

RESILIENCE AMONG CANADIAN RURAL ADOLESCENTS: FINDINGS FROM THE  
NATIONAL LONGITUDINAL SURVEY OF CHILDREN AND YOUTH

by

PATRICIA RUTH FRASER

B. Ed., University of British Columbia, 1979

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF  
THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF ARTS

in

THE FACULTY OF GRADUATE STUDIES

Special Education

THE UNIVERSITY OF BRITISH COLUMBIA

August 23, 2005

© Patricia Ruth Fraser, 2005

## Abstract

Using a resilience theoretical framework, this longitudinal study explored the moderating influence of early adolescent protective factors on risk for psychological health outcomes in middle adolescence (Masten, 2001). Data from the National Longitudinal Survey of Children and Youth (NLSCY) were analyzed via hierarchical regression to measure the interaction effects of community protective variables (important relationships with peers, teachers, and community leaders; school bonding; and extracurricular activities) on risk variables at age 10 to 11, for self-worth, and internalizing and externalizing problems, at age 14 to 15 ( $N = 940$ ). School bonding influenced risk for internalizing and externalizing outcomes when all variables were entered into the equations. Gender main effects were found for self-worth and internalizing problems; however, gender did not interact with risk. These results attest to the important role of early adolescent school bonding in influencing risk among Canadian rural adolescents.

Key words: School bonding, resilience, rural, adolescence, protective factors, risk, self-worth, internalizing problems, externalizing problems, gender, interaction effects, moderation.

## TABLE OF CONTENTS

|   |      |
|---|------|
| Abstract.....   | ii   |
| Table of Contents.....                                      | iii  |
| List of Tables.....   | vi   |
| List of Figures.....  | vii  |
| Acknowledgements.....                                       | viii |
| Co-authorship statement.....                                | ix   |
| INTRODUCTION.....   | 1    |
| LITERATURE REVIEW.....                                      | 5    |
| Risk and Resilience.....                                    | 5    |
| <i>Defining Risk</i> .....                                  | 5    |
| <i>Multiple risks</i> .....                                 | 6    |
| <i>Defining Resilience</i> .....                            | 6    |
| <i>Protective Factors</i> .....                             | 12   |
| <i>Risk and Resilience: Multiple Predictors</i> .....       | 12   |
| Rural Research.....   | 13   |
| <i>Defining Rural</i> .....                                 | 13   |
| <i>Rural Versus Urban</i> .....                             | 16   |
| <i>Rural: Risk or Protection?</i> .....                     | 17   |
| Adolescence.....  | 18   |
| <i>Early and Middle Adolescence</i> .....                   | 19   |
| <i>Early and middle adolescence in rural contexts</i> ..... | 20   |
| <i>Gender and Socio-Economic Status (SES)</i> .....         | 22   |
| <i>Gender</i> .....   | 22   |
| <i>Socio-economic status (SES)</i> .....                    | 25   |
| The Present Study.....                                      | 25   |
| <i>Risk Indices</i> .....                                   | 25   |
| <i>Maternal education</i> .....                             | 27   |
| <i>Maternal depression</i> .....                            | 27   |
| <i>Paternal rejection</i> .....                             | 29   |
| <i>Alcohol abuse in the family</i> .....                    | 30   |
| <i>Divorce</i> .....  | 32   |
| <i>Learning disabilities</i> .....                          | 32   |

|  |    |
|--|----|
|  | iv |
| <i>Protective Factors Derived From the Community</i> .....       | 33 |
| <i>Important relationships</i> .....                             | 33 |
| <i>Important relationships in rural contexts</i> .....           | 34 |
| <i>Extracurricular activities</i> .....                          | 35 |
| <i>Extracurricular activities in rural settings</i> .....        | 36 |
| <i>Multiple extracurricular activities</i> .....                 | 37 |
| <i>School bonding</i> .....                                      | 37 |
| <i>Outcomes</i> .....  | 40 |
| <i>Self-worth</i> .....  | 40 |
| <i>Internalizing problems</i> .....                              | 41 |
| <i>Externalizing problems</i> .....                              | 42 |
| Hypothesis and Research Questions.....                           | 45 |
| METHOD.....  | 47 |
| Design.....  | 47 |
| Source of Data.....  | 47 |
| Sample.....  | 49 |
| Measures.....  | 50 |
| <i>Putatively Protective Factors</i> .....                       | 53 |
| <i>Important relationships</i> .....                             | 53 |
| <i>Community attachment</i> .....                                | 53 |
| <i>Risk Index</i> .....  | 54 |
| <i>Low maternal education</i> .....                              | 54 |
| <i>Depression in the PMK</i> .....                               | 55 |
| <i>Parental rejection</i> .....                                  | 55 |
| <i>Alcohol abuse in the family</i> .....                         | 55 |
| <i>Parental divorce</i> .....                                    | 56 |
| <i>Presence of a learning disability in the adolescent</i> ..... | 56 |
| <i>Outcome Variables</i> .....                                   | 56 |
| <i>Self-worth</i> .....  | 56 |
| <i>Internalizing problems</i> .....                              | 57 |
| <i>Externalizing problems</i> .....                              | 57 |

|   |     |
|---|-----|
|   | v   |
| Procedure.....  | 58  |
| <i>Missing Data</i> .....   | 58  |
| <i>Hierarchical Regression</i> .....                                      | 59  |
| <i>Assumptions</i> .....  | 60  |
| RESULTS.....  | 62  |
| Descriptive Statistics.....   | 63  |
| Research Question 1.....  | 69  |
| Research Question 2.....  | 69  |
| Research Question 3.....  | 73  |
| DISCUSSION.....   | 77  |
| Summary of Results.....   | 77  |
| Resilience Research.....  | 80  |
| Rural.....  | 83  |
| <i>Rural as Risk?</i> .....   | 83  |
| <i>Rural as Social Representation</i> .....                               | 86  |
| School Bonding.....   | 87  |
| Limitations.....  | 90  |
| Summary.....  | 93  |
| REFERENCES.....   | 94  |
| Appendix I Permission to Copy.....  | 114 |
| Appendix II Proposal for Access to Statistics Canada Restricted Data..... | 115 |
| Appendix III NLSCY Variables From Which Study Variables Were Derived..... | 121 |

## LIST OF TABLES

|         |  |     |
|---------|--|-----|
| Table 1 | <i>Operational Definitions for Study Variables.....</i>  | 51  |
| Table 2 | <i>Descriptive Statistics for Outcomes and Predictors.....</i>   | 65  |
| Table 3 | <i>Frequency and Percentage for Risk Index Dichotomies.....</i>  | 66  |
| Table 4 | <i>Correlations Between Study Variables.....</i>   | 67  |
| Table 5 | <i>Correlations Between Study Variables by Gender.....</i>   | 68  |
| Table 6 | <i>Results of Regressions Examining Interactions Between Risk and Protective<br/>Variables at Age 10-11 and Self-worth Scores at Age 14-15.....</i>    | 70  |
| Table 7 | <i>Results of Regressions Examining Interactions Between Risk and Protective<br/>Variables at Age 10-11 and Internalizing Scores at Age 14-15.....</i> | 71  |
| Table 8 | <i>Results of Regressions Examining Interactions Between Risk and Protective<br/>Variables at Age 10-11 and Externalizing Scores at Age 14-15.....</i> | 72  |
| Table 9 | <i>NLSCY Variables From Which Study Variables Were Derived.....</i>  | 121 |

## LIST OF FIGURES

|                  |   |    |
|------------------|---|----|
| <i>Figure 1.</i> | Schematic representation of some constructs of resilience among Canadian rural adolescents..... | 3  |
| <i>Figure 2.</i> | Example of interaction model from resilience research.....                                      | 11 |
| <i>Figure 3.</i> | The influences of school bonding on risk for internalizing problems.....                        | 75 |
| <i>Figure 4.</i> | The influences of school bonding on risk for externalizing problems.....                        | 76 |

## ACKNOWLEDGEMENTS

I gratefully acknowledge the extensive support, guidance, teaching, and coaching given me by my advisor and friend, Dr. Kimberly Schonert-Reichl, professor, Faculty of Education, University of British Columbia. Kim's mentorship was principled, balanced, and transforming. Ever kind, Kim is a consummate teacher, one whose every thought, word, and action is directed towards the growth and fulfillment of her students. I am privileged to have been one of them.

I further acknowledge the knowledge, expertise, and extensive help of Dr. Susan Dahinten, School of Nursing, University of British Columbia. Susan's wise guidance through the proposal defence and while working with the NLSCY data was timely and detailed. Moreover, Susan shared generously of her time in the Inter-University Research Data Centre of British Columbia.

I appreciate the generosity of Dr. Jennifer Shapka, who willingly stepped in as external examiner. Jennifer's skilled assistance at the Inter-University Research Data Centre of British Columbia is much appreciated.

Although Dr. Bruno Zumbo, Faculty of Education, University of British Columbia had to be absent and thus could not be my external examiner, I appreciate his wisdom, kindness, and advice concerning statistical analyses of this study.

Barry Forer, Ph D candidate with the Faculty of Education, University of British Columbia, provided extensive peer coaching through the early days of statistical analysis in a large data set for this novice researcher. He was ever available by telephone or in person, with practical help and encouragement, and I am very grateful.

Most of all, without the unwavering and unqualified faith and generosity of "my beloved," Doug, this thesis would never have reached completion. I am eternally grateful.



## CO-AUTHORSHIP STATEMENT

The first author, under the supervision and mentorship of Dr. Kimberly Schonert-Reichl, conceived this thesis. Extensive guidance, support, and authorship was provided by Dr. Susan Dahinten for the Methods and Results pertaining to the National Longitudinal Survey of Children and Youth, and the dataset we created using NLSCY archival data. Dr. Dahinten, Dr. Schonert-Reichl, and Ms. Fraser conjointly wrote the Method and Results sections. Ruth Fraser substantively wrote the Literature Review and Discussion sections.

---

Ruth Fraser, Thesis Author

## Introduction

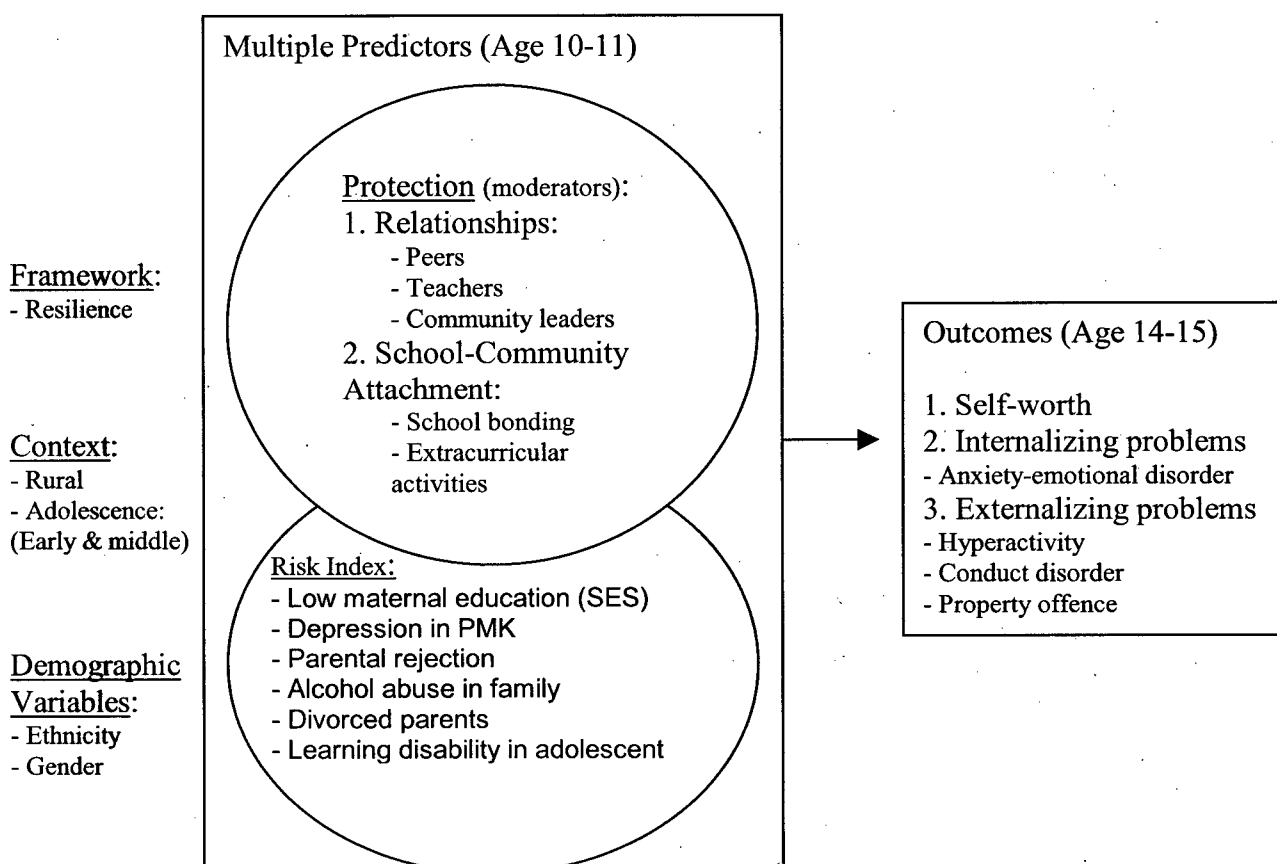
In the early 21<sup>st</sup> century, with its increasing demands for technological skills, Canadian rural adolescents, like their rural counterparts in the U.S. and in other western industrialized nations, have been identified as being at-risk for healthy development (Bollman, 2002; Dasgupta, 1988; Ehrensaft & Beeman, 1992). Although 2001 census data indicate that a significant proportion of Canadians (30.4 %) were living in or adjacent to rural communities (Mollins, 2002), it is important to note that there is great variability (Crockett, Shanahan, & Jackson-Newsom, 2000) in Canadian rural settings, from small, resource-based towns to farmlands to the Canadian hinterland. A commonality, however, is that isolation and high poverty rates restrict opportunities for many rural adolescents (Summers, 1995). Low educational attainment among adults in poor rural communities (Khattri, Riley, & Kane, 1997; Teixeira, 1995) suggests that, in contrast to their urban peers, many Canadian rural adolescents have less exposure to diversity among adult role models and occupations than do their urban counterparts (Andres, Anisef, Krahn, Looker, & Thiessen, 1999; Dupuy, Mayer, & Morissette, 2000; Ehrensaft & Beeman, 1992).

Whereas, on the one hand, rurality places many adolescents at increased risk for poorer psychological health than urban and suburban youth (Crockett et al., 2000), on the other hand, multiple supportive relationships and connections to the community serve as protective factors for at-risk youth in much of rural and small town Canada. Community attachment has been found to be differentially strong for rural youth (McGrath, Swisher, Elder, & Conger, 2001). Even as they cope with relative deprivation Canadian rural adolescents may be protected by close relationships with peers and important adults (e.g., teachers, coaches) and by deep attachments to their communities.

The present study examines the roles that important relationships and community attachment play in predicting healthy outcomes for adolescent rural Canadians. It is hypothesized

that important relationships and community attachment moderate (Baron & Kenny, 1986) the effects that multiple risks identified in early adolescence have on outcomes in middle adolescence (age 10 to 14 and 15 to 17 respectively, Arnett, 2001). Such moderation, with important factors differentiating outcomes, places this study within the theoretical framework of resilience, that is, the study of healthy outcomes under conditions of chronic adversity (Elias et al., 1994; Kaplan, 1999). It is proposed that relationships and community attachments may be particularly strong in much of rural Canada (Andres et al., 1999; Israel, Beaulieu, & Hartless, 2001). Here rurality is conceptualized diversely as those myriad places with low population where peoples' allegiances and sense of place identity are distinct from major cities and large towns, rooted instead in qualitatively salient lifestyles and interactions (Dasgupta, 1988; Hajesz & Dawe, 1997; Valentine, 1997; van Dam, 2002). For the purposes of this study, rurality is operationalized as communities farther than one day's commute from an urban center (Statistics Canada, 2001b), with a population of 30,000 or less.

The constructs that will be examined in this study are depicted in Figure 1.



*Figure 1.* Schematic representation of some constructs of resilience among Canadian rural adolescents

As Figure 1 illustrates, the purpose of the present study was to examine the role that relationships with peers and adults, and community attachments in early adolescence play on adaptive outcomes in middle adolescence among a sample of rural Canadian youth. Previous research indicates that risk and protective factors identified among individuals during early adolescence differentiate outcomes by middle-adolescence (Murdoch, Anderman, & Hodge, 2000). Much behavior in middle adolescence indicative of self-worth, and internalizing and externalizing problems, can be predicted in early adolescence (Arnett, 2001; Ebata, Peterson, & Conger, 1990). In particular, supportive relationships, mentorship, and community attachment in early adolescence (Battistich, 2001; Crockett & Bingham, 2000; Hektner, 1995; Israel et al., 2001; Murdoch et al., 2000) may predict adaptive functioning in middle adolescence.

Much of the previous psychological and sociological research on Canadian rural adolescents has examined the transition to post-secondary education and training (e.g., Andres et al., 1999; Andres & Looker, 2001; Looker, 1997). There is an overall paucity of research examining psychological outcomes among rural Canadian teens during middle adolescence. Moreover, although there are a number of studies that have examined the experiences of rural adolescents in the United States (e.g., Israel et al., 2001; Resnick et al., 1997), these research findings do not generalize to Canadian rural adolescents. Regional and national similarities and dissimilarities within and between countries are important to explicate in order that ecologically valid (Gall, Borg, & Gall, 1996) interventions be designed. Hence, studies investigating the resilient adaptation of Canadian rural adolescents are clearly needed. This research proposes to advance the study of resilience in two important ways. First, it extends the study of Canadian resilient adaptation as described by Jenkins and Keating (1998). Whereas Jenkins and Keating (1998) investigated the psychological effects of important relationships in children (age 6) and young teens (age 10) via the National Longitudinal Survey of Children and Youth (NLSCY), the present investigation extends this analysis into middle adolescence. Second, this research specifically examines resilient adaptation in rural Canadian settings. Studies in rural Canada are needed to determine the commonalities and any distinctions between youth adaptation nationally. This rural Canadian analysis represents a modest beginning in a research area generally neglected in the social sciences.

## Literature Review

The literature review provides the theoretical rationale and empirical background for the investigation of resilience functioning among Canadian rural adolescents. It does so, first, by summarizing the current theoretical issues underpinning empirical investigations of resilience functioning in early to middle adolescence. The literature review then goes on to preview rural research and research on adolescents. Lastly, the literature review delineates constituent constructs in the research design of the present study (see Figure 1).

### *Risk and Resilience*

For much of the 20<sup>th</sup> century, social scientists studied pathology because it was commonly assumed that maladaptation needed to be investigated in order to be treated (Schonert-Reichl, 2000). In the late 20<sup>th</sup> century, however, some researchers began to acknowledge that some children and adolescents thrived in the context of much pathology. Thus began the empirical search for antecedents and concomitants of resilience functioning.

### *Defining Risk*

Unlike the study of resilience that has only emerged in recent decades, the study of risk is centuries old (Garmezy, 1985). Most risk factors analyzed in empirical studies were structural. For example, the Kauai Study (Werner & Smith, 1992), Project Competence (Masten et al., 1999), and Jenkins and Keating's (1998) analysis of NLSCY data gave supporting evidence that risk variables located within the family have prominent effects. However, studies by Dubois, Felner, Meares, & Krier (1994), Elder and Conger (2000), and Israel et al. (2001), while still giving prominence to the family's role in mediating risk, also demonstrated statistically significant risk originating in the community. It appears that a broad range of risk factors exacted a common influence (Fergusson & Horwood, 2002; Luthar & Zelazo, 2003; Masten & Powell, 2003).

From a developmental psychological perspective Blyth and Leffert (1995) analyzed community risk. They did so by treating the community as the unit of analysis (see also, Allen & Dillman, 1994). For 112 small, geographically isolated communities from the Midwest (p. 67), Blyth and Leffert (1995) demonstrated that individual and family strengths, along with community involvement, were significantly related to community health (defined by level of seven domains of potential youth problems: alcohol, illicit drugs, sexual activity, depression and suicide, antisocial behaviour, and school problems, pp. 68-69). The health of communities differentially influenced vulnerable youth, with youth in the least healthy communities initiating drug use and sex at a young age.

*Multiple risks.* Risks have been found to co-occur, with the influence of multiple risks “piling up in the lives of children over time” (Masten & Powell, 2003, p. 7). Thus the theoretical interest among researchers of resilience has been “the investigation of the ways in which multiple genetic and environmental risk factors combine in the causal processes leading to disorder” (Rutter, 2000, p. 658). Blyth and Leffert (1995), for example, analyzed multiple risks when they assessed the effect on vulnerable youth of their least healthy and healthiest communities (set at the 25<sup>th</sup> and 75<sup>th</sup> %ile respectively for numbers of problem behaviors in youth, Grades 9 to 12). At the individual level of analysis, risks were defined as the mean number of problem behaviors out of 16 (e.g., substance abuse, depression and suicide, and antisocial behavior, p. 69).

### *Defining Resilience*

At the close of the 20<sup>th</sup> Century, the study of resilience represented a paradigm shift (Kuhn, 1970) away from the focus on adversity and disease, towards the ecological study of well-being (Bronfenbrenner, 1979, 1994; Elder, 1995); away from problem identification to the search for solutions (Rutter, 2000); and away from the “fiction of the individual” (Coleman, 1990, pp. 300-301) to the social embedding of human interaction (Bandura, 1986, 1997; Elder, 1995; Rutter,

Champion, Quinton, Maughan, & Pickles, 1995). The present study is concerned with that branch of resilience that studies “a class of phenomena characterized by patterns of positive adaptation in the context of significant adversity or risk.” (Masten & Reed, 2002, p. 75).

Resilience is a multi-dimensional, context-specific concept. It cannot be measured directly, but rather is inferred when positive adaptation occurs in the face of risk within a specific environment (Luthar & Zelazo, 2003).

As initially conceived in the 1980s by Garmezy (Garmezy, 1987; Garmezy & Tellegen, 1984; Rolf, 1999), Rutter (1979), and Werner (Werner & Smith, 1982), the study of resilience began with acknowledging the role of context in individual health (Bandura, 1986, 1997; Bateson, 1972; Bronfenbrenner, 1994; Elder, 1995). The branch of resilience research concerned with sustained competence under stress studied unusually good processes and outcomes under chronic adversity (Elias et al., 1994). This resilience research was informed by multiple disciplines and researched diverse contexts. In adverse circumstances, in addition to adaptive intra-psychoic strengths (Beardslee, 1989; Gordon & Song, 1994; Masten et al., 1988; Rae-Grant, Thomas, Offord, & Boyle, 1989; Werner, 1993b), resilience researchers observed that children’s well-being also depended on contextual factors in their schools (Battistich, Schaps, Watson, Solomon, & Lewis, 2000; Nettles, Mucherah, & Jones, 2000) and communities (Blyth & Leffert, 1995; Valentine, 1997; Werner & Smith, 1992). Among studies of resilient adaptation in context to date, however, few (Albrecht, 1998; Elder & Conger, 2000; Fisher, 2001; Israel et al., 2001; Schonert, Elliott, & Bills, 1991; Smith, Krannich, & Hunter, 2001) addressed the relative urbanity or rurality of that context. Yet, clearly the geographic, social, and economic parameters of context captured by rural studies powerfully constrain or promote rural adolescent development and resilience.

Whereas resilience research began with identifying individuals who, despite adverse circumstances (e.g., parental mental illness, chronic poverty, political violence), performed



remarkably well, presently researchers acknowledge that, more than a function of individuals, resilient adaptation is a function of processes (Kumpfer, 1999; Luthar, Cicchetti, & Becker, 2000b; Masten & Coatsworth, 1998). At the dawn of the 21<sup>st</sup> century researchers have begun to clarify models in order to direct future studies that explain these resilience processes operationally (Masten et al., 1988; Masten & Reed, 2002; Rutter, 2000). Such models should account theoretically for individual, ecological adaptation (Werner, 2000). Potent models are those that, within the constraints and opportunities of contextual, multiple risk and protective factors, explain how some individuals act with agency through such resilience processes, achieving healthy outcomes (Bandura, 2001; Elder, 1995), despite risk.

At the outset of the 21<sup>st</sup> century, resilience researchers face theoretical and methodological issues (Luthar & Zelazo, 2003). Whereas resilience research overlaps with historically older research into risk, it differs from risk research primarily in the search for trajectories of positive adaptation arising from family variables and variables found in the wider environment (community). In resilience investigations, constructs must be developmentally appropriate (Beardslee, 1989; Cicchetti & Toth, 1992; Ebata et al., 1990) and conceptually linked to risk (i.e., resilience is defined in the presence of considerable risk).

The conceptual link between risk and resilience begs the question whether risks and protective factors are conceptually distinct, or whether they represent opposite poles on a common continuum. Stouthamer-Loeber and colleagues (1993) addressed this question about the possible independence of risk and protective factors empirically. Their longitudinal sample ( $N = 1500$ ) included boys in grades 1, 4, and 7 in Pittsburgh, USA. In each age group, the 250 most anti-social boys were matched with 250 boys randomly selected from the remaining school populations. All independent variables were trichotomized in order that "all variables had a potentially protective, neutral, and risk part to their distributions" (p. 686). No variables were identified that were protective only. Some variables (attention deficit and hyperactivity disorder,

oppositional conduct disorder, attitudes to anti-social behaviour, and variables linked to low socio-economic status and neighbourhood crime) were predominantly risk factors. That is, the positive end of those continua implied no protective effect. Both risk and protective factors in this sample increased in potency across age groups, with the oldest group showing the highest proportion of protective and risk factors related to delinquency (pp. 697-698). The researchers in the Pittsburgh Study have provided some clues to suggest that, with much overlap, risk and protection can be conceptually distinct. While they found no factors that were protective only, the existence of risk factors without matched opposites gives some evidence to suggest that risks and protective factors are not merely opposites of each other. The study bears replication and extension in order to test both ends of risk-protection continua for many developmentally pertinent variables in various demographic contexts (Luthar & Zelazo, 2003).

A second issue currently debated among resilience researchers is the search for and interpretation of interaction effects. That is, whereas some factors were universally compensatory or main effects (e.g., Luthar, 1991), others *stepped* or challenged and strengthened rigorous adaptation at moderate levels of risk (Garmezy, 1985; Garmezy, Masten, & Tellegen, 1984; Luthar et al., 2000b; Masten et al., 1988; Rutter, 1985, 1990). However, most researchers examining the construct of resilience have studied interaction effects that differentially protected children and adolescents in high-risk contexts (Jenkins & Keating, 1998; Luthar & Zelazo, 2003; Masten, Morison, Pellegrini, & Tellegen, 1990; Roosa, 2000; von Eye & Schuster, 2000; Zimmerman & Arunkumar, 1994). Zimmerman and Arunkumar (1994) explained that protective factors moderate the effect of risks on outcomes. In a study conducted by Jenkins and Keating (1998) an interaction effect or moderation was illustrated. The researchers found that good relationships with siblings, teachers, and peers had little effect on their sample of 10-year-olds at low levels of risk. At high levels of risk, however, having zero or one good relationship correlated with higher externalizing behavior scores; whereas two or more good relationships

were shown to maintain low levels of externalizing behavior under high risk conditions (pp. 48-49). The presence of such interaction between relationships and risk led Jenkins and Keating (1998) to conclude that resilience functioning was evident in the lives of their high-risk 10-year-olds.

For a graphical illustration of one type of interaction effect, see Figure 2. This graph illustrates that with low levels of protection, individuals evidence low levels of a desired outcome under conditions of high risk. When a desired outcome is maintained at high levels of risk, the desirable effect is thought to be due to the presence of sufficiently high levels of a protective factor or factors.

Resilience research runs the risk of becoming amorphous and atheoretical (Luthar & Cicchetti, 2000). Without theoretical models and clear constructs to inform empirical replication, tautology could render the study of resilience meaningless (Kaplan, 1999). Until it is eclipsed by a more operational conception, however, resilience research presently best captures the multidisciplinary search for the empirical validity of contextual, developmental adaptation under adversity (Luthar, Cicchetti, & Becker, 2000a; Roosa, 2000; Rutter, Pickles, Murray & Eaves, 2001; Luthar & Zelazo, 2003).

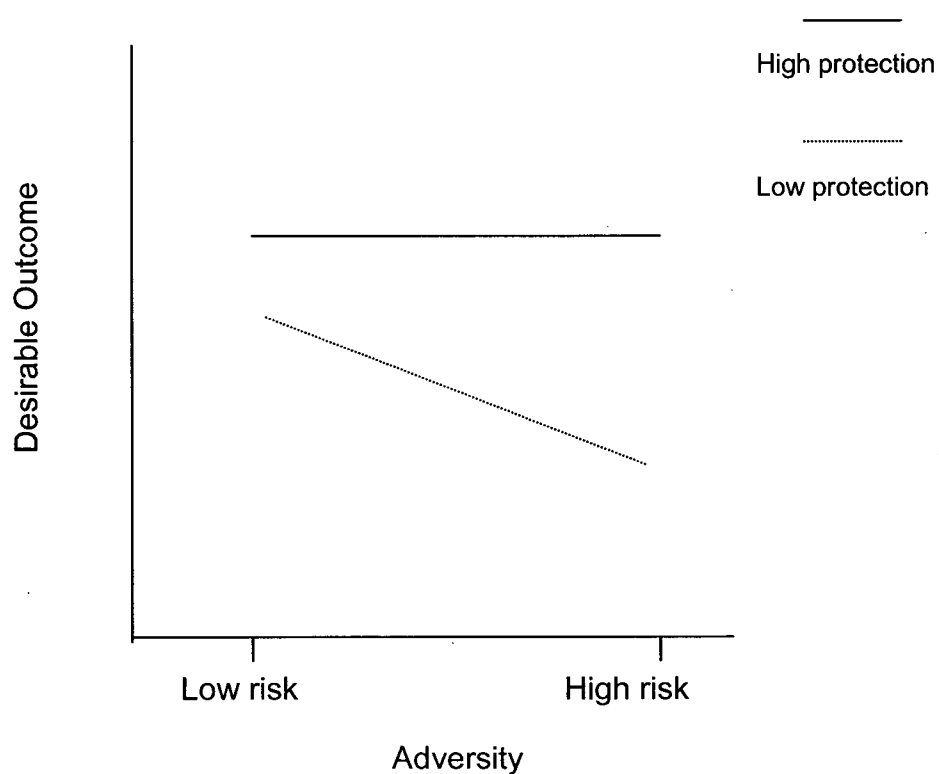


Figure 2. Example of interaction model from resilience research.<sup>1</sup>

---

<sup>1</sup>From "Ordinary Magic: Resilience Processes in Development," by A. S. Masten, 2001, *American Psychologist*, 56, p. 231. Copyright 2001 by the American Psychological Association. Reproduced with permission of the author (see Appendix I).

