# A Gender-Based Comparison of Levels and Determinants of Adolescent Well-Being: Results from a Canadian National Survey[1]

Robert Weaver and Nazim Habibov

Abstract

Using data from Canada's National Longitudinal Survey of Children and Youth, the authors compared the levels of well-being between female and male adolescents and examined the specific determinants of well-being for each gender. The authors determined that a higher proportion of female youth reported doing well in school whereas the male youth reported higher levels of self-esteem and physical aggression. For both genders, the number of children living in the home and level of parental education were associated with their school performance. The self-esteem of female youth was apparently influenced by various parental factors such as home ownership status, level of education, and depression, whereas family dysfunction was associated with the self-esteem of male youth. Living in poverty, family dysfunction and parental age were all associated with the physical aggression levels of male youth, while for females, physical aggression was seemingly influenced by the level of parental education.

Introduction

Adolescence is a transitional period between childhood and adulthood characterized by the acquisition of skills deemed necessary to survive and to live independently from one's parents or other caregivers. While the

age range during which this transitional phase occurs varies, it frequently encompasses one's second decade of life (White, 2004).

Bergman and Scott (2001) note the divergent research findings regarding adolescence, as it has been labeled by some researchers as a crisis-ridden time "of Sturm und Drang (storm and urges) [characterized by] raging hormones, conflicts with parents, and peer pressures" (p. 183). Other researchers, however, opine that such a depiction is an overstatement, since "according to some findings, most adolescents maintain positive relationships with significant others and show few adjustment difficulties as they make the transition into adulthood" (p. 183).

Bergman and Scott (2001) suggest this divergence in findings may be partially attributed to the fact that even though well-being is a multi-dimensional construct, there are "often unstated theoretical and conceptual assumptions… subsumed in the misleadingly simple characterization [of] 'adolescent well-being'" (p. 183). In other words, differing conclusions regarding the specific determinants of adolescent well-being, and the extent to which youths actually experience or demonstrate well-being, may be at least partially due to how the construct is operationalized.

The purpose of this study is twofold: First, using a nationally representative sample of Canadian youth, we test for differences in levels of well-being between adolescent females and males. Second, through multivariate analysis we determine how poverty, as well as parental, familial, and neighborhood factors, influence adolescents' well-being. Bronfenbrenner's ecological systems model, which emphasizes how multiple levels of the environment influence developmental outcomes (Eamon, 2001), provides the theoretical rationale for our selection of these multi-level factors stated above. Analyses of these factors are done separately by gender, as we as ascertain the determinants of well-being for both adolescent females and males. Our literature review outlined below reflects how the ecological systems model informed our study, as we highlight previous studies that consider how familial and environmental influences, as well as poverty, affect adolescent well-being.

Literature Review

There are a limited number of studies which focus on the impact of the above-mentioned influences within a Canadian context. Hence, for the influences discussed in the literature review below we will commence with relevant Canadian studies (when they are available) and then proceed with international studies.

*Family Influences*

There is considerable evidence that family structure and dynamics influence the well-being of adolescents. For instance, Sampson and Laub (1994) analyzed data originally collected from delinquent and non-delinquent male youth who were raised in slum environments in Boston during the Great Depression era. This data were initially analyzed by Sheldon and Eleanor Glueck, who published their now classic study, entitled Unraveling Juvenile Delinquency, in 1950. The major finding by Sampson and Laub was that family processes, which include components such as parental discipline, supervision, and parent-child attachment, mediated about two-thirds of the effect of poverty and other structural factors on delinquent behavior. Hence, their findings suggest that "strong family social controls may serve as an important buffer against structural disadvantage in the larger community" (p. 538).

In their analysis of data from the 1987-88 National Survey of Families and Households (NSFH), Thomson, Hanson and McLanahan (1994) determined that family structure influenced the well-being of children and youth aged 5 – 18. For instance, poor academic performance was linked to living in a single-mother household, and children living with their mothers and stepfathers or a cohabitating partner exhibited more problematic behaviors, such as losing one's temper or bullying others, than did children living with both of their original parents. Moreover, Spruijt and de Goede's (1997) analysis of data from the Utrecht Study of Adolescent Development (USAD) revealed that youth between 12 to 24 years of age from single-parent families scored lowest on various measures of psychological well-being, whereas those from stable, intact families scored the highest. Moreover, youth from single-parent families reported a higher rate of problems within their own personal relationships, including divorce, than did the other participants.

