of competence in importantly-valued domains, they experienced low self-worth. Conversely, high self-worth children were able to discount non-competent domains and place a higher value on successful domains. These children were able to displace the importance previously placed on non-competent domains and place higher importance on those domains in which they demonstrated competence. Thus, these children were able to enhance their self-worth. Harter also discovered that the more children perceived significant others to have regard for the child's self, the more the children demonstrated increased levels of self-worth. As such, children and young adolescents incorporated the attitudes of significant others into their own self-worth (Harter, 1987).

Both the 'competence/importance' and 'positive regard for significant others' concepts contribute to an adolescent's self-worth. However, these two concepts may be independent and may not interact nor compensate for each other (Harter, 1987).

Harter proposed an additive model based on these concepts to form an adolescent's self-worth. To modify an adolescent's self-worth, one would need to pay attention to both the adolescent's perceived competence/importance construct and the emotional support of significant others (Harter, 1987). In addition, certain domains contribute more to self-worth than others. For example, for elementary and middle school children, ranging in age from eight to fifteen, physical appearance and social acceptance are more powerful determinants of self-worth than scholastic and athletic competence (Harter, 1987). Public peer group support (eg. classmate, organizations) plays a greater role in the determination of self-worth than the support of a close friend (Harter, 1987). Social institutions encourage or discourage the enhancement of self-esteem, leading to an increase or decrease in the overall self-esteem of members in the group (McCarthy & Hoge, 1982). With this in mind, school and neighbourhood sense of community could be linked to adolescent self-esteem due to the support provided.

How stable is self-esteem over the adolescent period? In an examination of 7,183 late adolescents over a two-year period, self-esteem was stable overall (Tashakkori et al., 1990); while not significant, self-esteem tended to increase with age. The strongest predictors of self-esteem and its change over time were attributions of personal control over one's own outcomes and behaviours. Individuals who had low self-esteem at time one also had low self-esteem at time two, while those with initial high self-esteem retained it. Individuals with high self-esteem likely retained this level by either dealing effectively with negative experiences or by managing to

produce positive experiences, or some combination of the two. The slight increase in self-esteem in late adolescence was attributed to the change in adolescents' perceptions in their ability to control (attributional style) future outcomes (Tashakkori et al., 1990). Self-esteem and attributional style influenced each other, but the direction of the influence was not clear. Self-beliefs, orientation to community and work and attributional style significantly predicted the changes in self-esteem.

Summary

In summary, adolescence is a time of great change-- physically, emotionally, and socially. Adolescents are faced with a rapidly changing physical appearance, a developing sexuality, needs for affiliation and peer acceptance, and career options and choices, all of which can affect an adolescent's mental health. Two of the primary tasks of adolescence are the development of an autonomous self (Ostrov & Offer, 1978) and the formation of self-esteem (Coopersmith, 1967). The quest for autonomy, which involves physical and psychological separation from parents, can leave the adolescent isolated and lonely (Ostrov & Offer, 1978). For adolescents, their school and neighbourhood environments are potential sources for the development of, and exposure to, supportive individuals and the social skills that may prevent loneliness (Pretty, Andrewes, & Collett, 1994). An individual's self-esteem reflects the attitudes held by significant others toward the individual (Cooley, 1902; Harter, 1987). As well, public peer group support (eg. classmates, organizations) plays a greater role in formation self-esteem than the support of a close friend (Harter, 1987). Finally, social institutions can encourage or discourage the positive development of self-esteem

(McCarthy & Hoge, 1982). The areas of life that are most closely related to an individual's personal life most influence their SWB (Campbell, Converse, & Rodgers, 1976). As such, neighbourhood, school and family environments most likely influence an adolescent's SWB.

Research on Adolescent Mental Health

What follows below is an account on the research on the mental health indices of loneliness, subjective well-being, and self-esteem. Adolescent loneliness and self-esteem have been extensively researched, while adolescent subjective well-being has received less attention.

Loneliness

Loneliness is believed to be a central component in many psychological disorders (Sullivan, 1953; Tabachnick, 1981). Loneliness is related to many mental health indices, including depression and self-esteem. Many cross-sectional studies demonstrate a significant positive relationship between loneliness and depression (Berndt, 1981; Brage, Meredith, & Woodward, 1993; Bragg, 1979; Moore & Schultz, 1983; Rusell, Peplau, & Cutrona, 1980; Young, 1979). Individuals with high levels of loneliness tend to have high levels of depression. However, this link and the causal nature of this relationship need to be established through longitudinal research.

Loneliness is also associated with self-esteem in adolescents (Brennan, 1982, Goswick & Jones, 1981; Woodward & Frank, 1988). Individuals with high levels of loneliness tend to have low levels of self-esteem. Lonely adolescents suffer feelings of worthlessness, incompetency, and lack of love. As well, low self-esteem has often

been intertwined with self-defeating cognitions and behaviours that damage the adolescent's social competencies, which in turn leads to an increased risk of loneliness (Peplau, Miceli, & Morasch, 1982)

Chronic loneliness places adolescents at risk for developing serious emotional difficulties such as depression (Kaiser & Berndt, 1985; Moore & Schultz, 1983), suicide (Tabachnick, 1981), and low self-esteem (Brennan, 1982; Ostrov & Offer, 1978; Rosenberg, 1965; Woodward & Frank, 1988). In a cross-sectional study of 186 ninth graders ranging in age from 13 to 16 years, both males and females with low levels of self-esteem reported high levels of loneliness (Inderbitzen-Pisaruk, Clark, & Solano, 1992). However, low self-esteem was more strongly related to loneliness for males than for females. Since male friendships were more group-oriented, male group members may have influenced each other's self-esteem more so than did females. Males used group interaction to resolve their adolescent identity crisis, fostering independence and autonomy from their parents. For females, social skills were most related to loneliness. While males were more group-oriented, females tended to pair off into more intimate relationships, having a few close friendships (Inderbitzen-Pisaruk, Clark, & Solano, 1992). Females developed the social skills needed to assert their autonomy through their interactions in more intimate relationships (Douvan & Adelson, 1966, as cited in Inderbitzen-Pisaruk, Clark, & Solano, 1992). Both male and female adolescents with supportive networks of interpersonal relationships tend to be less lonely due largely to the sense of belonging and community fostered by the networks (Stokes, 1985). In light of this, adolescent

males who belong to groups and females who have a few intimate friendships should have higher self-esteem and lower loneliness.

Adolescent loneliness is also related to happiness and life satisfaction (Goswick & Jones, 1981; Medora & Woodward, 1986, Moore & Schultz, 1983, Schultz & Moore, 1986). In adolescents, high indices of loneliness and long durations of lonely episodes were associated with low levels of happiness and with lower levels of life satisfaction (Moore & Schultz, 1983). Both of these findings imply that lonely adolescents tend to be less happy and less satisfied with their lives than individuals who are less lonely.

Are there are differences in the experience of adolescent loneliness? Weiss suggested that there would be. Specifically, Weiss hypothesized that loneliness would be predominant in early adolescence, but diminish toward late adolescence. Indeed, Mahon (1983) found that early adolescents were significantly more lonely than middle and late adolescents, but that there were no significant differences in loneliness between middle and late adolescents. Similarly, high school students reported significantly more loneliness than college students (Schultz & Moore, 1988, as cited in Mahon, Yarcheski, & Yarcheski, 1994). These two studies suggest differences in loneliness with respect to adolescent development, loneliness appears to decrease across adolescence.

Studying loneliness across the adolescent development span with groups of early adolescents (aged 12 to 14 years), middle adolescents (aged 15 to 17 years), and late adolescents (aged 18 to 21 years) Mahon, Yarcheski, and Yarcheski (1994) did not

find any significant differences in loneliness among the groups, however, loneliness decreased from early to late adolescence. Another cross-sectional study with adolescents (ranging in age from 11 to 18 years) found the older adolescents were significantly lonelier than the younger participants (Brage, Meredith, & Woodward, 1993). However, increased social isolation may have influenced these latter findings. As adolescents get older, they may experience greater social isolation which is associated with greater levels of loneliness. To summarize, the majority of these cross-sectional studies suggested that loneliness in adolescence decreases with age. Longitudinal studies are needed to more accurately explore the relationship between age and loneliness in adolescents.

Just as the literature on the relationship between age and loneliness is inconsistent, mixed results occur for gender differences in adolescent loneliness. Some studies have found females to have higher loneliness scores than males (Brennan & Auslander, 1979, Woodward & Frank, 1988). Senior high school girls were the loneliest group compared to all others (Woodward & Frank, 1988). Other studies have found adolescent males to be lonelier than their female counterparts (Borys & Perlman, 1985; Schultz & Moore, 1986); specifically, adolescent male college students had significantly higher levels of loneliness than females (Schultz & Moore, 1986). Finally, other studies report no statistical differences in loneliness with respect to gender (Mahon, 1983; Mahon, Yarcheski, & Yarcheski, 1994); however, males appear to have slightly higher levels of loneliness. This trend may be due to the measure used, namely the R-UCLA Loneliness Scale. Both the original and revised scales are

often insensitive to gender differences (Borys & Perlman, 1985). However, when differences do occur, males often score higher on loneliness than females (Borys & Perlman, 1985; Mahon, Yarcheski, & Yarcheski, 1994; Russell, Peplau, & Cutrona, 1980).

Subjective Well-Being (SWB)

There is insufficient research on adolescent subjective well-being to establish a relationship between age and SWB in adolescents. However, older adults report increased satisfaction in every area of life, except for health (Campbell, Converse, & Rodgers, 1976). Satisfaction tends to rise slowly with age, however, positive and negative affects (emotions) have been most intensely experienced by youth (Diener, 1984). Specifically, younger people report experiencing higher levels of joy, but older people judge their lives more positively.

There are few differences in subjective well-being (SWB) between females and males (Diener, 1984). While women tend to experience more negative affect (eg. low mood, depression) than men, they also report more intense joys. However, age and gender interact in the experience of SWB (Medley, 1980; Spreitzer & Snyder, 1976, as cited in Diener, 1984). Younger females demonstrate higher levels of happiness than younger males, but older males report higher levels of happiness than older females. Females have a tendency to be happier than males before age 45, but males appear happier after age 45.

Self-Esteem

It remains unclear whether there is an association between age and self-esteem

in adolescents. Following a thorough literature, Wylie (1979) concluded that there was no association between self-esteem and age. However, six of the seven longitudinal studies reviewed show an increase in self-esteem, while 21 of 22 cross-sectional studies show no relationship or a decline in self-esteem. Longitudinal studies are considered superior to cross-sectional studies in uncovering changes in self-esteem with age, as sampling variability and measurement error are less likely (McCarthy & Hoge, 1982)

To test if self-esteem increases with age, McCarthy and Hoge (1982) carried out a two-year longitudinal study of adolescents in grades seven to twelve. There were small, but significant, increases in self-esteem as the adolescents grew older. Other studies have replicated this result (Bachman & O'Malley, 1977; Jessor & Jessor, 1977; O'Malley & Bachman, 1983). This trend appears to be due to individuals being motivated to increase their self-esteem, developmental changes in personality, or gains in autonomy which allow the adolescent to interact in ways that enhance self-esteem (McCarthy & Hoge, 1982).

With one exception (Tashakkori et al., 1990) every study that has examined the relationship between gender and adolescent self-esteem has found a gender effect in early-adolescents (Hare, 1980; Simmons, Brown, Bush, & Blyth, 1978; Simmons & Rosenberg, 1975), high school students (Harper & Marshall, 1991; O'Malley & Bachman, 1979), and late adolescents (Richman, Clark, & Brown, 1985). Females consistently report lower self-esteem scores at all age groups. This lower self-esteem has been attributed to the discrepancy in gender-role attitudes and societal behavioral

expectations. Specifically, society places a high value on masculine behaviours, while at the same time devaluing traditionally feminine behaviours (Harper & Marshall, 1991; Richman, Clark, & Brown, 1985). Lower self-esteem in females may reflect this conflict of femininity versus masculinity. There seems to be an inconsistency in societal expectations of women, where being masculine or possessing masculine traits (strength, aggression, low emotionality) is desired over feminine traits (nurturing, passive, sensitive) if one is to succeed in a competitive world. This discrepancy in gender role expectations and the failure to achieve these expectations, can result in decreased self-esteem for females (Harper & Marshall, 1991; Richman, Clark, & Brown, 1985).

High levels of loneliness have been associated with low levels of self-esteem, life satisfaction, and happiness. There is no established developmental component to the experience of adolescent loneliness or subjective well-being. However, self-esteem does tend to increase with age. It is also unclear whether gender affects adolescent loneliness or subjective well-being. Gender does appear to affect self-esteem, with females tending to have lower levels compared to males.