### *Protective Factors*

A protective factor is a variable that is found to have a positive effect on outcomes at higher levels of risk, whereas without measurable risk the effect of the protective factor is negligible (Jenkins & Keating, 1998, p. 11). Because resilience is defined as processes leading to outcomes that are better than expected in adverse contexts (Luthar et al., 2000b, p. 543), to account for healthy adaptation researchers logically search for protective factors (Garmezy, 1985; Garmezy & Masten, 1991; Rutter, 1979). For example, some studies of resilience in adolescents analyzed the protective nature of social, transactional relationships (e.g., Egeland, Carlson, & Sroufe, 1993). Among their competence measures, Elder and Conger (2000) included "peer success" to indicate that an adolescent was adapting socially (p. 256); and Fergusson and Lynskey (1996) found affiliation with conforming peers to be protective. Meanwhile, using NLSCY cross-sectional data of ten-year-olds, to avoid tautology because they analyzed risks located in the family, Jenkins and Keating (1998) analyzed relationships with peers, siblings, and teachers as their indicators of protection.

### *Risk and Resilience: Multiple Predictors*

Among high-risk adolescents, beyond the context within which maladaptation occurs, another important conceptual consideration is whether factors are summative in their effects (Garmezy, 1993; Gest, Reed, & Masten, 1999; Masten & Reed, 2002; Radke-Yarrow & Brown, 1993; Richters & Martinez, 1993; Rutter, 1979, 2000; Schonert-Reichl, 2000; Werner, 1987; Werner & Smith, 1992). Studies have demonstrated that an isolated risk or protective factor has little influence on overall psychological development. Yet, as the number of risk factors within an individual's context increases, the chances for resilience operate multiplicatively (Jenkins & Keating, 1998), as much as one hundredfold in one instance (Fergusson & Lynskey, 1996; Rutter, 2000). In several studies in this literature review (e.g., Elder & Conger, 2000; Fergusson & Lynskey, 1996; Masten et al., 1999; Masten et al., 1990), resilient or poor adaptation in high-

risk circumstances was shown to correlate with combinations of risks or protective factors.

Collectively researchers of these studies concur that patterns of risks and protective factors over time impinge on adaptational development (Masten & Powell, 2003; Masten & Reed, 2002; Rutter, 2000). Researchers of adolescents also empirically analyzed the influence of both multiple risks and important relationships, on measures of self-worth, and internalizing and externalizing problems (Battistich et al., 2000; Dubois et al., 1994; Jenkins & Keating, 1998; Masten et al., 1999; Masten & Powell, 2003; Radke-Yarrow & Brown, 1993).

### *Rural Research*

*Rural* is both an everyday and an empirical term (Halfacree, 1993), serving very diverse research traditions (Castle, 1995). Rural places and people are diverse worldwide and within Canada (Dasgupta, 1988). For the purposes of this investigation, with its concern for psychological development of youth, the term *rural* is used broadly to refer to sparsely populated and small town regions of Canada that are more than one day's commute from a metropolis (Beshiri & Bollman, 2001; du Plessis, Beshiri, Bollman, & Clemenson, 2001; Ehrensaft & Beeman, 1992; Mollins, 2002; Statistics Canada 2001a).

### *Defining Rural*

In Canada, deriving a national rural dataset to test hypotheses of interest to social scientists presents challenges. These challenges are echoed worldwide: researchers examining rural communities have faced common challenges. Whereas the definition of rural was deemed to be self-evident, in reality scholars faced a plethora of overlapping and sometimes contradictory conceptions bound up in the term *rural*. Rurality has been studied from agricultural (Albrecht, 1998), economic (Lyson, 2002), criminological (Lee, Maume, & Ousey, 2003), socio-geographical (Muilu & Rusanen, 2003), educational (Reeves, 2003), sociological (Allen & Dillman, 1994; Salamon, 2003), historical (Dasgupta, 1988), and socio-cultural perspectives (Frank, 2003), among others. Rural studies have embraced disparate localities including large

agricultural holdings, mining and other resource-based settlements, habitations on the fringe of forests, and subsistence dwellings in remote frontiers. Some rural localities are relatively wealthy and enjoy enviable social cohesion; others are poor and factious. Precise empirical definitions of *rural* have proven to be elusive, and have conflated much regional, economic, and cultural diversity. Of longstanding debate has been whether *rural* is a geographical location or a social representation (du Plessis, et al., 2001; Halfacree, 1993). Yet, even as they call for research designs that account for rural diversity (Khattri et al., 1997), rural scholars have defended the omnibus term *rural* (Castle, 1995; Smailes, Argent & Griffin, 2002). From a developmental psychological perspective, conceptions of the rurality experience of rural inhabitants are more relevant to the study of rural youth development than precise definitions of *rural* based on locality. Ultimately conceptions of rurality are dynamic human constructs designed to describe the psychological experience of place (Bauch, 2001; Howley, Harmon, & Leopold, 1996; Theobald & Nachtigal, 1995). Empirically, rural social scientists' overarching purpose is to advance human well-being in all the diverse places people describe as *rural* (Halfacree, 1993; Valentine, 1997; van Dam et al., 2002).

From the perspectives of disparate disciplines, researchers conducting empirical rural studies have attempted to consistently quantify rurality. Many studies employed national census definitions of rural space. Census definitions of *rural* combine small population numbers with low population density measures of people living in a given area. Depending on the terrain and population density of the nation of interest, population numbers and density for distinguishing rural from urban vary widely between countries (Dasgupta, 1988; Smailes et al., 2002). Based on density-population figures, many studies dichotomized rurality by determining an arbitrary cut-off between rural and urban classifications (Lee et al., 2003; Nachtigal, 1994). In Canada, census statisticians established a population less than 1,000, with a population density less than 400 people/km<sup>2</sup>, as the Canadian rural cut-off. Density-population definitional measures were also

employed in rural studies from the United States (Dreyfus, 1994), Australia (Smailes et al., 2002), and Finland (Muilu & Rusanen, 2003). Since 1986, to enrich the definition of *rural*, Census Canada statisticians have inserted into density-population statistics data on the proportion of the adult population (age 25-54) who commute to work in an urban area, with 40% being the urban/rural cut-off (Andres & Looker, 2001; Frenette, 2002; Statistics Canada, 2001b). In the past, some scholars (e.g., Lewis, 1967, & Dewey, 1960, as quoted in Dasgupta, 1988) argued that the psychological and sociological effects of a rural versus an urban human ecology were minor. Presently it is recognized, however, that rurality worldwide represents a continuum of human adaptation in context, from urban fringe through small town to remote hinterland. In more current studies, a continuum that can be dichotomized has proven to be practical, enabling researchers to account for disparate outcomes in rural versus urban settings nationally (e.g., Haller & Virkler, 1993; Israel et al., 2001; Lee et al., 2003) by interpreting outcomes within a conceptual frame of reference (Dasgupta, 1988). In the study by Israel and colleagues (2001), for example, researchers used National Educational Longitudinal Survey (NELS) data to investigate the effects of family and community protective factors on educational outcomes. These researchers found some distinct outcomes for their adolescents in *nonmetro nonadjacent* areas, where the effect of community variables was most evident (pp. 55, 60).

Population size and density measures enabled researchers to sometimes conflate populations within small towns with those of surrounding rural regions (Looker, 1993; Smailes et al., 2002). Small towns have been demonstrated to differentially attract rural youth from nearby outlying regions. For example, in one study 17-year-old rural Nova Scotian respondents reportedly enjoyed the rural atmosphere and proximity to home afforded them in small towns (Looker, 1993). From the vantage point of the daily life experience of its inhabitants, rural literature suggests that rural and small town residents in many ways inhabit the same universe (e.g., Drixler, Krahn, & Wood, 2001; Salamon, 2003). A research team recently completed a



detailed analysis of rural-small town *symbiosis* in 84 communities in South Australia. Rural density (defined as rural dwellings/100km<sup>2</sup>) was the independent variable of interest, with community characteristics treated as outcomes. Having established statistically significant positive correlation between rural density and population (size) of the nearest main town, both rural density and size of the main town were found to statistically negatively predict the percentage of the population less than 15 years of age (Smailes et al., 2002, p. 402). These researchers' findings supported the practice of conflating rural and small town settings for outcomes related to adolescent development, such as those examined in the present study.

In Canada, six alternative definitions of rurality based on census data are used by researchers. Among them, the "rural and small town" (RST) category has been derived from a labour market context based on non-proximity to *urban cores*, *census metropolitan areas* (CMA's) and *census agglomerations* (CA's) with combined populations greater than 10,000. CMA's and CA's include all neighbouring municipalities where 50% or more of the workforce commute to the urban core. For broadly "understanding Canada's rural population," RST is the recommended default definition (du Plessis et al., 2001, p. 1).

In North American rural studies, rural communities are generally relatively ethnically homogenous within (Crockett et al., 2000). This tendency towards racial and cultural homogeneity within rural communities prompted some researchers to choose ethnic monocultures for their studies (e.g., Elder & Conger, 2000; Schonert et al., 1991). Rural studies at the national level, however, must account for any substantive ethnicity represented in their samples.

#### *Rural Versus Urban*

From a policy perspective, an important contribution of rural research to the social sciences generally is that, whether by design or by default, researchers who examine rural issues account for the context of study participants. By definition, rural researchers examine variables of interest

in specific settings (e.g., Salamon, 2003). By way of contrast, policies derived in urban settings with urban participants have been applied indiscriminately to rural settings, sometimes with deleterious effect. (Much provincial educational policy is of this type. For example, school budgets based on urban class size configurations are difficult to apply in small isolated school districts, see Nachtigal, 1992; Wotherspoon, 1998.) The erosion of the countryside and disproportionate poverty of some rural settings (Fitchen, 1995; Hirschl & Brown, 1995; Lee et al., 2003) was often attributed both directly and pervasively to the influences of "urban bias" (Schonert-Reichl & Elliott, 1994, p. 4). All researchers who identify their specific rural settings thereby account for the physical context of rural inhabitants; despite rural diversity, rural dwellers have in common the effects of urban policies on places that are *not urban*. The commonality of the use and even exploitation of rural places in the service of urban imperialism justifies the holistic study of rurality, from the vantage point of disparate disciplines. Economists, politicians, and civic planners have vested interests in the resources and amenities found in different types of rural hinterland. More than researchers from many disciplines, however, social scientists acknowledge the developmental needs of those who inhabit the rural places that urbanites only exploit in varying ways and degrees (Castle, 1995).

This review of research leads to the realization that for the purposes of empirical studies, definitions of *rural* need to conform to the disciplines as well as the hypotheses and research questions advanced. Some developmental research pleads for the generalization of rurality for outcomes of interest to social scientists. When it comes to the psychosocial development of rural adolescence at the national level particularly, despite great variability, the commonalities of experience in disparate rural locations permit the study of a rural universe.

#### *Rural: Risk or Protection?*

Although rural communities figure nostalgically in North American consciousness, in reality "the stresses on rural communities have been accumulating over time" (Cahill &

Martland, 1996, p. 157). Growing up in rural communities overall can place Canadian rural youth at risk, despite certain positive community attributes, such as community attachment (Looker, 1993). It is reported in the empirical literature that, despite developing a distinct rural identity, the majority of Canadian youth felt disenfranchised in their rural communities (Andres et al., 1999; Andres & Looker, 2001; Bellamy, 1993; Cahill & Martland, 1996; Covell & Howe, 1999; Jeffery, Lehr, Hache, & Campbell, 1992; Looker, 1993, 1997; Shepard & Marshall, 2000; but see Hajesz & Dawe, 1997). Limited accesses to diverse role models, and limited opportunities for higher education reduce the likelihood that rural youth can escape the poverty that characterizes many rural communities (Castle, 1995; Bollman & Biggs, 1992; Fitchen, 1995; Hirschl & Brown, 1995; Khattri et al., 1997; Shepard & Marshall, 2000; Summers, 1995; but see Lyson, 2002). As in the United States (Elder & Conger, 2000; Schonert-Reichl & Elliott, 1994, 1996, 1998), it is likely that the stronger community attachments of youth, along with documented sense of place aspirations (Bauch, 2001; Elder, King, & Conger, 1996; Howley, 1997; Howley et al., 1996; Nachtigal, 1994; Theobald & Nachtigal, 1995) and financial hardship involved in leaving home for higher education (Hektner, 1995; Jeffery et al., 1992; Ley, Nelson, & Beltyukova, 1996) heightens inner conflict for rural youth in Canada. Thus, for Canadian rural youth during middle adolescence, important relationships may predict inner conflict even as these same relationships protect the youth from lower self-worth and internalizing and externalizing problems.

### *Adolescence*

The second decade of life, a period of unparalleled growth, is marked at the outset by puberty and at its conclusion by transitions into young adulthood. During this decade, within their cultural context, adolescents grow along every developmental marker, including cognitive, affective, and social growth. In North America, scholars now locate the onset of pubescent change at about age 10 (Ebata et al., 1990). Among researchers who have studied the young end

of the adolescent age range (e.g., Battistich et al., 2000; Dubois et al., 1994; Israel, et al., 2001; Stouthamer-Loeber et al., 1993), more than their categorical age the youths' behaviour determines their inclusion in the adolescent stage of development, from 10 to 18 approximately, with ages 10 to 14 considered to represent early adolescence, and 15 to 17 representing the middle stage. Thus, the sample of this study, at age 10 to 11, despite individual variance is considered to have entered early adolescence (Arnett, 2001). Because most North American scholars conceive of adolescence as continuing until at least age 18, the outcomes analyzed in this study at age 14 to 15 are thought to occur in middle adolescence (Arnett, 2001).

### *Early and Middle Adolescence*

In the late 20<sup>th</sup> century, research conducted within a resilience framework extended the study of childhood resilience (e.g., Masten et al., 1988) into adolescence (e.g., Luthar, 1991; Masten et al., 1995; Werner & Smith, 1982). Among such research programs that promoted the healthy adaptation of adolescents in high-risk contexts were findings that informed interventions for problem behavior (for literature reviews, see Siegel & Scovill, 2000; and Zahn-Waxler, Klimes-Dougan, & Slattery, 2000). Studies of adolescent adaptation emphasized the dual concepts of continuity across the lifespan (Elder, 1998; Maccoby, 1984) along with age-specific developmental growth (Sroufe, Carlson, & Shulman, 1993). Several researchers have analyzed predictors in early adolescence contextually, such as in middle school or late elementary school settings, and were interested in middle adolescent outcomes with respect to the transition to secondary school (Battistich et al., 2000; Eccles et al., 1993; Morison & Masten, 1991; Murdoch et al., 2000; Radke-Yarrow & Brown, 1993; Perkins, Jacobs, Barber, & Eccles, 2004). Findings from these previous investigations suggest that a variety of influences of well-being and school engagement in middle adolescence can be predicted by early adolescents' relationships with peers and important adults.

*Early and middle adolescence in rural contexts.* In contrast to resilience studies of young adolescence generally, few studies have examined young adolescents residing in rural contexts. One notable exception to the general urban bias was a large study of Grade 7 to 12 adolescents undertaken by Resnick et al. (1997). The researchers used a resilience framework to analyze adolescent health outcomes among the 11,572 participants from a stratified sample of 134 schools in the Adolescent (Add) Health program across the United States. Findings revealed that those adolescents from rural communities ( $n = 3,264$ , J. Tabor, personal communication, April 7, 2005) had the highest rates of internalizing problems (19.9%, vs. 18.6% for urban and 17.5% for suburban participants, p. 827). Moreover, school connectedness was found to protect across substance use risk domains (p. 830).

A second adolescent study noteworthy for its attention to adolescents in rural communities was that undertaken by Blyth and Leffert (1995). Over 33,000 participants from 112 self-contained communities with populations less than 27,000 (45% of whom had populations less than 2,000) were measured for the health of their adolescents in Grades 9 to 12. In this study community health was operationalized via 16 problem youth problem behaviours in seven domains: alcohol, illicit drugs, sexual activity, antisocial behaviour, and school problems (pp. 68-69). Blyth and Leffert measured accessible resources, operationalized by the number of assets (family strengths, school strengths, community involvement strengths, and peer strengths) for adolescents in the middle of and nearing their exit from the second decade of life. Blyth and Leffert (1995) found that "the size of the decrease in problem behaviors among community types [from least healthy to healthiest] was greatest for vulnerable youth" (p. 70), and moreover that "vulnerable youth in the healthiest communities had more external assets" (e.g., support, control, and structured time use, pp. 73-80). The researchers thus demonstrate in their large study that important factors in the community (i.e., connections to nonparental adults, peer behaviors, and

time spent in structured extracurricular activities) protect rural youth, with the vulnerable youth deriving the greatest benefit.

A third exemplary study of rural adolescent development in North America was undertaken by the Iowa Youth and Families Project (Elder & Conger, 2000). Longitudinal data were collected for six years from 451 families who entered the study in 1989 when one targeted adolescent was in Grade 7. The longitudinal research design facilitated the study of development and adjustment to the Mid-west farm crisis of these early adolescents throughout middle and up to late adolescence. Likelihood of resilience functioning in Grade 12 (defined as being above the 75<sup>th</sup> percentile on at least three out of four measures of prosocial competence) was detected by academic competence, participating in a religious community, and feelings of self-confidence (p. 207).

The utility of some adolescent research is limited when researchers fail to account for the rurality of the sample. For example, in a signature study of early adolescents, Mahoney (2000) and colleagues (Mahoney, Cairns, & Farmer, 2003) measured outcomes in young adulthood of 695 students via predictors in early adolescence (ages 10 to 13). Of the five communities in which their public schools were located, two were rural. From Grades 7 to 10, lower aggression correlated reciprocally and positively with extracurricular activities particularly for the low-competence subgroup (Mahoney et al., 2003). Results were not disaggregated by rural versus urban context, however, thereby forfeiting the generalization of these findings to rural adolescents.

The utility of some adolescent research can also be limited when researchers fail to account for development over the adolescent period. An example is a study of rural adolescents wherein Quaglia and Perry (1995) analyzed the aspirations of 3,000 respondents in Grades 8 to 12 in rural Maine. According to self-report, adolescents spent very little time doing homework. They enjoyed sports and hobbies, and watching television, but saw little purpose to these or most other activities. The researchers examined dimensions of extracurricular participation of adolescents in

rural communities that are of current interest in the field of adolescent development. In that these researchers did not disaggregate adolescence into early versus middle versus late adolescence, however, they did not supply information on the development of aspirations during adolescence in this rural context.

It can be surmised that early and middle adolescents have been understudied in rural Canada. The majority of Canadian studies of rural adolescents have been concerned with transition to post secondary training and adult occupations (Andres et al., 1999; Andres & Looker, 2001; Breton, McDonald, & Richer, 1972; Guppy & Pendakur, 1989; Hajesz & Dawe, 1997; Looker, 1997; Porter et al., 1982; Rothwell, 2001; Vera-Toscano, Phimister, & Weersink, 2000; Young, 1977). Although Covell and Howe (1999) studied adolescence when they analyzed the labour force participation of 12- to 17-year olds in economically depressed, *semi-rural* regions of Canada (p. 232), these researchers did not disaggregate adolescence into subgroups (early, middle, or late). In analyzing the role of relationships in ameliorating the risk factors for 10-year-olds from the NLSCY, Jenkins and Keating (1998) anticipated an extension of their work from early to middle adolescence. In the absence of studies of rural adolescent development, their study invites the application and extension of their findings to Canadian rural adolescents.

#### *Gender and Socio-Economic Status (SES)*

*Gender.* Studies of adolescent development have consistently found some differences in adaptation based on gender. For instance, whereas girls have been found to be more depressed in adolescence and beyond (Arnett, 2001; Zahn-Waxler et al., 2000) boys have demonstrated proclivities for externalizing problems throughout their lifespans (Allen, Leadbeater, & Aber, 1994; Compas, Hinden, & Gerhardt, 1995; Ebata et al., 1990). Gender differences have been found to increase with age (Rutter, 1994).

Evidence of gender differences in early adolescence has been reported. For example, Rae-Grant et al. (1989) found that good peer relationships protect early adolescent girls but not boys (see also, Grizenko & Fisher, 1992). Relatedly, in their sample of 10-year-olds, Jenkins and Keating (1998) found good relationships with teachers to be important for both low-risk and high-risk boys, but for high-risk girls only. Overall boys in this study had significantly poorer relationships with peers and teachers than girls. Another early adolescent gender difference was explored in a study of Grade 5 to 6 Latino students grouped for aggression. Morrison, Robertson, and Harding (1998) found gender differences in this study for academic self-concept. Generally the group high on academic competence had higher self-concepts, more social support, and better parental supervision than the group with lower classroom academic competence. However, aggressive low-learning boys but aggressive high-learning girls had higher academic self-concepts. As can be discerned, many researchers of early adolescents (e.g., Battistich et al., 2000; Dubois et al., 1994) have recognized the importance of gender as it relates to resilient adaptation (Gordon & Song, 1994). Clearly there exists evidence of the need to take gender effects into account in empirical research in early adolescence.

In the middle to late adolescent period (ages 14 to 19), gender-specific interactions related to sociability have been reported. For example, Morison and Masten (1991) found that being highly sociable correlated with externalizing problem for girls but not for boys. Girls with higher sensitive-isolate scores were less prone to externalizing problems. Relatedly, Luthar (1995) found significant correlations between grades, leadership, and internalizing problems for middle adolescent girls only in her co-educational inner city sample. For the same age group, Masten et al. (1995) also found that academics moderated the effect of conduct on job competence for girls only. In late adolescence, Masten et al. (1999) found that significantly higher positive emotional engagement distinguished resilient girls (but not boys) from both maladaptive and competent



groups. Thus gender effects have been noted in empirical studies concerning early to middle to late adolescence.

There are some gender effects among adolescents specific to rural settings. In her longitudinal study of the 1955 birth cohort of the rural Island of Kauai, for example, Werner (1985) found that, by age 18, gender of the adolescent and gender of the parent both differentiated outcomes, making boys and the offspring of mothers who were alcoholic more vulnerable than girls and the offspring of fathers who were alcoholic. Moreover 70% of the sons of alcoholic parents exhibited problems adapting, whereas 70% of the girls did not. However, delinquent girls had more serious mental health problems and more repeated police contacts than delinquent boys (Werner, 1987).

In a study of depression in a sample of 98 Grade 8 to 10 students in one remote town in rural British Columbia, one researcher found girls to be more depressed than boys (McDonald-Dennill, 1996). Relatedly, in a sample of rural-suburban adolescents (Grades 7-12), multiple-risk girls who participated in extracurricular activities were found to be more prone to school drop-out (Mahoney, 2000). In rural Iowa, girls were found to be more active in extracurricular activities than were boys, and were also more likely to attend college (Elder & Conger, 2000). In the same sample, girls who sacrificed higher education to stay in closer proximity to parents showed more internalizing problems (Elder et al., 1996).

As noted earlier, researchers examining adolescent adaptation in rural Canada focussed mainly on transitions to post-secondary training (Andres et al., 1999; Andres & Looker, 2001; Looker, 1997; Young, 1977). An early study of rural adolescent adaptation in Canada found rural Grade 10 girls to be the only geographic group to equal their male peers in their resolve to attend university (Porter et al., 1982). By the 21<sup>st</sup> century, however, a qualitative study of rural women's educational aspirations revealed that the post-secondary needs of rural women were still largely ignored (Shepard & Marshall, 2000). Moreover, girls aged 15 and older in rural and

small town Canada had lower employment rates than girls from urban centers, and than Canadian boys generally (Rothwell, 2001). Thus, the empirical literature to date summons researchers to account for gender effects, generally and in rural contexts.

*Socio-Economic Status (SES).* In order to measure variance attributable to the variables of interest, researchers must account for the influence of SES on outcomes (Bradley & Corwyn, 2002). Along with parental occupational status, the educational level of parents (the higher of two in two-parent households) is a useful proxy for SES (Elias et al., 1994; Fan & Chen, 1999; Hauser, 1994; Hernandez, 1997; Hughes, 1999; Mueller & Parcel, 1981). In studying childhood vulnerability using NLSCY data, Willms (2002b) found that, compared with other dimensions of SES, mother's education played a dominant role in predicting cognitive difficulties and behavior problems in offspring (pp. 339-340).

#### *The Present Study*

Using the risk and resilience theoretical framework, the present study examined constructs relevant to the psychological health of middle adolescents in rural Canada. This section of the literature review examines risk factors and protective factors in early adolescence that are theoretically and empirically linked to psychological health outcomes for rural Canadians during middle adolescence (see Figures 1, 2).

#### *Risk Indices*

Because as noted earlier the influence of multiple risks has been found to be pervasive over time, some researchers (Fergusson & Horwood, 2003; Fergusson & Lynskey, 1996; Loeber, Farrington, Stouthamer-Loeber, Moffitt, & Caspi, 1998; Resnick et al., 1997; Stouthamer-Loeber et al., 1993) have devised summative risk indices. Currently (Luthar & Zelazo, 2003; Masten, 2001; Rutter, 2000) and from its inception (Masten & Garmezy, 1985; Rutter, 1994) researchers using a resilience paradigm methodologically endorsed a summative risk index as one way to measure risk, provided that: (a) the index sub-components are developmentally appropriate, and

(b) collectively, the risk index items account for most of the significant risk in the sample population (Luthar & Zelazo, 2003). In the present study, because during the adolescent stage of development most risk and protection derives from the family (Dubois et al., 1994; Gerard & Buehler, 2004; Israel et al., 2001; Masten et al., 1999; Resnick et al., 1997; Rutter, 2000; Werner, 2000), it was deemed developmentally appropriate to locate most of the risk that sample adolescents incurred in the family. Parental demographic conditions (level of education, divorce) and parental poor psychological attributes (depression, alcohol abuse, rejection of adolescent) were thought to mainly capture the kinds of familial risks an early adolescent might endure.

In the present study, six risk factors were dichotomized and then summed to form a risk index (Blyth & Leffert, 1995; Gerard & Buehler, 2004; Luthar & Zelazo, 2003). Some researchers (e.g., Gerard & Buehler, 2004; Loeber et al., 1998; Mahoney, 2000; Stouthamer-Loeber et al., 1993) have defended the dichotomizing of some variables under certain conditions. For example, it is sometimes desirable to suppress a curvilinear effect of a predictor via dichotomization. A second advantage of dichotomization is that it facilitates the investigation of interaction effects (Loeber et al., 1998, p. 162).

The risk index created in the present study was derived from that of Jenkins and Keating (1998). Using NLSCY data and hierarchical regression analyses, Jenkins and Keating (1998) examined risk and resilience predictors among cross-sectional samples of 6- and 10- year old Canadians. Interaction effects between the risk index and putative protective factors (important relationships) were explored. Outcomes included internalizing problems and externalizing problems.

In the Jenkins and Keating (1998) study, all risks but one (learning disability in the child) were derived from the family. Familial risks included "the presence of alcohol abuse in the mother and in the father, marital dissatisfaction, low income, the presence of depression in the mother, large family size, teenage pregnancy, hostility in the parent-child relationship, and the

parents having divorced" (p. 17). Risks were dichotomized such that those in the risk position represented participants in the top 10-15% of the sample for that continuous measurement.

Jenkins and Keating (1998) found a fivefold increase in internalizing and externalizing problems for children exposed to four or more risks. At age 10, good relationships with teachers and peers interacted with risk to protect those most at risk from disturbance, a protective effect. Gender differences favoured girls in this study. The question pertinent to the present study is how similar risks would be moderated by putative community protective factors in the lives of rural early adolescents.

*Maternal education.* In the present study, low maternal education was considered to be a risk factor in early adolescence for poor psychological health outcomes in middle adolescence (Willms, 2002a, 2000b). Moreover, for the present study, maternal education was deemed to be the proxy for SES.

*Maternal depression.* Despite the increased salience of peer and community influences in adolescence, parental influences retain primacy throughout adolescence (Arnett, 2001; Eccles, Early, Fraser, Belansky, & McCarthy, 1997). Depression in the biological mother (who has primary responsibility for the care of her children), whether diagnosed clinically or self-reported, has been found to negatively affect her children and adolescents throughout the developmental period (Burt et al., 2005; Frye & Garber, 2005; Hammen, 2003; Hammen, Brennan, & Shih, 2004). The mechanisms whereby maternal depression affects adolescents are not well understood. It is known, however, that several risk factors co-occur with and mediate maternal depression as a predictor (Somers & Willms, 2002). For example, maternal depression is often co-morbid with family alcohol abuse, where it has been found to predict aggression-delinquency and alcohol abuse in adolescents (Barnow Schuckit, Lucht, John, & Freyberger, 2002).

Depression of the mother during the childhood of her offspring has been implicated in both internalizing and externalizing problems for those offspring in adolescence (Somers & Willms,

2002). The mechanisms whereby depressive maternal influences extend across the lifespan of the offspring are intricate and not well understood. For example, researchers (Hammen et al., 2004; Ohannessian et al., 2005) found high family conflict and stress mediated maternal depression in predicting depression, an internalizing disorder, in 15-year-olds. Moreover, internalizing problems for girls due to depression in their mothers were found to linger into late adolescence (Burt et al., 2005). The complexity and bidirectional nature of the influences is illustrated in one study of maternal depression and early adolescent internalizing and externalizing problems, in that maternal criticism co-occurred with maternal depression in predicting adolescent internalizing and externalizing problems in Grades 6 and 8. Additionally, maternal depression was found to be a mediator with Grade 6 externalizing problems of maternal criticism in Grade 8 (Frye & Garber, 2005).

Given the pervasive, long-term negative implications of maternal depression, resilience functioning is problematic to infer in the lives of adolescents with depressed mothers. To determine that offspring of depressed parents not only remain free of psychopathology, but moreover, create psychologically healthy environments in turn for their own children, requires longitudinal studies, of which there are few at the present time (Hammen, 2003). In a limited manner, however, researchers have found evidence of resilience functioning in, for example, a cross-sectional study of 816 fifteen-year-olds. Three interaction terms (lows levels of parental psychological control, high levels of maternal warmth, and low levels of maternal over-involvement) interacted with maternal depression, and correlated with the absence of pervasive markers of psychopathology (including internalizing and externalizing problems) in offspring in middle adolescence (Brennan, Le Brocque, & Hammen, 2003). Relatedly, in one noteworthy longitudinal study of the effects of maternal depression, over the span of ten years (from ages 5-8 to 15-18), researchers found that resilient adolescents were associated with "a unique, sustaining relationship with the disturbed parent or other family member" (p. 591, Radke-Yarrow & Brown,

1993). In the present study, maternal depression was defined in the same way as other studies that have used NLSCY data have defined it: that is, utilizing the 12-item Centre for Epidemiological Studies-Depression (CES-D) scale (Radloff, 1977, in Jenkins & Keating, 1998; Somers & Willms, 2002).

*Parental rejection.* In addition to maternal depression, perceived parental rejection is another risk variable in the lives of adolescents that emanates from the family. With regards to parental rejection, attachment types (secure vs. anxious) during infancy have been found to continue throughout development, leading to competence with peers in early adolescents, and “the capacity to be vulnerable” in middle adolescents (Sroufe, et al., 1993, p. 332). Moreover, Loeber and Stouthamer-Loeber (1998) reported that maternal rejection in the first year of life predicted violent offending at age 18. In another study among a sample of early adolescents (Grades 7-8), researchers found that family variables (connection, regulation, and autonomy, under which parental rejection is subsumed) more so than school and peer variables, predicted academic alienation, when all three contexts (family, school, and peers) were analyzed together in one step of regression analysis (Eccles et al., 1997).

Researchers have stressed that family relationship variables are complex, and work in multiple pathways that researchers are currently investigating, to predict internalizing and externalizing problems. For example, poor supervision by parents, poor parent-boy communication, and physical punishment all increased the risk of externalizing problems in early adolescence. These three factors were conceptually linked to the boys’ perceptions of parental rejection (Loeber & Stouthamer-Loeber, 1998). Moreover, a clear example of the influences of parental rejection was reported in one study (Barnow et al., 2002), when parental rejection as perceived by the adolescent (aged 12-18) predicted adolescent aggression-delinquency. The present study used adolescent-reported (Schonert-Reichl & Offer, 1992) parental rejection as an

indicator of poor family connections placing the early adolescent at significant risk of poor psychological health outcomes in middle adolescence.