Michael, Torres, and Seemann (2007) referred to scores from the Perceptions of Interparental Conflict Intensity/Frequency (PIC-I/F) scale as a means of dividing a sample of late adolescents (17-19 year-olds) into either a High Family Conflict (HC) or Low Family Conflict (LC) group. The authors found that family conflict seemed to negatively influence adolescent well-being in a variety of ways. For instance, the HC group reported lower levels of academic performance and self-worth than did their LC counterparts. Furthermore, the HC group was less likely to set aside time for personal relaxation.

Craig (2006) mined data from the Australia Bureau of Statistics (ABS) Time-use Survey (TUS) to explore how parental education affects child-rearing strategies and practices. Craig found a positive association

between the level of parents' education and the amount of time they spent caring for their children. This time is "mainly spent in physical and developmental care … activities believed to be critical for social and linguistic development" (p. 568). Craig also found that while women at all education levels did more housework and childcare than men, there was a positive relationship between the education level of males and the amount of time they spent in childcare activities, including the amount of time they reported being in "sole charge" (p. 570) of their children.

On the other hand, Han (2006) determined that maternal nonstandard work schedules (i.e., hours of employment primarily in evenings, nights, or weekends) is negatively associated with their children's levels of school engagement and extracurricular activities. It should be noted that in this study Han analyzed data from the National Survey of American Families (NSAF), a representative sample of the population under the age of 65 and which contains an over-sample of families whose incomes are under 200% of the poverty line.

The quality of the parent-youth relationship is also a determinant of adolescent well-being. This is evinced by Turner, Kaplan, and Badger (2006), who conducted two studies with two separate samples of adolescent Hispanic females living in the New York area. In one of the studies, they found that those participants in mental health treatment who had "good relationships with their mothers" (p. 272) were less likely to attempt suicide. In the other study, a strong mother-daughter relationship was associated with positive attitudes toward school for youth enrolled in an after-school program.

*Environmental Influences*
Curtis, Dooley, and Phipps (2003) used data from the Canadian National Longitudinal Survey of Children and Youth (NLSCY) to test the association between the well-being of children aged 4 – 11 and the quality of the neighborhood they resided in. They found an association between lower-quality neighborhoods and poorer outcomes in children. This result was obtained based on various outcome measures relating to the emotional, behavioral, and physical vitality of the children, whereas neighborhood quality measures included indicators such as safety, cohesiveness (e.g., helpfulness of neighbors) and problems (e.g., garbage or drugs). Other factors which predicted poor child outcomes were residing in a single-parent home and low family income.

In their investigation on the influence of neighborhood conditions on the school functioning and psychological adjustment of adolescents, Meyers and Miller (2004) operationalized neighborhood distress by combining a scale that measured community problems, such as

insufficient police protection and the number of abandoned buildings, with school quality, which incorporated elements such as school safety, school discipline, and the skills of teachers. The researchers reported that even after controlling for parental and peer factors, as well as the socioeconomic status of the family of origin, adolescents living in high-risk neighborhoods were more apt to experience psychological difficulties and problems at school. Likewise, Caughy and O'Campo (2006) found that the economic impoverishment of a neighborhood had a negative impact on the cognitive development of children residing in that neighborhood. In this case, the economic impoverishment measure was comprised of the neighborhood poverty rate, unemployment rate, vacant housing rate, and the proportion of single-headed households with children under the age of 5.

Kowaleski-Jones and Dunifon (2006) used data from America's National Longitudinal Survey of Youth (NLSY) to explore how community context (which included indicators such as neighborhood quality, residential stability, and school quality) and family structure influenced the well-being of adolescents. Separating the sampled youth by race (i.e., Black and White), the researchers operationalized well-being through academic performance, behavior, and psychological functioning. The results of their analysis suggest community-level factors play a "key role in influencing the well-being of U.S youth" (p. 127). Community factors were particularly robust predictors of well-being amongst Black youth, whereas the community context appeared to mediate some of the effect of family structure on the well-being of White adolescents.