Definition and Theory of Psychological Sense of Community

There are two main definitions for community (Gusfield, 1975). One is a territorial definition that incorporates geography and refers to cities, neighbourhoods, and towns. The other is a relational definition that refers to the qualities of human relationships, without reference to location. This latter definition includes professional (ie. engineering, teaching organizations) and spiritual (ie. church groups) types of

communities. Today's societies often form communities around common interests rather than around geographical locales (Durkheim, 1964; as cited in McMillan & Chavis, 1986). For the purposes of this research, both the territorial and relational definitions of community will be explored.

Sarason (1974) appears to have coined the term 'psychological sense of community'. He defined it as the perception of similarity to others, an acknowledgement of interdependence with others, and the feeling that one belongs to a larger, dependable, and stable structure. As modern society becomes more transient and technology-dependent, psychological sense of community (PSC), particularly the loss of PSC, has become an important area of study in community psychology. Sarason stated that the weakening of sense of community is the most destructive force in the lives of people in society. PSC is important to both societal and individual well-being (Sarason, 1974), and has been linked to such mental health indices as loneliness (Pretty, Andrewes & Collett, 1994; Pretty, Conroy, Dugay, Fowler, & Williamson, in press), happiness (Davidson & Cotter, 1991; Pretty et al., in press), and subjective well-being (Davidson & Cotter, 1991; Pretty et al., in press).

PSC also can be defined as the feelings that members have of belonging and of mattering to each other and to the group, as well as a common faith that their needs will be met through the mutual commitment to be together (McMillan, 1976; as cited in McMillan & Chavis, 1986). This definition of PSC formed the foundation for the further development of the concept. McMillan and Chavis (1986) proposed that sense of community has four elements: *membership* refers to the sense of belonging,

identification, and feeling of emotional safety; *influence* involves the individual's influence on the community, while at the same time being influenced by the community; *integration and fulfilment of needs* refers to the opportunity to fulfil needs in a community, and the rewards that follow reinforce membership and motivate community behaviour; and *shared emotional connection* refers to the quality of interaction among members. An examination of each of these elements in greater detail follows below, outlining the theory of PSC postulated by McMillan and Chavis.

Membership is one element of PSC and it has five attributes: sense of belonging and relatedness; boundaries; emotional safety; personal investment; and a common symbol system. Members feel a bond or connection with others in their community and, due to their personal investment to become a member, they feel their community is where they belong and are accepted. Communities foster intimacy; it is here that members express their vulnerability by letting their needs and feelings be known, knowing that membership provides emotional safety. Membership also establishes boundaries between members and nonmembers. Through such things as dress and language, a source of identification is provided for group members that is unique to members only. Finally, membership provides a common symbol system which aids in maintaining the boundaries of the community (ie logo, flag, language; McMillan & Chavis, 1986).

Another element is *influence*, which is a bidirectional concept. In one direction, there is the idea that for individuals to be attracted to the group, they need to feel that they can have an influence over what the group does. Individuals need to feel like

meaningful members and have a sense of 'ownership' within the group. In the other direction, group cohesiveness is determined by the ability of the group to influence its members. These two forces can work simultaneously: Members feel they contribute to their community in a way that matters to the group, while at the same time, the group matters to the individual members. However, there is a positive relationship between group cohesiveness and pressure to conform, which sometimes contributes to a loss of individuality and individual freedom. Successful communities provide a balance: Members are committed to the group and conform to it, but at the same time do not feel they have lost their freedom.

The balance between cohesiveness and conformity is achieved through consensual validation, the knowledge that what one feels and does is experienced by others in the same manner. Individuals like reassurance that they are indeed similar to others and neither deviant nor 'crazy'. Further, conformity can be a transactional influence from individuals and from the group leading to the validation of members, along with the creation of group norms. Conformity does not necessarily have to be associated with loss of personal choice. However, many people seeking individual freedom do try to escape the conformity of the community. How can communities keep their members? This is achieved through the recognition and appreciation of individual differences within communities. Individual members want to feel that they directly or indirectly influence what goes in their community. In terms of group dynamics, the most powerful group members are those that respect the needs and opinions of other members. These individuals foster group cohesiveness lowers the

risk of members leaving the group due to a perceived loss of individuality. The least powerful members are those who are domineering and who ignore the wishes and needs of others and precipitate a breakdown in group cohesiveness (McMillan & Chavis, 1986).

Integration and fulfilment of needs is another element of PSC. For a group to maintain a positive sense of cohesion among members, the interactions between members and the group must be rewarding for the individual members. Reinforcement is a motivator of human behaviour; there are many reinforcers that exist in the community that unite members and motivate individual behaviour associated with the community. Two such reinforcers are status and competence. There is a certain amount of status associated with being a group member; the more successful the group, the higher the status of group membership. For example, adolescents who are members of a very successful athletic team in high school experience the status and pride associated with being part of this prestigious group within their school community. Individuals are attracted to others whom they perceive as having abilities and competencies that can be beneficial to their needs. As a result, individuals within the community are united through the status and competence afforded by membership. Within the community, members meet other's needs while at the same time meeting their own. Finally, individuals who share the same values come together within a community setting and find they have similar goals and beliefs. They feel that by uniting together in membership they might best satisfy their needs and benefit from the rewards (McMillan & Chavis, 1986).

A final element in PSC is *shared emotional connection*. Membership allows individuals to identify with and to interact through shared events. It is the interaction of members in shared events that unites them. According to the contact hypothesis, the more individuals interact with one another, the closer they will become to one another (as cited in McMillan & Chavis, 1986). Further, membership provides a high quality of interaction. Positive experiences and relationships within the group intensify the bond among members; successful endeavours facilitate cohesion. In addition, the more important a shared event, the more intense the bond among members within the community becomes. Members invest time, energy, and emotion into membership. The amount of personal investment affects the degree of PSC. For example, an individual who spends a considerable amount of time and energy involved in community activities and derives a great deal of enjoyment and benefit from this would most likely have a high perception of belonging in the community. Finally, this shared emotional connection creates somewhat of a spiritual bond within the community and fosters a sense of pride in membership (McMillan & Chavis, 1986).

To summarize, an individual's sense of community is created and maintained through the combination of the four elements. Individuals high in sense of community feel that they belong in their community/group. They contribute to the group in a meaningful way and exert some control over the activities of the group while at the same time being influenced by the group. These individuals feel that their needs are being met through membership in the group. The rewards that they obtain encourage their membership and behaviour associated with the group. Due to the investment of

time, energy and emotion, along with a shared history, these individuals feel emotionally bonded to other members in the group and to the group as a whole. As such, individuals with high senses of community feel they belong in a community in which they contribute in a meaningful way, while at the same time benefiting from other members and the group.

Links between Mental Health and Psychological Sense of Community

Loneliness. Lonely adolescents experience alienation from others and exclusion from membership in a desired group (Young, 1981). This description agrees with the notion that loneliness may stem from the community's failure to provide individuals with psychological sense of community (Felton & Shinn, 1992). In particular, loneliness may result from the community's failure to provide the membership and integration. Adolescents lack a clear sense of belonging and role in society, and experience this in the form of isolation and loneliness (Rappoport, 1972). Facilitation of attachment and new ways of participating in social arenas compensate for this negative trend (Brennan, 1982). Communities can provide individuals with resources, such as social skill development and interpersonal contacts, that may prevent loneliness (Pretty, Andrewes, & Collett, 1994). The school and neighbourhood are two of the primary 'communities' for adolescents. Within the school community there are teachers and extracurricular activities (eg. music, sports) that could foster a sense of belonging and, in turn, prevent loneliness. Within the neighbourhood community, there are sporting and cultural activities, along with neighbours and community members that could foster a sense of community to aid in preventing

loneliness. Unless individuals feel they belong to their communities, they may not take advantage of the people and opportunities that encourage positive mental health.

Subjective Well-Being. Links also exist between the components of PSC and subjective well-being (SWB). *Membership* offers emotional safety, which in turn comes from *shared emotional connection*. There is also a relation between perceived efficacy to cope and the *integration and fulfilment of needs*. Finally, the ability and opportunity to exert *influence* in your community affords the opportunity to interact with others to meet your needs (Pretty et al., in press). The areas of life that are most immediate to an individual's personal life most influence their SWB, or general psychological health (Campbell, Converse, & Rodgers, 1976; Diener, 1984). Adolescents' life areas of school and neighbourhood should thus influence their SWB. Increases in the positive and decreases in the negative aspects of adolescent environments could possibly lead to an increase in their SWB.

Self-Esteem. High self-esteem is desirable and individuals are often urged to seek these levels. Both competence/importance and positive regard from significant others may modify an individual's self-worth. Peer group support (eg. classmates, organizations) for example, plays a greater role in the determination of self-worth of an individual than does a close friend (Harter, 1987). Additionally, social institutions encourage or discourage the enhancement of self-esteem (McCarthy & Hoge, 1982). Neighbourhood and school environments may provide opportunities to encourage or discourage self-esteem development. As such, adolescents' sense of belonging in these environments could possibly be tied to their self-esteem.

Research on Psychological Sense of Community (PSC)

Research on PSC has primarily focused on adult experiences. Only in recent years has the specific link between PSC and mental health been examined (Davidson & Cotter, 1991; Pretty, McCarthy, & Catano, 1992). In one study, neighbourhood PSC was significantly related to SWB. Individuals with a high sense of community had high levels of subjective well-being. PSC was most strongly associated with the happiness component of SWB. Individuals with high levels of PSC tended to be happier than individuals with low levels of PSC. As individuals perceived and attained higher levels of belonging in their community, they may have had more opportunities to satisfy their needs, thus increasing their happiness (Davidson & Cotter, 1991). However, a longitudinal analysis would be needed to establish such causal relations.

PSC is also associated with burnout in the corporation (Pretty, McCarthy, & Catano, 1992). Telecommunication workers with low ratings of PSC experienced more exhaustion and depersonalization in the workplace. Conversely, individuals with high ratings of PSC also experienced high levels of personal accomplishment

Meeting the needs for peer relationships, through social resource acquisition, is a primary task of adolescence (Pretty, Andrewes, & Collett, 1994). The PSC feelings of emotional connection and membership appear to aid in meeting this task. Students who had high levels of loneliness, which indicate a failure of the adolescent to develop peer relationships, reported low levels of PSC for both within the school and neighbourhood (Pretty, Andrewes, & Collett, 1994). PSC may be an important

component of the adolescent environment.

Developmental Issues Does PSC vary depending upon the age of the adolescent? A cross-sectional study of adolescents 13 to 18 years old, suggested a developmental component (Pretty et al., in press). In this study, the younger adolescents (13 to 14 years old) demonstrated significantly higher senses of community in both school and neighbourhood settings than did their older counterparts (15 to 18 years old), suggesting that PSC decreased with age. Intuitively, this makes sense; as adolescents get older, they seek out greater independence and greater mobility (eg. driving a car). As a result, older adolescents move away from their neighbourhood and family environments as primary social venues (Pretty et al., in press). Therefore, as adolescents get older, neighbourhood PSC may hold less importance for individual well-being. Activities and peers in the greater community may have more influence on older adolescent PSC; school PSC may also influence this group. Both neighbourhood and school PSC may be more influential for younger adolescents. Comparison of two age groups (two years difference) in two separate studies revealed no differences in overall PSC ratings.

PSC and Loneliness

Both school and neighbourhood PSC have been linked to loneliness among adolescents (Pretty, Andrewes, & Collett, 1994). Adolescents with high levels of PSC reported low levels of loneliness. School PSC was a more significant 'predictor' of loneliness than neighbourhood PSC. These findings were replicated in a later study (Pretty et al., in press). While both school and neighbourhood PSC were significantly

associated with adolescent loneliness, neighbourhood PSC was the more significant 'predictor' of loneliness. The adolescents in the first study averaged two years older than the adolescents in the second study, these adolescents may have spent more time in the school environment socializing with peers, than in their neighbourhood environment. Younger adolescents, while spending time in both school and neighbourhood environments, might spend more time in their neighbourhood than older adolescents. This could explain why school PSC was a more significant predictor of loneliness in older adolescents and neighbourhood PSC the more significant predictor for younger adolescents. These results are consistent with the theory that the environment is influential in the experience of loneliness.

For older adolescents, school belonging may be more influential than neighbourhood belonging in the experience of loneliness (Pretty et al., in press). Neighbourhood and family-centered activities may be the prominent social site for younger adolescents, where school friendships, activities and interests become prominent. Thus, both neighbourhood and school PSC may be significantly related to adolescent loneliness. In addition, for older adolescents school PSC may be most related to loneliness, while for younger adolescents, neighbourhood PSC may be most related.

PSC and Subjective Well-Being (SWB)

PSC and SWB appear to be associated in adults (Davidson & Cotter, 1991) Specifically, high levels of PSC are associated with high levels of SWB, particularly the happiness component of SWB. For adolescents PSC appears to be related to three

indices of SWB (happiness, worry, and coping; Pretty et al., in press). Specifically, adolescents high in PSC have high levels of happiness, low levels of worry, and high levels of perceived efficacy to cope. While both neighbourhood and school PSC are related to SWB, neighbourhood PSC is more important to happiness, worry, and coping than is school PSC (Pretty et al., in press).