*Alcohol abuse in the family.* In studies of risk and resilience, alcohol abuse in the family has been theoretically subsumed under general child maltreatment (Beardslee, 1989; Cicchetti, 1996). Although family history of alcohol abuse correlates with alcohol abuse in offspring (Glantz & Leshner, 2000; Weinberg, 2001), empirical researchers have not identified a causal link between alcohol abuse in the family and alcohol abuse in offspring (Barnow et al., 2002; Fuller et al., 2003). Rather, generational alcohol abuse is mediated by multiple heritable and contextual risks to predict multiple pathologies.

Parental mediators of alcohol abuse in the family that place adolescents at risk include parental depression (Zucker, Wong, Puttler, & Fitzgerald, 2003), parental anti-social personality, and both historical and concurrent family conflict (Barnow et al., 2002; Fergusson & Horwood, 2002; Fuller et al., 2003; Jester et al., 2005; Loukas, Fitzgerald, Zucker, & Krull, 2003; Ohannessian et al., 2005). Moreover, poor parental discipline practices and a close relationship with a parent who has alcohol use disorder have been found to predict male adolescent substance use by age 15 (Dishion, Capaldi, & Yoerger, 1999). One study (Loukas et al., 2003) spanned three generations, prospectively and retrospectively, following the third generation until age 12. Loukas and colleagues (2003) found that alcohol abuse in the grandparents (co-occurring with marital and parent-to-child aggression) predicted alcohol abuse, an anti-social personality, and marital aggression in the adult offspring. This second generation morbidity in turn predicted aggression in boys in the third generation throughout their development until early adolescence (Loukas et al., 2003). The effect of adult alcohol abuse and concurrent morbidities on the developing adolescent may well be "the failure to facilitate development of normal resilience and coping skills" in the youth (Glantz & Leshner, 2000, p. 806).

In addition to familial factors, there are child mediators of poor outcomes when alcohol abuse exists in the family. Currently, researchers are exploring the genetic component of child disruptive behaviors (Glantz & Leshner, 2000, Rutter et al., 2001; Weinberg, 2001). For example, one group of researchers found that Grade 4 anti-social behaviour, comprised of both innate and learned components, predicted substance abuse in middle adolescence (Dishion et al., 1999). Another example of heritability at play in the manifestation of poor adolescent psychological outcomes is the co-morbidity between environmental factors (including familial alcohol abuse) and learning disabilities (Weinberger, 2001; Werner, 1985). The most potent child mediator of familial alcohol abuse, however, is the peer group, which, by middle adolescence, is beginning to outweigh other predictors in salience (Barnow et al., 2002). Even as early as Grade 4, peer influences, especially when they are anti-social, have predicted middle adolescent substance use (Dishion et al., 1999). Moreover, child disruptive behaviors have been found to broadly predict internalizing and externalizing problems by late adolescence (Jester et al., 2005).

There has been limited research into the resilience functioning of children who grow up in families experiencing alcohol abuse. Although her study was descriptive rather than prescriptive due to the lack of a control group (Zucker et al., 2003), an early longitudinal investigation of children of alcoholics found that being female, having an even temperament, adequate SES, and living with low family conflict protected rural adolescents in families enduring alcoholism (Werner, 1985). Family alcohol abuse has been found to interact with good adolescent psychosocial adjustment and good adolescent achievement to protect early adolescents. However, resilient early adolescents were found to evidence higher internalizing symptoms, suggesting that their overall contexts exact a cost on their well-being (Zucker et al., 2003). Due to the pervasive, contextual nature of alcohol abuse in the family, and its broad-based



repercussions on the lives of developing adolescents, this variable was included in the risk index in the present study.

*Divorce.* Traditionally, divorce of one's parents has been associated with poor outcomes for adolescents (Arnett, 2001; Hernandez, 1997; Hetherington & Elmore, 2003; Werner & Smith, 1982). Divorce was included among ten risk factors in a Canadian study of children and early adolescents (Jenkins & Keating, 1998). However, recent empirical studies indicated some positive outcomes for some children and early adolescents of divorced parents. The effects were interactional, with better program outcomes reported for some children and young adolescents (age 9 to 12) with lower initial scores on maternal warmth and consistency in discipline, when the divorced mother was the custodial parent (Sandler, Tein, Mehta, Wolchik & Ayers, 2000; Sandler, Wolchik, Davis, Haine, & Ayers, 2003).

The present study adopted the operational definition of divorce utilized by Jenkins and Keating (1998) using NLSCY data. Divorce was defined in order to capture all sample adolescents who were not living with both biological parents in one household.

*Learning disabilities.* Whereas many risk factors analyzed in empirical studies were structural, some are innate. Learning disabilities are recognized as a distinctive biological risk factor (Grizenko & Pawliuk, 1994). For example, among 289 early adolescents, those with learning disabilities (33.2 %) reported greater perceptions of danger as assessed using the Seattle Personality Questionnaire for Children (Greenberg & Kusche, 1990, as reported in Murray & Greenberg, 2001). In another study, among 65 early adolescents (aged 12) with learning disabilities, 57% developed substance use disorders by late adolescence (age 19, Beitchman, Wilson, Douglas, Young, & Adlaf, 2001). In a rural setting, learning disabilities (Werner, 1993a) were co-morbid with delinquency (Werner, 1987). Moreover, remedial education for 10-year-olds, higher among those with learning disabilities, correlated with parental substance abuse (Werner, 1985).

Thus, six risk factors (low maternal education, maternal depression, parental rejection, alcohol abuse in the family, divorce, and the presence of a learning disability in the adolescent) were utilized to comprise the risk index in the present study. Because the theoretical emphasis of primary interest to the present study was the interaction effects that community-based putative protective factors would have in early adolescence in the face of substantive risk in rural Canada, it was considered parsimonious to dichotomize the above risk factors which were all located in the family or within the early adolescent.

#### *Protective Factors Derived From the Community*

The present study investigated whether the effect of risk factors in early adolescence would be moderated by the presence of putative protective factors in early adolescence for major indices of psychological health measured in middle adolescence. To avoid tautology, whereas risks were located in the family (Cowen et al., 1997; Gest, Neeman, Hubbard, Masten, & Tellegen, 1993; Wyman et al., 1999), or the self (Beardslee, 1989; Rutter et al., 2001; Werner, 1999), important variables that might moderate risk were all derived from the adolescents' communities, because community influences become stronger in adolescence (Maddox & Prinz, 2003). Important variables that were selected for their putatively protective effect included important relationships with peers and significant adults in the community, and two forms of community attachment: extracurricular activities and school bonding (See Figure 1).

*Important relationships.* In the second decade of life, relationships with peers become more important than hitherto (Arnett, 2001; Caplan et al., 1992; Luthar & McMahon, 1996; Morison & Masten, 1991). For example, in middle childhood to early adolescence (Grades 3-6), peer reputation was an important predictor of externalizing problems and perceived self-worth in late adolescence, with notable gender differences: sensitivity predicted lower self-worth for boys, whereas sociability was more strongly and negatively related to externalizing problems for girls (Morison & Masten, 1991). Relatedly, for Grades 6 and 7 participants, Connor and Schonert-

Reichl (2001) found that peer acceptance militated against loneliness, whereas Caplan et al. (1992) found that early adolescents appreciated learning conflict resolution skills with peers. In early adolescents (10- and 11-year olds) researchers (Craig, Peters, & Willms, 2002) found anxiety, emotional problems, hyperactivity and conduct problems to all be predicted by affiliation with "friends who get in trouble" (pp. 324-325). By middle adolescence peer reputation was more differentiated than in childhood, with peer acceptance being associated with both disruptive and responsible types in one inner-city sample (Luthar & McMahon, 1996). Collectively these studies attest to the increased salience of peer relationships by early adolescence.

In addition to peer relationships, relationships with teachers remain important in adolescence (Maddox & Prinz, 2003). For example, in early adolescents, Dubois et al. (1994) found the perceived quality and availability of support from school personnel to be protective against psychological distress and conduct problems. Disadvantaged youth demonstrated greater benefits. Researchers have moreover shown that teacher support correlated with better social and emotional adjustment scores (Murray & Greenburg, 2001; Nettles et al., 2000).

*Important relationships in rural contexts.* Important relationships during adolescence may function distinctly in rural contexts. Relationships with important adults (teachers and mentors such as coaches and youth program leaders) may be differentially strong in rural as opposed to urban contexts. Relationships with community leaders have been shown to increase in salience during adolescence, particularly in rural places (Blyth & Leffert, 1995; Elder & Conger, 2000; McGrath et al., 2001; Werner & Smith, 1982). Moreover, when youth were in the vulnerable circumstance of lacking adequate familial support, Elder and Conger (2000) reported that community protective factors were especially important. Community mentors increased the self-confidence (but not the academic achievement) of resilient adolescents; however school mentors were associated with increases in both self-confidence and school achievement (pp. 122, 289).

Relatedly, Elder and Conger (2000) found that rural twelfth graders' social and academic competence, and resilience, varied with the strength of their ties to their community (pp. 111, 286-289), which in turn was promoted during adolescence by relationships with mentors.

As well as relationships with important adults, relationships with peers may function somewhat distinctly in rural contexts. More so than in congested urban settings, rural youth may be required to interact with peers of all ages (Allen & Dillman, 1994). Moreover, peer behavior has been linked to community health for youth in one large rural study, with prosocial behavior and avoidance of negative behaviors typifying the healthiest communities (Blyth & Leffert, 1995; see also Fergusson & Lynskey, 1996).

*Extracurricular activities.* Research has demonstrated that interpersonal competence and educational success are the primary benefits derived from sport and other forms of extracurricular activity (Mahoney et al., 2003; Weiss, Smith, & Theeboom, 1996; Zaff, Moore, Papillo, & Williams, 2003). The key benefit of both sport and non-sport activities may be derived from the structure and supervision that discouraged unsupervised risk-taking. That is, structured, supervised out-of-school pursuits reportedly discourage engagement in dangerous activities, or, at the very least, limit their accessibility and duration (Drixler et al., 2001; Fergusson & Horwood, 2003; Fergusson & Lynskey, 1996).

However, there are some disadvantages attached to some kinds of supervised activities (Perry & Kelder, 1992, p. 458). For example, extracurricular leadership during high school correlated with less post-secondary academic persistence in one rural study (Schonert et al., 1991, p. 280). Moreover, Grade 10 team-sports involvement has been found to predict Grade 12 alcohol consumption rates (Eccles & Barber, 1999). Nevertheless, some researchers have found prosocial activities to be protective in childhood and early adolescence (Rae-Grant et al., 1989) and in middle to late adolescence (Eccles & Barber, 1999). In early adolescence, active extracurricular involvement may protect early adolescents by enhancing school motivation

(Stouthamer-Loeber et al., 1993), through an increased sense of belonging (Connor & Schonert-Reichl, 2001).

*Extracurricular activities in rural settings.* As with adolescents generally, researchers have found that rural adolescents are protected overall by involvement in extracurricular activities. Indeed, it has been argued that, whether derived from school, the community, or both, extracurricular activities are a differentially rich resource for community attachment in rural settings (Allen & Dillman, 1994; Elder & Conger, 2000; Quaglia & Perry, 1995; Stevens & Peltier, 1994). For example, in early to middle adolescence school-based extracurricular participation has been found to protect against arrest and school dropout in one suburban-rural sample (Mahoney, 2000; Mahoney et al., 2003; for a literature review see Stevens & Peltier, 1994). Moreover, cooperative community activities (e.g. 4-H, YMCA-YWCA) are important to resilience functioning among rural youth during late adolescence (Elder & Conger, 2000; Werner, 1993b). Often school and community activities overlap for rural adolescents (Bauch, 2001; Khattri, et al., 1997). For example, in their analysis of 112 rural communities, Blyth and Leffert (1995) determined that for adolescents in Grades 9 to 12 structured activities sponsored by both school and community organizations were significantly correlated with community health (p. 77).

As with extracurricular activities for adolescents generally, there are some provisos to the beneficial effects of extracurricular activities for rural adolescents. For example, a surprise finding of the Elder and Conger (2000) study was that, with academic success controlled, sports and other school activities advanced problem behaviours. That is, sports and other activities appealed both to adolescents who are doing well academically and to those who are not (p. 203). Israel et al. (2001) concurred that, due to limited resources, small, remote communities were least supportive of adolescent development (p. 63). Thus, the empirical literature to date is somewhat equivocal on the protective functions of extracurricular activities in rural contexts.

*Multiple extracurricular activities.* The protective effect of extracurricular activities might be that resilient youth who were active in supervised activities reported less affiliation with peers in unsupervised settings (Elder & Conger, 2000, pp. 122, 289; Fergusson & Horwood, 2003; Fergusson & Lynskey, 1996). Researchers (Zaff et al., 2003) found consistent participation in extracurricular activities from Grades 8 to 12 predicted academic achievement and prosocial behaviors in young adulthood. An aggregate variable of all extracurricular activity types significantly predicted voting, volunteering, and attending college (Zaff et al., 2003, p. 607). In large rural studies, limiting unsupervised time was the protective characteristic of multiple extracurricular activities (Elder & Conger, 2000; Israel et al., 2001).

In one study, researchers found the relationship between extracurricular involvement and Grade 8 mathematics and reading scores to be curvilinear. Whereas involvement in one or two organizations was beneficial, involvement in three or more organizations correlated with reduced scores (Israel et al., 2001, p. 58). Thus as an omnibus measure, Mahoney (2000) defended a dichotomous definition of extracurricular activities, stating, "the specific activity pursued may be less important than the act of participation" (p. 503). He found kappa coefficient estimates of reliability of .99 for 64 dichotomously scored activities (Grades 6-10). Thus there exist precedents in the empirical literature for suppressing a potentially curvilinear effect of extracurricular activities by dichotomizing between those who participate and those who do not participate (see also Coladarci & Cobb, 1996). In the present study a dichotomous extracurricular activities variable (some participation vs. no participation) was used to assess the potential benefit of extracurricular activities in early adolescence to the psychological health of adolescents four years later.

*School bonding.* Besides extracurricular activities, as normative, community-based, and putatively protective institutions, some researchers have analyzed the role of schools (Doll & Lyon, 1998; Elias et al., 1994; Goodenow, 1993, 1994; Pianta & Walsh, 1998). These

researchers provide evidence that the role of schools as socializing institutions increases across the developmental lifespan, into adolescence and beyond (Werner, 1999, 2000).

School bonding is a distinct form of community attachment that is normative for adolescents (Goodenow, 1993; Hawkins, Doueck, & Lishner, 1988). It has been variously operationalized as a feeling of belonging or sense of community at school, a sense of relatedness to others, and recognition of personal competence and academic engagement (Catalano, Haggerty, Oesterle, Fleming, & Hawkins, 2004; Maddox & Prinz, 2003; Osterman, 2000). For early adolescents in high-risk contexts, the function of school bonding may well be to “sever a link in a chain of continuity [towards adversity], and reconstruct pathways between social opportunities” (Caspi, 1993, p. 366).

Whereas it has been the traditional function of schools to develop the academic competence of students, in the late 20<sup>th</sup> century researchers further recognized the role that schools fulfill in developing students’ overall well-being. Building on the work of Maslow (1962, in Goodenow, 1993) that found socio-emotional need satisfaction to be the necessary precursor to intellectual engagement, educators and researchers have come to the realization that personal connections to school profoundly influence student engagement or disengagement (Solomon, Battistich, Watson, Schaps, & Lewis, 2000), and are important in the promotion of healthy individuals and schools, over and above their contributions to academic competence (Goodenow, 1993; Eccles, et al., 1997; Jennings, 2003; Willms, 2000a). For example, in their national longitudinal study of adolescents from Grades 7 to 12, Resnick et al. (1997) found school connectedness was negatively and statistically significantly associated with emotional distress, suicidality and violence.

An ambitious project designed to develop and test school bonding is the California-based Child Development Project. Almost 2,000 participants per year for four years (1991-1995) enrolled in Grades 5 and 6 in 24 elementary schools from 6 school districts across the United

States. The mandate was to become “a caring community of learners” (Battistich et al., 2000, p. 77). Schools were located in urban, rural and suburban settings. (However, a limit to the findings was that results were not disaggregated by demographic setting.) Battistich et al. (2000) have demonstrated that school bonding is a significant protective factor in developing positive academic and social attitudes, values and behavior, (e.g., liking school, concern for others, altruism), and in preventing drug use and conduct problems. A follow-up study of 525 middle school students for three years (1997-2000) revealed that educational performance and aspirations were higher and delinquency was reduced for program students. All program effects “were mediated through ... students’ sense of the school as a community” (Battistich, 2000, p. 2). Relatedly, in another study, “school bonding made the largest unique contribution to the variance in school competence scores” among 289 early adolescents, one third of whom had disabilities (Murray & Greenberg, 2001, p. 36).

School bonding may function somewhat distinctly in different rural settings. One Canadian analysis among three rural Kindergarten to Grade 12 Saskatchewan schools found that these small schools did not fulfill the expectation that they would promote community attachment through school bonding. The investigated schools were factious (Leonard, Leonard, & Sackney, 2001). However, in a review of rural extracurricular participation, Stevens and Peltier (1994) demonstrated that small schools, a proxy for small communities, conferred socialization benefits (e.g., leadership, responsibility, and perseverance) in adolescence and young adulthood. Relatedly, the healthiest rural communities saw their schools as caring and supportive (Blyth & Leffert, 1995), while for 366 rural Albertan adolescents aged 15 to 18, “social bonding” variables (educational ambition and respect for authority) correlated negatively with drinking and driving (Drixler, et al., 2001, p. 78), indicating protective functions for these middle to late adolescents in a Canadian rural setting.



The present study investigated the role of school bonding as a community attachment variable in protecting early adolescents in the face of familial risks from poor psychological health outcomes in middle adolescence (see Figure 1).

### *Outcomes*

In the present study, three indicators of psychological health in middle adolescence were examined: self-worth, internalizing problems, and externalizing problems. In the research design, these outcomes were thought to derive in part from the interactions of risk and positive influences in early adolescence in rural Canada (see Figure 1).

*Self-worth.* Self-worth is a global construct involving an evaluation of self. In empirical studies, the term self-worth has been used interchangeably with self-esteem to indicate contentment with self-attributes, pride in self, and favourable evaluation of self-competency and value (Bandura, 1997; Gerard & Buehler, 2004; Harter, 1990). During the second decade of life, adolescents' fundamental developmental task is the formation of an identity (Erikson, 1959, in Caspi, 1993) that promotes positive self-worth, and "preserves a sense of the continuity of self over time" (Harter, 1990, p. 355).

The importance of self-worth in adolescence has been demonstrated in a plethora of studies. For example, in a qualitative study of thirty-eight 8- to 16-year-olds, relationships with peers involved in sports boosted self-esteem in early adolescence (ages 10 to 12, Weiss et al., 1996). Moreover, for an urban-suburban sample of 238 adolescents, healthy self-concept development in Grade 7 predicted plans by Grade 9 to attend college (Murdoch et al., 2000). By middle adolescence, ego-development was found to be a compensatory (main) effect for grades, assertiveness, and disruptiveness in an inner city sample (Luthar, 1991). In one seminal longitudinal study of 189 participants, by late adolescence, self-worth significantly distinguished competent and resilient adolescents from those who were deemed maladaptive (Masten et al.,

1999). Self-worth scores have thus been found to vary by demographic context in the face of risk throughout adolescence.

In a literature review by Crockett et al. (2000), generally lower self-image has been reported among rural in contrast to urban-suburban adolescents. In an Adolescent Health (ADD Health) study conducted by Resnick et al. (2000), for nearly 12,000 American adolescents, 28% of whom were rural, self-esteem was found to be inversely related to internalizing problems and alcohol use throughout adolescence. Researchers moreover found that high self-esteem correlated with decreased use of cigarettes and marijuana by Grades 9 to 12 (Resnick et al., 1997). Self-worth may figure distinctly in the psychological development and well-being of rural adolescents. Hence, measures of self-worth are important to consider as psychological health outcomes in middle adolescence in rural Canada.

*Internalizing problems.* Internalizing problems manifested in the lives of adolescents are traditionally conceptualized as a superordinate construct synonymous with emotional disorder (Jenkins & Keating, 1998). Indeed, factor analytic work has provided a rationale for summing anxiety and depression scores to form an internalizing problems variable (Achenbach, 1991, in Zahn-Waxler et al., 2000). Internalizing problems are thought to have both biological and environmental antecedents. Whereas some emotional expression would be healthy, emotions become maladaptive when they are inordinately intense, of long duration, and are inappropriate to the situation (Zahn-Waxler et al., 2000). Whereas internalizing problems can persist throughout the lifespan, in adolescence they are found to be exacerbated by multiple risks (e.g., poverty, family conflict, parental psychopathology, maltreatment of adolescents, and parental emotional remoteness). Being of the female gender is the strongest risk factor for internalizing problems in adolescents (Zahn-Waxler et al., 2000).

Thus in empirical studies an omnibus measure of internality in adolescence is generally recognized as a measure of an enduring trait of high relevance to the ongoing psychological health of the individual.

A measure of internalizing problems is commonly used as an outcome measure in empirical studies. Internalizing problems as an outcome have been found to be predicted by overall environmental risk (Blyth & Leffert, 1995; Hammen et al., 2004; Windle, 1992). Specifically, internalizing problems in middle adolescence have been found to be the outcome of maternal depression (Frye & Garber, 2005; Ohannessian et al., 2005) and poor peer relations (Leadbeater Kuperminc, Blatt, & Hertzog, 1999; Windle, 1992), among other risks.

Because a number of researchers examining resilience functioning in adolescence have utilized low levels of internalizing problems as an indicator of healthy adolescent development, the present study utilized a superordinate variable from the NLSCY dataset, *anxiety-emotional disorder*, renamed *internalizing problems*, as an outcome variable (see Table 9, Appendix III). Important relationships and community attachments in early adolescence were hypothesized to protect early adolescents facing high familial risks from manifesting internalizing problems in middle adolescence.

*Externalizing problems.* In addition to self-worth and internalizing problems, a third measure indicative of psychological health during middle adolescence is low levels of externalizing problems. Externalizing problems occur when maladaptive behavior is directed towards others as opposed to the self (Arnett, 2001). Although directly maladaptive, externalizing problems in early adolescence are also of concern in that they provide an early proxy indicator for the emergence of substance abuse problems in middle to late adolescence (Zucker et al., 2003). Externalizing problems that have been studied extensively over the past 30 years include hyperactivity, conduct disorder, and property offences (Fergusson & Lynskey,

1996; Jester et al., 2005; Leadbeater et al., 1999; Loeber et al., 1998; Resnick et al., 1997; Siegel & Scovill, 2000; Zhang, Loeber, & Stouthamer-Loeber, 1997).

Hyperactivity-inattention is a widely recognized disorder originating in childhood that predisposes individuals to lifelong adaptational challenges (Hallowell & Ratey, 1994). Developmental problems indicative of hyperactivity-inattention include inability to concentrate, restlessness, and poor performance (Jester et al., 2005. For the purposes of the present study, the term *hyperactivity* is used to indicate hyperactivity-inattention). The developmental trajectory of hyperactivity is remarkably stable across the adolescent period (Hallowell & Ratey, 1994; Jester et al., 2005). Indeed, in a longitudinal study of the 1955 birth cohort on the rural island of Kauai, Werner (1987) reported that high activity levels in infancy (shown to persist throughout development) were among key behavioral predictors of delinquency in late adolescence. Adolescent manifestations of hyperactivity have been empirically linked with poor school achievement and delinquency (Arnett, 2001). For example, among 109 adolescents (aged 13-18) with childhood diagnoses of hyperactivity, or *attention deficit hyperactivity disorder* (ADHD), a statistically significant correlation was observed between poor childhood reading scores and adolescent alcohol abuse (DSM-IV dependency, Molina & Pelham, 2001). Moreover, hyperactivity joined conduct disorder as an externalizing problem in studies of behaviour disorders in early (Jenkins & Keating, 1998, Stouthamer-Loeber et al., 1993) and middle adolescence (Rae-Grant et al., 1989). In a large longitudinal urban study, ADHD in early to middle adolescent boys significantly correlated with seven other problem behaviors, including delinquency, conduct problems, and physical aggression. Additionally, hyperactivity mediated the correlation between poor reading performance and delinquency (Loeber, et al., 1998).

Conduct disorder represents externalizing problems with potentially lifetime repercussions. Late 20<sup>th</sup> century researchers conceptualized multiple pathways to lifetime anti-social conduct. *Late onset conduct disorder* appeared at age 12, and peaked in middle adolescence (Loeber &

Stouthamer-Loeber, 1998). However, many adolescent conduct problems do not persist beyond middle adolescence, and can be conceptualized as belonging to communities, not individuals (Zhang et al., 1997), so much so that Perry and Kelder (1992) defined communities as the smallest unit of effective intervention for vulnerable youth (see also Siegel & Scovill, 2000). Conduct disorder has been associated with peer rejection for intractable adolescents (Ebata et al., 1990). In support of a contextual view of adolescent conduct disorder, life stresses significantly predicted problem behaviors among a sample of suburban mid-adolescents (Windle, 1992; see also Werner, 1989).

Property offence, affecting community security, is sometimes measured as a proxy for externalizing problems. For example, in one longitudinal study of 1,517 boys, researchers found that the onset and frequency of serious property offences (including car theft and robbery) increased substantially by middle adolescence (Loeber et al., 1998). Researchers in another study found that self-reported property offences and violence offences significantly distinguished high- and low-risk adolescents in their study of resilient adaptation among 940 sixteen-year-olds (Fergusson & Lynskey, 1996).

At the adolescent stage of life, it can be queried whether hyperactivity, conduct disorder, and property offense co-occur in individuals. Recent research (Jester et al., 2005) supports the notion that they do. As evidence, in a longitudinal study from school entry throughout adolescence, latent trajectory class analysis models were used to determine parallel development of hyperactivity and aggression. Jester et al. (2005) found that "inattention-hyperactivity overall tended to remain constant throughout the course of childhood [and adolescence] while aggression problems were decreasing ... there are few children [and adolescents] with aggressive problems who do not have inattention-hyperactivity in most population samples" (p. 118). Given that aggression has not typically decreased by middle adolescence (Fergusson & Horwood, 2002), in the present study we followed the example of Jenkins and Keating (1998). These

researchers, using NLSCY data, created a superordinate outcome variable based on factor analysis by summing conduct disorder, hyperactivity, and indirect aggression scores. Internal consistency (assessed by Cronbach's  $\alpha$ ) for parent's report of externalizing behaviors was .88 for that study.

In the present study, because middle adolescents can be expected to have not yet desisted from aggression (Loeber et al., 1998), we created a superordinate variable, *externalizing problems*, by summing hyperactivity, conduct disorder, and property offence scores.

### *Hypothesis and Research Questions*

In the present study, the manner in which risk in early adolescence is moderated by important relationships and community attachment in predicting psychological health outcomes in middle adolescence among Canadian rural adolescents was examined. Following in the resilience research tradition that stresses the importance of interaction effects more than main effects, the present study tested an interaction model of protective variables. Figure 2 illustrates one type of interaction effect. It was hypothesized that statistically significant interaction effects similar to that depicted in Figure 2 would indicate resilient adaptation. As can be seen in Figure 2, regression lines are plotted for a risk factor (on the abscissa), an outcome (on the ordinate) and a presumed moderator, represented by solid and dotted lines on the grid (Luthar & Zelazo, p. 518; Masten, 2001, p. 231). In this illustration, protective influences are universal at low levels of risk. However, when risk is high, the effects of protective factors are noticed differentially. Then, if the variable on the grid protects high-risk adolescents to nearly the same degree as their low risk counterparts (represented by the nearly horizontal line, *high protection*), resilience functioning is theoretically considered to account for the good adaptation (Luthar et al., 2000b, Luthar & Zelazo, 2003; Masten, 2001).

Three research questions flow from the above hypothesis. Each question considers Canadian rural adolescents:

1. Do important relationships and community attachments in early adolescence serve to moderate risk in early adolescence on self-worth in middle adolescence? Are differences by gender evident in the moderating effect?
2. Do important relationships and community attachments in early adolescence serve to moderate risk in early adolescence on internalizing problems in middle adolescence? Are differences by gender evident in the moderating effect?
3. Do important relationships and community attachments in early adolescence serve to moderate risk in early adolescence on externalizing problems in middle adolescence? Are differences by gender evident in the moderating effect?

## Method

### *Design*

The present study was a longitudinal panel study<sup>1</sup> of a cohort of rural Canadians who were 10 to 11 years old in 1994-5, and 14 to 15 years old in 1998-9. Data were drawn from the National Longitudinal Survey of Children and Youth (NLSCY, Statistics Canada, 1995b, 1998).

The primary goal of this investigation was to examine the moderating effects of putative protective variables on risks at age 10 to 11, for psychological health outcomes in the same adolescents at age 14 to 15. The NLSCY data set was used to analyze five protective variables (peer relationships, relationships with teachers, relationships with other community leaders, school bonding, and extracurricular participation), a risk index, and three psychological health outcomes (self-worth, internalizing problems, and externalizing problems). Moderating effects were analyzed via a series of hierarchical multiple regression analyses.

### *Source of Data*

This study drew on two waves of longitudinal data from the Canadian NLSCY (Statistics Canada, 1995a, 1995b, 1998). The NLSCY is a joint project between the Applied Research Branch of Human Resources Development Canada and Statistics Canada, and has involved collecting of both cross-sectional and longitudinal data about the well-being and development of children and youth in Canada. The NLSCY is particularly well suited for the present study because of its focus on understanding "how risk and protective variables, as well as life events, influence children's development" (Statistics Canada 2001b, p. 2). The NLSCY began with a clustered probability sample of Canadian households from the sampling frame of Statistics

---

<sup>1</sup> "A type of investigation in which changes in a population over time are studied by selecting a sample at the outset of the study and then collecting data from the same sample throughout the duration of the study" (Gall, Borg, & Gall, 1996, p.765).



Canada's Labour Force Survey (LFS).<sup>2</sup> A purpose of the LFS was to ensure national representation of families from all socioeconomic conditions. (However, it should be noted that households from the northern territories or on aboriginal reserves, and children in institutions, were excluded.) A maximum of 4 children per family were included in Cycle 1 data, but this was reduced to 2 children per family from Cycle 2 on. The first wave of data (Cycle 1), collected in 1994-1995 consisted of a cohort of 22,831 children aged 0 to 11, to be measured every two years (1996-97, 1998-99, 2000-01, etc.) until age 25. The longitudinal sample size was reduced by 26% to 16,903 in Cycle 2 for cost cutting reasons. In Cycle 3 the longitudinal sample ranged in age from approximately 4 to 15 years. Almost 14,800 (90%) of the longitudinal cohort responded to the wave of data collection in Cycle 3 (1998-1999, Statistics Canada, 2001b).