*Poverty*

In their analysis of data from the Montreal Longitudinal-Experimental Study, Pagani, Boulerice, Vitaro, and Tremblay (1999) observed that persistent financial hardship for boys aged 10-15 years predicted their poor academic functioning. Moreover, transitory family poverty, as opposed to persistent poverty, was linked to the male youths' higher risk of engaging in "extreme delinquency" (p. 1217), or behaviors such as breaking and entering, purposely setting a fire, and vandalizing a car.

Low family income was also associated with the poor cognitive development of children aged 4-15 years in a study of Canadian youth conducted by Lethbridge and Phipps (2006). To et al. (2004) investigated determinants of various facets of children's developmental (e.g., motor, social, cognitive) attainment by analyzing data from Canada's NLSCY. Poverty was found to be a significant determinant of poor developmental attainment (PDA), as were low maternal education (i.e., less than high school), maternal immigrant status, and maternal depression.

Eamon (2001) analyzed data from the NLSY to ascertain if parental, peer, and neighborhood factors mediate the association that poverty has with antisocial behavior (e.g., bullying, breaking things on purpose, cheating, and showing little remorse for engaging in such activities) exhibited by youth aged 10 to 12-years-old. Although Eamon's multivariate analysis indicated that the above factors mediated the influence of poverty, it nonetheless remained a "statistically significant" (p. 16) predictor of antisocial behavior amongst youth. In another study on the determinants of problematic behavior exhibited by British youth, Collishaw, Goodman, Pickles, and Maughan (2007) found a significant relationship between low family income and behaviors such as fighting, bullying, and stealing.

There is also evidence that poverty is detrimental to the physical health of adolescents. For instance, poor youth are more likely than non-poor youth to reside in environments and homes where the pollution levels exceed recommended safety thresholds and to have unsafe levels of lead in their bodies (Brooks-Gunn & Duncan, 1997; Evans, 2004; OECD, 2003, cited by Smith & Ashiabi, 2007). They are also at higher risk for HIV/AIDS, sexual abuse, and being victims of violence than are non-poor youth (Smith & Ashiabi, 2007).

Weitoft, Hjern, Batljan, and Vinnerljung (2008) analyzed registry data of over 1 million Swedish families to examine the relationship between disposable income, length of social assistance receipt, and the health and social outcomes of children and youth. The researchers' findings indicated that those children and youth who lived in families receiving social assistance on a long-term (i.e., greater than one year) basis experienced worse health and social outcomes than did other children and youth, including those from low-income families not in receipt of social assistance on a long-term basis. Low income on its own was associated with negative outcomes, but the relationship between low income and negative outcomes further increased when length of social assistance receipt was taken into account.

*Gender Differences*
There have also been studies that have considered gender differences in regards to adolescent well-being. For instance, Benjet and Hernanadez-Guzman (2001) surveyed approximately 1100 Mexican youth between the ages of 9 - 14 as a means of assessing the impact that puberty has on the psychological well-being of female and male youth. The researchers found that while prepubertal females and males reported similar levels of depression, the depression levels of postpubertal females steadily worsened while those of postpubertal males stayed the same. Moreover,

the body image of males improved while the body image of females noticeably decreased, which contributed to the authors' conclusion that it appears "early adolescence is a particularly difficult time for females…..[and there is a need] for the design and implementation of prevention and intervention programs" (p. 62).

In their analysis of the 1994-1997 Youth Surveys of the British Household Panel Study (BHPS), Bergman and Scott (2001) investigated gender differences in the well-being of adolescents. Measuring well-being with the constructs of positive self-esteem, negative self-efficacy, unhappiness, and worrying, the researchers found that females reported lower levels of self-esteem and self-efficacy than did the males, as well as higher levels of unhappiness and worrying.

In a longitudinal study with Chinese adolescents from low-income families, Shek (2005a) determined that for adolescent females, high levels of family dysfunction predicted higher levels of psychological distress and lower levels of overall mental health. Family functioning had no such effect on the psychological functioning of adolescent males, however, prompting Shek to opine that since "Chinese women tend to use their family to define their identity, this would make them more susceptible to the influence of the family" (p. 536).

While the studies noted above do provide some valuable information regarding the difference between female and male adolescents in respect to their psychological status, it is evident that more studies are needed to determine if the two genders differ in levels of other indicators of well-being, be they physical, behavioral, or mental. Moreover, there is a paucity of knowledge regarding if there are differences between female and male adolescents in regards to the specific determinants of their well-being. If differences do occur, then this has important implications for human service program development and implementation, as services targeting adolescents, such as afterschool programs, may require gender-specific interventions (Shek, 2005).