Research has not yet linked PSC to gender or developmental stage. Both PSC in the neighbourhood and the school are related to adolescent loneliness, with high levels of PSC associated with low levels of loneliness. This relationship appears to be different for older and younger adolescents. For older adolescents, school PSC appears most predictive of loneliness, while for younger adolescents neighbourhood PSC appears more predictive. PSC is also related to SWB, with high levels of PSC associated with high levels of happiness. Finally, there has been no research conducted to date exploring a possible relationship between PSC and self-esteem in adolescents.

Siblings

Do two siblings in the same family experience and perceive things in their environment in the same manner? Upon first consideration, one would assume that full biological siblings reared in the same home would experience and perceive very similar environments; this is not necessarily the case. School PSC might be more predictive in older adolescent loneliness, while neighbourhood PSC might be more predictive in younger adolescent loneliness (Pretty et al., in press). This may reflect the different environments of older and younger adolescents. Older adolescents are

more likely to spend time away from family and neighbourhood environments and focus more on peers and activities that are not tied to neighbourhood environments. Younger adolescents, lacking the mobility (eg. car) that an older adolescent might have, are more likely to spend more time closer to home and school. As this applies to older and younger adolescents in general, this is also likely true for older and younger siblings. An interesting way to examine this possibility is to study more than one child in a family.

Research in behavioral genetics suggests that siblings growing up in the same family may experience unique family environments (Daniels et al., 1985; Daniels & Plomin, 1985; Goldsmith, 1993; Plomin & Daniels, 1987). That is, the environment can exert an influence to make two siblings in the same family as different as if they were each from different families. Sibling similarities are the result of shared genetics, and not due to the shared family environment. It is differences in environment which make siblings different from one another (Daniels et al., 1985).

There are two main environmental influences on siblings. *Shared environment* refers to all environmental influences that make siblings similar to each other (Plomin & Daniels, 1987). Equal parental treatment of siblings and shared family activities are examples of shared environment. *Nonshared environment* refers to all environmental influences not due to the shared environment which makes siblings different from one another (Plomin & Daniels, 1987). Examples of nonshared environment are different school experiences, different peers, and different activities of siblings. Siblings may differ in their perceptions of family and peer environments and experiences. That is,

whether or not there are actual differences in the siblings' environments, siblings may perceive differences (Daniels et al., 1985, Goldsmith, 1993).

Both shared and nonshared environment influences change over adolescence. The influence of the nonshared environment may increase with age (Plomin & Daniels, 1987). This would most likely be due to the expansion of siblings' social and environmental networks of peers and activities beyond the family (Plomin & Daniels, 1987). This is consistent with the effect of changes in neighbourhood and school environments on loneliness for older versus younger adolescents. However, research is needed to confirm this speculation.

There are both systematic and unsystematic environmental influences within families that can make siblings different from one another (Plomin & Daniels, 1987). Systematic influences include the birth-order of siblings, gender differences, sibling interactions, differential treatment of siblings by parents and extrafamilial influences (eg. sporting activities, peers; Plomin & Daniels, 1987). Unsystematic influences include traumas, accidents, and illnesses that strike one sibling and not the other (Plomin & Daniels, 1987).

Siblings in the same family experience little shared environmental influence that contributes to behavioral similarities. Additionally, the environment of siblings reared together is no more similar than the environment of strangers in different families (Plomin & Daniels, 1987). Therefore, it is important to examine the influence of the environment, and siblings provide an excellent method for this examination.

Summary and Models

The preceding review of literature suggests links between indices of mental health (loneliness, happiness, and subjective well-being) and psychological sense of community (neighbourhood and school) in adolescents. However, that the majority of this research is based on cross-sectional designs. That is, the research has only examined individuals at one point in time and is correlational. Based on the previous research on these variables, an emerging model of within-time (contemporaneous) relationships would show relationships in the direction of influence from PSC to the indices of mental health.

The current short-term longitudinal study provides an opportunity to examine the previous research on PSC and the mental health indices. Specifically, with a two-year study, it is possible to examine how neighbourhood and school PSC are related to loneliness (school and general), as well as happiness and subjective well-being. PSC should be significantly related to loneliness, happiness, and subjective well-being. PSC and loneliness should be negatively related, while PSC should be positively related to both happiness and subjective well-being. Social institutions, such as schools and community groups, can encourage or discourage the enhancement of self-esteem (McCarthy & Hoge, 1982). Individuals who feel a sense of belonging in their group, might be more likely to have their self-esteem influenced, whether positively or negatively. PSC should be positively related to self-esteem in adolescents. Two contemporaneous (within-time) models, one for Year 3 and one for Year 4, present these relationships among PSC and the mental health indices (see Figures 1 and 2)

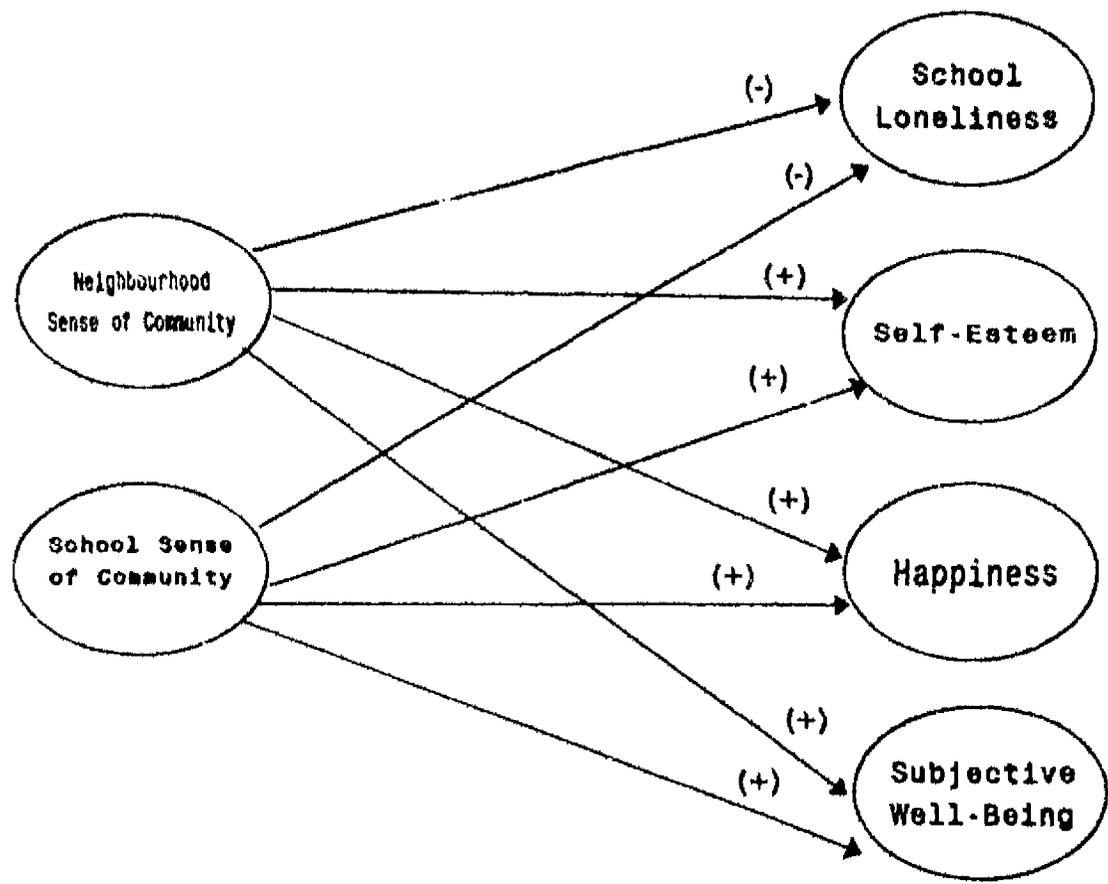


Figure 1. Contemporaneous Model 1
 Predicting Mental Health Indices from Psychological Sense of
 Community Year 3

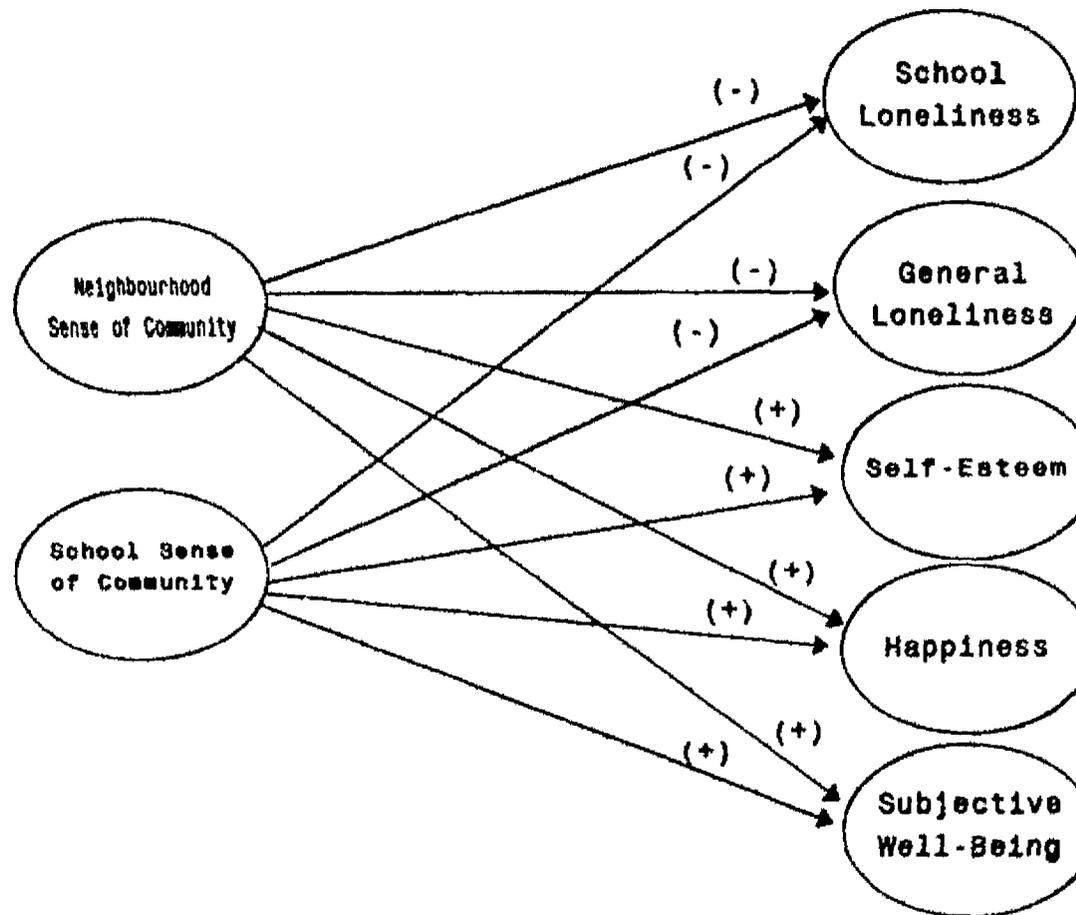


Figure 2. Contemporaneous Model 2
 Predicting Mental Health Indices from Psychological Sense of
 Community Year 4

These models allow an explanation of predictive associations among mental health and sense of community indices across-time. Two possible models can be tested. Does PSC predict mental health in adolescents? That is, does how adolescents perceive their environment influence their loneliness, self-esteem, happiness, and subjective well-being? The first longitudinal model is presented in Figure 3. This model examines PSC as a predictor of mental health. Specifically, this model tests how well the indices of neighbourhood and school PSC predict loneliness, self-esteem, happiness, and subjective well-being, measured one year later. This model is based on the contemporaneous research which proposes that PSC is an antecedent of mental health.

It is possible that mental health influences psychological sense of community. That is, does adolescents' loneliness, self-esteem, happiness, and subjective well-being influence their perception of belonging in their community? A second longitudinal model will be examine this question. As seen in Figure 4, this model proposes that the indices of mental health predict neighbourhood and school PSC measured one year later.

In addition to testing the four models, differential influences of the environment on adolescent development will be explored by comparing the fit of the models for two siblings (grouped as older and younger siblings) in the same family. These differences could be due to the difference in ages between the siblings or due to their developmental stage.