NLSCY data collection was achieved via responses from the parents or guardians, and via self-report for children above 9 years of age. Most of the NLSCY risk measures of interest to the present study were responses from the *person most knowledgeable* (PMK) about the adolescent. For 91.3% of responding children, the PMK was the mother; for 8.2% of children the PMK was the father. For a very small percentage (0.5%) the PMK was not a parent, but usually a grandparent (Statistics Canada, 2001a). For the purposes of this paper, the term PMK is used interchangeably with parent. Face-to-face or telephone interviews were conducted (for Cycle 1 data) by Statistics Canada interviewers between December 1994 and April 1995 (Statistics Canada, 1995, Feb.); data for Cycle 3 were collected either in person or by telephone. No remuneration was given to respondents (Statistics Canada, 2001b).

---

<sup>2</sup> "The Labour Force Survey (LFS) is a monthly household survey carried out by Statistics Canada in approximately 59,000 households throughout the country ... It employs a stratified, multistage probability sample design on an area frame in which dwellings (residences) are the sampling units. ... In the NLSCY, households were selected from the LFS sample frame. The children in each economic family were selected at random, up to a maximum of four children per household" (Statistics Canada, 1999, p.41, 5).

### *Sample*

The sample was comprised of adolescents who were 10 or 11 years of age in 1994 or 1995, and who participated in the third wave of data collection when they were 14 or 15 years of age in 1998 or 1999. All respondents lived in rural Canada. (The operational definition of *rural* can be found below). The NLSCY is a dataset that does not readily lend itself to studies of aboriginal youth. At times of data collection, aboriginals living on reserve were excluded (Statistics Canada, 1995b). The remaining off-reserve aboriginals were small enough in number to pose a disclosure risk in the analyses of the present study. Moreover, including off-reserve aboriginal adolescents in the sample would contribute variation to the study that could not be modelled statistically but would only contribute to error (Zucker et al., 2003). Therefore, all aboriginals were excluded from the sample. The final sample size ( $N = 940$ ; 472 boys, 468 girls) represented 74% of Cycle 1 respondents. Due to the method used to create the sample for this study, aboriginals are included among this 74%.

The sample was derived in the following manner: First, variables of interest were selected from the Cycle 1 and Cycle 3 NLSCY dataset. Second, Cycle 1 and Cycle 3 datasets were merged to include only those Cycle 3 respondents aged 12 to 15 who had completed the Self Questionnaire ( $n = 6,425$ ). Third, 14- to 15-year-old Cycle 3 adolescents were selected. Fourth, rural 14- and 15-year olds were selected. To avoid disclosure of the small number of aboriginal respondents, aboriginals were deleted from the sample in the last step of dataset creation; see Table 9, Appendix III.

The classification of participants as *rural* in this study was based on data drawn from Cycle 3. In the NLSCY data set, respondents who live in households with a population less than 1,000, or a population density less than 400 people per square kilometer, are considered to be rural. In the present study, participants were identified as *rural* if they lived in small towns ( $< 15,000$ ), rural fringes of census metropolitan areas, remote and wilderness settings, or on agricultural

lands, and in the smallest census metropolitan areas (< 30,000). This expanded definition of rural allowed the creation of a sufficiently large sample to investigate interactions implied by the research questions. It follows the example of recent empirical studies that have included small town populations in their investigations of rural adolescent psychological health (e.g., Blyth & Leffert, 1995; Hektner, 1995; Schonert-Reichl & Elliott, 1996).

The sample was racially homogenous. PMK's reported that 930 (98.9%) of the adolescents were *White*. Almost 18% (166) adolescents had parents who were divorced. Mean maternal education was Grade 12.02 (SD 2.00; Range 3.0–20.0). The average income per household was between \$30,000 and \$39,999.<sup>3</sup> The mean number of persons per household was 4.47 (SD 1.09; Range 2-9). The mean age of the PMK was 37.05 (SD 4.78; range 27.00–49.59).<sup>4</sup>

#### *Measures*

The focus of the present study was to examine the moderating effects of significant putative protective factors (peer relationships, adult relationships, community relationships, and community attachment), on risk among a sample of youth living in rural Canada. Risk and protective factors were measured when adolescents were 10 to 11 years old (Cycle 1 data); and outcomes were measured at 14 to 15 years of age (Cycle 3 data). Operational definitions of study variables and reliability indices (measures of internal consistency) are presented in Table 1. For definitions of NLSCY variables from which study variables were derived, see Appendix III, Table 9.<sup>5</sup>

<sup>3</sup> British Columbia Inter-university Research Data Centre staff, due to disclosure risk, suppressed the precise mean income for the sample.

<sup>4</sup> Race and maternal education were measured at Cycle 3. All other sample descriptive statistics were measured at Cycle 1. Relevant statistics were weighted.

<sup>5</sup> For the purposes of the present study, coding from the original NLSCY format was changed. Whereas NLSCY coding typically begins with position 1, in this study scales begin at 0.

Table 1

*Operational Definitions of Study Variables*

| Variable                       | $\alpha$ | Operational Definition  | I <sup>a</sup> | Response Scale   |
|--------------------------------|----------|---|----------------|--|
| Gender                         | -        | -   | 1              | 0 <i>boy.</i><br><br>1 <i>girl.</i>  |
| Peer relationships             | .77      | NLSCY Friends composite variable.   | 4              | See Appendix III   |
| Teacher relationships          | -        | <i>I have a teacher I can talk to.</i>  | 1              | 0 <i>no.</i><br><br>1 <i>yes.</i>  |
| Community leader relationships | -        | <i>I have a coach or leader (e.g., scout or church leader) I can talk to.</i> | 1              | 0 <i>no.</i><br><br>1 <i>yes.</i>  |
| School bonding                 | -        | <i>I feel like an outsider (or left out of things) at school.</i>             | 1              | 0 <i>All of the time.</i><br><br>1 <i>Most of the time.</i><br><br>2 <i>Some of the time.</i><br><br>3 <i>Rarely.</i><br><br>4 <i>Never.</i> |

| Variable                   | $\alpha$ | Operational Definition   | I <sup>a</sup> | Response Scale  |
|----------------------------|----------|--|----------------|---|
| Extracurricular activities | -        | NLSCY response items first summed, then dichotomized.  | 3              | 0 <i>No out of school supervised activities.</i><br><br>1 <i>One or more out of school supervised activities.</i> |
| Risk Index                 | -        | Sum of NLSCY variables (see Appendix III). Before summing, each factor comprising the risk index was dichotomized such that <i>risk</i> (< -1 SD on continuous variables) = 1; <i>no risk</i> = 0. | 6              | 0 <i>No risks.</i><br>1 <i>One risk ...</i><br>6 <i>Six risks.</i><br>Range 0 to 6.                               |
| Self-worth                 | .87      | NLSCY General-self composite variable.   | 4              | See Appendix III.   |
| Internalizing problems     | .83      | NLSCY Anxiety-emotional disorder composite variable.   | 8              | See Appendix III.   |
| Externalizing problems     | .72      | Summed scale total of NLSCY composite variables: Hyperactivity-inattention + conduct disorder + property offence.  | 3              | Range 0 to 31.  |

Note. Cronbach's  $\alpha$  scores are standardized.

<sup>a</sup>I represents the number of response items.

### *Putatively Protective Factors*

In the present study, five variables identified as protective in the extant literature were examined in relation to risk. Three of these variables represented significant relationships in the youth's social support network and were operationalized as relationships with peers, and relationships with teachers, or mentors from the community. Community attachment was operationalized along two dimensions, school bonding and extra-curricular activities (see Figure 1). Important relationships outside the family, and community attachments, were examined to test the hypothesis that variables derived from the community protect rural adolescents from risks incurred in the family.

*Important relationships.* Three dimensions of relationships of importance to adolescents were examined in the present study: peer relationships, teacher relationships, and relationships with adult leaders in the rural community. First, the peer relationships scale was comprised of four items from the NLSCY survey: *I have a lot of friends*, *I get along with kids easily*, *other kids want me to be their friend*, and *most other kids like me*. As can be seen Table 1, internal consistency for this scale was found to be adequate.

Second, relationships with teachers were assessed via a single item in which respondents were asked whether or not they felt they could talk to their teachers. Responses to this question were dichotomous (0 = *no*, 1 = *yes*).

Third, relationships with significant community adult leaders were assessed in a manner similar to the assessment of relationships with teachers. Namely, a single item asked participants to indicate whether or not they felt they could talk to a community leader. Again, responses to this question were dichotomous (0 = *no*, 1 = *yes*).

*Community attachment.* Attachment to community was assessed along two dimensions: school bonding and participation in extracurricular activities outside of school. To assess school bonding, respondents were asked to indicate the degree to which they felt like an outsider at

school on a five-point scale (0 = *always*, 1 = *usually*, 2 = *sometimes*, 3 = *rarely*, 4 = *never*, *felt like an outsider at school*). Higher scores indicated higher levels of school bonding (i.e., less likely to report feeling like an outsider).

Involvement in extracurricular activities was assessed via three items that asked the participants about their involvement in extracurricular activities at ages 10 to 11. Specifically, participants were asked to indicate whether or not they had participated in sports or non-sports activities out of school, in clubs or groups such as Girl Guides-Boy Scouts, and in lessons in the fine arts (art, dance, or music, see Table 9 Appendix III). Responses were recoded so that scores of 1 indicated extracurricular involvement in one or more extracurricular activities and scores of 0 indicated no participation in extracurricular activities.

#### *Risk Index*

A composite risk index was developed that was comprised of six risk factors: low maternal education, depression in the PMK, parental rejection, alcohol abuse in the family, divorced parents, and the presence of a learning disability in the adolescent (see Table 9, Appendix III). These factors were measured when the participant was 10 to 11 years old. Scores were derived for each of these risk factors, with an individual receiving a score of 1 if the risk factor was present, and a score of 0 if the risk factor was absent. These dichotomized risk scores were then summed to form an overall risk index with a range of 0 to 6 (higher scores indicating higher levels of risk).

*Low maternal education.* Low maternal education was defined as less than Grade 11, and was used as a proxy for low SES (Willms, 2002b).<sup>6</sup> Scores were dichotomized such that 0 = *Grade 11 education and above*, and 1 = *Grade 10 education and below* in order to capture

---

<sup>6</sup> In most cases (91.3%), the education of the PMK was synonymous with maternal education level. For those 8.2% of the respondents whose PMK was their father, the educational level of the spouse of the PMK was used. The 0.5% of children whose PMK's were not parents constituted missing data in the present study.

education levels that fell approximately 1 standard deviation below the mean (approximately 20% of the sample).

*Depression in the PMK.* Parental or PMK depression was measured with the NLSCY scale total for a 12-item shortened version of the Centre for Epidemiological Studies-Depression scale (CES-D, Radloff, 1977). The internal consistency ( $\alpha$ ) score for the parental depression variable with the present sample was .83. Scores could range from 0 to 36, with higher scores indicating higher levels of depression. Scores were dichotomized at the cut-off of 10 to identify scores that were more than 1 standard deviation above the mean for depression (approximately 15% of the sample). Scores of 0 to 9 were recoded as 0 (*no risk*); scores of 10 to 36 were recoded as 1 (*risk*).

*Parental rejection.* Adolescents' perceptions of their parent's rejecting behaviors were measured with the NLSCY scale total for the parental rejection scale. This scale was comprised of six items and included such items as, *My parents hit me or threaten to do so*, *My parents enforce rules depending on their mood*. Items for this scale were derived from work by Lempers and colleagues (1989) as utilized in the Western Australia Child Health Survey (Statistics Canada, 1995a). The internal consistency ( $\alpha$ ) score for the parental rejection variable with the present sample was .96. Scores ranged from 0 to 18, with higher scores indicating greater levels of parental rejection. In order to identify scores that were more than 1 standard deviation above the mean for parental rejection, scores were dichotomized to 0 for scores 0 to 8 (*no risk*) and 1 for scores 9 to 18 (*risk*).

*Alcohol abuse in the family.* PMK's responded on a four-point scale (*strongly agree, agree, disagree, strongly disagree*) to a single test item asking the degree that drinking was a source of tension in the family. The four-point scale was then dichotomized with responses that indicated disagreement or strong disagreement recoded as 0 (*no risk*) and responses that indicated strong agreement or agreement as 1 (*risk*).



*Parental divorce.* To create an index of parental divorce, a variable was constructed that represented whether or not the early adolescent was living in a family with both biological parents, as reported by the PMK at Cycle 1. The NLSCY variable *child's parents' status - who the child lives with* was used to assess parental divorce and was gathered when the participant was 10 to 11 years old. The participant was identified as having experienced the divorce of parents if the PMK reported that the early adolescent was living with a biological mother and step father; biological father and step mother; one biological parent and one adoptive parent; two step parents; one adoptive parent and one step parent; biological mother and no father; biological father and no mother; single parent-other: one female non-biological parent; single parent, other: one male non-biological parent. Adolescents who were reported as living with both biological parents were considered to be from a home without divorce, and were given a score of 0 (*no risk*), whereas those adolescents who were reported as living in a family constellation other than both biological parents were given a score of 1 (*risk*).

*Presence of a learning disability in the adolescent.* A single item constituted the measure of *learning disability*. The PMK in the NLSCY at Cycle 1 was asked to respond to the prompt, *Has your child ever been diagnosed with a learning disability by a health professional?* No-yes responses were recoded as 0 (*no risk*) and 1 (*risk*), respectively.

#### *Outcome Variables*

Three measures of outcomes were utilized in the present study, namely: self-worth, internalizing problems and externalizing problems. These outcomes were measured at Cycle 3, when the participants were 14 to 15 years of age.

*Self-worth.* Items comprising the self-worth composite score were taken from Marsh' Self Description Questionnaire, General Self Scale (SDQ; Marsh, 1992, in Marsh, Ellis, Parada, Richards, & Heubeck, 2005). These items included the following questions that participants were asked to rate on a 5-point scale (*false, mostly false, sometimes false/sometimes true, mostly true,*

true); *I like the way I am, I have a lot to be proud of, A lot of things about me are good, When I do something, I do it well.* Total scores could range from 0 to 16, with higher scores representing a higher level of overall self-worth. (Items are also listed in the *General self* variable defined in Table, 9, Appendix III).

*Internalizing problems.* To assess internalizing problems, an 8-item NLSCY scale total for anxiety and emotional disorder was used. These 8 items were drawn from the Ontario Child Health Study and the Montreal Longitudinal Survey (Statistics Canada, 2001a). Total scores could range from 0 to 16, with higher scores indicating higher levels of internalizing problems. (For sample items, see the *Anxiety-emotional disorder* variable defined in Table 9, Appendix III).

*Externalizing problems.* To determine participants' externalizing problems three scales from the NLSCY were identified: conduct disorder-physical aggression, hyperactivity-inattention, and property offence. These scales were drawn from the Ontario Child Health Study and Montreal Longitudinal Survey (Statistics Canada, 2001a). A series of bivariate correlations were computed and revealed statistically significant relations among three indices of externalizing problems,  $p < .006$ . The present study used, first, an NLSCY composite variable to measure conduct disorder-physical aggression. Scores for the 6-item scale ranged from 0 to 12. Internal consistency with the present sample as measured by Cronbach's  $\alpha$  was .79, indicating acceptable reliability. Secondly, the present study used an NLSCY composite variable to measure hyperactivity-inattention. Scores for the 8-item scale ranged from 0 to 16. Cronbach's  $\alpha$  was .80, indicating acceptable reliability. Thirdly, the present study used an NLSCY composite variable to measure property offence. Scores for the 6-item scale ranged from 0 to 12. Internal consistency as measured by Cronbach's  $\alpha$  was .73, indicating somewhat low reliability. Overall for the outcome variable externalizing problems the alpha score was .72, also indicating somewhat low reliability. Nevertheless, a summed composite score, externalizing problems was computed (see also Jenkins & Keating, 1998). For the present study, therefore, psychological

health during middle adolescence was operationalized in terms of low externalizing problems. By reducing the number of outcome variables from five to three, the risk of a Type 1 error was thereby also reduced.

### *Procedure*

Analyses began with performing descriptive statistics for six predictor factors (peer relationships, teacher relationships, relationships with community adult leaders, school bonding, extracurricular activities, and risk) and three outcomes (self-worth, internalizing problems, and externalizing problems). Next, bivariate correlations among study variables were analyzed, in total and separately for boys and for girls. Third, multivariate hierarchical regressions were performed. Moderating effects were analyzed via a series of regression analyses, conducted separately for each of the three outcomes (self-worth, internalizing problems, and externalizing problems).

### *Missing Data*

NLSCY variables contain four scale items (*not applicable, don't know, refusal, not stated*) to account for non-response (Statistics Canada, 1995b, 1999). All of these scale positions were considered to represent missing data in the present study. Therefore, variables created in the present study were given identical scale items. To reduce sampling bias for non-response of subgroups, and to create a sample representative of the Canadian population, NLSCY sample weights were applied to the analyses in this study, in the following manner: First, a variable was derived using the mean sample weight for longitudinal data for the sample. A rescaled weight equal to the original person weight divided by the mean weight was calculated. This sample weight was then applied to all subsequent analyses (Statistics Canada, 1995b).

Variables other than the nine study variables were of theoretical interest. However, Tabachnik and Fidell (2001) advised that variables with high frequencies of missing data that are highly correlated to other complete variables or are not critical to analyses might be profitably

dropped from analyses (p. 59). In the present study, two variables, parental nurturance and parental monitoring, were highly correlated with the parental rejection variable,  $p < .006$ . The educational aspirations variable was judged to be not critical to the analyses. As these three variables contained missing data in excess of approximately 20%, they were not included in the study. The nine study variables had less than 20% missing data.

### *Hierarchical Regression*

Regressions were run using Statistical Program for the Social Sciences (SPSS) software. Three regressions tested the null hypothesis that important relationships and community attachment during early adolescence would not moderate the risk of poor psychological health outcomes in middle adolescence. Moderating effects were analyzed via a series of hierarchical multiple regression analyses, conducted separately for each of the three outcomes (general self-worth, internalizing problems, and externalizing problems). Six predictor variables (peer relationships, teacher relationships, relationships with community leaders, school bonding, extracurricular activity participation, and a risk index) were entered into regression analyses, followed by interaction terms.

The order of entry of variables into regression equations was governed by various considerations. Gender was entered first into each regression because it is a *fixed* factor that cannot be influenced by other independent variables. In order to conform to the theoretical paradigm shift that favours protective influence over risk factors, all putative protective moderators were entered in the second step of the regression (Luthar, 1991). Third, the risk index was entered. Fourth, to determine their unique contribution to variance after predictor variables had been entered, interaction terms between each protective variable and risk were entered (Luthar, 1991; Pedhazur, 1997). In the fifth and final step of each regression gender effects were explored via three-way interactions between gender, risk and putative protective factors.

Separate regressions were run for each dependent measure. In the regressions, three factors (peer relationships, school bonding, and the risk index) were continuous, and three factors (relationships with teachers, relationships with community leaders, and extracurricular activity participation) were dichotomous.

### *Assumptions*

The present study assumes that the predictor measures of interest are normally distributed in the sample. It also assumes that the sample is representative of Canadian rural adolescents. Further assumptions of the present study are specific to hierarchical multiple regression:

1. The independent (X) variables are fixed. Any future replication would require that the same variables be used. This requirement is met in the present study inasmuch as it used an existing dataset with some previously constructed variables.
2. The X variables are measured without error. Measurement errors in the independent variables potentially lead to over-estimation or under-estimation of the regression coefficient.
3. The regression of Y on X is linear. Dichotomizing X variables in the present study served to suppress curvilinearity.
4. The mean of errors is zero. Hierarchical multiple regression is robust to violations of this assumption.
5. Homoscedasticity: Variance of errors is the same at all levels of X. Hierarchical multiple regression is robust to violations of this assumption.
6. Errors are random and do not correlate with each other. Hierarchical multiple regression is robust to violations of this assumption.
7. Errors do not correlate with X. Hierarchical multiple regression is robust to violations of this assumption.

8. Errors are normally distributed. Hierarchical multiple regression is robust to violations of this assumption (Pedhazur, 1997, pp. 33-34).

## Results

This section presents results of regression analyses for six predictor variables (peer relationships, teacher relationships, community leader relationships, school bonding, extracurricular activities, and risk) at age 10 to 11 on three outcomes (self-worth, internalizing problems, and externalizing problems) for the same adolescents at age 14 to 15. Results are presented separately for each outcome. Interaction effects between protective factors and risk are also presented for each of the three outcomes. These analyses were conducted to test the hypothesis that protective factors in early adolescence would moderate the effect of risk factors in early adolescence on psychological health outcomes in middle adolescence.

Based on extant literature on resilience (Luthar & Zelazo, 2003; Masten & Reed, 2002; Rutter, 2000; Werner, 2000), we predicted that early adolescent peer relationships, and the existence of supportive relationships with significant adult leaders in the adolescents' schools and communities, would result in higher self-worth, and lower levels of internalizing and externalizing problems for the same adolescents four years later. Moreover, we expected some gender differences to be found in psychological adaptation of these rural youth. We expected boys to evidence less internalizing problems than girls (Zahn-Waxler et al., 2000). For externalizing problems, we predicted the opposite, that girls would evidence less maladaptation than boys (Siegel & Scovill, 2000). Critical to our hypothesis was the prediction that some protective factors would interact with risk, thereby indicating resilient adaptation in rural Canada. That is, some adolescents would maintain psychological health in the face of considerable risk. Gender interactions with risk and putative protective factors were explored to test for differences between boys and girls with regard to risk and protection.

### *Descriptive Statistics*

Descriptive statistics revealed skewness and kurtosis of distributions of scores through visual analysis of SPSS graphical data presentations. Negative skews were observed for self-worth (-.83), peer relationships (-1.15), and school bonding (-1.40). The internalizing and externalizing problems variables and the risk index were positively skewed (1.02, 1.45 and 1.13 respectively). Skewness for the hyperactivity variable (0.70) differed from that of the other two components of the externalizing problems composite variable (2.51 for conduct disorder, and 2.02 for property offence), resulting in a skewness score for the externalizing problems variable in the present study that represented the most extreme skew among the nine study variables.

Ranges, means and standard deviations for continuous variables, and frequencies and percentages for dichotomous variables, are presented in total, and separately for girls and for boys, in Table 2. The standard deviations for school bonding and the risk index indicated low variance. Gender differences were observed in relation to self-worth and internalizing problems,  $p < .001$ . Gender differences in the risk index score were among the statistically significant gender differences in predictor variables,  $p < .01$ .

Frequencies and percentages for variables comprising the risk index are presented in Table 3. Percentages below 10% were observed for family alcohol abuse and learning disability in the adolescent. Risk positions for the other four constituent scores of the risk index approximated 20%. The only statistically significant gender difference in the risk index was the difference in frequencies of boys and girls with learning disabilities,  $p < .01$ .

Bivariate correlations were computed for all variables of interest, in total and separately by gender (see Table 4 & Table 5). The Bonferroni correction factor was applied to Pearson correlations, resulting in an acceptable probability that null is true of less than .006. Results were used to determine statistically significant correlations among variables prior to regression analyses. School bonding reached statistical significance in its correlations with all three



outcome variables. The risk index correlated significantly with school bonding and extracurricular activity. Some statistically significant differences were observed in correlations by gender. For self-worth, statistically significant correlations were observed for community leader relationships, school bonding, extracurricular activities, and the risk index for boys but not for girls. Peer relationships negatively predicted internalizing problems for boys but not girls. School bonding negatively predicted externalizing problems for girls but not boys. Due to the number of correlations computed, the alpha level for rejecting null was reduced from the conventional 0.05 to 0.01 for all hierarchical regression analyses (Coladarci & Cobb, 1996).

Table 2<sup>a</sup>

*Range, Mean and Standard Deviation, or Frequency and Percentage<sup>b</sup>, for Outcomes and Predictors, by Gender and Total*

| Variable                   | <i>M</i> /( <i>SD</i> ) | Boys<br><i>n</i> = 472 | Girls<br><i>n</i> = 468 | Total | <i>t</i> <sup>c</sup> / $\chi^2$ <sup>d</sup> |
|----------------------------|-------------------------|------------------------|-------------------------|-------|---|
| Developmental Outcomes     |                         |                        |                         |       |   |
| Self-worth                 | <i>M</i>                | 12.94                  | 11.71                   | 12.30 |   |
| (0-16) <sup>e</sup>        | ( <i>SD</i> )           | 2.66                   | 3.00                    | 2.91  | 0.000**                                       |
| Internalizing problems     | <i>M</i>                | 2.69                   | 4.54                    | 3.65  |   |
| (0-16)                     | ( <i>SD</i> )           | 2.58                   | 3.31                    | 3.12  | 0.000**                                       |
| Externalizing problems     | <i>M</i>                | 6.35                   | 6.42                    | 6.39  |   |
| (0-31)                     | ( <i>SD</i> )           | 5.42                   | 5.32                    | 5.36  | 0.845   |
| Predictor Variables        |                         |                        |                         |       |   |
| Peer relationships         | <i>M</i>                | 12.48                  | 13.17                   | 12.83 |   |
| (0-16)                     | ( <i>SD</i> )           | 2.89                   | 2.75                    | 2.84  | 0.000**                                       |
| Teacher relationships      | <i>f</i>                | 183                    | 152                     | 335   |   |
|                            | %                       | 47.0                   | 36.7                    | 41.7  | 0.004*  |
| Community leader           | <i>f</i>                | 57                     | 38                      | 95    |   |
|                            | %                       | 14.5                   | 9.2                     | 11.8  | 0.021   |
| Extracurricular activities | <i>f</i>                | 328                    | 342                     | 669   |   |
|                            | %                       | 81.1                   | 81.1                    | 81.1  | 1.000   |
| School bonding             | <i>M</i>                | 3.29                   | 3.28                    | 3.29  |   |
| (0-4)                      | ( <i>SD</i> )           | 0.94                   | 0.92                    | 0.93  | 0.937   |
| Risk Index                 | <i>M</i>                | 0.84                   | 0.65                    | 0.74  |   |
| (0-6)                      | ( <i>SD</i> )           | 0.91                   | 0.77                    | 0.85  | 0.003*  |

*Note.* All significance statistics are two-tailed or two-sided.

<sup>a</sup>Sample weights were applied to all statistics. <sup>b</sup>Percentages are valid. <sup>c</sup>Equal variances are not assumed.

<sup>d</sup>Degree of freedom is 1 for all chi square statistics reported in Table 2. <sup>e</sup>Range for each variable appears below variable name.

\**p* < .01. \*\**p* < .001.

Table 3<sup>a</sup>*Frequency and Percentage<sup>b</sup> for Risk Index Dichotomies*

| Variable               | <i>f</i> /% | Boys<br><i>n</i> = 472 | Girls<br><i>n</i> = 468 | Total | $\chi^2$ <sup>c</sup> |
|------------------------|-------------|------------------------|-------------------------|-------|-----------------------|
| Low maternal education | <i>f</i>    | 97                     | 86                      | 183   |                       |
|                        | %           | 21.4                   | 18.7                    | 20.0  | .284                  |
| Depression in PMK      | <i>f</i>    | 72                     | 66                      | 139   |                       |
|                        | %           | 16.2                   | 14.2                    | 15.2  | .460                  |
| Parental rejection     | <i>f</i>    | 52                     | 42                      | 94    |                       |
|                        | %           | 13.6                   | 10.2                    | 11.8  | .126                  |
| Family alcohol abuse   | <i>f</i>    | 25                     | 29                      | 55    |                       |
|                        | %           | 5.5                    | 6.2                     | 5.9   | .676                  |
| Divorce                | <i>f</i>    | 106                    | 85                      | 191   |                       |
|                        | %           | 22.8                   | 17.9                    | 20.3  | .062                  |
| Learning disability    | <i>f</i>    | 32                     | 12                      | 44    |                       |
|                        | %           | 7.0                    | 2.5                     | 4.7   | .002*                 |

*Note.* All significance statistics are two-tailed or two-sided.

<sup>a</sup>Sample weights were applied to all statistics. <sup>b</sup>Percentages are valid. Equal variances are not assumed.

<sup>c</sup>Degree of freedom is 1 for all chi square statistics reported in Table 2

\* $p < .01$

Table 4<sup>a</sup>*Correlations Between Study Variables*

| Construct                                      | 1     | 2     | 3     | 4     | 5    | 6    | 7     | 8     | 9 |
|--|-------|-------|-------|-------|------|------|-------|-------|---|
| 1. Self-worth                                  | —     |       |       |       |      |      |       |       |   |
| 2. Internalizing problems                      | -.51* | —     |       |       |      |      |       |       |   |
| 3. Externalizing problems                      | -.28* | .45*  | —     |       |      |      |       |       |   |
| 4. Peer relationships                          | .12*  | -.05  | -.09* | —     |      |      |       |       |   |
| 5. Teacher relationships <sup>b</sup>          | .06   | .02   | -.00  | .07   | —    |      |       |       |   |
| 6. Community leader relationships <sup>b</sup> | .11   | -.06  | -.02  | .03   | .28* | —    |       |       |   |
| 7. School bonding                              | .18*  | -.21* | -.17* | .49*  | -.08 | .01  | —     |       |   |
| 8. Extracurricular activities <sup>b</sup>     | .22*  | -.05  | .02   | .12   | .09  | .10* | .01   | —     |   |
| 9. Risk index                                  | -.08  | .04   | .09   | -.10* | .10  | .03  | -.12* | -.13* | — |

*Note.* Pearson product-moment  $r$ , with Bonferroni correction.

<sup>a</sup>Sample weights were applied to all analyses. <sup>b</sup>Indicates a dichotomous variable.

\* $p < .006$ , due to Bonferroni correction.

Table 5<sup>a</sup>*Correlations Between Study Variables by Gender<sup>b</sup>*

| Construct                                      | 1     | 2     | 3     | 4     | 5    | 6              | 7    | 8              | 9     |
|--|-------|-------|-------|-------|------|----------------|------|----------------|-------|
| 1. Self-worth                                  | —     | -.47* | -.33* | .28*  | .07  | .18*           | .31* | .22*           | -.16* |
| 2. Internalizing problems                      | -.50* | —     | .56*  | -.17* | -.11 | -.13           | -.16 | -.11           | .04   |
| 3. Externalizing problems                      | -.34  | .53*  | —     | -.10  | -.12 | -.05           | -.12 | -.09           | .10   |
| 4. Peer relationships                          | .17*  | -.14  | -.20  | —     | .04  | .09            | .57* | .19*           | -.09  |
| 5. Teacher relationships <sup>c</sup>          | .04   | .10   | -.00  | .06   | —    | .30*           | -.01 | .14*           | .02   |
| 6. Community leader relationships <sup>c</sup> | -.03  | .04   | -.04  | -.07  | .28* | —              | .03  | — <sup>d</sup> | .00   |
| 7. School bonding                              | .14   | -.26  | -.19* | .46*  | -.07 | -.06           | —    | .11            | -.11  |
| 8. Extracurricular activities <sup>c</sup>     | .13   | -.07  | .09   | -.02  | .04  | — <sup>d</sup> | -.06 | —              | -.11  |
| 9. Risk index                                  | -.09  | .10   | .13   | -.11  | .02  | .05            | -.16 | -.11           | —     |

*Note.* Pearson product-moment  $r$ , with Bonferroni correction.

<sup>a</sup>Sample weights were applied to all analyses. <sup>b</sup>Correlations for boys are displayed above the diagonal; correlations for girls are displayed below the diagonal. <sup>c</sup>Indicates a dichotomous variable. <sup>d</sup>Statistic suppressed by Research Data Centre staff due to the potential for threat to disclosure in low frequency cross-tabulation cells.

\* $p < .006$ , due to Bonferroni correction.