As noted above, adolescent well-being is a multidimensional construct that may be captured empirically in a variety of ways. This is reflected in our study, as we measure adolescent well-being by incorporating indicators of perceived academic performance, psychological functioning, and behavior, as found in Kowaleski-Jones and Dunifon (2006).

In this study we analyze data from the Canadian NLSCY as a means of answering two specific research questions: (1) Do female and male adolescents differ in their levels of well-being, as measured by indicators of their perceived academic performance, psychological functioning, and

behavior?  (2) What are the specific determinants of well-being for both female and male adolescents?

Methodology
*Data*
As outlined above, the data set used in this study is the Canadian NLSCY. This survey represents a nation-wide research effort to study the development and well-being of Canadian youth from birth to early adulthood. The NLSCY is jointly designed and implemented by Statistics Canada, Canada's national statistics authority, and Human Resources Development Canada, in order to collect information about factors influencing the social, emotional, and behavioral development of Canadian children and youth. The NLSCY records information about children's personal health, physical development, learning, and behavior. Moreover, it includes information about children's social environments, such as their families, peer groups, and the neighborhoods they reside in (Statistics Canada and Human Resource Development Canada, 1995).

This study uses cycle 4 of the NLSCY, which is the latest publicly available cycle with a cross-sectional sample of Canadian children and youth.  The data collection for cycle 4 was conducted between September 2000 and June 2001, with a resultant sample of 30,540 youth.  The final release of the micro-data file with updated sample weights was initiated on December 2004. The cycle 4 sample represents all Canadian children and youth who were 0 to 17 years old on January 1st, 2001 (Statistics Canada, 2005).

Given their different levels of development, not all of the children and youth participating in cycle 4 were asked questions, nor were the same questions asked of all the youth. Only youth between the ages of 10-15 responded to all of the questions pertaining to the well-being indicators that we selected for this study.  Hence, our study sample consisted of 5,806 Canadian youth, all between the ages of 10-15 at the time of data collection.  There were 2,907 males and 2,899 females.

To construct data that is nationally representative of the total population of Canadian children and youth, the NLSCY employs a complex sample design, including stratification, clustering, multiple stages of selection, and unequal probabilities of the selection of respondents. Such a complex sample design may render the result of estimations seriously biased, especially when multivariable modeling is involved (Levy & Lemeshow, 2008).

In order to compute correct estimations from the NLSCY, we used a subprogram developed and recommended by Statistics Canada for the STATA 10 statistical software package (Stata, 2007; Statistics Canada,

2001).  By using this subprogram, we were able to provide correct estimations from the NLSCY when taking into account the complex survey design outlined above. Hence, all "weighted" estimations in this paper are nationally representative.

*Measures*
Independent variables.  The "Person Most Knowledgeable" (PMK) about the children responded to the questions that formed the basis for the independent variables we selected for this study.   The independent variables were both discrete and continuous.  The discrete variables were single parent (0 = no; 1 = yes), not owning one's dwelling (0 = no, which means person owns their own dwelling; 1 = yes), PMK is not in good health (0 = no, which means she/he is in good health; 1 = yes), total family income is below Statistics Canada's Low-Income Cutoff (LICO) (0 = no, 1 = yes), the PMK is female, and the PMK is not a university graduate (0 = no, meaning she/he is a university graduate, 1 = yes).

As for the continuous independent variables, they were the age (in years) of the PMK, the number of children in the family aged 0 – 17 years, and the years lived in the neighborhood. Moreover, there were measures of family functioning (scores ranged from 0 – 36, with a higher score indicating a higher level of family dysfunction, Cronbach's alpha = .88), depression of PMK (scores ranged from 0 – 36, with a higher score indicating the greater presence of depressive symptoms, Cronbach's alpha = .82), social support (scores ranged from 0 – 24, with a higher score indicating a greater presence of social support for the PMK, Cronbach's alpha = .88), and neighborhood safety (scores ranged from 0 – 9, with a higher score indicating a greater sense of safety within the neighborhood one resides in, Cronbach's alpha = .70) (Statistics Canada, n.d.).