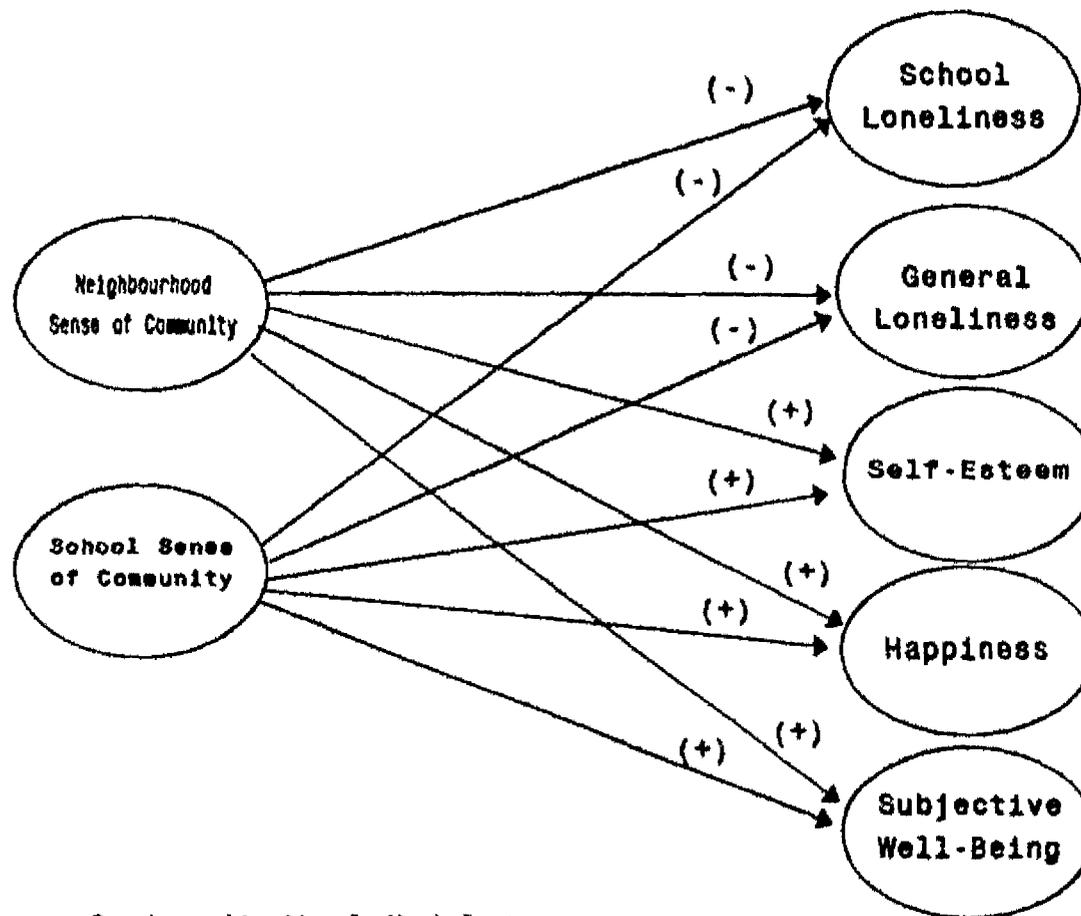


Figure 3. Longitudinal Model 1
Predicting Mental Health Indices in Year 4 from Psychological
Sense of Community in Year 3

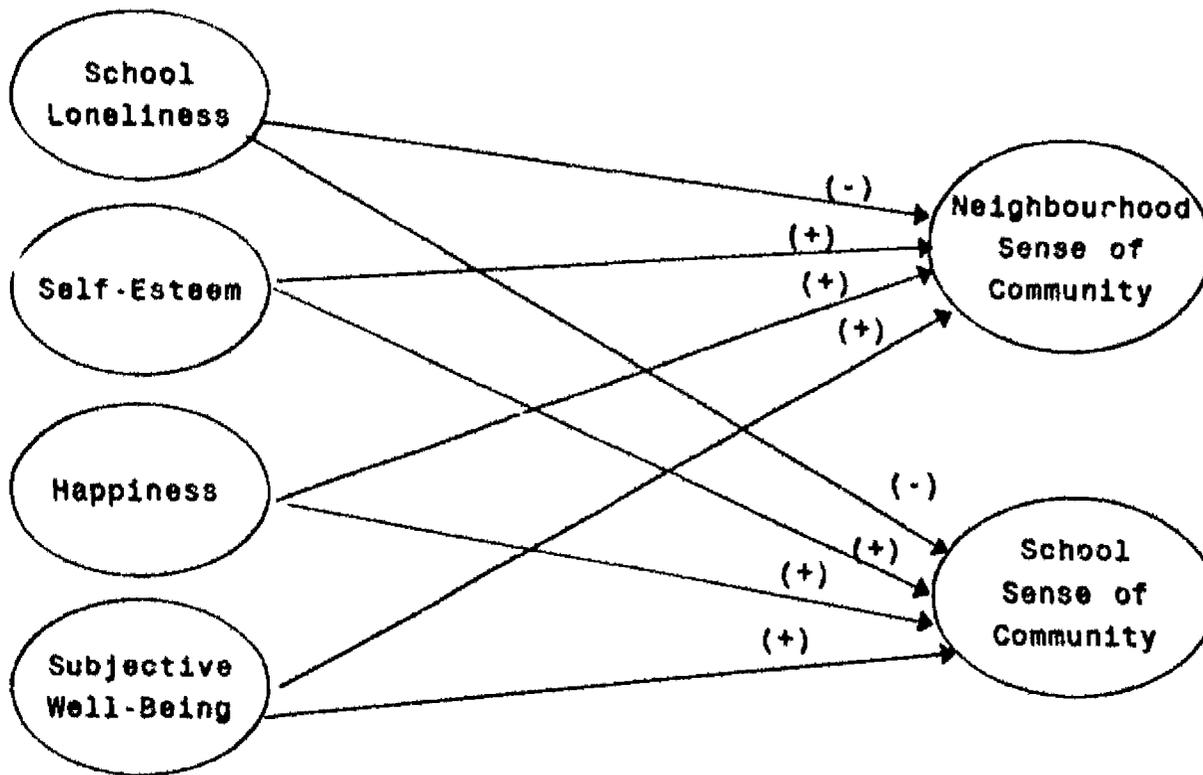


Figure 4. Longitudinal Model 2
 Predicting Psychological Sense of Community in Year 4
 from Mental Health Indices in Year 3

Methodology

Participants

Participants were part of a four year study that started in the fall of 1992 (Chipuer, 1992). The current study included those sibling dyads who had participated in the third and fourth years of the study. Year 3 participants consisted of 123 older and 124 younger siblings. Older siblings ranged in age from 12 to 16 years old ($M = 14$ years, $SD = 1.21$), while younger siblings ranged in age from 10 to 14 years old ($M = 11$ years, $SD = 0.94$). There were 58 (47.2%) male and 65 (52.8%) female older siblings, and 58 (46.8%) male and 66 (53.2%) female younger siblings. In year 4, data was obtained from 90 older and 90 younger siblings. Older siblings ranged in age from 12 to 18 years old ($M = 15$ years, $SD = 1.28$), while younger siblings ranged in age from 11 to 16 years old ($M = 12$ years, $SD = 1.02$). There were 39 (43.3%) male and 51 (56.7%) female older siblings, and 40 (44.4%) male and 50 (55.6%) female younger siblings. Participants were predominantly white, and came from predominantly middle- to upper-middle class families

Participants were recruited from Halifax County and Halifax City School Boards; children in grades four and five who met the selection criteria were identified. Letters were sent home with the children inviting their family to participate. Selection criteria for participation required that the target child must live at home with both biological parents and have a biological sibling no more than four years older. Those families that satisfied these criteria returned a reply form and agreed to participate, they were later contacted with details about the study. More details of the study

sample are presented elsewhere (Chipuer, 1992)

Procedure

In Year 3, trained interviewers visited the participants' homes. Depending on the preference of the child, an interviewer either read the study questions out loud to one or both siblings, or the siblings completed the questions on their own. In order to maintain confidentiality and independence of responses, each sibling was asked to complete the measures without consulting the other sibling. Before completing the questionnaires, both siblings were told the purpose of the study.

In Year 4, each member of the sibling dyad was interviewed during a 40-minute telephone survey. Sheets of coloured paper containing the possible responses for each section of the survey were mailed to the participants' homes. This was done to aid the children in answering the survey questions over the telephone. Interviewers attempted to interview both siblings in the same evening to discourage discussion of responses between siblings. Older and younger siblings were interviewed in a random order. Participants were informed that they were free to withdraw their consent to participate at any point in the study.

Measures

Psychological Sense of Community was measured by the short form of the Sense of Community Index (SCI; Perkins et al., 1990). This measure consists of 12 true/false questions and was designed to assess perceived sense of community in the neighbourhood. A modified version of the SCI, using a three-point scale ('not at all true', 'true', and 'always true'), was used to assess both neighbourhood and school sense

of community. To assess school sense of community, the words 'block' and 'neighbour' were replaced by 'school' and 'student'. A recent psychometric analysis of the SCI indicated that the three-point scale may be advantageous over the original true/false format (Chipuer, Pretty, & Catano, submitted). In the current study, Year 3 reliabilities for neighbourhood sense of community were .71 for older siblings and .74 for younger siblings. Year 3 reliabilities for school sense of community were .70 for older siblings and .64 for younger siblings. For Year 4, neighbourhood sense of community reliabilities were .72 for both older and younger siblings, while school sense of community reliabilities were .73 for older and .59 for younger siblings. These reliabilities were consistent with previous findings (Chipuer, Pretty, & Catano, submitted). Construct validity for the SCI has been previously demonstrated (Pretty, 1990; Pretty & McCarthy, 1991).

Loneliness was measured by two scales, one each to assess school and general loneliness. The Children's Loneliness Scale (Asher, Hymel, & Renshaw, 1984) is a 24-item measure designed to assess feelings of social dissatisfaction and loneliness at school. The scale consists of 10 items worded in the lonely direction and six items worded in the nonlonely direction. There are eight filler items, referring to interests and hobbies. Respondents indicate agreement on a five-point scale ranging from one 'always true', to five 'not at all true'. Ignoring the filler items in scoring, scores can range from 16 to 80, with higher scores indicating higher loneliness. The 16-item scale has good internal consistency with a Cronbach's alpha of .90, as well as having demonstrated convergent and divergent validity (Asher, Hymel, & Renshaw, 1984). In

the current study, alphas were .93 for the older sibling and .92 for the younger sibling in Year 3, and .94 for the older sibling and .93 for the younger sibling in Year 4.

The Revised UCLA Loneliness Scale (Russell, Peplau, & Cutrona, 1980) is a 20-item self-report measure assessing frequency of loneliness. Items are rated on a four-point scale from one "I have never felt this way", to four "I have felt this way often". Scores can range from 20 to 80, with higher scores indicating greater loneliness. The scale has an internal reliability coefficient alpha of .94, and has demonstrated concurrent validity (Russell et al., 1980). This scale was not administered in Year 3 of the current study. In the present study, alphas for Year 4 were .89 for the older sibling and .79 for the younger sibling.

Self-Esteem was measured by the Adolescent Self-Perception Profile (Harter, 1988). This is a 45-item measure assessing adolescent self-perception in a variety of domains, including social acceptance, physical appearance, and scholastic competence. For the current study, the five-item subscale of Global Self-Worth was used to measure self-esteem. Items are rated on a four-point scale, with a score of one reflecting low perceived competence (self-esteem) and a score of four reflecting high perceived competence (self-esteem). Internal consistency estimates for the Global Self-Worth subscale have been reported as ranging from .80 to .89 (Harter, 1988). For the current study, Year 3 reliability estimates were .81 for the older sibling and .75 for the younger sibling. For year 4, reliabilities were .80 and .76, for the older and younger sibling respectively

Happiness was measured by the standard one-item happiness question used by

the University of Chicago's National Opinion Research Center (NORC) and the University of Michigan's Survey Research Center (SRC, Gurin, Veroff, & Feld, 1960)

The item is, "Taken all together, how would you say things are these days?"

Response options were one (not too happy), two (pretty happy), and three (very happy).

Subjective Well-Being was measured by the Index of Well-Being (IWB, Campbell, Converse, & Rodgers, 1976). This is a self-report measure assessing individual well-being with current life experience. The eight-item Index of General Affect (IGA) and the single-item Life Satisfaction comprise the Index of Well-Being. The Life Satisfaction item is weighted by 1.1 and added to the IGA to produce a final score indicative of well-being. Scores can range from lowest well-being (0.0) to highest well-being (14.7). The IGA has demonstrated high internal consistency having a Cronbach alpha of .89 (Campbell, Converse, & Rodgers, 1976). The IWB has demonstrated both convergent and discriminant validity, having correlations from .20 to .26 with fear and worry measures, .35 with a measure of personal competence, .20 with the Crowne-Marlowe Social Desirability Scale, and .29 with the Deny Bad subscale (Campbell, Converse, & Rogers, 1976). In the current study, Cronbach alpha estimates for Year 3 were .88 for the older sibling and .86 for the younger sibling, and .89 for the older sibling and .90 for the younger sibling in Year 4.