*Research Question 1: Do important relationships and community attachments in early adolescence serve to moderate risk in early adolescence on self-worth in middle adolescence? Are differences by gender evident in the moderating effect?*

Results of the hierarchical regressions conducted on psychological health outcomes are presented in Tables 6 to 8. As Table 6 illustrates, changes in the  $R^2$  statistic reached significance at steps one, two, and four, when gender, putative protective variables, and interactions between protective variables and risk were entered into the first equation,  $p < .001$ . Beta scores reveal statistical significance for gender favouring boys,  $p < .001$ . Note that gender differences were observed for means and standard deviations for the self-worth variable: Boys had statistically significantly higher scores than girls,  $p < .001$  (see Table 2). Betas for school bonding and extracurricular activities reveal statistical significance for these variables before risk was entered into the equation,  $p < .001$  and  $.01$ , respectively. However, no variable stood out as protective in its interaction with risk; nor were there statistically significant three-way interactions between gender, risk, and protective variables, for the self-worth outcome. The fact that the change in the  $R^2$  statistic reached significance at step 4, whereas the betas did not, suggests evenly shared variance among the two-way interaction terms.

*Research Question 2: Do important relationships and community attachments in early adolescence serve to moderate risk in early adolescence on internalizing problems in middle adolescence? Are differences by gender evident in the moderating effect?*

As depicted in Table 7, changes in the  $R^2$  statistic reached significance,  $p < .001$ , at steps one and two of the second hierarchical regression equation, when gender, and putative protective variables were entered. Step 4 of the equation, interactions with risk, also produced a significant change in the  $R^2$  statistic,  $p < .01$ . Beta scores reveal statistical significance for gender,  $p < .001$ . Note that gender differences were observed, for means and standard deviations for the

Table 6<sup>a</sup>

*Results of Hierarchical Regression Analyses Examining Interactions Between Risk and Protective Variables at Age 10-11 in Predicting Self-Worth Scores at Age 14-15 (N = 589)*

| Step and Predictor                    | B     | SE <sub>B</sub> | $\beta$ | Adjusted<br>R <sup>2</sup> | R <sup>2</sup> | df    |
|---------------------------------------|-------|-----------------|---------|----------------------------|----------------|-------|
| 1. Gender                             | -1.33 | 0.30            | -.23**  | .05                        | .05**          | 1,586 |
| 2. Peer relationships                 | -0.08 | 0.07            | -.07    | .12                        | .07**          | 5,581 |
| Teacher I can talk to                 | -0.14 | 0.32            | -.02    |                            |                |       |
| Community leader to talk to           | -0.10 | 0.47            | -.01    |                            |                |       |
| School bonding                        | 0.99  | 0.21            | .31**   |                            |                |       |
| Extracurricular                       | 1.30  | 0.44            | .17*    |                            |                |       |
| 3. Risk                               | -0.36 | 0.73            | -.11    | .12                        | .00            | 1,580 |
| 4. Risk X peer relationships          | 0.04  | 0.07            | .17     | .15                        | .03**          | 5,575 |
| Risk X teacher relationships          | 0.13  | 0.34            | .03     |                            |                |       |
| Risk X community leader relationships | 1.03  | 0.45            | .16     |                            |                |       |
| Risk X extracurricular activities     | 0.33  | 0.40            | .09     |                            |                |       |
| Risk X school bonding                 | -0.30 | 0.21            | -.30    |                            |                |       |
| 5. Gender X risk X peer relationships | 0.14  | 0.07            | .43     | .15                        | .01            | 5,570 |
| Gender X risk X teacher               | 0.49  | 0.44            | .08     |                            |                |       |
| Gender X risk X community leader      | -0.68 | 0.57            | -.07    |                            |                |       |
| Gender X risk X extracurricular       | -0.83 | 0.50            | -.17    |                            |                |       |
| Gender X risk X school bonding        | -0.39 | 0.25            | -.28    |                            |                |       |

<sup>a</sup>Sample weights were applied to all analyses.

\* $p < .01$ . \*\* $p < .001$ .

Table 7<sup>a</sup>

*Results of Hierarchical Regression Analyses Examining Interactions Between Risk and Protective Variables at Age 10-11 in Predicting Internalizing Scores at Age 14-15 (N = 567)*

| Step and Predictor                    | B     | SE <sub><math>\beta</math></sub> | $\beta$ | Adjusted R <sup>2</sup> | R <sup>2</sup> | df    |
|---------------------------------------|-------|----------------------------------|---------|-------------------------|----------------|-------|
| 1. Gender                             | 1.99  | 0.32                             | .32**   | .10                     | .11**          | 1,565 |
| 2. Peer relationships                 | 0.08  | 0.08                             | .07     | .14                     | .04**          | 5,560 |
| Teacher I can talk to                 | 0.55  | 0.35                             | .09     |                         |                |       |
| Community leader to talk to           | 0.02  | 0.50                             | .00     |                         |                |       |
| School bonding                        | -1.30 | 0.23                             | -.37**  |                         |                |       |
| Extracurricular                       | -0.71 | 0.50                             | -.09    |                         |                |       |
| 3. Risk                               | -1.45 | 0.79                             | -.40    | .14                     | .00            | 1,559 |
| 4. Risk X peer relationships          | -0.13 | 0.08                             | -.47    | .16                     | .03*           | 5,554 |
| Risk X teacher relationships          | -0.70 | 0.37                             | -.15    |                         |                |       |
| Risk X community leader relationships | -0.32 | 0.49                             | -.05    |                         |                |       |
| Risk X school bonding                 | 0.89  | 0.23                             | .81**   |                         |                |       |
| Risk X extracurricular activities     | 0.83  | 0.44                             | .22     |                         |                |       |
| 5. Gender X risk X peer relationships | 0.14  | 0.08                             | .41     | .16                     | .01            | 5,549 |
| Gender X risk X teacher               | 0.37  | 0.48                             | .06     |                         |                |       |
| Gender X risk X community leader      | -0.04 | 0.61                             | -.00    |                         |                |       |
| Gender X risk X extracurricular       | -0.70 | 0.54                             | -.14    |                         |                |       |
| Gender X risk X school bonding        | -0.42 | 0.27                             | -.28    |                         |                |       |

<sup>a</sup>Sample weights were applied to all analyses.

\* $p < .01$ . \*\* $p < .001$ .



Table 8<sup>a</sup>

*Results of Hierarchical Regression Analyses Examining Interactions Between Risk and Protective Variables at Age 10-11 in Predicting Externalizing Scores at Age 14-15 (N = 545)*

| Step and Predictor                    | B     | SE <sub>B</sub> | $\beta$ | Adjusted<br>R <sup>2</sup> | R <sup>2</sup> | df    |
|---------------------------------------|-------|-----------------|---------|----------------------------|----------------|-------|
| 1. Gender                             | 0.01  | 0.53            | .00     | -.00                       | .00            | 1,543 |
| 2. Peer relationships                 | 0.07  | 0.13            | .04     | .01                        | .02            | 5,538 |
| Teacher I can talk to                 | -0.51 | 0.57            | -.05    |                            |                |       |
| Community leader to talk to           | 0.09  | 0.83            | .01     |                            |                |       |
| School bonding                        | -1.79 | 0.38            | -.34**  |                            |                |       |
| Extracurricular                       | -0.04 | 0.81            | -.00    |                            |                |       |
| 3. Risk                               | -2.70 | 1.30            | -.47    | .02                        | .01            | 1,537 |
| 4. Risk X peer relationships          | -0.07 | 0.15            | -.17    | .04                        | .04*           | 5,532 |
| Risk X teacher relationships          | 0.15  | 0.64            | .02     |                            |                |       |
| Risk X community leader relationships | 0.09  | 0.86            | .01     |                            |                |       |
| Risk X school bonding                 | 1.24  | 0.44            | .73*    |                            |                |       |
| Risk X extracurricular activities     | 0.10  | 0.77            | .02     |                            |                |       |
| 5. Gender X risk X peer relationships | -0.07 | 0.15            | -.12    | .04                        | .01            | 5,527 |
| Gender X risk X teacher               | 0.62  | 0.81            | .06     |                            |                |       |
| Gender X risk X community leader      | -1.38 | 1.05            | -.08    |                            |                |       |
| Gender X risk X extracurricular       | 0.88  | 0.91            | .11     |                            |                |       |
| Gender X risk X school bonding        | 0.05  | 0.48            | .02     |                            |                |       |

<sup>a</sup>Sample weights were applied to all analyses.

\* $p < .01$ . \*\* $p < .001$ .

internalizing problems variable, with girls scoring significantly higher than boys,  $p < .001$  (see Table 2). Among the five putative protective variables the beta score for school bonding reached statistical significance before risk was entered into the equation,  $p < .001$ . In its interaction with risk the beta for school bonding emerged as statistically significant,  $p < .001$ . Note that the beta score for the interaction between risk and school bonding with respect to internalizing problems is positive. There were no statistically significant three-way interactions between gender, risk, and protective variables for internalizing problems outcome.

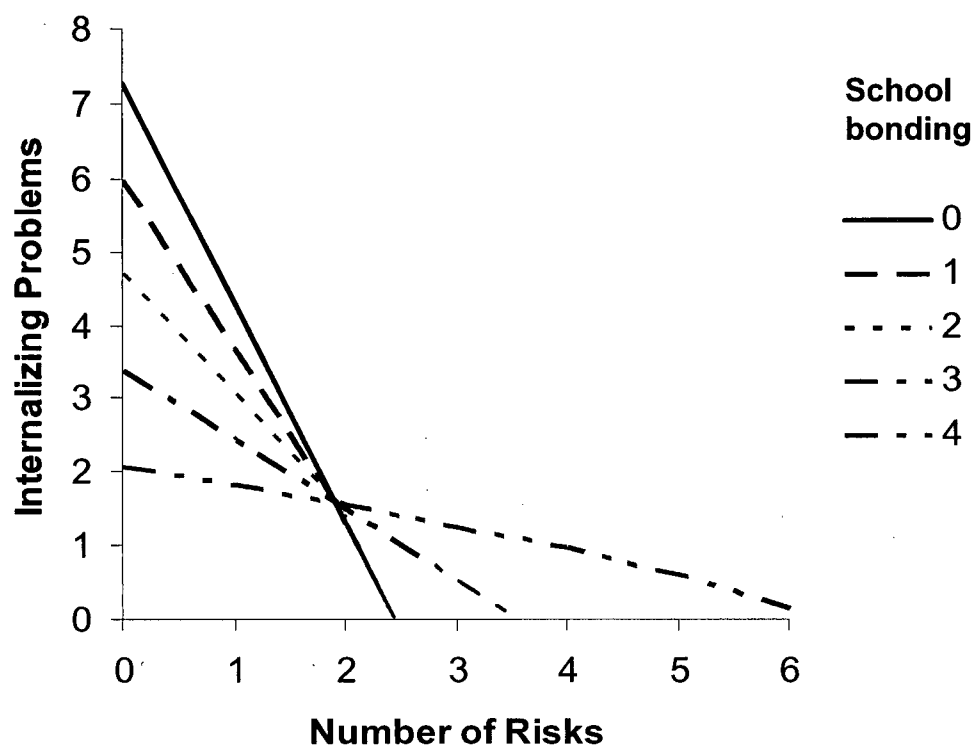
Figure 3 depicts the graphed equation for the internalizing problems outcome with all predictor variables, except risk and school bonding, held at their respective means. In this figure, the statistically significant interaction between school bonding and risk for internalizing problems is made evident. Participants with the lowest level of school bonding and low levels of risk had the highest levels of internalizing problems in this model. At two risks Figure 3 indicates that school bonding scores converge: Respondents with two risks cannot be distinguished from each other with regards to school bonding and internalizing problems. At three or more risks, those with the lowest levels of school bonding evidenced the least internalizing problems. This counter-intuitive finding is discussed in the Discussion section.

*Research Question 3: Do important relationships and community attachments in early adolescence serve to moderate risk in early adolescence on externalizing problems in middle adolescence? Are differences by gender evident in the moderating effect?*

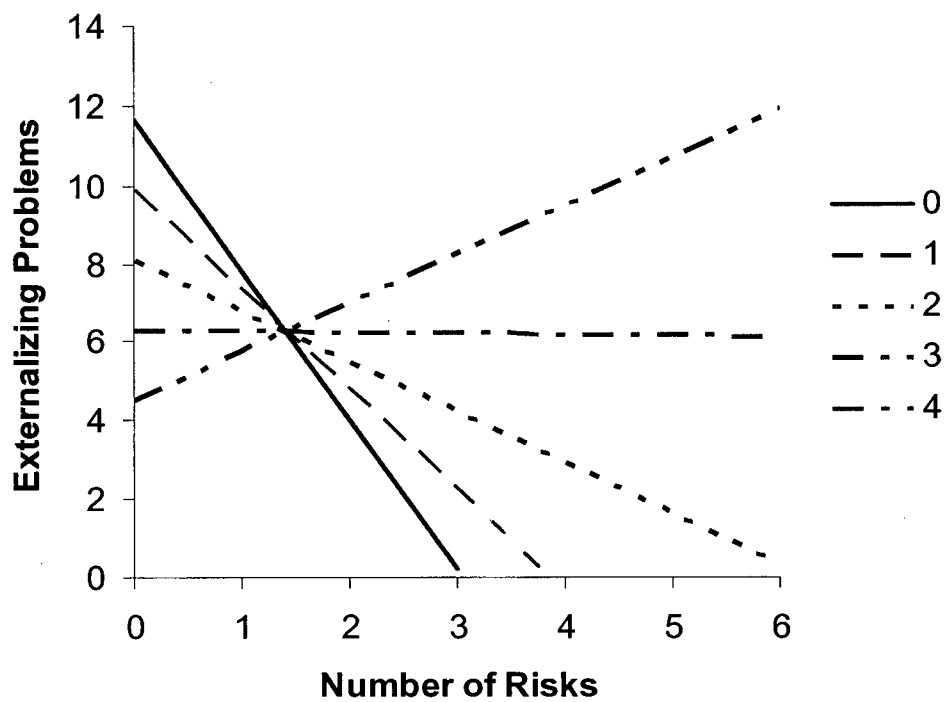
As depicted in Table 8, only the change in the  $R^2$  statistic at step 4 when two-way interaction terms were introduced into the equation, reached significance,  $p < .01$ . Beta scores reveal statistical significance for school bonding at step 2,  $p < .001$ . In its interaction with risk school bonding reached statistical significance,  $p < .01$ . Note that the beta score for the interaction between risk and school bonding with respect to externalizing problems is positive.

There were no statistically significant three-way interactions between gender, risk, and protective variables, for the externalizing problems outcome.

Figure 4 depicts the graphed equation for the externalizing problems outcome with all predictor variables except risk and school bonding held at their respective means. In this figure the statistically significant interaction between school bonding and risk for externalizing problems is made evident. Participants with the lowest level of school bonding and low levels of risk had the highest level of externalizing problems in this model. At two risks Figure 4 indicates that school bonding scores converge: These respondents cannot be distinguished from each other with regards to school bonding and externalizing problems. At three or more risks, counter-intuitively those with the highest levels of school bonding evidenced the most externalizing problems.



*Figure 3.* The influences of school bonding on risk for internalizing problems with the remaining predictor variables held at the mean.



*Figure 4.* The influences of school bonding on risk for externalizing problems with remaining predictor variables held at the mean.

## Discussion

### *Summary of Results*

In the present study, influences of family risk factors and putative community protection in early adolescence on psychological health outcomes four years later were explored. The context was rural Canada and the theoretical framework was drawn from the work on resilience. The community attachment variable, school bonding, was found to predict the three outcomes of interest to the study, namely self-worth, internalizing problems, and externalizing problems, in the expected direction before risk was entered into the model. No important relationship variables were found to have a significant effect. For internalizing and externalizing problems, school bonding was found to interact with risk, permitting the observation that some interplay was at work whereby school bonding in early adolescence influenced the evidencing of intropunitive or outwardly expressed maladaptation in middle adolescence for rural youth. These findings to a degree support past research (Blyth & Leffert, 1995; Elder & Conger, 2000; Israel et al., 2001; Werner 1993b), which has found significant community effects in rural contexts after the variability attributable to family effects had been partialled out. The present study extends these findings into rural Canada, where psychological health among rural middle adolescents had not yet been empirically investigated.

Like previous research in other contexts (Masten et al., 1995; Werner & Smith, 1982), this study extends investigations of early adolescence longitudinally by exploring adaptive mechanisms whereby rural adolescents could achieve healthy outcomes through school support. Because the design was longitudinal, we can make the case for stronger inferences of prediction than has been possible in cross sectional studies to date (e.g., Goodenow, 1993; Jennings, 2003; Singh & Dika, 2003; Stouthamer-Loeber et al., 1993).

The most important contribution of this study to the extant literature is the centrality it suggests for school bonding in the developmental health of rural Canadians in early and middle

adolescence. Results run contrary to the expected direction of influence, however. At low levels of risk, school bonding worked in the expected direction, whereas at higher levels of risk the results suggest that low school bonding predicted lower levels of maladaptation. These counter-intuitive findings will be discussed in more detail.

Whereas gender significantly predicted self-worth and internalizing problems in step 1 of the first and second equations in the present study (see Table 6 and Table 7), further gender effects were not found in interactions with predictor variables. However, both school bonding and extracurricular activities predicted higher self-worth scores in middle adolescence as main effects. That is, higher school bonding and higher extracurricular activities scores in early adolescence correlated with higher self-worth scores for the entire sample, before taking risk status into account. That the change of  $R^2$  statistic reached statistical significance at step 4 of the first equation (the interaction step) suggests that some mechanism is at play between putative protective factors and risk for the self-worth outcome. In the present research design for this sample, however, not one relationship or community attachment variable stood out statistically as carrying the interaction effect.

In the model, school bonding in early adolescence predicted lower internalizing problems four years later (a main effect). Although gender reached statistical significance at step 1, three-way interactions between gender, risk, and putative protective variables were not significant. Past research suggests that these gender effects for internalizing problems are both age specific and context specific. The non-significant findings for gender interacting with risk with the internalizing problems outcome contradict findings extant in the literature that girls are more susceptible to internalizing problems than are boys (Arnett, 2001; Zahn-Waxler et al., 2000). There are precedents for generally higher rates of internalizing problems among adolescents in rural settings (Resnick et al., 1997), with no evidence of gender differences in middle adolescence. Perhaps gender differences in internalizing problems emerge in later adolescence

(Elder & Conger, 2000; Looker, 1997). Further study of rural adolescence is needed to understand the processes that predict vulnerability for internalizing problems in middle adolescence, for both genders.

For the externalizing problems outcome no gender differences were detected. This finding continues the tradition of some past research acknowledging a slightly higher proclivity for externalizing problems in middle adolescents (Loeber et al., 1998) for both genders (Fergusson & Horwood, 2002; Maddox & Prinz, 2003). Similar to the finding for internalizing problems, school bonding in early adolescence predicted lower externalizing problems in middle adolescence as a main effect. (Note that school bonding correlated negatively with the externalizing problems outcome, see Table 4). The significant beta in the regression for externalizing problems supports data from school bonding literature that programs designed to promote early adolescent school bonding evidenced program effects suppressing problem behaviours two years later (Battistich, 2001; Battistich et al., 2000).

With respect to interaction effects, at low levels of risk (0 or 1), school bonding worked in the expected direction, with lower school bonding scores in early adolescence predicting higher internalizing and externalizing problems four years later. Figure 3 and Figure 4 indicate that with two risks, all school bonding scores converged, thereby indicating a unitary correlation between school bonding in early adolescence and internality and externality in middle adolescence. At three or more risks, surprisingly, low school bonding predicted lower internalizing and externalizing problems, indicating vulnerability processes.

There are at least three possible explanations for the counter-intuitive findings with respect to the interaction effects between school bonding and risk for the internalizing and externalizing outcomes. The first possibility is that these findings are an artifact of measurement error. As described in the Method section, school bonding was operationalized in this study by a single test item (see Table 1). The item captures a sense of feeling like an outsider, which we inferred to



represent a sense of alienation from school. Therefore, those with high school bonding scores were conceptualized as being least alienated from school. The variable may operate with less stability in models than would have a more robustly defined school bonding variable derived from multiple informants (e.g., Battistich, 2001; Battistich et al., 2000).

A second consideration regarding our surprising findings for interactions between risk and school bonding is that this sample did not indicate high levels of risk overall. Most of the adolescents in our sample had 0, 1, or 2 risks. Indeed, only 66 adolescents (35 boys and 31 girls) evidenced three or more risks. Of the 66, the majority reported three risks. Hence, it would be erroneous to attach too much meaning to interactions based on a few respondents at high levels of risk.

Nevertheless, a third possibility exists that our findings represent a prediction unique to the lives of high-risk Canadian rural adolescents. It could be that school bonding interacted with risk in ways that are attributable to the unique experience of growing up in rural Canada in the late 20<sup>th</sup> Century. Our findings may reflect the rural dilemma, with community resources presenting both constraints and opportunities for Canadian rural adolescents.

### *Resilience Research*

In the present study, the early-adolescent school bonding variable predicted self-worth, and internalizing and externalizing problems for the same adolescents four years later (main effects). It is the interpretation of statistically significant interaction effects between school bonding and risk for internality and externality that proved to be surprising and problematic, as discussed earlier. Nevertheless, this study investigated and extends research in the resilience tradition in at least two important ways. First, it follows the tradition of extending studies from early adolescence into the middle adolescent years (Luthar & McMahon, 1996; Masten et al., 1995; Werner, 1985, 1987; Werner & Smith, 1982), a time when lowered self-confidence is more evident (Arnett, 2001; Harter, 1990). Understanding the mechanisms that keep adolescents'

sense of self-worth intact has been modestly advanced by the main effect findings of the present study. Main effects between school bonding and extracurricular activities and higher self-worth scores, and between school bonding and lowered internalizing and externalizing problems, are demonstrated at this important juncture of adolescent development, midway between pubescence and transitions to adult status.

Of relevance to the resilience research paradigm, school bonding functioned in its interactions with risk for internalizing and externalizing problems, inferring an influence, but in the counter-intuitive direction, with lower levels of school bonding predicting better outcomes. Findings of lowered internality and externality in the face of higher risk plead for further longitudinal study using the NLSCY or other large datasets to disaggregate psycho-social influence at several points of time from childhood through adolescence and into young adulthood.

As to the issue of whether risk and protection operate solely on continua as conceptual opposites (Stouthamer-Loeber, 1993; Luthar & Zelazo, 2003), our study did not demonstrate that that school bonding functions in a bipolar fashion, with high vs. low school alienation representing opposite ends of a continuum. Further study is needed to continue to unravel the important mechanisms underpinning one-dimensional as well as bi-polar functioning of putatively protective factors. Mediators as well of moderators of risk need to be explored (Luthar & Zelazo, 2003). In the context of rural Canada, it would be important for future research to explore whether or not some risk factors increase school disengagement at the same time that school bonding and other important variables influence risk.

The interactions reported in this study between risk and school bonding for internality and externality are "important but by no means definitive" (Luthar & Zelazo, 2003, p. 521). It is quite feasible that the absence of other statistically significant interaction effects is an artifact of the present research design. For example, sample selection and missing data may exert a

selection effect whereby model variables behave conservatively because some high-risk respondents or responses were missing from analyses. Moreover, with more robust operational definitions utilizing multiple informants, variables may have been more stable. Interaction effects, which can be small in magnitude and thus difficult to detect, may have been obscured by measurement limitations with the present sample (Luthar et al., 2000b; Luthar & Zelazo, 2003).

The present study investigated the role of putative protective factors originating in the community. In future, in the various specific contexts wherein resilience mechanisms are explored, it will be increasingly important to differentiate between biologically versus environmentally determined risk. In this study the learning disabilities component of the risk index is believed to possess biological substrates. When researchers find that some risk factors and assets are biologically based, more parsimonious exploration of the remaining malleable variables will inform policies and interventions (Luthar & Zelazo, 2003; Rutter et al., 2001).

In the future, regional research could search out differences between and within communities (Israel et al., 2001; Zimmerman & Arunkumar, 1994). Time lapse models (Elder & Conger, 2000; Masten et al., 1999; Morison & Masten, 1991; Werner & Smith, 1992) especially in diverse rural places, would further explain how rural adolescents achieve healthy adaptation in the face of their constraints. Using existing datasets poses methodological difficulties and limitations (Elder, Pavalko, & Clipp, 1993) at the same time that it holds the promise of large samples with statistical power. Urban-suburban controls (Hektner, 1995) and comparisons (Israel et al., 2001; Resnick et al., 1997) would bring the rural context into sharper relief empirically.

Another crucial debate in current iterations of resilience research is whether excellent or adequate functioning is required in order to infer resilience. Recently researchers (Luthar et al., 2000b; Masten, 2001; Masten & Powell, 2003) have emphasized that normative (adequate) functioning suffices. In life, resilience processes reflect the choices made and conditions maximized or endured within the self-organization of complex individuals. To detect adaptive

functioning in the face of multiple risks is to inform policy and interventions that are pragmatic to specific contexts of risk.

A methodological qualifier of our findings concerns the order of entry of predictors in our statistical models. In keeping with the paradigm shift that gives preeminence to the role of protection in healthy adaptation, putatively protective factors were entered in to the model before risk, even though we were attempting to demonstrate the moderating effect of protection on risk (Luthar et al., 2000a, 2000b). The effect of the order of entry was likely small (Luthar, 1991). Luthar, and colleagues (2000b) caution against too rigid adherence to mathematical interactions in the empirical search for resilience functioning: "There needs to be explicit conceptual consideration of how interrelations among the matrix of constructs examined may be affected by the nature of the specific adversity condition under study" (p. 553). Here, the definition of risk was broadly conceived. Its interaction with school bonding would be found whether it preceded or followed school bonding in the equation. The interest is in the phenomenon at play in the complex lives of vibrant adolescents, where, in reality, influences are multi-dimensional at one point in time and fluid across years of development.

It is important that researchers employing a resilience paradigm not over-generalize results (Luthar et al., 2000b; Luthar & Zelazo, 2003). The findings in this study are context specific. At best they generalize only to Canadian rural adolescents, and cannot be attributed to adolescents living in specific regions of Canada. Similarly, the results can be attributed neither to rural regions internationally, nor to other demographic (i.e., urban, suburban) contexts.

### *Rural*

#### *Rural as Risk?*

In addition to exploring the resilience research paradigm, a second way that this study advances the extant empirical literature in Canada is to follow researchers from other nations (e.g., Muilu & Rusanen, 2003; Resnick et al., 1997; Smailes et al., 2002) and demographic

contexts (Bartlett, 1994; Caplan et al., 1992; Cowen et al., 1997; Goodenow, 1993; Luthar, 1991, 1995; Masten et al., 1999) by investigating resilience functioning in rural adolescents. A pivotal question to the present study was whether rurality in Canada constitutes risk for rural adolescents growing up in small Canadian communities or the surrounding hinterland. Investigating risk and protection with the study sample did not reveal high levels of cumulative risk. Indeed, as mentioned previously, only 66 adolescents (10.2% of boys and 8.0% of girls,  $\chi^2 = .302, ns$ ) reported three or more risks. That 91.0 % of the sample overall reported 0 to 2 risks may reflect a measurement concern, in that not every risk factor in the risk index carried equal valence. Whereas three variables (maternal education, divorce status, and learning disability) reflect immutable characteristics in the lives of rural adolescents, the rest (maternal depression, perceived parental rejection, and perceived family strife due to alcohol abuse) were episodic. Comprising risk indices from a full range of sub-factors involving multiple informants could increase statistical power in future rural investigations. Alternatively, it is conceivable that Canadian rural settings present relatively less risk for adolescent development compared to urban settings. Our study raises the conundrum extant in rural studies, that rurality both imposes risk and confers protection upon young Canadians. Further empirical study in rural and urban contexts is needed to continue to unravel the effects and mediation and moderation of risk for rural Canadians. Researchers could compare the rural Canadian context to other demographic settings (inner city and suburban, see Fan & Chen, 1999) in Canada. Alternately, one could compare adolescent adaptation in different regions of rural Canada (McCreary, 2000; Stedman, Parkins, & Beckley, 2004). This study presents a modest beginning to these research enterprises.

Our results testify to the valence of one community factor, school bonding, in its interaction with risk for middle adolescent psychological health in rural Canada. The findings were surprising, with low levels of school bonding at ages 10 to 11 predicting better internalizing and externalizing scores four years later. It may be that community attachment in various forms

and mechanisms is differentially strong for adolescents in rural Canada. Other than being an artifact of measurement error, our results may testify to the unique ways that school bonding works in the lives of Canadian rural adolescents. It is possible that those with low school bonding scores in early adolescence have disassociated themselves from the school community by middle adolescence. Other social supports and career options, for example working in trades under the supervision of older extended family, may be open to youth who are disaffected with school by age 14 to 15 (Elder & Conger, 2000). For example, in a study of rural adolescents who were compared to urban and suburban controls, Hektner (1995) found evidence of a *rural conflict* (the attraction of the rural lifestyle vs. the need to leave for tertiary education) among his rural participants. This *rural conflict* was highest among the rural youth at grade 10, an age similar to that of the middle adolescents in the present study. Counter-intuitively, Hektner (1995) found that those rural youth who were *not* conflicted (both boys and girls) reported more worry and less curiosity regarding post-secondary options than the conflicted youth.

The results reported by Hektner (1995) may shed some light on the finding in the present study indicating that lower school bonding (higher alienation from school) predicted less psychopathology. Perhaps middle adolescents in our study with lower school bonding scores in early adolescence have opted for psycho-social investments among rural resources other than schools. That is, it may be that some of the adolescents who are deemed to be at *high risk* during early adolescence, and who wish to stay in their rural communities, connect with extended family and other local trades people who afford a better fit with vocational aspirations, resulting in lower internalizing problems and externalizing problems for those who disengage from school and instead engage in the community outside of school. If such is the case, it would be important in future studies to empirically trace the career routes and psychological profiles of high-risk rural adolescents. Qualitative studies would represent an important and rich source of research questions (Shepard & Marshall, 2000).

It is noteworthy that other counter-intuitive findings regarding risk and resilience in other demographic settings have been reported in middle adolescence. In Luthar's (1991) study among 144 grade 9 inner city adolescents, internality predicted higher school grades (a main effect), whereas risk interacted with intelligence and positive events, indicating a vulnerability process. Contradictory findings in both rural and inner city samples may be evidence of the context-specific nature of inquiry into resilience functioning, and a caution against over-generalizing the results.

### *Rural as Social Representation*

Common socio-cultural experiences have partially under laid the commonalities of diverse rural experiences. For example, despite some disproportionate poverty (Reeves, 2003), rural places are also often known as places where, along with isolation, the pace of life slowed, and family and community values and sanctions were potent (Allen & Dillman, 1994; Khattri et al., 1997). Researchers have demonstrated that rural dwellers value the esoteric qualities of their home; they have developed a *sense of place* (Bauch, 2001; Howley et al., 1996; Nachtigal, 1994; Orderud, 1997). Researchers in Britain (Valentine, 1997) and Holland (van Dam et al., 2002) analyzed the qualities of country living that attracted some people away from urban settings in densely populated countries. These researchers found that, among these qualities, living closer to nature and the seasons in a community system where people play viable roles were named. These studies demonstrated the viability of a *rural idyll* in some rural populations. What reportedly mattered to rural residents most was the psychological experience of living in a place that they conceived to be rural, with close community ties (see also, Allen & Dillman, 1994; Elder & Conger, 2000).