Dependent variables. The data used to measure the construct of adolescent well-being, which consisted of four indicators, were collected from the youth participating in the survey.  For perceived school performance, a dichotomous variable was constructed to measure if the youth believed she/he was doing well in school (0 = no; 1 = yes).  The other indicators were continuous measures. They were self-esteem (scores ranged from 0 to 16, with a higher score indicating higher self-esteem, Cronbach's alpha = .73), indirect aggression (scores ranged from 0 – 16, with a higher score indicating a higher level of indirect, or non-physically aggressive behavior, Cronbach's alpha = .73), and direct aggression (scores ranged from 0 – 16, with a higher score indicating a higher level of direct, or physically aggressive behavior, Cronbach's alpha = .73) (Statistics Canada, 2001).

Results

The descriptive statistics for the entire sample, both weighted and unweighted, may be found in Table 1. We will focus our discussion on the weighted sample only. Approximately 91% of the parents considered the "Person Most Knowledgeable" (PMK) about the children in their household were female, with an average PMK age of 41.4 years and 2.2 children living in the household. Approximately 80% of the parents surveyed owned their own homes, and about 24% of the PMKs were university graduates. Nearly 14% (13.6) of the children in this study lived in a household with an income below Statistic Canada's Low Income Cut-off (LICO), Canada's most often used indicator of poverty (Curtis et al., 2004), and 19% lived in a single-parent family.

Table 1

*Weighted and unweighted descriptive statistics of the sample*

| Variables | Weighted Sample | | Unweighted Sample | | | |
|---|---|---|---|---|---|---|
| | Mean or % | Std. Error | Mean or % | SD | Min. | Max. |
| *Dependent* | *variables* | | | | | |
| selfesteem | 13.26 | 0.06 | 13.29 | 2.57 | 0 | 16 |
| dowellschool | | | | | | |
| 0 (no) | 31.98 | 1.18 | 30.1 | | | |
| 1 (yes) | 68.02 | 1.18 | 69.9 | | | |
| indaggress | 1.41 | 0.07 | 1.42 | 1.72 | 0 | 10 |
| phyaggress | 1.11 | 0.04 | 1.15 | 1.77 | 0 | 12 |
| | | | | | | |
| *Independent* | *variables* | | | | | |
| agepmk | 41.38 | 0.20 | 40.35 | 5.42 | 16 | 76 |
| nochildhouse | 2.18 | 0.03 | 2.12 | 0.89 | 1 | 8 |
| famfunc | 9.06 | 0.13 | 9.16 | 4.74 | 0 | 34 |
| depress | 4.42 | 0.15 | 4.32 | 5.63 | 0 | 36 |
| socsupp | 18.59 | 0.11 | 18.39 | 3.58 | 0 | 24 |
| nbhdsafe | 6.52 | 0.05 | 6.58 | 1.55 | 0 | 9 |
| yearsnbhd | 8.85 | 0.17 | 9.10 | 7.06 | 0 | 41 |
| singleparent | | | | | | |
| 0 (no) | 81.13 | 0.87 | 82.41 | | | |
| 1 (yes) | 18.87 | 0.87 | 17.59 | | | |

Table 1 (continued)

| Variables | Mean or % | Std. Error | Mean or % | SD | Min. | Max. |
|---|---|---|---|---|---|---|
| notowndwell | | | | | | |
| 0 (no) | 80.17 | 1.03 | 83.02 | | | |
| 1 (yes) | 19.83 | 1.03 | 16.98 | | | |
| nogoodhealth | | | | | | |
| 0 (no) | 90.31 | 0.69 | 91 | | | |
| 1 (yes) | 9.69 | 0.69 | 9 | | | |
| belowlico | | | | | | |
| 0 (no) | 86.38 | 0.85 | 87.43 | | | |
| 1 (yes) | 13.62 | 0.85 | 12.57 | | | |
| pmkfemale | | | | | | |
| 0 (no) | 8.85 | 0.69 | 8.27 | | | |
| 1 (yes) | 91.15 | 0.69 | 91.73 | | | |
| nounivgrad | | | | | | |
| 0 (no) | 24.06 | 1.33 | 20.31 | | | |
| 1 (yes) | 75.94 | 1.33 | 79.69 | | | |

Refer to Table 2 for a frequency distribution of each indicator of adolescent well-being for the entire sample. Seventy-eight percent of the youth participants reported self-esteem scores in the relatively high range of 12 to 16, while 69.9% reported doing well in school. In terms of indirect aggression, 87.1% of the participants scored at the low end of the continuum, that is, scores between 0 and 3, whereas 90.3% had the same scores for the direct aggression measure.