Analyses

The first step in the analyses was to determine whether the variance-covariance matrices of the variables for each of the four proposed models were similar for older

and younger siblings. If the matrices were not significantly different from one another, then the variables were associated with each other in the same way for older and younger siblings. The next step examined the direction of effects, as indicated by the four models (see Figures 1 to 4), using multisample regression analyses. For each of the four models, three model-fitting analyses were conducted, with each analysis having an increasing degree of constraint. Each model-fitting analysis was nested within the one that preceded it: i) Model-Fitting Analysis 1--examined how well the model fit for older and younger siblings separately; ii) Model-Fitting Analysis 2--examined whether the regression weights were the same for older and younger siblings; and iii) Model-Fitting Analysis 3--examined whether the regression weights and the interfactor correlations among the variables were the same for older and younger siblings. Model-Fitting Analysis 1 was a just-identified model. A just-identified model occurs when the number of structural equations (knowns) in the model equals the number of unknowns to be solved (Joreskog & Sorbom, 1987; Kelloway, 1995). This model always provides a perfect fit ($p=1.00$) to the covariance matrix. As such, there is only one set of values that will completely fit the covariance matrix.

Model Fitting

Analyses were conducted using LISREL VII (Joreskog & Sorbom, 1987). The chi-square statistic provided by LISREL VII is an indication of how well a model reproduces the observed covariance matrix. A nonsignificant chi-square indicates that the model provides a reasonable fit to the data. However, the chi-square statistic is

dependent upon sample size. As such, when multiple groups are analyzed, the interpretation of the chi-square is limited. Thus, other fit criteria should be used in conjunction with the chi-square to provide an indication of the overall fit of the model to the obtained data. One such alternative is to correct the chi-square statistic by the degrees of freedom (df) of the model (Alwin & Jackson, 1980, Bohmstedt, 1983). While there is no standard criterion available for this ratio, it is common practice that the statistic should be less than or equal to two. Another criterion is the goodness of fit index (GFI), which is a measure of the amount of variance and covariance accounted by the model. The closer the GFI is to a value of 1.00, the better the fit, with 0.90 being the minimum acceptable value. An additional fit criterion frequently used is the root mean squared residual (RMSR). The RMSR is the square root of the mean of the squared differences between the implied and observed correlation/covariance matrices. Values less than .05 indicate a good fit. However, due to the sensitivity of the index to scale differences, it does not work well when using covariance matrices (Kelloway, 1995). As such, the RMSR was not used as a fit index. One final criterion used is the F-test, which evaluates the extent to which the model provides information about the relative importance of the x variables as predictors of the y variables. For Contemporaneous Models 1 and 2 and Longitudinal Model 1, the F-test evaluated the extent to which the model provided information about the importance of school and neighbourhood PSC as predictors of the mental health indices. For Longitudinal Model 2, the F-test evaluated the importance of the indices of mental health as predictors of PSC. This test is based on the total

coefficient of determination (R^2) for the structural equations. The formula used for calculating the F-test was:

$$F = \frac{R^2/q}{(1-R^2)/(N-q-1)}, \text{ where } q \text{ is equal to \# of } x \text{ variables}$$

Results

For all models, correlation matrices were used as input data (see Tables 1-6). Means and standard deviations were included in the command files to enable LISREL VII to convert the data to variance-covariance matrices (see Table 7). Therefore, all analyses were based on covariance matrices. Additionally, reliabilities for the measures used were included to enable LISREL to correct for some of the poor scale reliabilities (see Table 7). The results are presented for each of the four proposed models separately.

Contemporaneous Model 1- Predicting Mental Health Indices from PSC in Year 3

Before conducting any of the model-fitting analyses, the equality of the covariance structure for the siblings' data was examined. The analysis revealed a good fit, $X^2(42, N = 123) = 19.42, p > .05, GFI = 0.96, X^2\text{-to-}df \text{ ratio} = 0.46$. This suggested that the siblings' variance-covariance matrices were not significantly different from each other. Therefore, the pattern of variances and covariances among the variables was not significantly different for older and younger siblings. As such, the same model would be expected to reproduce the older siblings' and younger siblings' data.

Model-Fitting Analysis 1--Separate Model. The first model-fitting analysis tested the fit of the contemporaneous model for Year 3 for older siblings and younger siblings separately. The analysis revealed a good fit, $X^2(0, N = 123) = 0.98, p = 1.00, GFI = 1.00$. This indicated that PSC 'predicted' the indices of mental health for older and younger siblings when all variables were left variant.

Table 1

Correlations for Year 3 Sense of Community and Mental Health Indices for Older Sibling

Variable	1	2	3	4	5	6	7	8
1. PSC-S	-							
2. PSC-N	.44**	-						
3. LONELY-S	-.43**	-.23*	-					
4. S-ESTEEM	.32**	.21*	-.37**	-				
5. HAPPY	.12	.12	-.34**	.43**	-			
6. W-BEING	.21*	.26**	-.35**	.53**	.49**	-		
7. AGE	.19*	.06	-.06	-.13	-.08	.00	-	
8. SEX	-.04	.06	-.08	-.12	-.04	-.02	-.04	-

Note 1. PSC-S= School Sense of Community. PSC-N= Neighbourhood Sense of Community. LONELY-S= School Loneliness. S-ESTEEM= Self-Esteem. HAPPY= Happiness. W-BEING= Well-Being. AGE= Age. SEX= Sex.

* $p \leq .05$ ** $p \leq .01$

Table 2

Correlations for Year 3 Sense of Community and Mental Health Indices for Younger Sibling

Variable	1	2	3	4	5	6	7	8
1. PSC-S	-							
2. PSC-N	.58**	-						
3. LONELY-S	-.35**	-.28**	-					
4. S-ESTEEM	.27**	.26**	-.32**	-				
5. HAPPY	.09	.18*	-.34**	.46**	-			
6. W-BEING	.32**	.33**	-.48**	.53**	.50**	-		
7. AGE	.01	-.11	.07	.03	.04	-.07	-	
8. SEX	.05	.13	-.07	-.07	-.04	-.07	-.02	-

Note 1. PSC-S= School Sense of Community. PSC-N= Neighbourhood Sense of Community. LONELY-S= School Loneliness. S-ESTEEM= Self-Esteem. HAPPY= Happiness. W-BEING= Well-Being. AGE= Age. SEX= Sex.

* $p \leq .05$ ** $p \leq .01$

Table 3

Correlations for Year 4 Sense of Community and Mental Health Indices for Older Sibling

Variable	1	2	3	4	5	6	7	8	9
1. PSC-S	-								
2. PSC-N	.24*	-							
3. LONELY-S	-.47**	-.31**	-						
4. LONELY-G	-.47**	-.29**	.71**	-					
5. S-ESTEEM	.34**	.12	-.39**	-.38**	-				
6. HAPPY	.07	.08	-.23*	-.27*	.59**	-			
7. W-BEING	.36**	.18	-.47**	-.49**	.58**	.55**	-		
8. AGE	.13	.10	-.23*	-.22*	.07	.04	.05	-	
9. SEX	.10	.16	.05	-.12	-.26*	-.10	.02	.02	-

Note 1. PSC-S= School Sense of Community. PSC-N= Neighbourhood Sense of Community. LONELY-S= School Loneliness. LONELY-G= General Loneliness. S-ESTEEM= Self-Esteem. HAPPY= Happiness. W-BEING= Well-Being. AGE= Age. SEX= Sex.

* $p \leq .05$ ** $p \leq .01$

Table 4

Correlations for Year 4 Sense of Community and Mental Health Indices for Younger Sibling

Variable	1	2	3	4	5	6	7	8	9
1. PSC-S	-								
2. PSC-N	.61**	-							
3. LONELY-S	-.38**	-.34**	-						
4. LONELY-G	-.41**	-.33**	.45**	-					
5. S-ESTEEM	.24*	.20	-.34**	-.41**	-				
6. HAPPY	.20	.22*	-.05	-.37**	.34**	-			
7. W-BEING	.37**	.36**	-.39**	-.54**	.42**	.45**	-		
8. AGE	.09	.14	.04	-.20	.05	.03	.07	-	
9. SEX	.10	.21	-.08	-.14	.04	.06	.04	-.07	-

Note 1. PSC-S= School Sense of Community. PSC-N= Neighbourhood Sense of Community. LONELY-S= School Loneliness. LONELY-G= General Loneliness. S-ESTEEM= Self-Esteem. HAPPY= Happiness. W-BEING= Well-Being. AGE= Age. SEX= Sex.

* $p \leq .05$ ** $p \leq .01$

Table 5

Correlations Among Year 3 and Year 4 Sense of Community and Mental Health Indices for Older Sibling

	<u>Year 3</u>							
Variable	PSC-S	PSC-N	LONELY-S	S-ESTEEM	HAPPY	W-BEING	AGE	SEX
<u>Year 4</u>								
PSC-S	.42**	.14	-.30**	.34**	.05	.29**	.10	.10
PSC-N	.16	.39**	-.24*	.15	.09	.20	.06	.16
LONELY-S	-.29**	-.19	.55**	-.30**	-.12	-.35**	-.21	.05
LONELY-G	-.18	-.18	.45**	-.29**	-.12	-.30**	-.20	-.12
S-ESTEEM	.17	.12	-.12	.57**	.34**	.48**	.06	-.26*
HAPPY	.10	.08	-.07	.41**	.38**	.43**	.03	-.10
W-BEING	.11	.08	-.19	.34**	.25*	.45**	.05	.02
AGE	.29**	.16	-.14	-.11	-.07	-.04		
SEX	-.01	.04	-.04	-.26*	-.14	-.14		

Note 1. PSC-S= School Sense of Community. PSC-N= Neighbourhood Sense of Community. LONELY-S= School Loneliness. LONELY-G= General Loneliness. S-ESTEEM= Self-Esteem. HAPPY= Happiness. W-BEING= Well-Being. AGE= Age. SEX= Sex. * $p \leq .05$ ** $p \leq .01$

Table 6

Correlations Among Year 3 and Year 4 Sense of Community and Mental Health Indices for Younger Sibling

Variable	<u>Year 3</u>							
	PSC-S	PSC-N	LONELY-S	S-ESTEEM	HAPPY	W-BEING	AGE	SEX
<u>Year 4</u>								
PSC-S	.31**	.41**	-.05	.11	.04	.20	.15	.10
PSC-N	.33**	.48**	-.08	.21	.11	.29**	.09	.21
LONELY-S	-.27*	-.38**	.55**	-.10	-.17	-.29**	-.01	-.08
LONELY-G	-.07	-.11	.12	-.25*	-.23*	-.15	-.13	-.14
S-ESTEEM	.00	.12	-.14	.36**	.41**	.28**	.02	.04
HAPPY	-.01	-.04	-.03	.22*	.31**	.15	.02	.06
W-BEING	.00	.15	-.21	.22*	.32**	.20	.10	.04
AGE	.06	-.01	.05	.06	.12	.00		
SEX	.05	.14	.03	-.03	-.09	-.10		

Note 1. PSC-S= School Sense of Community. PSC-N= Neighbourhood Sense of Community. LONELY-S= School Loneliness. LONELY-G= General Loneliness. S-ESTEEM= Self-Esteem. HAPPY= Happiness. W-BEING= Well-Being. AGE= Age. SEX= Sex. * $p \leq .05$ ** $p \leq .01$

Table 7

Means, Standard Deviations, and Reliability Estimates (α)

Variable	M	SD	α
<u>Year 3</u>			
<u>Older Sibling</u>			
PSC-S	27.37	3.55	.70
PSC-N	27.83	3.63	.71
LONELY-S	29.07	9.82	.93
S-ESTEEM	15.84	2.62	.81
HAPPY	2.34	.54	
W-BEING	11.97	1.68	.88
<u>Younger Sibling</u>			
PSC-S	27.95	3.39	.64
PSC-N	28.58	3.44	.74
LONELY-S	28.11	9.40	.92
S-ESTEEM	16.23	2.54	.75
HAPPY	2.44	.56	
W-BEING	12.40	1.70	.86

Note 1. PSC-S= School Sense of Community. PSC-N= Neighbourhood Sense of Community. LONELY-S= School Loneliness. S-ESTEEM= Self-Esteem. HAPPY= Happiness. W-BEING= Well-Being.

Table 7 Continued:

Means, Standard Deviations, and Reliability Estimates

Variable	M	SD	α
<u>Year 4</u>			
<u>Older Sibling</u>			
PSC-S	27.74	3.26	.73
PSC-N	27.69	3.31	.72
LONELY-S	26.09	7.07	.94
LONELY-G	29.88	7.01	.89
S-ESTEEM	17.14	2.68	.80
HAPPY	2.37	.63	
W-BEING	12.40	1.94	.89
<u>Younger Sibling</u>			
PSC-S	28.09	2.84	.59
PSC-N	28.42	3.27	.72
LONELY-S	25.77	7.55	.93
LONELY-G	29.55	5.05	.79
S-ESTEEM	17.21	2.76	.76
HAPPY	2.41	.56	
W-BEING	12.60	1.40	.90

Note 1. PSC-S= School Sense of Community. PSC-N= Neighbourhood Sense of Community. LONELY-S= School Loneliness. LONELY-G= General Loneliness. S-ESTEEM= Self-Esteem. HAPPY= Happiness. W-BEING= Well-Being.