From the psychological developmental perspective, "representations of rural were dynamic" (van Dam et al., 2002, p. 473) because more than locality rurality is a social representation (Halfacree, 1993). Individualistic qualities of life are found to varying degrees and

ways in many rural settings. Although there are many rural communities that may not possess these characteristics, to belong in a rural place can mean to embrace lifestyles that defy mercantile objectives of efficiency and product but rather stress face-to-face encounters (Allen & Dillman, 1994). Post-modern study of rurality as social representation could complement geographically-based empirical studies of rurality.

### *School Bonding*

In this study the overall sense of belonging at school in early adolescence predicted indicators of psycho-social health in middle adolescence in the face of other predictor variables (Blyth & Leffert, 1995; McGrath et al., 2001). At higher levels of risk, however, surprisingly school bonding acted as a vulnerability factor, with those with high school bonding scores indicating the highest psychopathology (see Figure 3 and Figure 4). At the turn of this century school bonding was represented in empirical literature by affective, behavioral, and cognitive dimensions. It has been variously conceptualized as belongingness, attitudes to school, or school connectedness (Brown, Higgins, Pierce, Hong, & Thoma, 2003; Catalano et al., 2004; Jimmerson, Campos, & Greif, 2003; Maddox & Prinz, 2003), terms that can be either redundant or discrepant (O'Farrell & Morrison, 2003). Low school bonding has been linked to school dropout, alienation, normlessness,<sup>7</sup> and disaffection with peers and teachers (Osterman, 2000). Indeed, in a factor analysis of self-reported school bonding and related constructs in early adolescence, O'Farrell and Morrison (2003) found the best model fit for defining school bonding with a Root Mean Squared Error of Approximation (RMSEA) value of 0.049 (when values < .05 indicate close fit, p. 63). The five factor patterns of school bonding that fit the data well included: relationships, competence, school belonging, attitudes towards academics, and expectations

---

<sup>7</sup>Normlessness was defined as "dislike of school and non-conformity to accepted school norms" (Osterman, 2000, p. 338).



about future academic and vocational endeavours (pp. 65-67). Pattern 3 (school belonging) was most conceptually linked to school bonding as operationalized in the present study.

School bonding as defined in our analyses was thinly operationalized. Although in the present study constructs of school bonding, peer relationships, relationships with teachers and adult leaders in the community, and extracurricular activities were operationalized distinctly, conceptions of school bondedness have included relationships and extracurricular activities in other studies (Goodenow, 1993; Mahoney et al., 2003; Murray & Greenburg, 2001; Robertson, Harding, & Morrison, 1998; Solomon et al., 2000; for a summary see Jimmerson et al., 2003). Nevertheless, that our school bonding variable predicted statistically significant results across three outcomes may be parsimonious, and a methodological strength of the present study.

Personal acceptance and inclusion have been recognized as important dimensions of school bonding (Goodenow, 1993; Osterman, 2000). In contrast to urban settings, rural school-community connections can be disproportionately strong (Bauch, 2001; Hughes, 1999). Schools play central roles in many diverse kinds of rural communities (Hardre & Reeve, 2003; Leonard et al., 2001; Wotherspoon, 1998). The results of the present study might lead researchers to question the effect of schools on adolescents in the poorest, smallest rural communities (Khattri et al., 1997; Lyson, 2002). Key school resources may be the sense of belonging (Bauch, 2001), and social and emotional support (Singh & Dika, 2003) that permit rural schools to engage early adolescents with low levels of risk. In rural Iowa, researchers posited that a sense of belonging may have accounted for post-secondary persistence (Schonert et al., 1991) and higher self-esteem (Schonert-Reichl & Elliott, 1994). Small schools in one part of rural Iowa were thought to promote more self-confidence in their secondary school students (Elder & Conger, 2000), through their connection or bondedness to school. To the degree that the current findings are valid, they lead educators to search for specific policies and strategies to engage the majority of

rural adolescents who evidence low levels of risk, with alternate policies and strategies targeting high-risk rural adolescents.

A methodological consideration to qualify the findings in this study with respect to school bonding is that each sphere of influence (family, community, and intra-psychic development) was forced into one step of the research design only (risk, protection, or outcomes, see Figure 1). Yet, bidirectional influences are probable. In adolescence as in all life phases, psychological health evolves concomitantly with life's continuities and discontinuities (Caspi, 1993). Fuller longitudinal models assessed across multiple points in time (e.g., Kim, Conger, Elder, & Lorenz, 2003) account for multiple directions of influence.

With respect to school bonding this study has practical implications. School bonding may be central to students' well-being at low levels of risk. Therefore, teachers and administrators in rural schools, many of which are small and cash-strapped (Wotherspoon, 1998) beyond academics need to attend to the mentorship that the majority of students. Several strategies could be adopted (Henderson & Milstein, 2003). First, it is incumbent upon teachers of early adolescents to encourage, explain, and model prosocial behavior in their classrooms (Osteman, 2000; Maddox & Prinz, 2003; Solomon et al., 2000). Second, the possible preeminence of school bonding as a protective moderator behooves educators to refine and implement classroom strategies that will promote a sense of belonging among students (Catalano et al., 2004; Hawkins et al., 1988). Among effective strategies, cooperative learning allows teachers to model and reward emergent pro-social behaviors along with academic competencies. Cooperative learning has been found to reduce clique formation and increase the frequency and pro-social nature of peer interactions. Cooperative learning strategies moreover increase the level and quality of student discourse (Osterman, 2000). Third, in order for adolescents to stay connected to school, their autonomy development needs to be fostered, especially in view of the observation that "secondary classrooms typically provide few opportunities for students to experience

autonomy,” and autonomy development fosters relatedness. The implementation of these and other educational strategies and reforms are needed to bolster students’ belonging or perceptions of support at school (Osterman, 2000, p. 357), thereby assuring maximal adolescent social and academic development for low-risk adolescents. Concurrently, specific strategies and programs may need to be developed, based on future research, to engage those middle adolescents in rural Canada with high levels of risk, who may have already disengaged from school.

### *Limitations*

Several limitations exist in the present study. Many of these are a result of limitations that emerge with the NLSCY data set. First, although the NLSCY longitudinal sample is a clustered probability representative of the Canadian population, non-response bias may remain after weights are applied, even though weighting is the most economical and practical type of probability sampling, especially when the population is large and widely dispersed. Census weights applied to variables to compensate for sample design and to aid in generalization of results were not available for all data (Statistics Canada, 2001a). As new census data is disseminated approximately every four years, weight estimates are recalibrated. Such future revision of weights could affect any future replication of the present findings.

Second, aboriginals living on reserve were excluded from the NLSCY sample. Had aboriginals living on reserve been included, there might have been a sufficient number of aboriginals to include them in the present study as a distinct group. Clearly aboriginals in Canada, disproportionately residing in rural places (Armstrong, 1999; Bollman, 2002), have much to inform us about the psychological health of rural adolescents (Chandler & Lalonde, 1998). Third, measurements of rural variability among rural Canadian adolescents were limited using NLSCY data, despite great variability in rural regions in different parts of the country.

Fourth, the Survey is long,<sup>8</sup> increasing the risk of respondent fatigue and attrition. The response rate on the Self Questionnaire at Cycle 3 in the NLSCY ranged from 72.8% to 78.3% (Statistics Canada, 2001a). Fifth, attrition rates (11.8% overall) were not random but rather were highest among high-risk groups. Non-responders in the NLSCY had lower income, less education, less employment, were more likely to be renters not homeowners, and had poorer perceptions of their child's academic performance than did responders (for a discussion of selective non-response in longitudinal studies, see Taris, 2000). Sixth, the NLSCY practice of using sub-components of standardized measures necessitates post hoc assessments of reliability and validity (Statistics Canada, 2001a, pp. 4-5).

Other limitations are specific to the present study. First, as outlined in the literature review, rurality is highly variable worldwide and in Canada; the definition of rural proved elusive for the purposes of this study. Using demographic information collected by Statistics Canada was not the preferred method for determining a rural divide in the population of interest for psychological health outcomes. Moreover, being able to distinguish suburban from rural would have improved the measure. Second, alpha scores measuring item reliability were as low as .7 in the present study, lower than the .8 recommended for measuring instruments (Spatz, 1997, p. 91). However, Japel, Normand, Tremblay, and Willms (2002) set a precedent when using NLSCY data of using scales with reliabilities as low as .5 (p. 113). Still, the limitation of internal reliability must be considered when interpreting the findings of this study. In particular, sub-group effects may interfere with the findings for externalizing problems, due to differences in skewness of the three components of the variable (conduct disorder, hyperactivity, and property offence). Third, three single test items from the NLSCY (teacher relationships, community leader relationships and school bonding) were elevated to the level of variables of interest in the present study. The possibility of measurement instability for these three items thereby increased standard error in

---

<sup>8</sup> The PMK Questionnaire alone is several hundred items long.

the analyses. This limitation is particularly potent in the face of the counter-intuitive findings of this study for school bonding. Importantly, our conclusions are specific to the measures we used in this study (see also, Fergusson & Horwood, 2002). One cannot presume equity between our results and those in other studies with similar constructs but different operational definitions. Fourth, the relatively high proportions of missing data due to non-response and attrition derived from the NLSCY were not statistically redressed in the present study. The likely result in the present study was the existence of some sampling selection, with high-risk adolescents disproportionately dropped from the study. Fifth, outcome variables were each analyzed with separate hierarchical regressions, increasing the likelihood that Type 1 errors occurred (Taris, p. 118).

The sixth limitation inherent to this study is the possibility that some of our outcomes are artifacts, in that the order of effects could be bidirectional. By separating predictors and outcomes by age and origin, we sought to reduce tautology, possibly at the expense of oversimplicity. Whereas the design of the present study locates risk and protective predictors in early adolescent family and relationships, outcomes reflect psychological states four years later. Yet in life all these variables are at work at all stages of adolescence. It is possible that some of our *outcomes* predate or are concomitant with the constructs that purportedly predict them (Masten & Reed, 2002). It is possible, for example, that internalizing problems and externalizing problems predicted school bonding as well as the other way around. The counter-intuitive findings with respect to school bonding at high levels of risk need to be interpreted bearing in mind the bi-directional influences of risk, community variables, and psycho-social health in the lives of rural adolescents. Fuller models would have better accounted for the direction of risk and community influences, in part through such analyses as repeated measures (e.g., Masten et al., 1999). Path analyses could begin to unravel causal directions (Bradley & Corwyn, 2002;

Leadbeater et al., 1999). Longitudinal studies, particularly over several waves of data collection, are needed in order to clarify the strength and direction of predictions.

### *Summary*

This study represents a modest beginning in an important and under-studied area of adolescent development in rural Canada. The findings reported in this study warrant further testing. For the present, in Canada the longitudinal NLSCY is the available data source for deriving a sufficiently large sample of rural adolescents to test for interaction effects across time. Based on these and further findings, models need to be built and tested on multiple directions of psychosocial influence at multiple stages of adolescent development. If rural Canadian adolescents are to continue to thrive in succeeding decades, empirical studies need to account for regional variability, gender effects, and life course continuities and discontinuities (Elder, 1998). Empirical studies could further explore school bonding and other putative protective influences on all rural youth, including the most vulnerable. Rural adolescents in Canada and worldwide deserve nothing less than a concerted, long-term research commitment into understanding and assuring their resilience functioning in their contexts.

## References

- Albrecht, D. E. (1998). The industrial transformation of farm communities: Implications for family structure and socioeconomic conditions. *Rural Sociology*, 63, 51-64.
- Allen, J. C., & Dillman, D. A. (1994). *Against all odds: Rural community in the Information Age*. Oxford: Westview Press.
- Allen, J. P., Leadbeater, & Aber, J. L. (1994). The development of problem behavior syndromes in at-risk adolescents. *Development and Psychopathology*, 6, 323-342.
- Andres, L., Anisef, P., Krahn, H., Looker, D., & Thiessen, V. (1999). The persistence of social structure: Class and gender effects on the occupational aspirations of Canadian youth. *Journal of Youth Studies*, 2, 261-282.
- Andres, L., & Looker, D. (2001). Rurality and capital; Educational expectations and attainments of rural, urban/rural and metropolitan youth. *Canadian Journal of Higher Education*, 31(2), 1-46.
- Armstrong, R. P. (1999, June). Geographical patterns of socio-economic well-being of first nations communities [Electronic version] (Catalogue No. 21-006-XIE). *Rural and Small Town Canada Analysis Bulletin* 1(8), 1-13. Retrieved Jul 24, 2002 from <http://www.statcan.ca/english/freepub/21-006-XIE/free.htm>
- Arnett, J. J. (2001). *Adolescence and emerging adulthood*. Upper Saddle River, NJ: Prentice-Hall.
- Bandura, A. (1986). *Social foundations of thought and action*. Englewood Cliffs, NJ: Prentice-Hall.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: W.H. Freeman.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective [Electronic version]. *Annual Review of Psychology*, 52: 1-26. Retrieved January 11, 2002 from <http://www.emory.edu/EDUCATION/mfp/effpage.html>
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173-1182.
- Barnow, S., Schuckit, M. A., Lucht, M., John, U., & Freyberger, H. J. (2002). The importance of a positive family history of alcoholism, parental rejection and emotional warmth, behavioral problems and peer substance use for alcohol problems in teenagers: A path analysis [Electronic version]. *Journal of Studies on Alcohol*, 63, 305-315.
- Bateson, G. (1972). *Steps to an ecology of mind: Collected essays in anthropology, psychiatry, evolution, and epistemology*. Toronto, Ontario, Canada: Chandler.

- Battistich, V. (2001, April). Effects of an elementary school intervention on students' "connectedness" to school and social adjustment during middle school. In J. Brown (Chair). *Resilience education: Theoretical, interactive and empirical applications*. Symposium conducted at the annual meeting of the American Educational Research Association, Seattle, WA.
- Battistich, V., Schaps, E., Watson, M., Solomon, D., & Lewis, C. (2000). Effects of the child development project on students' drug use and other problem behaviors. *The Journal of Primary Prevention, 21*, 75-99.
- Bauch, P. A. (2001). School-community partnership in rural schools: Leadership, renewal, and a sense of place [Electronic version]. *Peabody Journal of Education, 76*, 204-221.
- Beardslee W. R. (1989). The role of self-understanding in resilient individuals: The development of a perspective. *American Journal of Orthopsychiatry, 59*, 266-278.
- Beitchman, J. H., Wilson, B., Douglas, L., Young, A., & Adlaf, E. (2001). Substance use disorders in young adults with and without LD: Predictive and concurrent relationships. *Journal of Learning Disabilities, 34*, 317-332.
- Bellamy, L. A. (1993). Life trajectories, action, and negotiating the transition from high school. In P. Anisef, & P. Axelrod (Eds.), *Transitions: Schooling and employment in Canada* (pp. 137-158). Toronto, Ontario, Canada: Thompson Educational.
- Beshiri, R., & Bollman, R. D. (2001, January). Population structure and change in predominantly rural regions [Electronic version] (Catalogue No. 21-006-XIE). *Rural and Small Town Canada Analysis Bulletin 2(2)*, 1-15. Retrieved Jul 24, 2002 from <http://www.statcan.ca/english/freepub/21-006-XIE/free.htm>
- Blyth, D. A., & Leffert, N. (1995). Communities as contexts for adolescent development: An empirical analysis. *Journal of Adolescent Research, 10*, 64-87.
- Bollman, R. D. (2002, May). Presentation to the Federal Advisory Committee on Rural Issues [CD].
- Bollman, R. D., & Biggs, B. (1992). Rural and small town Canada: An overview. In R. D. Bollman (Ed.), *Rural and small town Canada* (pp. 3-44). Toronto, Ontario, Canada: Thompson Educational.
- Bradley, R. H., & Corwyn, R. F. (2002). Socioeconomic status and child development. *Annual Review of Psychology, 53*, 371-399.
- Brennan, P. A., Le Brocque, R. & Hammen, C. (2003). Maternal depression, parent-child relationships, and resilient outcomes in adolescence [Electronic version]. *Journal of the American Academy of Child and Adolescent Psychiatry, 42*, 1469-1477.
- Breton, R., McDonald, J., & Richer, S. (1972). *Social and academic factors in the career decisions of Canadian youth*. Ottawa, Ontario, Canada: Manpower and Immigration.



- Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design*. Cambridge, MA: Harvard University Press.
- Bronfenbrenner, U. (1994). Ecological models of human development. In T. Husen, & T. N. Postlethwaite (Series Eds.), *International Encyclopedia of Education, Vol. 3*. (2<sup>nd</sup> ed., pp. 1643-1647). New York: Pergamon/Elsevier Science.
- Brown, M. R., Higgins, K., Pierce, T., Hong, E., & Thoma, C. (2003). Secondary students' perceptions of school life with regard to alienation: The effects of disability, gender and race [Electronic version]. *Learning Disability Quarterly*, 26, 227-238.
- Burt K. B., Van Dulmen, M.H. M., Carlivati, J., Egeland, B., Sroufe, L. A., & Forman, D. R., et al. (2005). Mediating links between maternal depression and offspring psychopathology: The importance of independent data [Electronic version]. *Journal of Child Psychology and Psychiatry*, 46, 490-499.
- Cahill, M., & Martland, S. (1996). Community career counselling for rural transitions. *Canadian Journal of Counselling*, 30, 155-164.
- Caplan, M., Weissberg, R. P., Grober, J. S., Sivo, P. J., Grady, K., & Jacoby, C. (1992). Social competence promotion with inner-city and suburban young adolescents: Effects on social adjustment and alcohol use. *Journal of Consulting and Clinical Psychology*, 60, 56-63.
- Caspi, A. (1993). Why maladaptive behaviors persist: Sources of continuity and change across the life course. In D. C. Funder, R. D. Parke, C. Tomlinson-Keasey, & K. Widaman (Eds.), *Studying lives through time: Personality and development* (pp. 343-376). Washington, DC: American Psychological Association.
- Catalano, R. F., Haggerty, K. P., Oesterle, S., Fleming, C. B., & Hawkins, J. D. (2004). The importance of bonding to school for healthy development: Findings from the Social Development Research Group [Electronic version]. *Journal of School Health*, 74, 252-261.
- Castle, E. N. (1995). The forgotten hinterlands. In E. N. Castle (Ed.), *The changing American countryside: Rural People and places* (pp. 3-9, 495-539). Lawrence, Kansas: University Press of Kansas.
- Chandler, M. J., & Lalonde, C. (1998). Cultural continuity as a hedge against suicide in Canada's first Nations. *Transcultural Psychiatry*, 35, 191-219.
- Cicchetti, D. (1996). Child maltreatment: Implications for developmental theory and research. *Human Development*, 39, 18-39.
- Cicchetti, D., & Toth, S. L. (1992). The role of developmental theory in prevention and intervention. *Development and Psychopathology*, 4, 489-493.
- Coladarci, T., & Cobb, C. D. (1996). Extracurricular participation, school size, and achievement and self-esteem among high school students: A national look. *Journal of Research in Rural Education*, 12, 92-103.

- Coleman, J. S. (1990). *Foundations of Social Theory*. Cambridge, MA: Belknap Press of Harvard University Press.
- Compas, B. E., Hinden, B. R., & Gerhardt, C. A. (1995). Adolescent development: Pathways and processes of risk and resilience. *Annual Review of Psychology*, 46, 265-293.
- Connor, J., & Schonert-Reichl, K. A. (2001, April). *Extracurricular participation in early adolescence: Links with peer group acceptance and emotional well-being*. Poster presented at the biennial meeting of the Society for Research in Childhood Development, Minneapolis, MN.
- Covell, K., & Howe, B. (1999). Working adolescents in economically depressed areas of Canada. *Canadian Journal of Behavioural Science*, 31, 229-239.
- Cowen, E. L., Wyman, P., A., Work, W. C., Kim, J. Y., Fagen, D. B., & Magnus, K. B. (1997). Follow-up study of young stress-affected and stress-resilient urban children [Electronic version]. *Development and Psychopathology*, 9, 565-577.
- Craig, W. M., Peters, R. D., & Willms, J. D. (2002). The role of the peer group in pre-adolescent behaviour. In J. D. Willms (Ed.), *Vulnerable children: Findings from Canada's National Longitudinal Survey of Children and Youth* (pp. 317-325). Edmonton, Alberta, Canada: University of Alberta Press.
- Crockett, L. J., & Bingham, C. R. (2000). Anticipating adulthood: Expected time of work and family transitions among rural youth. *Journal of Research on Adolescence*, 10, 151-172.
- Crockett, L. J., Shanahan, M. J., & Jackson-Newsom, J. (2000). Rural youth: Ecological and life course perspectives. In R. Montemayor, G. R. Adams & T. P. Gullotta (Eds.), *Adolescent diversity in ethnic, economic, and cultural contexts: Vol. 10. Advances in adolescent development* (pp. 43-74). Thousand Oaks, CA: Sage.
- Dasgupta, S. (1988). *Canadian Studies: Vol. 3. Rural Canada: Structure and change*. Queenston, Ontario, Canada: The Edwin Mellen Press.
- Dishion, T. J., Capaldi, D. M., & Yoerger, K. (1999). Middle childhood antecedents to progressions in male adolescent substance use: An ecological analysis of risk and protection. *Journal of Adolescent Research*, 14, 175-205.
- Doll, B., & Lyon, M. A. (1998). Risk and resilience: Implications for the delivery of educational and mental health services in schools. *School Psychology Review*, 27, 348-363.
- Dreyfus, A. (1994). Agricultural and rural education. In T. Husen & T. N. Postlethwaite (Series Eds.), *The International Encyclopedia of Education, Vol. 1* (2<sup>nd</sup> ed., pp. 240-244;). New York: Pergamon / Elsevier Science.
- Drixler, C., Krahn, H., & Wood, R. T. (2001). Teenage drinking and driving in rural Alberta. *Journal of Youth Studies*, 4(1), 63-81.

- Dryfoos, J. G. (1998). *Safe passage: Making it through adolescence in a risky society*. New York: Oxford University Press.
- Dubois, D. L., Felner, R. D., Meares, H., & Krier, M. (1994). Prospective investigation of the effects of socio-economic disadvantage, life stress, and social support on early adolescent adjustment. *Journal of Abnormal Psychology, 103*, 511-522.
- du Plessis, V., Beshiri, R., Bollman, R. D., & Clemenson, H., (2001). Definitions of rural [Electronic version] (Catalogue No. 21-006-XIE). *Rural and Small Town Canada Analysis Bulletin 3*(3), 1-17.
- Dupuy, R., Mayer, F., & Morissette, R. (2000, September). *Rural youth: Stayers, leavers, and return migrants* [Electronic version] (Catalogue No. 11F0019MPE No. 152). Ottawa, Ontario, Canada: Statistics Canada. Retrieved July 24, 2002 from <http://www.statcan.ca:80/english/research/11F0019MIE/00152/11F0019MIE00152.pdf>
- Ebata, A. T., Petersen, A. C., & Conger, J. J. (1990). The development of psychopathology in adolescence. In J. Rolf, A. S. Masten, D. Cicchetti, K. H. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 308-333). New York: Cambridge University Press.
- Eccles, J. S., & Barber, B. L. (1999). Student council, volunteering, basketball, or marching band: What kind of extracurricular involvement matters? *Journal of Adolescent Research, 14*, 10-43.
- Eccles, J. S., Early, D., Fraser, K., Belansky, E., McCarthy, K. (1997). The relation of connection, regulation, and support for autonomy to adolescents' functioning. *Journal of Adolescent Research, 12*, 263-286.
- Eccles, J. S., Midgley, C., Wigfield, A., Buchanan, D. R., Reuman, D., Flanagan, C., et al. (1993). Development during adolescence: The impact of stage-environment fit on young adolescents' experiences in schools and in families. *American Psychologist, 48*, 90-101.
- Egeland, B., Carlson, E., & Sroufe, L. A. (1993). Resilience as process. *Development and Psychopathology, 5*, 517-528.
- Ehrensaft, P., & Beeman, J. (1992). Distance and diversity in nonmetropolitan economies. In R. D. Bollman (Ed.), *Rural and small town Canada* (pp. 193-224). Toronto, Ontario, Canada: Thompson Educational.
- Elder, G. H., Jr., (1995). The life course paradigm: Social change and individual development. In P. Moen, H. H. Elder, and K. Lüscher (Eds.), *Examining lives in context: Perspectives on the ecology of human development* (pp. 101-139). Washington, DC: American Psychological Association.
- Elder, G. H., Jr., (1998). The life course and human development. In W. Damon (Series Ed.) & R. M. Lerner (Vol. Ed.), *Handbook of child Psychology: Vol. 1. Theoretical models of human development* (5<sup>th</sup> ed., pp. 939-991). New York: Wiley.

- Elder, G. H., Jr., & Conger, R. D. (2000). *Children of the Land: Adversity and success in rural America*. Chicago: University of Chicago Press.
- Elder, G. H., Jr., King, V., & Conger, R. D. (1996). Attachment to place and migration prospects: A developmental perspective. *Journal of Research on Adolescence*, 6, 397-425.
- Elder, G. H. Jr., Pavalko, E. K., & Clipp, E. C. (1993). Working with archival data: Studying lives. In L. Beck (Series Ed.), *Quantitative applications in the social sciences* (Series no. 07-088). London, Sage.
- Elias, M. J., Weissberg, R. P., Hawkins, J. D., Perry, C. L., Zins, K. A., Dodge, K. A. et al. (1994). The school-based promotion of social competence: Theory, research, practice, and policy. In R. J. Haggerty, L. R. Sherrod, N. Garnezy, & M. Rutter (Eds.), *Stress, risk, and resilience in children and adolescents: Processes, mechanisms, and interventions* (pp. 268-316). New York: Cambridge University Press.
- Fan, X., & Chen, M. J. (1999). Academic achievement of rural school students: A multi-year comparison with their peers in suburban and urban schools. *Journal of Research in Rural Education*, 15, 31-46.
- Fergusson, D. M., & Horwood, L. J. (2002). Male and female offending trajectories [Electronic version]. *Development and Psychopathology*, 14, 159-177.
- Fergusson, D. M., & Horwood, L. J. (2003). Resilience to childhood adversity. In S. S. Luthar (Ed.), *Resilience and vulnerability: Adaptation in the context of childhood adversities* (pp. 130-155). New York: Cambridge University Press.
- Fergusson, D. M., & Lynskey, M. T. (1996). Adolescent resiliency to family adversity [Electronic version]. *Journal of Child Psychology and Psychiatry*, 37, 281-292.
- Fisher, D. R. (2001). Resource dependency and rural poverty: Rural areas in the United States and Japan. *Rural Sociology*, 66, 181-202.
- Fitchen, J. M. (1995). Why rural poverty is growing worse: Similar causes in diverse settings. In E. N. Castle (Ed.), *The changing American countryside: Rural People and places* (pp. 247-267). Lawrence, Kansas: University Press of Kansas.
- Frank, L. (2003). When bad things happen in good places: Pastoralism in big-city newspaper coverage of small-town violence. *Rural Sociology*, 68, 207-230.
- Frenette, M. (2001). Too far to go on? Distance to school and university participation. Ottawa, Ontario, Canada: Statistics Canada Business and Labour Market Analysis Division. Retrieved August 18, 2005 from <http://www.statcan.ca/english/research/11F009MIE202191.pdf>
- Frye, A. A., & Garber, J. (2005). The relations among maternal depression, maternal criticism, and adolescents' externalizing and internalizing symptoms [Electronic version]. *Journal of Abnormal Child Psychology*, 33, 1-11.

- Fuller, B. E., Chermack, S. T., Cruise, K. A., Kirsch, E., Fitzgerald, H. E., & Zucker, R. A. (2003). Predictors of aggression across three generations among sons of alcoholics: Relationships involving grandparental and parental alcoholism, child aggression, marital aggression and parenting practices [Electronic version]. *Journal of Studies on Alcohol*, 64, 472-493.
- Gall, M. D., Borg, W. R., Gall, J. P. (1996). *Educational research: An introduction* (6<sup>th</sup> ed.). New York: Longman.
- Garnezy, N. (1985). Stress-resistant children: The search for protective factors. In M. Berger & E. Taylor (Series Eds.) & J. E. Stevenson (Vol. Ed.), *Journal of child psychology and psychiatry: Book suppl. 4: Recent research in developmental psychopathology* (pp. 213-233). Toronto, Ontario, Canada: Pergamon Press.
- Garnezy, N. (1987). Stress, competence, and development: Continuities in the study of schizophrenic adults, children vulnerable to psychopathology, and the search for stress-resistant children. *American Journal of Orthopsychiatry*, 57, 159-174.
- Garnezy, N. (1993). Children in poverty: Resilience despite risk. *Psychiatry: Interpersonal and biological processes*, 56, 127-136.
- Garnezy, N., & Masten, A. S. (1991). The protective role of competence indicators in children at risk. In E. E. Cummings, A. L. Greene, K. H. Karraker (Eds.), *Life-span developmental psychology: Perspectives on stress and coping* (pp. 151-174). Hillsdale, NJ: Lawrence Erlbaum.
- Garnezy, N., Masten, A. S., & Tellegen, A. (1984). The study of stress and competence in children: A building block for developmental psychopathology. *Child Development*, 55, 97-111.
- Garnezy, N., & Tellegen, A. (1984). Studies of stress-resistant children: Methods, variables, and preliminary findings. In F. Morrison, C. Lord, & D. Keating (Eds.), *Advances in applied developmental psychology (Vol. 1)*, pp. 231-287. New York: Academic Press.
- Gerard, J. M., & Buehler, C. (2004). Cumulative environmental risk and youth maladjustment: The role of youth attributes. *Child Development*, 75, 1832-1849.
- Gest, S. D., Neeman, J., Hubbard, J. J., Masten, A. S., Tellegen, A. (1993). Parenting quality in adolescence: Testing process-oriented models of resilience. *Development and Psychopathology*, 5, 663-682.
- Gest, S. D., Reed, M. J., & Masten, A. S. (1999). Measuring developmental changes in exposure to adversity: A life chart and rating scale approach. *Development and Psychopathology*, 11, 171-192.
- Glantz, M. D., & Leshner, A. I. (2000). Drug abuse and developmental psychopathology [Electronic version]. *Development and Psychopathology*, 12, 795-814.