Table 2
*Distribution of Dependent Variables as Percentage of Observations*

| Score | Self-esteem | Doing Well in School | Indirect Aggression | Physical Aggression |
|---|---|---|---|---|
| 0 | .13 | 30.1 | 41.2 | 52.76 |
| 1 | .02 | 69.9 | 22.62 | 20.03 |
| 2 | .07 | | 14 | 10.92 |
| 3 | .16 | | 9.26 | 6.61 |
| 4 | .31 | | 6.28 | 3.46 |
| 5 | .29 | | 3.76 | 2.48 |
| 6 | .69 | | 1.37 | 1.86 |
| 7 | 1.07 | | .69 | .67 |
| 8 | 2.5 | | .6 | .6 |
| 9 | 3.64 | | .16 | .25 |

Table 2 (continued)

| Score | Self-esteem | Doing Well in School | Indirect Aggression | Physical Aggression |
|---|---|---|---|---|
| 10 | 5.83 | | .07 | .09 |
| 11 | 7.31 | | | .16 |
| 12 | 10.12 | | | .11 |
| 13 | 12.06 | | | |
| 14 | 15.06 | | | |
| 15 | 17.98 | | | |
| 16 | 22.74 | | | |

We compared the female and male youth on the four indicators of well-being outlined above. For perceived academic performance, 33.2% of the male youth reported not doing well in school while 66.8% reported doing well. There was a greater proportion of female youth who reported doing well in school (72.9%), while 27.1% reported not doing well. To test for significant differences, we computed the Pearson chi-square statistic while using the Rao-Scott correction factor, which takes into account the complex survey design used in the study and determines the proper p value, the adjusted F statistic, and the degrees of freedom (Lee & Forthofer, 2006). The findings suggest that perceived academic performance is dependent upon gender, as $p < .001$. Refer to table 3 for a summary of this bivariate analysis.

Table 3
*Comparison of Males and Females on Dichotomous Dependent Variable (weighted)*

| | Male | Female | Total |
|---|---|---|---|
| Do well in school? | | | |
| No | 719 | 609 | 1328 |
| Yes | 1445 | 1639 | 3084 |
| Total | 2164 | 2248 | 4412 |

Pearson:
Uncorrected chi-square (1) = 20.96
Design-based $F(1,1000) = 8.32$; $p = 0.0040$

As outlined above, the other three indicators of adolescent well-being were continuous measures. We tested for significant differences between the female and male youth in respect to these indicators with the adjusted Wald test, which is appropriate for data from surveys with complex

designs (Bijl, Cuijpers, & Smit, 2002).  In regards to self-esteem, there were significant differences between the females (M = 13.09, SE = .09) and the males (M = 13.38, SE = .08).  The male youth also scored significantly higher on the measure of physical aggression (M = 1.45, SE = .06) than did the female youth (M = 0.79, SE = 0.04), but there were no significant differences pertaining to indirect aggression.  Refer to table 4 for a summary of the findings.

Table 4
*Comparison of Females and Males on Continuous Dependent Variables (weighted)*

| Variable | Mean | Std. Err. | 95% CI |
|---|---|---|---|
| Selfesteem* | | | |
| Female | 13.09 | 0.09 | [12.92, 13.27] |
| Male | 13.38 | 0.08 | [13.21, 13.54] |
| | | | |
| Indirect Aggression | | | |
| Female | 1.43 | 0.05 | [1.33, 1.56] |
| Male | 1.39 | 0.06 | [1.28, 1.50] |
| | | | |
| Direct Aggression** | | | |
| Female | 0.79 | 0.04 | [0.71, 0.88] |
| Male | 1.45 | 0.06 | [1.33, 1.58] |

*Note. *p* < .05; *p* <. 001*

In regards to our multivariate analysis on the determinants of adolescent well-being, we conducted ordinary least squares (OLS) regression when ascertaining the determinants of self-esteem but we used tobit regression for the indirect and direct aggression indicators.  The tobit specification is suitable when data contain obvious floor effects, such as the aggression indicators, both of which yielded a high proportion of zeroes (Curtis et al., 2004).  We employed a logit function for the dichotomous perceived school performance indicator.