Model-Fitting-Analysis 2--Invariant Regression Weights. The next model-fitting analysis tested whether the regression weights were the same for older and younger siblings. The analysis revealed an excellent fit, $X^2 (8, N = 123) = 4.60, p > .05, GFI = 0.99, X^2\text{-to-df ratio} = 0.58$. Because Model-Fitting Analysis 2 was nested within Model-Fitting Analysis 1, the change in chi-square statistic tested whether there was a significant change in the fit of the model to the data. The change in chi-square was not significant, indicating that holding regression weights invariant for older siblings and younger siblings produced as good a fit as when the regression weights were variant (see Table 8). As such, a model with invariant regression weights was not fitting significantly different from the separate model. This suggested that a model with invariant regression weights across siblings was tenable.

Model-Fitting Analysis 3-- Invariant Interfactor Correlations. This analysis tested whether the interfactor correlations were the same for older and younger siblings when the regression weights were held invariant. The analysis revealed that the interfactor correlations could be held invariant across the two groups, $X^2 (18, N = 123) = 7.15, p > .05, GFI = 0.99, X^2\text{-to-df ratio} = 0.40$. Because both the regression weights and the interfactor correlations were held invariant, this model-fitting analysis was tested against the previous model-fitting analysis, which held only the regression weights invariant. The change in chi-square revealed that the present model-fitting analysis replicated the data more efficiently than the previous analysis (see Table 8). This indicated that a model with invariant regression weights and invariant interfactor correlations for older and younger siblings was tenable.

Table 8

Fit Indices and Change in Chi-Square for Contemporaneous Model 1 across Older and Younger Siblings' Data

Model-Fitting Analysis	X^2	GFI	X^2/df	X^2_{diff}
1. Separate Model	0.98	1.00	-	
2. Invariant Regression Weights	4.60	0.99	0.58	
Model 2 vs. Model 1				3.62
3. Invariant Interfactor Correlations	7.15	0.99	0.40	
Model 3 vs. Model 2				2.55

Note: GFI = goodness of fit index; X^2/df = X^2 -to-degrees of freedom ratio, X^2_{diff} = change in chi-square.

In summary, the best fitting model for Contemporaneous Model 1 was the one with both invariant regression weights and invariant interfactor correlations (see Figure 5). The analyses indicated that PSC accounted for a significant amount of the variance ($R^2 = .24$) in the mental health indices in Year 3, $F(2, 120) = 17.17, p < .005$. As seen in Figure 5, both neighbourhood and school PSC significantly predicted subjective well-being, while school PSC significantly predicted school loneliness and self-esteem. Neither neighbourhood nor school PSC significantly predicted happiness in Year 3.

Contemporaneous Model 2- Predicting Mental Health Indices from PSC in Year 4

The equality of the covariance structure for the siblings' data was examined. The analysis revealed a poor fit, $X^2(56, N=90) = 112.19, p < .001, GFI = 0.74, X^2$ -to-df ratio = 2.00. Based on the X^2 and the GFI, this analysis indicated that the siblings' patterns of variances and covariances were significantly different from each other. Therefore, the same model would not be expected to reproduce the older siblings' and younger siblings' data.

Model-Fitting Analysis 1--Separate Model. The first model-fitting analysis tested whether the contemporaneous model for Year 4 fit for older siblings and younger siblings separately. The analysis revealed an excellent fit, $X^2(0, N=90) = 1.24, p = 1.00, GFI = 1.00$. This indicated that, in a model without constraints, PSC predicted the indices of mental health for older and younger siblings. In other words, the proposed model did reproduce the older siblings' data and the younger siblings' data

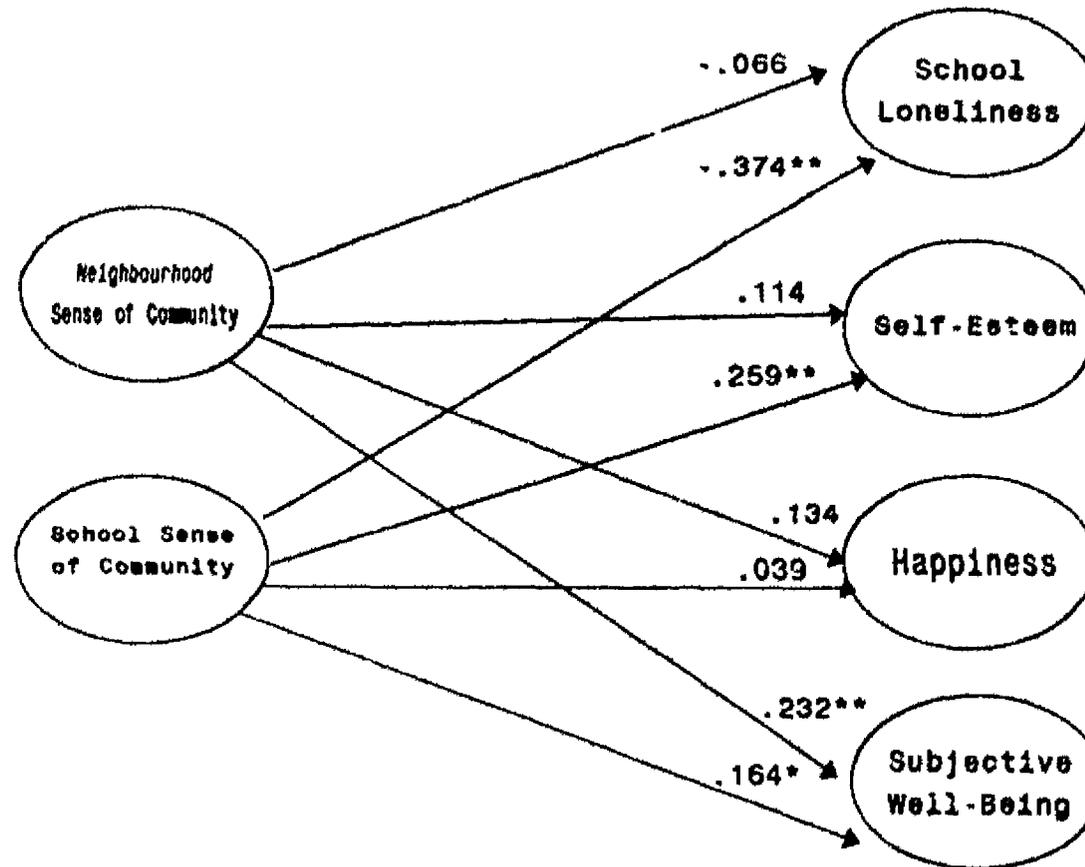


Figure 5. Contemporaneous Model 1- Standardized Solution
 Predicting Mental Health Indices from Psychological Sense of
 Community Year 3
 *p<.05 **p<.01

Model-Fitting-Analysis 2--Invariant Regression Weights The next model-fitting analysis tested whether the regression weights of the variables were the same for older and younger siblings. The analysis revealed an excellent fit, $\chi^2 (10, N = 90) = 6.58, p > .05, GFI = 0.99, \chi^2\text{-to-df ratio} = 0.66$. As before, because Model-Fitting Analysis 2 was nested within Model-Fitting Analysis 1, the change in chi-square was examined to determine if there was a significant change in the fit of the model to the data. The change in chi-square was not significant, indicating that holding the regression weights invariant for both older and younger siblings produced as good a fit as when the regression weights were variant (see Table 9). As such, a model with invariant regression weights was not fitting significantly different from the separate model. This provided further support that a model with invariant regression weights across siblings was tenable.

Model-Fitting Analysis 3--Invariant Interfactor Correlations. This analysis tested whether the interfactor correlations in the contemporaneous model for Year 4 were the same for older and younger siblings, when the regression weights were held invariant. Based on the GFI and the $\chi^2\text{-to-df ratio}$, the analysis revealed a good fit, $\chi^2 (25, N = 90) = 44.78, p < .01, GFI = 0.93, \chi^2\text{-to-df ratio} = 1.79$. Because this model-fitting analysis held both the regression weights and interfactor correlations invariant, it was tested against the previous analysis which held only the regression weights invariant. The change in chi-square was significant, indicating that this model-fitting analysis did not replicate the data more efficiently than the previous analysis (see Table 9). This indicated that a model with invariant regression weights and

Table 9

Fit Indices and Change in Chi-Square for Contemporaneous Model 2 across Older and Younger Siblings' Data

Model-Fitting Analysis	X ²	GFI	X ² /df	X ² _{diff}
1. Separate Model	1.24	1.00	-	
2. Invariant Regression Weights	6.58	0.99	0.66	
Model 2 vs. Model 1				5.34
3. Invariant Interfactor Correlations	44.78**	0.93	1.79	
Model 3 vs. Model 2				38.20**

Note: GFI = goodness of fit index; X²/df = X²-to-degrees of freedom ratio; X²_{diff} change in chi-square.

*p < .05

**p < .01

***p < .005

invariant interfactor correlations for older and younger siblings was not tenable.

In summary, the best fitting model for Contemporaneous Model 2 was the one with invariant regression weights (see figure 6). The analyses indicated that PSC accounted for a significant amount of the variance ($R^2 = 0.35$) in the mental health indices in Year 4, $F(2, 87) = 23.84, p < .005$. As seen in Figure 6, both neighbourhood and school PSC were significant predictors of school loneliness. School PSC also significantly predicted general loneliness, self-esteem, and subjective well-being in Year 4. As was found for Contemporaneous Model 1, neither neighbourhood nor school PSC in Contemporaneous Model 2 significantly predicted happiness.

Longitudinal Model 1- PSC In Year 3 Predicting Mental Health Indices in Year 4

Before any of the model-fitting analyses were conducted, the equality of the covariance structure for the siblings' data for Longitudinal Model 1 was examined. Based on the χ^2 and the GFI, the analysis revealed a poor fit, $\chi^2(56, N=90) = 92.83, p < .001, GFI = 0.76, \chi^2$ -to-df ratio = 1.66. This indicated that the siblings' variance-covariance matrices were significantly different from each other. As such, the same model would not be expected to reproduce the older siblings' and younger siblings' data

Model-Fitting Analysis 1--Separate Model. The first model-fitting analysis tested whether the first longitudinal model fit for older siblings and younger siblings separately. The analysis revealed an excellent fit, $\chi^2(0, N=90) = 0.71, p = 1.00, GFI = 1.00$. This indicated that PSC in Year 3 predicted the mental health indices in Year 4

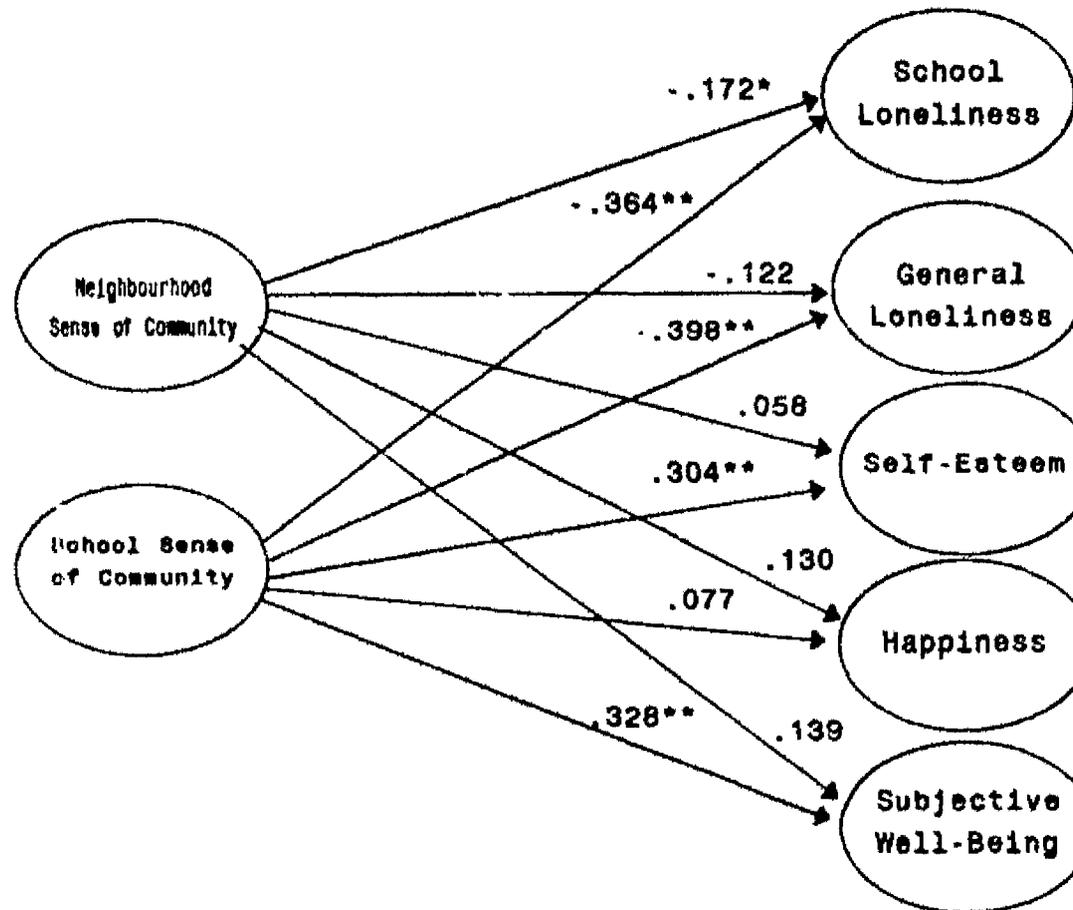


Figure 6. Contemporaneous Model 2 - Standardized Solution
 Predicting Mental Health Indices from Psychological
 Sense of Community Year 4 *p<.05 **p<.01

for both older and younger siblings when all variables were left variant.