- Goodenow, C. (1993). The psychological sense of school membership among adolescents: Scale development and educational correlates. *Psychology in the Schools*, 30, 79-90.
- Goodenow, C. (1994, February). *Conceptualizing and measuring classroom belonging and support among adolescents*. Paper presented at the biennial meeting of the Society for Research in Adolescence, San Diego, CA.
- Gordon, E. W., & Song, L. D. (1994). Variations in the experience of resilience. In M. C. Wang & E. W. Gordon (Eds.), *Educational resilience in inner-city America: Challenges and prospects* (pp. 27-43). Hillsdale, NJ: Erlbaum.
- Grizenko, N., & Fisher, C. (1992). Review of studies of risk and protective factors for psychopathology in children. *Canadian Journal of Psychiatry*, 37, 711-721.
- Grizenko, N., & Pawliuk, N. (1994). Risk and protective factors for disruptive behavior disorders in children. *American Journal of Orthopsychiatry*, 64, 534-544.
- Guppy, N., & Pendakur, K. (1989). The effects of gender and parental education on participation within post-secondary education in the 1970s and 1980s. *Canadian Journal of Higher Education*, 29(1), 49-62.
- Hajesz, D. & Dawe, S. P. (1997). De-mythologizing rural youth exodus. In R. D. Bollman & J. M. Bryden (Eds.), *Rural employment: An international perspective* (pp. 114-135). New York: CAB International.
- Halfacree, K. H. (1993). Locality and social representation: Space, discourse and alternative definitions of rural. *Journal of Rural Studies*, 9, 23-37.
- Haller, E. J., & Virkler, S. J. (1993). Another look at rural-nonrural differences in students' educational aspirations. *Journal of Research in Rural Education*, 9, 170-178.
- Hallowell, E. M., & Ratey, J. J. (1994). *Driven to distraction: Recognizing and coping with attention deficit disorder from childhood through adulthood*. New York: Touchstone.
- Hammen, C. (2003). Risk and protective factors for children of depressed parents. In S. S. Luthar (Ed.), *Resilience and vulnerability: Adaptation in the context of childhood adversities* (pp. 50-75). New York: Cambridge University Press.
- Hammen, C., Brennan, P. A., & Shih, J. H. (2004). Family discord and stress predictors of depression and other disorders in adolescent children of depressed and nondepressed women [Electronic version]. *Journal of the American Academy of Child and Adolescent Psychiatry*, 43, 994-1002.
- Hardre, P. L., & Reeve, J. (2003). A motivational model of rural students' intentions to persist in, versus drop out of, high school. *Journal of Educational Psychology*, 95, 347-356.
- Harter, S. (1990). Self and identity development. In S. S. Feldman, & G. R. Elliott (Eds.), *At the threshold: The developing adolescent* (pp. 352-387). Cambridge, MA: Harvard University press.

- Hauser, R. M. (1994). Measuring socioeconomic status in studies of child development. *Child Development* 65, 1541-1545.
- Hawkins, J. D., Doueck, H. J., & Lishner, D. M. (1988). Changing teaching practices in mainstream classrooms to improve bonding and behavior of low achievers. *American Educational Research Journal*, 25, 31-50.
- Hektner, J. M. (1995). When moving up implies moving out: Rural adolescent conflict in the transition to adulthood. *Journal of Research in Rural Education*, 11, 3-14.
- Henderson, N., & Milstein, M. M. (2003). *Resiliency in schools: Making it happen for students and educators*. Thousand Oaks, CA: Corwin Press.
- Hernandez, D. J. (1997). Child development and the social demography of childhood. *Child Development*, 68, 149-169.
- Hetherington, E. M., & Elmore, A. M. (2003). Risk and resilience in children coping with their parents' divorce and remarriage. In S. S. Luthar (Ed.), *Resilience and vulnerability: Adaptation in the context of childhood adversities* (pp. 182-212). New York: Cambridge University Press.
- Hirschl, T. A., & Brown, D. L. (1995). The determinants of rural and urban poverty. In E. N. Castle (Ed.), *The changing American countryside: Rural people and places* (pp.229-246). Lawrence, Kansas: University Press of Kansas.
- Howley, C. B. (1997). How to make rural education *rural*: An essay at practical advice. *Journal of Research in Rural Education*, 13, 131-138.
- Howley, C. B., Harmon, H. L., & Leopold, G. D. (1996). Rural scholars or bright rednecks? Aspirations for a sense of place among rural youth in Appalachia. *Journal of Research in Rural Education*, 12, 150-160.
- Hughes, M. F. (1999). Similar students – dissimilar opportunities for success: High- and low-achieving elementary schools in rural, high poverty areas of West Virginia. *Journal of Research in Rural Education*, 15, 47-58.
- Israel, G. D., Beaulieu, L. J., & Hartless, G. (2001). The influence of family and community social capital on educational achievement. *Rural Sociology*, 66, 43-68.
- Japel, C., Normand, C., Tremblay, R., & Willms, J. D. (2002). Identifying vulnerable children at an early age. In J. D. Willms (Ed.), *Vulnerable children: Findings from Canada's National Longitudinal Survey Children and Youth*. (pp.105-119). Edmonton, Alberta, Canada: University of Alberta Press.
- Jeffery, G. H., Lehr, R., Hache, G., & Campbell, M. (1992). Empowering rural parents to support youth career development: An interim report. *Canadian Journal of Counselling*, 26, 240-255.

- Jenkins, J., & Keating, D. P. (1998, October). Risk and resilience in six- and ten-year-old children [Electronic version]. (Human Resources Development Canada Research Branch Strategic Policy No. W-98-23E). Retrieved January 25, 2002 from <http://www.hrdc-drhc.gc.ca/arb/>
- Jennings, G. (2003). An exploration of meaningful participation and caring relationships as contexts for school engagement [Electronic version]. *The California School Psychologist*, 8, 43-52.
- Jester, J. M., Nigg, J. T., Adams, K., Fitzgerald, H. E., Puttler, L. I., Wong, M. M., et al. (2005). Inattention/hyperactivity and aggression from early childhood to adolescence: Heterogeneity of trajectories and differential influence of family environment characteristics [Electronic version]. *Development and Psychopathology*, 17, 99-125.
- Jimmerson, S. R., Campos, E., & Greif, J. L. (2003). Towards an understanding of definitions and measures of school engagement and related terms [Electronic version]. *The California School Psychologist*, 8, 53-72.
- Kaplan, H. B. (1999). Toward an understanding of resilience: A critical review of definitions and models. In M. D. Glantz, J. L. Johnson, & L. Huffman (Eds.), *Resilience and development: Positive life adaptations* (pp. 17-83). New York: Kluwer Academic/Plenum.
- Khatti, N., Riley, K. W., & Kane, M. B. (1997). Students at risk in poor, rural areas: A review of the research. *Journal of Research in Rural Education*, 13, 79-100.
- Kim, K. J., Conger, R. D., Elder, G. H. Jr., & Lorenz, F. O. (2003). Reciprocal influences between stressful life events and adolescent internalizing and externalizing problems. *Child Development*, 74, 127-143.
- Kuhn, T. S. (1970). *The structure of scientific revolutions*. Chicago: University of Chicago Press.
- Kumpfer, K. L. (1999). Factors and processes contributing to resilience: The resilience framework. In M. D. Glantz, J. L. Johnson, & L. Huffman (Eds.), *Resilience and development: Positive life adaptations* (pp. 179-224). New York: Kluwer Academic/Plenum.
- Leadbeater, B. J., Kuperminc, G. P., Blatt, S. J., & Hertzog, C. (1999). A multivariate model of gender differences in adolescents' internalizing and externalizing problems [Electronic version]. *Developmental Psychology*, 35, 1268-1282.
- Lee, M. R., Maume, M. O., & Ousey, G. C. (2003). Social isolation and lethal violence across the metro/nonmetro divide: The effects of socioeconomic disadvantage and poverty concentration on homicide. *Rural Sociology*, 68, 107-131.
- Leonard, L., Leonard, P., & Sackney, L. (2001). Confronting assumptions about the benefits of small schools. *Educational Management & Administration*, 29, 79-96.



- Ley, J., Nelson, S., & Beltyukova, S. (1996). Congruence of aspirations of rural youth with expectations held by parents and school staff. *Journal of Research in Rural Education*, 12, 133-141.
- Loeber, R., Farrington, D. P., Stouthamer-Loeber, M., Moffitt, T. E., & Caspi, A. (1998). The development of male offending: Key findings from the first decade of the Pittsburgh Youth Study. *Studies on Crime and Crime Prevention*, 7, pp. 141-171.
- Loeber, R., & Stouthamer-Loeber, M. (1998). Development of juvenile aggression and violence: Some common misconceptions and controversies. *American Psychologist*, 53, 242-259.
- Looker, E. D. (1993). Interconnected transitions and their costs: Gender and urban/rural differences in transitions to work. In P. Anisef & P. Axelrod (Eds.), *Transitions: Schooling and employment in Canada* (pp. 43-64). Toronto, Ontario, Canada: Thompson Educational.
- Looker, E. D. (1997). Rural-urban differences in youth transition to adulthood. In R. D. Bollman, & J. D. Bryden (Eds.), *Rural employment: An international perspective* (pp. 85-98). New York: CAB International.
- Loukas, A., Fitzgerald, H. E., Zucker, R. A., & Krull, J. L. (2003). Developmental trajectories of disruptive behavior problems among sons of alcoholics: Effects of parent psychopathology, family conflict, and child undercontrol [Electronic version]. *Journal of Abnormal Psychology*, 112, 119-131.
- Luthar, S. S. (1991). Vulnerability and resilience: A study of high-risk adolescents. *Child development*, 62, 600-616.
- Luthar, S. S. (1995). Social competence in the school setting: Prospective cross-domain associations among inner-city teens. *Child Development*, 66, 416-429.
- Luthar, S. S. (Ed.). (2003). *Resilience and vulnerability: Adaptation in the context of childhood adversities*. New York: Cambridge University Press.
- Luthar, S. S. & Cicchetti, D. (2000). The construct of resilience: Implications for interventions and social policies. *Development and Psychopathology*, 12, 857-885.
- Luthar, S. S. & Cicchetti, D., & Becker, B. (2000a). Research on resilience: Response to commentaries. *Child Development*, 71, 573-575.
- Luthar, S. S. & Cicchetti, D., & Becker, B. (2000b). The construct of resilience: A critical evaluation and guidelines for future work. *Child Development*, 71, 543-562.
- Luthar, S. S. & McMahon, T. J. (1996). Peer reputation among inner-city adolescents: Structure and correlates. *Journal of Research on Adolescence*, 6, 581-603.
- Luthar, S. S. & Zelazo, L. B. (2003). Research on resilience: An integrative review. In S. S. Luthar (Ed.), *Resilience and vulnerability: Adaptation in the context of childhood adversities* (pp. 510-549). New York: Cambridge University Press.

- Lyson, T. A. (2002). What does a school mean to a community? Assessing the social and economic benefits of schools to rural villages in New York. *Journal of Research in Rural Education, 17*, 131-137.
- Maccoby, E. E. (1984). Socialization and developmental change. *Child Development, 55*, 317-328.
- Maddox, S. J. & Prinz, R. J. (2003). School bonding in children and adolescents: Conceptualization, assessment, and associated variables. *Clinical Child and Family Psychology Review, 6*, 31-49.
- Mahoney, J. L. (2000). School extracurricular activity participation as a moderator in the development of antisocial patterns. *Child Development, 71*, 502-516.
- Mahoney, J. L., Cairns, B. D., & Farmer, T. W. (2003). Promoting interpersonal competence and education success through extracurricular activity participation [Electronic version]. *Journal of Educational Psychology, 95*, 409-418.
- Marsh, H. W., Ellis, L. A., Parada, R. H., Richards, G., & Heubeck, B. G. (2005). A short version of the Self Description Questionnaire II: Operationalizing criteria for short-form evaluation with new applications of confirmatory factor analyses [Electronic version]. *Psychological Assessment, 17*, 81-102.
- Masten, A. S. (2001). Ordinary Magic: Resilience processes in development. *American Psychologist, 56*, 227-238.
- Masten, A. S., & Coatsworth, J. D. (1998). The development of competence in favorable and unfavorable environments. *American Psychologist, 53*, 205-220.
- Masten, A. S., Coatsworth, J. D., Neeman, J., Gest, S. D., Tellegen, A. & Garmezy, N. (1995). The structure and coherence of competence from childhood through adolescence. *Child Development, 66*, 1635-1659.
- Masten, A. S., Garmezy, N., Tellegen, A., Pellegrini, D. S., Larkin, K., & Larsen, A. (1988). Competence and stress in school children: The moderating effects of individual and family qualities. *Journal of Child Psychology and Psychiatry, 29*, 745-764.
- Masten, A. S., Hubbard, J. J., Gest, S. D., Tellegen, A., Garmezy, N., & Ramirez, M. (1999). Competence in the context of adversity: Pathways to resilience and maladaptation from childhood to late adolescence. *Development and Psychopathology, 11*, 143-169.
- Masten, A. S., Morison, P., Pellegrini, D., & Tellegen, A. (1990). Competence under stress: Risk and protective factors. In J. E. Rolf & A. S. Masten et al. (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 236-256). New York: Cambridge University Press.
- Masten, A. S., & Powell, J. L. (2003). A resilience framework for research, policy, and practice. In S. S. Luthar (Ed.), *Resilience and vulnerability: Adaptation in the context of childhood adversities* (pp. 1-25). New York: Cambridge University Press.

- Masten, A. S., & Reed, M. G. (2002). Resilience in development. In C. R. Snyder & S. J. Lopez (Eds.), *Handbook of positive psychology* (pp. 74-88). Oxford, England: Oxford University Press.
- McCreary Centre Society (2000). *Listening to B.C. Youth: Kootenay Boundary Region*. Burnaby, British Columbia, Canada: Author.
- McDonald-Dennill, H. (1996). *Irrational thinking, depression, and anger in adolescents: A regression analysis*. Unpublished master's thesis, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.
- McGrath, D. J., Swisher, R. R. Elder, G. H. Jr., Conger, R. D. (2001). Breaking new ground: Diverse routes to college in rural America. *Rural Sociology*, 66, 244-267.
- Molina, B. S. G., & Pelham, W. E. (2001). Substance use, substance abuse, and LD among adolescents with a childhood history of ADHD. *Journal of Learning Disabilities*, 34, 333-342.
- Mollins, J. (2002, June). *Rural research note: Canadian rural population trends* (Agriculture and Agri-Food Canada Publication No. 2138/E). Ottawa, Ontario, Canada: Rural Secretariat, Agriculture and Agri-Food Canada. Retrieved December 30, 2004, from [http://www.rural.gc.ca/research/note/note1\\_e.pdf](http://www.rural.gc.ca/research/note/note1_e.pdf)
- Morison, P., & Masten, A. S. (1991). Peer reputation in middle childhood as a predictor of adaptation in adolescence: A seven-year follow-up. *Child Development*, 62, 991-1007.
- Morrison, G. M., Robertson, L., & Harding, M. (1998). Resilience factors that support the classroom functioning of acting out and aggressive students. *Psychology in the Schools*, 35, 217-227.
- Mueller, C., W., & Parcel, T. L. (1981). Measures of socioeconomic status: Alternatives and recommendations. *Child Development*, 52, 13-30.
- Muilo, T. & Rusanen, J. (2003). Rural young people in regional development: The case of Finland in 1970-2000. *Journal of Rural Studies*, 19, 295-307.
- Murdoch, T. B., Anderman, L. H., & Hodge, S. A. (2000). Middle-grade predictors of students' motivation and behavior in high school. *Journal of Adolescent Research*, 15, 327-351.
- Murray, C., & Greenberg, M. T. (2001). Relationships with teachers and bonds with school: Social emotional adjustment correlates for children with and without disabilities. *Psychology in the Schools*, 38, 25-41.
- Nachtigal, P. M. (1992, Winter). Rural schooling: Obsolete or harbinger of the future? *Educational Horizons*, 66-70.
- Nachtigal, P. M. (1994). Political trends affecting nonmetropolitan America. *Journal of Research in Rural Education*, 10, 161-166.

- Nettles, S. M., & Mucherah, W., & Jones, D. S. (2000). Understanding resilience: The role of social resources. *Journal of Education for Students Placed at Risk*, 5(1&2), 47-60.
- O'Farrell, S. L., & Morrison, G. M. (2003). A factor analysis exploring school bonding and related constructs among upper elementary students [Electronic version]. *The California School Psychologist*, 8, 53-72.
- Ohannessian, C. M., Hesselbrock, V. M., Kramer, J., Kuperman, S., Bucholz, K. K., Schuckit, M. A., et al. (2005). The relationship between parental psychopathology and adolescent psychopathology: An examination of gender patterns [Electronic version]. *Journal of Emotional and Behavioral Disorders*, 13(2), 67-76.
- Orderud, G. I. (1997). Youth in the periphery: Education, jobs, and a place to live. In R. D. Bollman & J. M. Bryden (Eds.), *Rural employment: An international perspective* (pp. 99-113). New York: CAB International.
- Osterman, K. (2000). Students' need for belonging in the school community [Electronic version]. *Review of Educational Research*, 70, 323-367.
- Pedhazur, E. J. (1997). *Multiple regression in behavioral research: Explanation and prediction* (3<sup>rd</sup> ed.). Toronto, Ontario, Canada: Harcourt Brace.
- Perkins, D. F., Jacobs, J. E., Barber, B. L., & Eccles, J. S. (2004). Childhood and adolescent sports participation in sports and physical fitness activities during young adulthood [Electronic version]. *Youth and Society*, 35, 495-520.
- Perry, C. L., & Kelder, S. H. (1992). Prevention. *Annual Review of Addiction Research and Treatment*, 453-472.
- Pianta, R. C., & Walsh, D. J. (1998). Applying the construct of resilience in schools: Cautions from a developmental systems perspective. *School Psychology Review*, 27, 407-417.
- Porter, J., Porter, M., Blishen, B. R., Barrados, M., Gilbert, S., McRoberts, H. A., et al. (1982). *Stations and callings: Making it through the school system*. Toronto, Ontario, Canada: Methuen.
- Quaglia, R. J., & Perry, C. M. (1995). A study of underlying variables affecting aspirations of rural adolescents [Electronic version]. *Adolescence*, 30, 233-243.
- Radke-Yarrow, M., & Brown, E. (1993). Resilience and vulnerability in children of multiple-risk families. *Development and Psychopathology*, 5, 581-592.
- Rae-Grant, N., Thomas, B. H., Offord, D. R., & Boyle, M. H. (1989). Risk, protective factors, and the prevalence of behavioral and emotional disorders in children and adolescents. *Journal of American Child and Adolescent Psychiatry*, 28, 262-268.
- Reeves, E. B. (2003). Disentangling the effects of nonmetro location and student poverty on school performance/improvement: Implications for equitable excellence in Kentucky public schools. *Journal of Research in Rural Education*, 18, 17-30.

- Resnick, M. D., Bearman, P. S., Blum, R. W., Bauman, K. E., Harris, K. M., Jones, J., et al. (1997). Protecting adolescents from harm: Findings from the National Longitudinal Study on Adolescent Health. *Journal of the American Medical Association*, 278, 823-832.
- Richters, J. E., & Martinez, P. E. (1993). Violent communities, family choices, and children's chances: An algorithm for improving the odds. *Development and Psychopathology*, 5, 609-627.
- Robertson, L. M., Harding, M. S., & Morrison, G. M. (1998). A comparison of risk and resilience indicators among Latino/a students: Differences between students identified as at-risk, learning disabled, speech impaired and not at-risk [Electronic version]. *Education and Treatment of Children*, 21, 331-350.
- Rolf, J. E. (1999). Resilience: An interview with Norman Garmezy. In M. D. Glantz, J. L. Johnson, & L. Huffman (Eds.), *Resilience and development: Positive life adaptations* (pp. 5-14). New York: Kluwer Academic/Plenum.
- Roosa, M. (2000). Some thoughts about resilience versus positive development: Main effects versus interactions, and the value of resilience. *Child Development*, 71, 567-569.
- Rothwell, N. (2001, December). Employment in rural and small town Canada: An update to 2000 [Electronic version] (Catalogue No. 21-006-XIE). *Rural and Small Town Canada Analysis Bulletin* 3(4), 1-32.
- Rutter, M. (1979). Protective factors in children's responses to stress and disadvantage. In M. W. Kent and J. E. Rolf (Eds.), *Primary prevention of psychopathology, Vol. 3. Social competence in children* (pp. 49-74). Hanover, NH: University Press of New England.
- Rutter, M. (1985). Resilience in the face of adversity: Protective factors and resistance to psychiatric disorder. *British Journal of Psychiatry*, 147, 598-611.
- Rutter, M. (1990). Psychosocial resilience and protective mechanisms. In J. Rolf, A. S. Masten, D. Cicchetti, K. H. Nuechterlein, & S. Weintraub (Eds.), *Risk and protective factors in the development of psychopathology* (pp. 181-214). New York: Cambridge University Press.
- Rutter, M. (1994). Stress research: Accomplishments and tasks ahead. In R. J. Haggerty, L. R. Sherrod, N. Garmezy, & M. Rutter (Eds.), *Stress, risk, and resilience in children and adolescents: Processes, mechanisms, and interventions* (pp. 354-385). New York: Cambridge University Press.
- Rutter, M. (2000). Resilience reconsidered: Conceptual considerations, empirical findings, and policy implications. In J. P. Shonkoff & S. J. Meisels (Eds.), *Handbook of early childhood intervention* (pp. 651-682). New York: Cambridge University Press.

- Rutter, M., Champion, L., Quinton, D., Maughan, B., & Pickles, A. (1995). Understanding individual differences in environmental-risk exposure. In P. Moen, G. H. Elder, & K. L. Scher (Eds.), *Examining lives in context: Perspectives on the ecology of human development* (pp. 61-93). Washington, DC: American Psychological Association.
- Rutter, M., Pickles, A., Murray, R., & Eaves, L. (2001). Testing hypotheses of specific environmental causal effects on behavior. *Psychological Bulletin*, 127, 291-324.
- Salamon, S. (2003). From hometown to nontown: Rural community effects of suburbanization. *Rural Sociology*, 68, 1-24.
- Sandler, I. N., Tein, J., Mehta, P., Wolchik, S., & Ayers, T. (2000). Coping efficacy and psychological problems of children of divorce. *Child Development*, 71, 1099-1118.
- Sandler, I., Wolchik, S., Davis, C., Haine, R., & Ayers, T. (2003). Correlational and experimental study of resilience in children of divorce and parentally bereaved children. In S. S. Luthar (Ed.), *Resilience and vulnerability: Adaptation in the context of childhood adversities* (pp. 213-240). New York: Cambridge University Press.
- Schonert, K. A., Elliott, J. P., & Bills, D. B. (1991). Rural Iowa Youth: A descriptive summary of postsecondary persistence five years after high school. *Research in Higher Education*, 32, 269-288.
- Schonert-Reichl, K. A. (2000). *Children and youth at risk: Some conceptual considerations*. Paper presented at the Symposium of the Pan-Canadian Education Research Agenda, Ottawa, Ontario, Canada. Retrieved February 9, 2002, from <http://www.cmec.ca/stats/pcera/symposium2000>
- Schonert-Reichl, K. A., & Elliott, J. P. (1994, February). *Rural pathways: Stability and change during the transition to young adulthood*. Paper presented at the biennial meeting of the Society for Research on Adolescence, San Diego, CA.
- Schonert-Reichl, K. A., & Elliott, J. P. (1996, March). "There's no place like home:" A longitudinal investigation of rural adolescents' efforts to re-create their rural communities during adulthood. Paper presented at the biennial meeting of the Society for Research on Adolescence, San Diego, CA.
- Schonert-Reichl, K. A., & Elliott, J. P. (1998, March). *Ties to the land: The educational, occupational, and social experiences of rural youth as they make the transition to young adulthood*. Poster presented at the biennial meeting of the Society for Research on Adolescence, San Diego, CA.
- Schonert-Reichl, K. A., & Offer, D. (1992). Gender differences in adolescent symptoms. In B. B. Lahey & A. E. Kazdin (Eds.), *Advances in Clinical Child Psychology: Vol. 14*. (pp. 27-60). New York: Plenum Press.
- Shepard, B., & Marshall, A. (2000). Career development and planning issues for rural adolescent girls. *Canadian Journal of Counselling*, 34, 155-171.

- Siegel, A. W., & Scovill, L. C. (2000). Problem behavior: The double symptom of adolescence. *Development and Psychopathology*, 12, 763-793.
- Singh, K., & Dika, S. (2003). The educational effects of rural adolescents' social networks. *Journal of Research in Rural Education*, 18, 114-128.
- Smailes, P. J., Argent, N., & Griffin, T. L. C. (2002). Rural population density: Its impact on social and demographic aspects of rural communities. *Journal of Rural Studies*, 18, 385-404.
- Smith, M. D., Krannich, R. S., & Hunter, L. M. (2001). Growth, decline, stability, and disruption: A longitudinal analysis of social well-being in four western rural communities. *Rural Sociology*, 66, 425-450.
- Solomon, D., Battistich, V., Watson, M., Schaps, E., Lewis, C. (2000). A six-district study of educational change: Direct and mediated effects of the child development project. *Social Psychology of Education*, 4, 3-51.
- Somers, M. A., & Willms, J. D. (2002). Maternal depression and childhood vulnerability. In J. D. Willms (Ed.), *Vulnerable children: Findings from Canada's National Longitudinal Survey of Children and Youth* (pp. 211-228). Edmonton, Alberta, Canada: University of Alberta Press.
- Spatz, C. (1997). *Basic statistics: Tales of distributions* (6<sup>th</sup> ed.). New York: Brooks.
- Sroufe, L. A., Carlson, E., & Shulman, S. (1993). Individuals in relationships: Development from infancy through adolescence. In D. C. Funder, R. D. Parke, C. Tomlinson-Keasey, & K. Widaman (Eds.), *Studying lives through time: Personality and development* (pp. 315-342). Washington, D. C.: American Psychological Association.
- Statistics Canada (1995a). *National Longitudinal Survey of Children and Youth: 1994-95 codebook Cycle 1*. Retrieved March 29, 2005, from <http://data.library.ubc.ca/datalib/survey/statscan/kids/Cycle1/codebook.html>
- Statistics Canada (1995b). *National Longitudinal Survey of Children and Youth: 1994-95 data dictionary primary file*. Retrieved March 29, 2005, from <http://data.library.ubc.ca/datalib/survey/statscan/kids/Cycle1/primary.html>
- Statistics Canada (1995, Feb.) *National Longitudinal Survey of Children: Survey instruments for 1994-95 data collection Cycle 1* [Catalogue no. 89F007XIE]. Ottawa, Ontario, Canada: Author.
- Statistics Canada (1998) *National Longitudinal Survey of Children and Youth: Data dictionary, 10-15 self-completed questionnaire file*. Retrieved March 29, 2005, from <http://data.library.ubc.ca/java/jsp/database/production/detail.jsp?id=380>
- Statistics Canada (1999). *National Longitudinal Survey of Children and Youth: Overview of survey instruments for 1998-99 data collection Cycle 3* [Catalogue no. 89F0078XPE, no. 3]. Ottawa, Ontario, Canada: Author.

- Statistics Canada (2001a). Census dictionary. Ottawa, Ontario, Canada: Author. Retrieved August 17, 2005, from <http://www12.statcan.ca/english/census01/Products/Reference/dict/appendices/92-378-XIE02002.pdf>
- Statistics Canada (2001b). *National Longitudinal Survey of Children and Youth: Cycle 3 data user's guide*. Ottawa, Ontario, Canada: Author. Retrieved March 30, 2005, from <http://data.library.ubc.ca/java/jsp/database/production/detail.jsp?id=380>
- Stedman, R. C., Parkins, J. R., & Beckley, T. M. (2004). Resource dependence and community well-being in rural Canada. *Rural Sociology*, 69, 213-234.
- Stevens, N. G., & Peltier, G. L. (1994). A review of research on small-school student participation in extracurricular activities. *Journal of Research in Rural Education*, 10, 116-120.
- Stouthamer-Loeber, M., Loeber, R., Farrington, D. P., Zhang, Q., van Kammen, W., & Maguin, E. (1993). The double edge of protective and risk factors for delinquency: Interrelations and developmental patterns. *Development and Psychopathology*, 5, 683-701.
- Summers, G. F. (1995). Persistent rural poverty. In E. N. Castle (Ed.), *The changing American countryside: Rural People and places* (pp. 213-228). Lawrence, Kansas: University Press of Kansas.
- Tabachnick, B. G., & Fidell, L. S. (2001). Cleaning up your act: Screening data prior to analysis. In *Using Multivariate Statistics* (4<sup>th</sup> ed.). Toronto, Ontario, Canada: Allyn and Bacon.
- Taris, T. (2000). *A primer in longitudinal data analysis*. Thousand Oaks, CA: Sage.
- Teixeira, R. A. (1995). Rural education and training: Myths and misconceptions dispelled. In E. N. Castle (Ed.), *The changing American countryside: Rural people and places* (pp. 419-435). Lawrence, Kansas: University Press of Kansas.
- Theobald, P., & Nachtigal, P. (1995). Culture, community, and the promise of rural education. *Phi Delta Kappan*, 77, 132-135.
- Valentine, G. (1997). A safe place to grow up? Parenting, perceptions of children's safety and the rural idyll. *Journal of Rural Studies*, 13, 137-148.
- van Dam, F., Heins, S., Elbersen, B. S. (2002). Lay discourses of the rural and stated and revealed preferences for rural living: Some evidence of a rural idyll in the Netherlands. *Journal of Rural Studies*, 18, 461-476.
- Vera-Toscano, E., Phimister, E., & Weersink, A. (2000, December). Factors associated with female employment rates in rural and small town Canada [Electronic version] (Catalogue No. 21-006-XIE). *Rural and Small Town Canada Analysis Bulletin* 2(1), 1-8.
- von Eye, A., & Schuster, C. (2000). The odds of resilience. *Child Development*, 71, 563-566.



- Weinberg, N. Z. (2001). Risk factors for adolescent substance abuse. *Journal of Learning Disabilities, 43*, 343-351.
- Weiss, M. R., Smith, A. L., & Theeboom, M. (1996). "That's what friends are for": Children's and teenagers' perceptions of peer relationships in the sport domain. *Journal of Sport and Exercise Psychology, 18*, 347-379.
- Werner, E. E. (1985). Resilient offspring of alcoholics: A longitudinal study from birth to age 18. *Journal of Studies on Alcohol, 47*, 34-40.
- Werner, E. E. (1987). Vulnerability and resiliency in children at risk for delinquency: A longitudinal study from birth to young adulthood. In J. D. Buchard & S. N. Buchard (Eds.), *Prevention of delinquent behavior: Vol. 10. Primary prevention of psychopathology* (pp. 16-43). London: Sage.
- Werner, E. E. (1989). Vulnerability and resiliency: A longitudinal perspective. In M. Bambring, F. Lösel, & H. Skowronek (Eds.), *Children at risk: Assessment, longitudinal research, and intervention* (pp. 157-172). New York: Walter de Gruyter.
- Werner, E. E. (1993a). Risk and resilience in individuals with learning disabilities: Lessons learned from the Kauai Longitudinal Study. *Learning Disabilities Research and Practice, 8*, 28-34.
- Werner, E. E. (1993b). Risk, resilience, and recovery: Perspectives from the Kauai Longitudinal Study. *Development and Psychopathology, 5*, 503-515.
- Werner, E. E. (1999). Risk and protective factors in the lives of children with high-incidence disabilities. In R. Gallimore, L. P. Bernheimer, D. L. MacMillan, D. L. Speece, & S. Vaughn (Eds.), *Developmental perspectives on children with high-incidence disabilities*, (pp. 15-31). Mahwah, NJ: Lawrence Erlbaum.
- Werner, E. E. (2000). Protective factors and individual resilience. In J. P. Shonkoff, & S. J. Meisels (Eds.), *Handbook of early childhood intervention* (pp. 115-132). New York: Cambridge University Press.
- Werner, E. E., & Smith, R. S. (1982). *Vulnerable but invincible*. Toronto, Ontario, Canada: McGraw-Hill.
- Werner, E. E., & Smith, R. S. (1992). *Overcoming the odds: High risk children from birth to adulthood*. Ithaca: Cornell University Press.
- Willms, J. D. (2002a). Implications of the findings for social policy renewal. In J. D. Willms (Ed.), *Vulnerable children: Findings from Canada's National Longitudinal Survey of Children and Youth* (pp. 359-377). Edmonton, Alberta, Canada: University of Alberta Press.