Model-Fitting Analysis 2--Invariant Regression Weights. The next analysis tested whether the regression weights for the variables were the same for older and younger siblings. The analysis revealed a good fit, $X^2 (10, N = 90) = 9.44, p > .05, GFI = 0.98, X^2\text{-to-df ratio} = 0.94$. Because of the nesting of Model-Fitting Analysis 2 within Model-Fitting Analysis 1, the change in chi-square was examined. The change in chi-square was not significant (see Table 10). This indicated that holding the regression weights for the older and younger siblings invariant produced as good a fit as when the regression weights were not constrained. This provided further support that a model with invariant regression weights across siblings was tenable.

Model-Fitting Analysis 3--Invariant Interfactor Correlations. Model-Fitting Analysis 3 tested whether interfactor correlations were the same for older and younger siblings, when the regression weights were held invariant. Based on the GFI and the $X^2\text{-to-df ratio}$, the analysis revealed a good fit $X^2 (25, N = 90) = 45.20, p < .01, GFI = 0.93, X^2\text{-to-df ratio} = 1.81$. However, the change in chi-square from a model with invariant regression weights to a model with both invariant regression weights and interfactor correlations was significant (see Table 10). This suggested a poor fit, with the present model-fitting analysis not replicating the data more efficiently than the previous analysis. This indicated that a model with invariant regression weights and invariant interfactor correlations for older and younger siblings was not tenable.

To summarize, the best fitting model for Longitudinal Model 1 was the one with invariant regression weights (see Figure 7). The analyses indicated that PSC in

Table 10

Fit Indices and Change in Chi-Square for Longitudinal Model 1 across Older and Younger Siblings' Data

Model-Fitting Analysis	X ²	GFI	X ² /df	X ² _{diff}
1. Separate Model	0.71	1.00	-	
2. Invariant Regression Weights	9.44	0.98	0.94	
Model 2 vs. Model 1				8.73
3. Invariant Interfactor Correlations	45.20**	0.93	1.81	
Model 3 vs. Model 2				35.76**

Note: GFI = goodness of fit index; X²/df = X²-to-degrees of freedom ratio, X²_{diff}= change in chi-square.

*p < .05

**p < .01

***p < .005

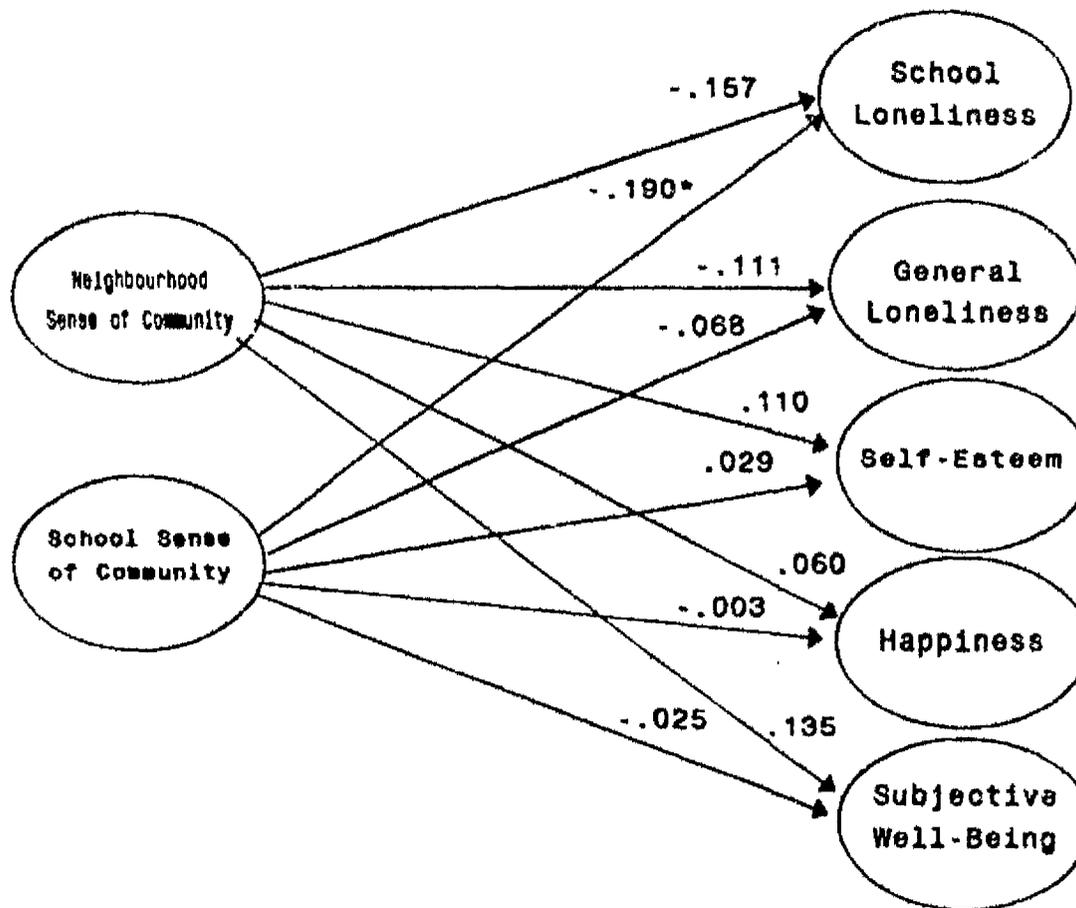


Figure 7. Longitudinal Model 1 - Standardized Solution
 Predicting Mental Health Indices in Year 4 from Psychological
 Sense of Community in Year 3 *p<.05 **p<.01

Year 3 accounted for a small, but significant, amount of the variance ($R^2 = 0.10$) in the mental health indices in Year 4, $F(2, 87) = 4.94, p < .05$. As seen in Figure 7, school PSC in Year 3 significantly predicted school loneliness in Year 4. Neighbourhood PSC was not a significant predictor of any of the mental health indices.

Longitudinal Model 2- Mental Health Indices in Year 3 Predicting PSC in Year 4

The equality of the covariance structure for the siblings' data for the second longitudinal model was examined first. Based on the χ^2 and the χ^2 -to-df ratio, the analysis revealed a good fit, $\chi^2(42, N=90) = 47.44, p > .05, GFI = 0.87, \chi^2$ -to-df ratio = 1.13. This suggested that the siblings' variance-covariance matrices were not significantly different from each other. With the pattern of variances and covariances among the variables not being significantly different for older and younger siblings, the same model would be expected to reproduce both groups' data.

Model-Fitting Analysis 1--Separate Model The first model-fitting analysis tested whether Longitudinal Model 2 fit for older siblings and younger siblings separately. The analysis revealed an excellent fit, indicating that the indices of mental health in Year 3 predicted PSC in Year 4, $\chi^2(0, N=90) = 2.38, p = 1.00, GFI = 1.00$.

Model-Fitting-Analysis 2--Invariant Regression Weights The next analysis tested whether the regression weights were the same for older and younger siblings. The analysis revealed a good fit, $\chi^2(8, N=90) = 12.16, p > .05, GFI = 0.98, \chi^2$ -to-df ratio = 1.52. The change in chi-square was examined to determine whether there was a significant change in the fit of the model to the data from Model-Fitting Analysis 1.

to Model-Fitting Analysis 2. The change in chi-square was not significant, indicating that holding regression weights invariant for older and younger siblings produced as good a fit as when the regression weights were not constrained (see Table 11). This suggested that a model with invariant regression weights across siblings was tenable.

Model-Fitting Analysis 3--Invariant Interfactor Correlations. Model-Fitting Analysis 3 tested whether the interfactor correlations of the variables were the same for older and younger siblings when the regression weights were held invariant. Based on the X^2 and the X^2 -to-df ratio, the analysis revealed a poor fit, $X^2 (11, N 90) = 27.67, p < .005, GFI = 0.94, X^2$ -to-df ratio = 2.52. Because both the regression weights and the interfactor correlations were held invariant, this model-fitting analysis was tested against the previous model-fitting analysis, which held only the regression weights invariant. The change in chi-square revealed that the present model-fitting analysis did not replicate the data more efficiently than the previous analysis (see Table 11). This indicated that a model with invariant regression weights and invariant interfactor correlations for older and younger siblings was not tenable.

In summary, the best fitting model for Longitudinal Model 2 was the one with invariant regression weights (see Figure 8). The analyses indicated that the mental health indices in Year 3 accounted for a significant amount of the variance ($R^2 = 0.13$) in PSC in Year 4, $F (4, 85) = 6.54, p < .05$. As seen in Figure 8, subjective well-being in Year 3 significantly predicted both neighbourhood and school PSC in Year 4. No other mental health indices were significant predictors of PSC.

Table 11

Fit Indices and Change in Chi-Square for Longitudinal Model 2 across Older and Younger Siblings' Data

Model-Fitting Analysis	X ²	GFI	X ² /df	X ² _{diff}
1. Separate Model	2.38	1.00	-	
2. Invariant Regression Weights	12.16	0.98	1.52	
Model 2 vs. Model 1				9.78
3. Invariant Interfactor Correlations	27.67***	0.94	2.52	
Model 3 vs. Model 2				15.51**

Note: GFI = goodness of fit index; X²/df = X²-to-degrees of freedom ratio; X²_{diff} = change in chi-square.

*p < .05

**p < .01

***p < .005

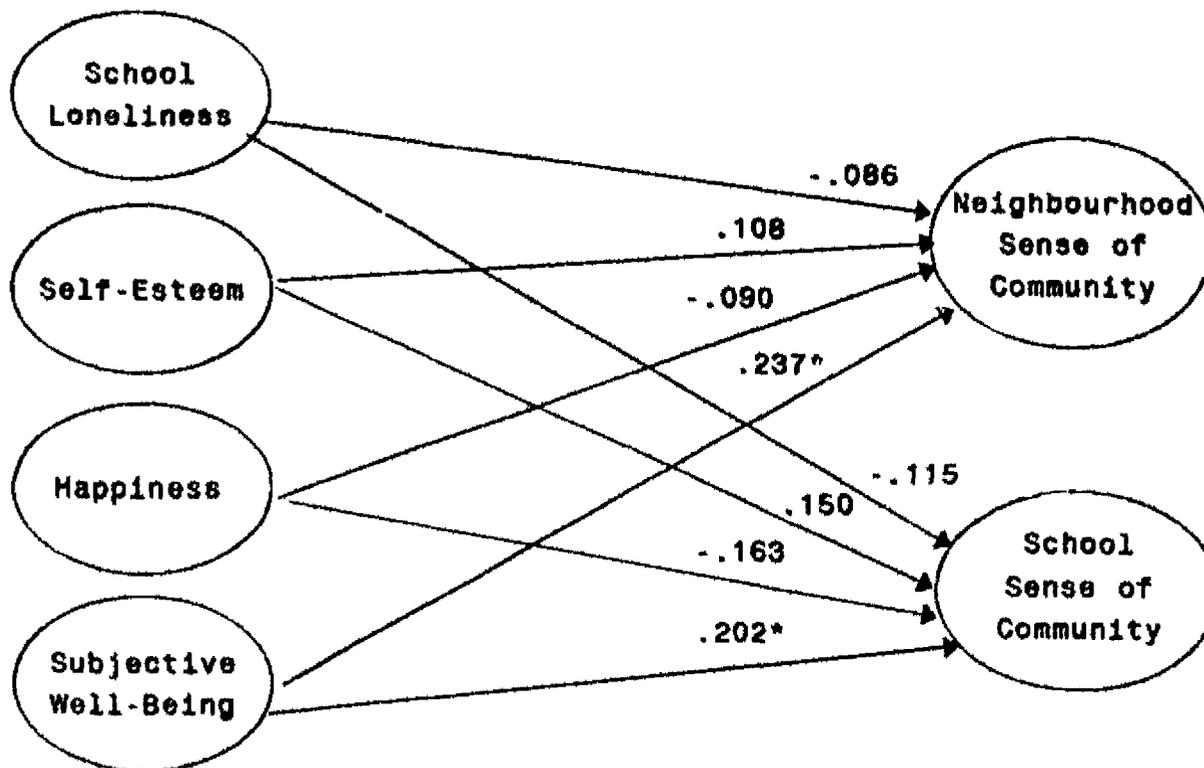


Figure 8. Longitudinal Model 2 - Standardized Solution
 Predicting Psychological Sense Of Community in Year 4
 from Mental Health Indices in Year 3
 *p<.05 **p<.01

Discussion

The primary purpose of the current study was to determine the nature of the relationship between the adolescent mental health indices of loneliness, happiness, subjective well-being, and self-esteem and psychological sense of community. Specifically, this study of adolescent siblings over a two-year period sought to determine the direction of influence in this relationship. Discussion of the results from structural equations, which were used to test these relationships, are organized around the two contemporaneous models, followed by a discussion of the two longitudinal models, and then the developmental results from the study of siblings. The discussion concludes with a presentation of the study's limitations and suggestions for future research.

Contemporaneous Associations

The present study demonstrated that psychological sense of community (PSC) and mental health in adolescents are related. Within-time, PSC in the school is predictive of loneliness, subjective well-being, and self-esteem. Adolescents with high levels of school PSC have low levels of loneliness and high levels of subjective well-being and self-esteem. These associations are indicative of positive mental health in adolescents as a result of having a sense of belonging in their community

The results reported here replicated the associations between PSC and loneliness and subjective well-being (Davidson & Cotter, 1991; Pretty, Andrewes, & Collett, 1994; Pretty et al., in press), but not that between PSC and happiness (Davidson & Cotter, 1991; Pretty et al., in press). The happiness measure used in this

study was a one-item measure, future research should use a multi-item happiness measure to better capture the dimensionality of the happiness construct. The association between PSC and self-esteem is an important new discovery in research on PSC and mental health in adolescents. This finding indicates that self-esteem is indeed an important component of adolescent mental health and should be included when examining the interrelations between psychological sense of community and mental health. It is consistent with previous research that suggests that peer group support (classmates, organizations) may be an important determinant of self-esteem (Harter, 1987) and that self-esteem might be enhanced by social institutions (McCarthy & Hoge, 1982). These results are the first empirical link between these two constructs.

In examining the associations among PSC and the mental health indices more closely, the PSC in the school environment was associated with each index of mental health (except happiness). On the other hand, PSC in the neighbourhood environment has only associated with one mental health index in each of the two years of study. Within-time, it appears that adolescents' perceptions of their school environment most influence their mental health: the school environment is more influential for adolescents than the neighbourhood environment. We previously postulated that for younger adolescents both school and neighbourhood environments would be important. For older adolescents, due to increased mobility and expansion of social circles, it would be the school environment that would hold the most importance. The present findings indicate, however, that it is the school environment which is most important

for both older and younger adolescents.

Both school and neighbourhood PSC are associated with loneliness (Pretty, Andrewes, & Collett, 1994; Pretty et al., in press). Why didn't PSC in the neighbourhood predict school loneliness in Year 3 and general loneliness in Year 4? Intuitively, we would expect PSC in the school to be associated with school loneliness. As such, we might expect PSC in the neighbourhood not to be associated with school loneliness. Additionally, the questions in the general loneliness measure may not have been specific enough for the adolescents to comprehend. Previous research has indicated that neighbourhood PSC is the primary predictor of loneliness for younger adolescents, while school PSC is the primary predictor of older adolescent loneliness (Pretty, Andrewes, & Collett, 1994; Pretty et al., in press). Regardless of the age of the adolescents or the year studied, PSC in the school is the primary predictor of loneliness in the current study.

We can conclude from both contemporaneous models that adolescents' perceptions of their environment (primarily their school environment) are associated with their levels of loneliness, subjective well-being, and self-esteem. Particularly, adolescents with high levels of PSC also have low levels of loneliness and high levels of subjective well-being and self-esteem. While we have loosely alluded to stating that PSC 'predicted' the indices of mental health, this is not true prediction. Without analyzing these within-time associations across-time, we cannot conclude that PSC is truly predictive of mental health.

Longitudinal Associations

With a short-term longitudinal study, we had the opportunity to examine the direction of effects between psychological sense of community and the mental health indices across-time. While the contemporaneous (within-time) analyses suggested that PSC 'predicts' the indices of mental health, this is not a true prediction indicative of causality. Only longitudinal analyses can afford the opportunity to discuss 'cause and effect' among the variables. Even then, with only a one-year longitudinal study, speculating that 'x causes y' should be done cautiously.

Two longitudinal models were examined, the first examining PSC as a predictor of mental health and the second examining mental health as a predictor of PSC. While the longitudinal models did not account for as much variance as did the contemporaneous models, the results are very intriguing and impact significantly upon research in this area of psychology. In the first longitudinal model, examining the indices of PSC as predictors of mental health, school PSC predicts school loneliness. While this was the only significant association, it is the first demonstration of PSC as a true predictor of an index of mental health. Cautiously generalizing beyond this specific result, how adolescents perceive their environments (particularly their school environment) may influence their subsequent mental health. In the second longitudinal model, examining the predictive abilities of the indices of mental health, subjective well-being predicted both school and neighbourhood PSC. This is an extremely important finding. This is the first association indicating that adolescents' mental health may have an impact upon perceptions of their environment. For the first time

we can cautiously discuss mental health as an influence upon PSC. Intuitively, we can see how a lonely individual might not feel a part of the community, or how an individual with high self-esteem might feel a high sense of belonging. But, taking the case of the chicken and the egg, what influences what first? Does loneliness in an adolescent result in a low PSC, or does having a low PSC cause an adolescent to withdraw and become lonely?

Taking the results of the two longitudinal models together, it is possible that a bidirectional relationship exists among the indices of mental health and PSC. Mental health might be both a consequence and an influence of whether adolescents feel they are part of a community; PSC could also be both a predictor and outcome of an individual's mental health functioning. Exploring the bidirectionality of this relationship should definitely be a focal point of future research. Due to the limited associations that were found, and the short-term nature of this study, these results should be interpreted with extreme caution. With specific results, alternative explanations possibly exist: Only one indicator is relevant; the wrong predictors were chosen; or the results are erroneous. These possible explanations for the current findings should be considered in future research in this area.

What are the implications of this research? We have seen that high levels of school PSC can influence mental health, resulting in low levels of loneliness, and high levels of subjective well-being and self-esteem for adolescents. We would most likely want to foster high levels of PSC among adolescents in their schools. Adolescents should be encouraged to participate in the activities of their school in order to

facilitate their sense of belonging, the fulfilment of needs, the opportunity to exert influence, and finally the opportunity to emotionally connect with other community members. The fostering of higher levels of PSC in the school environment should translate into positive mental health. Unfortunately, it is likely that school administrators and activity organizers would say that they have all the activities in which adolescents can participate, and lay the blame on adolescents for not participating.

However, not all adolescents are participating in school activities. If they were, then all adolescents would have high levels of PSC. Our primary concern should be with the adolescents not involved in their school community. The most important point to make is that, regardless of the number of opportunities available in the community, if adolescents do not perceive a sense of community and belonging, they will not take advantage of the opportunities that might enhance their PSC and subsequent mental health. As such, principals and other school personnel should target their efforts to the withdrawn, non-participating students. They should find out from the adolescents what types of activities would make them become more involved. It is not enough to encourage withdrawn adolescents to participate; they need to want to participate. With the input of the withdrawn adolescents, it would be hoped that the types of activities offered in a school would appeal to a wider range of adolescents. The ultimate goal would be for adolescents to perceive a PSC within their school, and that this perception of belonging would impact positively upon their mental health.

In addition to PSC influencing adolescent mental health, this study suggests

that adolescents' mental health has an impact upon perceptions of their environments. This finding on the impact of mental health on PSC has not been looked at previously, and goes against all previous researched hypotheses on the nature of the PSC and mental health relationship. The concept of PSC, while having its own inherent benefits, has often had its usefulness defined through the benefits it affords. One such benefit was thought to be mental health. With the indication that mental health can influence PSC, what is the usefulness of PSC if not defined by its impact upon mental health? According to S. Mason (1974), the best way to judge the success of a community intervention is whether a more positive psychological sense of community has been fostered among group members. PSC can be used as an outcome measure indicative of the success or failure of a community mental health intervention. For example, PSC could be used to measure the success or failure of a community-based psychosocial rehabilitation program for individuals with long-term mental illnesses (eg. depression). By measuring client levels of PSC before and after entering the intervention program, increases in PSC should reflect positive intervention while PSC decreases should be reflective of poor intervention.

Siblings

The differential influence of the environment on adolescent development was examined by comparing the fit of the four models for siblings of different ages (grouped as older and younger). Mixed results were found in the determination of developmental differences based on adolescent siblings. In all models (contemporaneous and longitudinal) the general associations between mental health and

PSC were the same for both older and younger siblings. No developmental differences in the pattern of associations among mental health and PSC appear to be present for older and younger siblings. As such, we can conclude that PSC and the indices of mental health influence each other in similar manners for both older and younger siblings. These findings are in contrast to the literature that suggests that older and younger siblings perceive their environments differently (Daniels et al., 1985; Goldsmith, 1993). It should be noted, that this was a primarily upper-middle class sample. It might be possible that both older and younger siblings in these families are highly encouraged to be involved in activities. As such, there might be little difference between the older and younger siblings in the manner in which mental health and environmental perceptions interact.

While the general associations among mental health and PSC were fitting similarly for older and younger siblings in all models, differences were found between siblings on the outcome side in three models (Contemporaneous Model 2, Longitudinal Models 1 and 2). There are differences in the mean levels of these outcome variables for the siblings. The lack of fit in the models, while we were not able to test it, suggests that something different is happening for older and younger siblings for the indices of mental health (in Contemporaneous Model 2 and Longitudinal Model 1) and the indices of PSC (in Longitudinal Model 2). These findings are consistent with the literature suggesting that older and younger siblings in the same family are as different as if they were from different families (Daniels et al., 1985; Daniels & Plomin, 1985, Goldsmith, 1993; Plomin & Daniels, 1987). Future research will be needed to more

accurately uncover the similarities or differences among older and younger siblings on the complete nature of the relationship between PSC and mental health

Limitations of the Present Study and Suggestions for Future Research

There are a few limitations to the current study, primarily due to the sample and the measures used. First, the sample itself was a highly self-selected sample, and not a representative sample that would result from random selection. Random recruitment of participants should be the selection method of choice for future studies. This would likely avoid the other two selection problems. The participants came primarily from middle to upper-middle class families. Future research should examine the associations found in the current study on different classes. Additionally, the participants were primarily urban adolescents attending schools in the Halifax and Halifax County school boards. Future research incorporate rural populations as well. It is possible that the relationships uncovered in the current study would be different for rural versus urban adolescents.

Problems were encountered with two of the measures used in this study. First, the lack of association found between PSC and happiness in this study might have been due to the one-item happiness measure used. Another measure, tapping more than one facet of happiness may provide a more accurate reflection of this construct than would a one-item measure. Second, poor scale reliabilities were obtained for the school version of the Sense of Community Index (SCI), particularly for younger siblings. The SCI was originally developed to assess neighbourhood sense of community in adults. A measure of school sense of community specific to adolescents

must be developed to more accurately measure this construct in a non-adult population. Recent work by a colleague has initialized this process by both developing and validating a sense of community measure specific to adolescents and their environments (Rumstein, 1996).

Finally, the most important limitation in the current study is the possible existence of multicollinearity among the measures of neighbourhood and school PSC. Due to the high intercorrelations among these indices, future research should factor analyze these measures to determine whether they are indeed distinct measures of sense of community or merely aspects of a single dimension. The existence of multicollinearity might explain why neighbourhood PSC was not a significant influence on adolescent mental health. School and neighbourhood PSC may actually tap the same dimensions, and 'fight' for variance in associations.

Conclusions

In spite of the limitations noted above, this research has been very worthwhile. We have extended previously researched contemporaneous findings by demonstrating an association between self-esteem and PSC. Additionally, we can conclude that PSC and the indices of mental health are highly related within-time for adolescents. While the contemporaneous associations are important, the focal point of the current study was its longitudinal associations. With results indicating that adolescents' PSC influences their subsequent mental health and that mental health impacts upon PSC, a new corner in community psychology research has been turned. Future researchers are urged to explore the possible bidirectionality of these associations. The implications

of these findings impact upon both school and community program development. Finally, these findings were consistently similar for both older and younger siblings within the same family. While actual experiences of mental health and PSC may differ for siblings, the general associations and interactions among these variables are similar. It is hoped that further research supporting these findings will provide the impetus needed to intervene in enhancing mental health in adolescents, as well as fostering a sense of community. The full impact of these findings upon adolescents, their mental health, and their environments has yet to be realized.

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