- Willms, J. D. (2002b). Research findings bearing on Canadian social policy. In J. D. Willms (Ed.), *Vulnerable children: Findings from Canada's National Longitudinal Survey of Children and Youth* (pp. 331-358). Edmonton, Alberta, Canada: University of Alberta Press.
- Windle, M. (1992). A longitudinal study of stress buffering for adolescent problem behaviors. *Developmental Psychology*, 28, 522-530.
- Wotherspoon, T. (1998). Education, place, and the sustainability of rural communities in Saskatchewan. *Journal of Research in Rural Education*, 14, 131-141.
- Wyman, P. A., Cowen, E. L., Work, W. C., Hoyt-Meyers, L., Magnus, K. B., & Fagen, D. B. (1999). Caregiving and developmental factors differentiating young at-risk urban children showing resilience versus stress-affected outcomes: A replication and extension. *Child Development*, 70, 645-659.
- Young, R. A. (1977). Career development: Values, attitudes, and behavior in rural adolescent males. (Doctoral dissertation, McGill University, Canada, 1977). *Dissertation Abstracts International*, DAI-A 38/07, 3976.
- Zaff, J. F., Moore, K. A., Papillo, A. R., Williams, S. (2003). Implications of extracurricular activity participation during adolescence on positive outcomes. *Journal of Adolescent Research*, 18, 599-630.
- Zahn-Waxler, C., Klimes-Dougan, B., & Slattery, M. (2000). Internalizing problems of childhood and adolescence: Prospects, pitfalls, and progress in understanding the development of anxiety and depression. *Development and Psychopathology*, 12, 443-466.
- Zhang, Q., Loeber, R., Stouthamer-Loeber, M. (1997). Developmental trends of delinquent attitudes and behaviors: Replications and synthesis across domains, time, and samples. *Journal of Quantitative Criminology*, 13, 181-215.
- Zimmerman, M. A., & Arunkumar, R. (1994). Resiliency research: Implications for schools and policy. *Social Policy Report for the Society for Research in Child Development*, 8 (4), 1-20.
- Zucker, R. A., Wong, M. M., Puttler, L. I., & Fitzgerald, H. E. (2003). Resilience and vulnerability among sons of alcoholics: Relationship to developmental outcomes between early childhood and adolescence. In S. S. Luthar (Ed.), *Resilience and vulnerability: Adaptation in the context of childhood adversities* (pp. 76-103). New York: Cambridge University Press.

## Appendix II: Proposal for Access to Statistics Canada Restricted Data

Researcher: Ruth Fraser (M. A. Student)  
 Supervised by: Dr. Kimberly Schonert-Reichl, Faculty of Education, U.B.C.  
 Dr. Susan Dahinten, Faculty of Nursing, U.B.C.

1. Project title: Stability and Hope: Resilience Among Canadian Rural Adolescents?
2. Statement of Objectives: The stated objective of the NLSCY, "to monitor the effect of risk factors, life events, and protective factors on the development of [Canadian] children" (NLSCY Codebook, Cycle 1, p. 4), lends the dataset to analysis from within a resilience framework. As first explicated by Rutter (1979), Garmezy (1987), and Werner (Werner & Smith 1982), resilience is concerned with adaptive outcomes under circumstances of chronic adversity.

My research proposes to advance the study of resilience in two important ways. First, as with resilience research in American longitudinal studies in the 1990's involving large datasets (e.g., Masten et al., 1995), this study will use NLSCY data to extend analysis of protective and risk factors from late childhood to mid-adolescence. Second, it will analyze the data for Canadian youth living in rural and small town settings. Whereas to date Canadian rural literature has focussed on the transition to post secondary training (e.g., Andres & Looker, 2001) this study proposes to analyze educational aspirations at mid-adolescence. This rural analysis represents a modest beginning in a research area neglected both within NLSCY analysis and in the social sciences generally.

*Resilience* Late in the 20<sup>th</sup> century, the empirical study of factors that protect children in high-risk contexts represented a departure from the traditional study of maladaptation (Garmezy, 1987). Among factors that early resilience researchers found protective were relationships. Werner and Smith (1982), for example, demonstrated the protective function of relationships with, peers, teachers, and religious leaders. Later, researchers turned their attention to the protective influence of siblings and community leaders (Elder & Conger, 2000), and of extracurricular activities (Connor & Schonert-Reichl, 2001). The Child Development Project was singular in its demonstration of the long-term academic and social-emotional benefits of school bonding in early adolescence (Battistich, 2001).

Protective factors were measured against the historical tradition of the study of risk (Garmezy, 1987). Early resilience literature paid particular attention to the function of parental risk factors. Low education of the child's caretaker (a proxy for low SES, Dubois, Felner, Meares, & Krier, 1994; Stouthamer-Loeber et al., 1993; Werner, 1993), maternal depression (Grizenko & Pawliuk, 1994) and adverse parental behaviors such as alcoholism and divorce (Radke-Yarrow & Brown, 1993) have all been linked in resilience literature to increased risk for poor outcomes. Among qualities inherent in the child, learning disabilities have been found to be disproportionately represented among low SES populations (Spekman, Herman, & Vogel, 1993; Werner, 1993), and to be associated with increased risk (Grizenko & Pawliuk, 1994).

*Rural* As Canada entered the 21<sup>st</sup> century, census data revealed a trend towards increased urbanization. Yet, in 2001, nine million Canadians (30%) lived in rural areas (Mollins, 2002). In an increasingly technological society it appeared that, compared to their urban peers, isolation and poverty placed Canada's rural youth at risk for poor adult outcomes (Dupuy, Mayer, & Morissette, 2000).

Although rural communities figure nostalgically in North American consciousness, in reality "the stresses on rural communities have been accumulating over time" (Cahill & Martland, 1999, p. 157). Growing up in rural communities thus places Canadian rural youth at risk overall, despite certain positive community attributes. It is reported in empirical literature that, despite developing a distinct rural identity, Canadian youth felt disenfranchised from their communities. Limited access to diverse role models and limited opportunities for higher education

reduced the likelihood that rural youth could escape the poverty that characterized rural communities (Bollman & Biggs, 1992; Shepard & Marshall, 2000). As in the United States (Elder & Conger, 2000; Schonert-Reichl & Elliott, 1994), it is likely that the stronger community attachments of youth, along with the documented extra sense of place aspirations (Howley, Harmon & Leopold, 1996) and financial hardship involved in leaving home for higher education (Jeffery, Lehr, Hache, & Campbell, 1992) would lead to heightened internal conflict for rural youth. Thus, for Canadian rural mid-adolescents, protective relationships may predict conflicted or lowered educational aspirations even as the relationships protect the youth from internalizing and externalizing problems.

*Hypothesis* For rural Canadian mid-adolescents, multiple risks in early adolescence will differentially predict educational and psychological health outcomes in mid-adolescence, depending on the moderating influence of multiple protective factors (see Figure 1, p. 5).

### 3. Proposed statistical/research methodology:

Estimating my sample size using public microfile (PUMF) data, I propose to select predictor variables from Canadian children who were aged 10-11 at Cycle 1, and who lived in rural areas (N=1766) and small towns (N=1688). Using Cycle 3 data, outcome variables will be analyzed from the same youth at ages 14-15. To control for gender effects, I will first analyze data separately for girls and for boys, only pooling data when no statistically significant gender difference is measured. To account for diverse ethnicity, I will analyze data separately for aboriginal rural adolescents.

My predictor variables will be the *number* of risks that the 10-year-old children endure. I derived the design for my proposed research from a cross-sectional analysis of NLSCY data for six- and ten-year olds (Jenkins & Keating, 1998). Their risk index was composed of 10 risk factors: learning disabilities in the child, depression in the PMK, family size, income, hostility in the parent-child relationship, marital dissatisfaction, teen parenting status, divorce, and parental alcohol abuse. I propose to retain four of these measures of risk (parental alcohol abuse, depression in the PMK, divorced parents, and learning disability in the child). However, given that one of my outcome domains is educational aspiration, it is more fitting to use low maternal education as opposed to low family income as the risk measure for SES. Moreover, at age 10, the child's perception of low parental nurturance, low parental rejection, and low parental monitoring are arguably more valid measures of risk in the home environment than the parent-child hostility reported by Jenkins and Keating for younger children. Thus, the risk index that I propose is comprised of these eight measures: low maternal education; the child's perception of low parental nurturance and monitoring, and of parental rejection; parental alcohol abuse; depression in the PMK; divorced parents; and a learning disability in the child. Whereas seven variables represent adverse family conditions, one (learning disability) resides within the child. These eight risk variables are taken from the NLSCY parent and child questionnaires. From the sample, following the research tradition of resilient adaptation in the face of multiple risks (Rutter, 1979; Garmezy, 1987; Jenkins & Keating, 1998), low (0-1) and high (4+) levels of risk in rural children will be analyzed for their effects on mid-adolescent outcomes.

Distinct from the risk variables, all the protective factors are taken from the child questionnaire. They include both the child's relationships with siblings, peers, teachers, and community members; and the child's ties to school and community. The addition of relationships with community members to my design again extends the work of Jenkins and Keating (1998), appropriately reflecting the developmental needs of early adolescents. A further expansion of their design is to determine low and high levels of child bonding with their schools (through a combination of response items on the child questionnaire), and number of extracurricular activities, as additional protective factors. I thus plan to determine, for the low-risk and high-risk

10-11 year olds, the level of protection (i.e., number of relationships) at age 10-11 (Cycle 1) that moderates risk (Baron & Kenny, 1986), predicting better outcomes at age 14-15 (Cycle 3).

The outcomes are measures taken from the child questionnaire at Cycle 3. They again extend the research of Jenkins and Keating, who used externalizing disorder and internalizing disorder as their outcomes. Some of my outcomes (general self, anxiety/emotional disorder, conduct disorder, hyperactivity, and property offence) are NLSCY composite variables; others (substance abuse, educational aspirations) are outcomes that I will integrate from questionnaire items.

I plan to use hierarchical regression to analyze the effects of multiple risk factors and multiple putative protective factors at age 10-11 on indicators of healthy adaptation at age 14-15. Hierarchical regression adds to the predictive power of my analysis (Cohen & Cohen, 1983). This statistical technique has a strong research tradition of demonstrating resilient adaptation through the interactions and predictions that they reveal among individuals from the same sample at two or more points in time (Luthar, 1991; Masten et al., 1995).

Software requirements for this proposed research are satisfied with SPSS. Analysis of the outcomes is facilitated by the fact that all outcome measures are continuous variables.

4. Rationale for access to the confidential data: From its inception, resilience research has a strong tradition of longitudinal research (Garmezy, 1987; Werner & Smith, 1982). Specifically, the longitudinal research that we are proposing is a panel study, allowing stronger probability links between the same individuals at two points in time (Gall, Borg, & Gall, 1996). Whereas the PUMF cross-sectional data limits generalizations because it analyzes different cohorts (Jenkins & Keating, 1998), the confidential data file allows analysis of the same cohort over two time periods, at the brink of adolescence (Cycle 1) and again in mid-adolescence (Cycle 3). Such analysis will allow bolder probability predictions (Taris, 2000) regarding the process of resilient adaptation among high-risk rural adolescents.

5. Preferred project start and completion dates: We prefer to analyze the NLSCY data during the summer of 2003. As the principal applicant is a full time teacher who is completing a two-year sabbatical in the summer of 2002, the remainder of this research must be completed during summers. To complete the thesis requires two summers. Hence, depending on the turnaround time, it is feasible that we may continue to require access to the data as late as summer, 2004(5?).

6. Research Data Center at which the work would be done: BC Inter-University Research Data Center (BCIRDC) located at Koerner Library, UBC.

#### References

- Andres, L., & Looker, E. D. (2001). Rurality and capital: Educational expectations and attainments of rural, urban/rural and metropolitan youth. *Canadian Journal of Higher Education*, 31(2), 1-46.
- Battistich, V. (2001, April). Effects of an elementary school intervention on students' "connectedness" to school and social adjustment during middle school. In J. Brown (Chair), *Resilience education: theoretical, interactive and empirical applications*. Symposium conducted at the annual meeting of the American Educational Research Association, Seattle, WA.
- Bollman, R. D., & Biggs, B. (1992). Rural and small town Canada: An overview. In R. D. Bollman (Ed.), *Rural and small town Canada* (pp. 3-44). Toronto, Ontario, Canada: Thompson Educational.
- Cohen, J., & Cohen, P. (1983). *Applied multiple regression/correlation analysis for the behavioral sciences* (2<sup>nd</sup> ed.). Hillsdale, NJ: Lawrence Erlbaum.
- Cahill, M., & Martland, S. (1996). Community career counselling for rural transitions. *Canadian Journal of Counselling*, 30, 155-164.

- Connor, J., & Schonert-Reichl, K. A. (2001, April). Extracurricular participation in early adolescence: Links with peer group acceptance and emotional well-being. Poster presented at the biennial meeting of the Society for Research in Childhood Development, Minneapolis, MN.
- Dubois, D. L., Felner, R. D., Meares, H., & Krier, M. (1994). Prospective investigation of the effects of socio-economic disadvantage, life stress, and social support on early adolescent adjustment. *Journal of Abnormal Psychology* 103, 511-522.
- Dupuy, R., Mayer, F., & Morissette, R. (2000). Rural youth: Stayers, leavers, and return migrants. [Electronic version]. *Statistics Canada*. Retrieved July 24, 2002 from <http://www.statcan.ca:80/english/research/11F0019MIE/00152/11F0019MIE00152.pdf>
- Elder, G. H., Jr., & Conger, R. D. (2000). *Children of the Land*. Chicago: University of Chicago Press.
- Gall, M. D., Borg, W. R., & Gall, J. P. (1996). *Educational research: An introduction* (6<sup>th</sup> ed.). White Plains, New York: Longman.
- Garnezy, N. (1987). Stress, competence, and development: Continuities in the study of schizophrenic adults, children vulnerable to psychopathology, and the search for stress-resistant children. *American Journal of Orthopsychiatry*, 57, 159-174.
- Grizenko, N., & Pawliuk, N. (1994). Risk and protective factors for disruptive behavior factors in children. *American Journal of Orthopsychiatry*, 64, 534-544.
- Howley, C. B., Harmon, H. L., & Leopold, G. D. (1996). Rural scholars or bright rednecks? Aspirations for a sense of place among rural youth in Appalachia. *Journal of Research in Rural Education*, 12, 150-160.
- Jeffery, Lehr, Hache, & Campbell (1992). Empowering rural parents to support youth career development: An interim report. *Canadian Journal of Counselling*, 26, 240-255.
- Jenkins, J., & Keating, D. P. (1998, October). Risk and resilience in six- and ten-year-old children. (Human Resources Development Canada Research Branch Strategic Policy No. W-98-23E). Retrieved January 25, 2002 from <http://www.hrdc-drhc.gc.ca/arb/>
- Luthar, S. S. (1991). Vulnerability and resilience: A study of high-risk adolescents. *Child development*, 62, 600-616.
- Masten, A. S., Coatsworth, J. D., Neeman, J., Gest, S.D., Tellegen, A., & Garnezy, N. (1995). The structure and coherence of competence from childhood through adolescence. *Child Development*, 66, 1635-1659.
- Mollins, J. (2002, June). Rural research note: Canadian rural population trends [Electronic version]. Retrieved July 24, 2002 from [http://www.rural.gc.ca/research/note/note1\\_e.pdf](http://www.rural.gc.ca/research/note/note1_e.pdf)
- NLSCY Codebook (Cycle 1). National Longitudinal Survey of Children and Youth Cycles 1, 2, & 3, 1994-1999. UBC Library Data Services.
- Rae-Grant, N., Thomas, B. H., Offord, D. R.; & Boyle, M. H. (1989). Risk, protective factors, and the prevalence of behavioral and emotional disorders in children and adolescents. *Journal of American Child and Adolescent Psychiatry*, 28, 262-268.
- Radke-Yarrow, M., & Brown, E. (1993). Resilience and vulnerability in children of multiple-risk families. *Development and Psychopathology*, 5, 581-592.
- Rutter, M. (1979). Protective factors in children's responses to stress and disadvantage. In M. W. Kent and J. E. Rolf (Eds.), *Primary prevention of psychopathology, Vol. 3. Social competence in children* (pp. 49-74). Hanover, NH: University Press of New England.
- Schonert-Reichl, K. A., & Elliott, J. P. (1994, February). *Rural pathways: Stability and change during the transition to young adulthood*. Paper presented at the biennial meeting of the Society for Research on Adolescence, San Diego, CA.
- Shepard, B., & Marshall, A. (2000). Career development and planning issues for rural adolescent girls. *Canadian Journal of Counselling*, 34, 155-171.

- Spekman, N. J., Herman, K. L., & Vogel, S. A. (1993). Risk and resilience in individuals with learning disabilities: A challenge to the field. *Learning Disabilities Research and Practice*, 8, 59-65.
- Stouthamer-Loeber, M., Loeber, R., Farrington, D. P., Zhang, Q., van Kammen, W., & Maguin, E. (1993). The double edge of protective and risk factors for delinquency: Interrelations and developmental patterns. *Development and Psychopathology* 5, 683-701.
- Taris, T. (2000). *A primer in longitudinal data analysis*. Thousand Oaks, CA: Sage.
- Werner, E.E. (1993). Risk and resilience in individual with learning disabilities: Lessons learned from the Kauai longitudinal study. *Learning Disabilities Research and Practice*, 8, 28-34.
- Werner, E. E., & Smith, R. S. (1982). *Vulnerable but invincible*. Toronto, Ontario, Canada: McGraw-Hill.

Framework:

- Resilience

Context:

- Rural
- Adolescence: (early & middle)

Demographic Variables:

- Ethnicity
- Gender

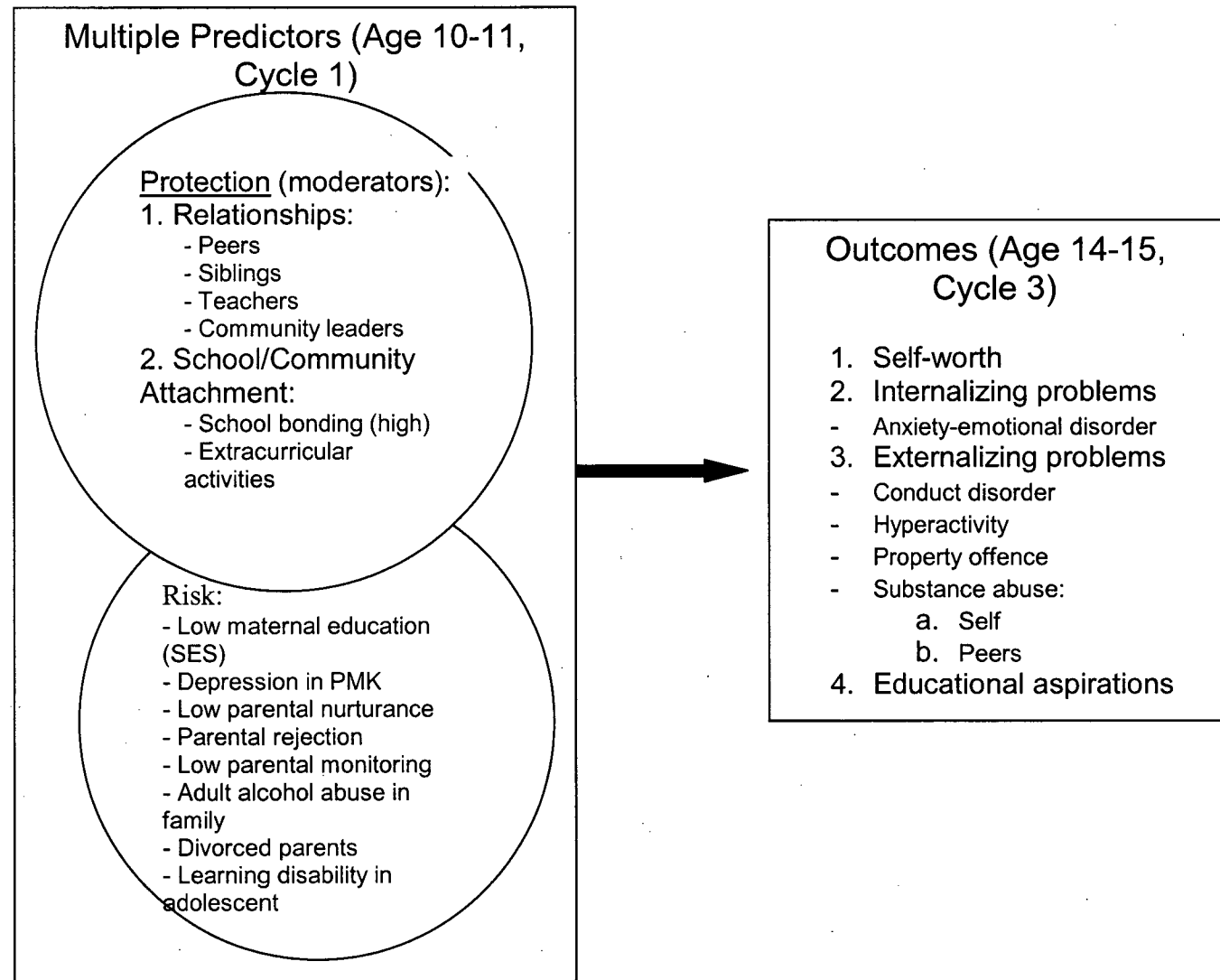


Figure 1: Stability and Hope: Resilience Among Canadian Rural Adolescents



## Appendix III

Table 9

*NLSCY Variables From Which Study Variables Were Derived*

| Variable name | R <sup>a</sup>   | I <sup>b</sup> | Response items   | Response scale <sup>c</sup>    |
|---------------|------------------|----------------|--|--------------------------------|
| Race          | PMK <sup>d</sup> | 1              | <i>How would you describe your child's race or colour? -</i> | 1 = <i>Yes.</i>                |
|               |                  |                | <i>Aboriginal</i>  | 2 = <i>No.</i>                 |
| Gender        | PMK              | 1              | -  | 1 = <i>Girls.</i>              |
|               |                  |                |  | 2 = <i>Boys.</i>               |
| Friends       | A1 <sup>e</sup>  | 4              | Scale total for Friends:                                     | 1 <i>False.</i>                |
|               |                  |                | <i>I have a lot of friends</i>                               | 2 <i>Mostly false.</i>         |
|               |                  |                | <i>I get along with kids easily</i>                          | 3 <i>Sometimes false/true.</i> |
|               |                  |                | <i>Other kids want me to be their friend</i>                 | 4 <i>Mostly true.</i>          |
|               |                  |                | <i>Most other kids like me.</i>                              | 5 <i>True.</i>                 |
|               |                  |                |  | Range 1 to 5.                  |
| -             | A1               | 1              | <i>Teacher I can talk to.</i>                                | 1 = <i>Yes.</i>                |
|               |                  |                |  | 2 = <i>No.</i>                 |

| Variable name | R <sup>a</sup> | I <sup>b</sup> | Response items   | Response scale <sup>c</sup>   |
|---------------|----------------|----------------|--|---|
| -             | A1             | 1              | <i>Coach or leader (e.g., scout or church leader) I can talk to.</i>   | 1= Yes.<br>2 = No.  |
| -             | A1             | 1              | <i>I feel like an outsider (or left out of things) at school.</i>  | 1 All of the time.<br>2 Most of the time.<br>3 Some of the time.<br>4 Rarely.<br>5 Never. |
| -             | A1             | 3              | <i>Outside of school, I take part in sports with a coach or instructor</i><br><i>Outside of school, I take part in Art, Dance or Music Groups or</i><br><i>Lessons</i><br><i>I take part in Clubs or groups such as Girl Guides or Boy</i><br><i>Scouts.</i> | 1 Never.<br>2 Less than once a week.<br>3 1 to 3 times a week.<br>4 4 times a week.       |

| Variable name                | R <sup>a</sup> | I <sup>b</sup> | Response items   | Response scale <sup>c</sup>  |
|------------------------------|----------------|----------------|--|--|
| Parental education           | PMK            | 2              | Female PMK education.  | 00 <i>No schooling.</i>  |
|                              |                |                | Female spouse of male PMK education.   | 03 <i>1 to 5 years of schooling.</i>                               |
|                              |                |                |  | 06 <i>6 years ...</i>  |
|                              |                |                |  | 13 <i>13 years of schooling.</i>                                   |
|                              |                |                |  | 16 <i>BA-BSc.</i>  |
|                              |                |                |  | 18 <i>Masters.</i>   |
|                              |                |                |  | 20 <i>MD-PhD.</i>  |
| Parental (PMK)<br>Depression | PMK            | 12             | Scale total: <i>How often you have felt or behaved this way during the past week:</i>            | 1 <i>Rarely or none of the time (&lt; 1 day).</i>                  |
|                              |                |                | <i>My appetite was poor.</i>   | 2 <i>Some or a little of the time (1-2 days).</i>                  |
|                              |                |                | <i>I felt that I could not shake off the blues even with the help from my family or friends.</i> | 3 <i>Occasionally or a moderate amount of the time (3-4 days).</i> |
|                              |                |                | <i>I had trouble keeping my mind on what I was doing.</i>  | 4 <i>Most or all of the time (5-7 days).</i>                       |
|                              |                |                | <i>I felt depressed.</i>   |  |
|                              |                |                | <i>I felt that everything I did was an effort.</i>   |  |
|                              |                |                | <i>I felt hopeful about the future [reverse scored].</i>   |  |
|                              |                |                |  | Range 0 to 36.   |

| Variable name      | R <sup>a</sup> | I <sup>b</sup> | Response items  | Response scale <sup>c</sup>          |
|--------------------|----------------|----------------|---|--------------------------------------|
| Parental (PMK)     |                |                | <i>My sleep was restless.</i>   |                                      |
| Depression,        |                |                | <i>I was happy [reverse scored].</i>                                  |                                      |
| (continued)        |                |                | <i>I felt lonely.</i>   |                                      |
|                    |                |                | <i>I enjoyed life [reverse scored].</i>                               |                                      |
|                    |                |                | <i>I had crying spells.</i>   |                                      |
|                    |                |                | <i>I felt that people disliked me.</i>                                |                                      |
| Parental rejection | A1             | 6              | Scale total: <i>My parents...</i>                                     | 1 <i>Never or not true.</i>          |
|                    |                |                | <i>soon forget a rule they have made.</i>                             | 2 <i>Sometimes or somewhat true.</i> |
|                    |                |                | <i>nag me about little things</i>                                     | 3 <i>Often or very true.</i>         |
|                    |                |                | <i>only keep rules when it suits them.</i>                            |                                      |
|                    |                |                | <i>threaten punishment more often than they use it.</i>               | Range 0 to 18.                       |
|                    |                |                | <i>enforce a rule or not depending upon their mood.</i>               |                                      |
|                    |                |                | <i>hit me or threaten to do so.</i>                                   |                                      |
| -                  | PMK            | 1              | <i>Drinking is a source of tension or disagreement in our family.</i> | 1 <i>Strongly agree.</i>             |
|                    |                |                |   | 2 <i>Agree.</i>                      |
|                    |                |                |   | 3 <i>Disagree.</i>                   |
|                    |                |                |   | 4 <i>Strongly disagree.</i>          |

| Variable name              | R <sup>a</sup>  | I <sup>b</sup> | Response items   | Response scale <sup>c</sup>   |
|----------------------------|-----------------|----------------|--|---|
| Who child lives with       | PMK             | 1              | Both biological parents.<br><br>One biological and one surrogate parent.<br><br>Two surrogate parents.   |   |
| -                          | PMK             | 1              | <i>Has your child received a diagnosis of learning disability from a health professional?</i>  | 1 = <i>Learning disability.</i><br>2 = <i>No learning disability.</i>   |
| General self               | A3 <sup>f</sup> | 4              | Scale total:<br><br><i>In general, I like the way I am.</i><br><br><i>Overall I have a lot to be proud of.</i><br><br><i>A lot of things about me are good.</i><br><br><i>When I do something, I do it well.</i> | 1 <i>False.</i><br>2 <i>Mostly false.</i><br>3 <i>Sometimes false, sometimes true.</i><br>4 <i>Mostly true.</i><br>5 <i>True.</i><br><br>Range 0 to 16. |
| Anxiety-emotional Disorder | A3              | 8              | Scale total:<br><br><i>I am unhappy, sad, or depressed.</i><br><br><i>I am not as happy as other people my age.</i><br><br><i>I am too fearful or anxious.</i><br><br><i>I worry a lot.</i>                      | 1 <i>Never or not true.</i><br>2 <i>Sometimes or somewhat true.</i><br>3 <i>Often or very true.</i><br><br>Range 0 to 16.                               |

| Variable name             | R <sup>a</sup> | I <sup>b</sup> | Response items   | Response scale <sup>c</sup>   |
|---------------------------|----------------|----------------|--|---|
| Anxiety-emotional         |                |                | <i>I cry a lot.</i>  |   |
| Disorder (continued)      |                |                | <i>I feel miserable, unhappy, tearful, or distressed.</i>  |   |
|                           |                |                | <i>I am nervous, high strung, or tense.</i>  |   |
|                           |                |                | <i>I have trouble enjoying myself.</i>   |   |
| Hyperactivity-inattention | A3             | 8              | Scale total:<br><br><i>I can't sit still, I am restless or hyperactive.</i><br><br><i>I am easily distracted. I have trouble sticking to any activity.</i><br><br><i>I fidget.</i><br><br><i>I can't concentrate, I can't pay attention.</i><br><br><i>I am impulsive, I act without thinking.</i><br><br><i>I have difficulty waiting for my turn in games or group activities.</i><br><br><i>I cannot settle to anything for more than a few moments.</i><br><br><i>I am inattentive, I have difficulty paying attention to someone.</i> | 1 <i>Never or not true.</i><br><br>2 <i>Sometimes or somewhat true.</i><br><br>3 <i>Often or very true.</i><br><br><br><br>Range 0 to 16. |

| Variable name                            | R <sup>a</sup> | I <sup>b</sup> | Response items  | Response scale <sup>c</sup>   |
|--|----------------|----------------|---|---|
| Conduct disorder-<br>physical aggression | A3             | 6              | Scale total:<br><br><i>I get into many fights.</i><br><br><i>When another kid accidentally hurts me I assume that the<br/>other kid meant to do it, &amp; I react with anger &amp; fighting.</i><br><br><i>I threaten people.</i><br><br><i>I am cruel, bully, or am mean to others.</i><br><br><i>I kick, bite, hit other people my age.</i> | 1 <i>Never or not true.</i><br><br>2 <i>Sometimes or somewhat true.</i><br><br>3 <i>Often or very true.</i><br><br>Range 0 to 12. |
| Property offence                         | A3             | 6              | Scale total:<br><br><i>I destroy my own things.</i><br><br><i>I destroy things belonging to my family or other young<br/>people.</i><br><br><i>I tell lies or cheat.</i>  | 1 <i>Never or not true.</i><br><br>2 <i>Sometimes or somewhat true.</i><br><br>3 <i>Often or very true.</i><br><br>Range 0 to 12. |

<sup>a</sup>R = Respondent. <sup>b</sup>I = Number of items. <sup>c</sup>Response scales and scale items reported in Appendix III are the original National Longitudinal Survey of Children and Youth scales and scale items. Those reported in Table 1 are response scales and scale items for this study. <sup>d</sup>PMK = Person most knowledgeable. <sup>e</sup>Respondent was the adolescent at Cycle 1. <sup>f</sup>Respondent was the adolescent at Cycle 3.