Hence, there were a total of four multivariate models and for each model we ran separate regressions on the data pertaining specifically to the female and male participants as a means of identifying the particular determinants of well-being for both genders.  We addressed the issue of multicollinearity by utilizing the method used by Habibov and Fan (2008), in which we ran simple linear regressions between the individual

predictors and the outcome variables. Any predictor variable whose coefficient in the simple regression test was in the opposite direction from its coefficient in a full model was dropped from the analysis.

Table 5 outlines the results of the multivariate analyses for the self-esteem and perceived school performance outcomes. Family functioning was the only predictor associated with the self-esteem of males, whereby as levels of family dysfunction increased their self-esteem decreased. As for females, a negative association was detected between the age of the PMK and self-esteem. Moreover, a lower self-esteem of females was associated with homes where the parent(s) did not own their own home, and specific characteristics of the PMK such as increasing levels of depression and not graduating from university. For both genders, perceived school performance was positively associated with the number of children living in the home and negatively associated with the PMK not graduating from university.

Table 5
*Determinants of self-esteem and doing well in school among Canadian female and male adolescents (weighted)*

| | Self-esteem | | | | Do well in school | | | |
|---|---|---|---|---|---|---|---|---|
| | Female | | Male | | Female | | Male | |
| Variables | Coef. | Std. Err. | Coef. | Std. Err. | Coef. | Std. Err. | Coef. | Std. Err. |
| singleparent | 0.26 | 0.33 | 0.11 | 0.24 | 0.07 | 0.30 | 0.24 | 0.26 |
| notowndwell | -.93* | 0.43 | -0.61 | 0.33 | 0.04 | 0.33 | -.61* | 0.30 |
| nogoodhealth | -0.31 | 0.45 | 0.05 | 0.30 | 0.26 | 0.36 | -0.01 | 0.41 |
| belowlico | 0.56 | 0.45 | 0.22 | 0.33 | -0.53 | 0.38 | | |
| agepmk | -.056* | 0.02 | 0.02 | 0.02 | -0.01 | 0.03 | -0.00 | 0.02 |
| pmkfemale | 0.20 | 0.37 | -0.03 | 0.38 | -0.25 | 0.36 | 0.55 | 0.31 |
| nochildhouse | 0.03 | 0.16 | -0.08 | 0.13 | .35** | 0.12 | .28** | 0.11 |
| nounivgrad | -.83*** | 0.24 | -0.39 | 0.22 | -.67* | 0.28 | -.54* | 0.25 |
| famfunc | -0.01 | 0.03 | -.056* | 0.03 | 0.00 | 0.03 | -0.04 | 0.02 |
| depress | -.09*** | 0.02 | 0.00 | 0.02 | -0.01 | 0.02 | -0.01 | 0.02 |
| socsupp | 0.02 | 0.03 | 0.02 | 0.03 | 0 | 0.03 | -0.02 | 0.03 |
| nbhdsafe | -0.05 | 0.07 | -0.05 | 0.06 | 0.11 | 0.07 | 0.07 | 0.06 |
| yearsnbhd | -0.01 | 0.02 | -0.01 | 0.02 | 0.04 | 0.02 | 0.00 | 0.02 |
| _cons | 16.4*** | 1.47 | 13.6*** | 1.37 | 0.63 | 1.31 | 0.46 | 1.22 |
| | Obs. | 1493 | Obs. | 1409 | Obs. | 1475 | Obs. | 1402 |
| | F(13) | 3.53 | F(13) | 1.74 | F(13) | 2.03 | F(12) | 2.55 |
| | Pr. > F | 0.00 | Pr. > F | 0.05 | Pr. > F | 0.02 | Pr. > F | 0.00 |
| | $R^2=$ | 0.08 | $R^2=$ | 0.03 | | | | |

Table 6 depicts the results of our regression analyses with the indirect and direct aggression outcomes.  Beginning with indirect aggression, there were no significant predictors for females.  For males, however, increasing levels of family dysfunction and neighborhood safety predicted higher levels of aggression, whereas the increasing age of the PMK predicted lower levels. The PMK's status of not graduating from university was associated with an increased level of physical aggression amongst female youth.  For male youth, age of PMK was a negative predictor of physical aggression levels, whereas living below the LICO and family dysfunction were positive predictors.

Table 6
*Determinants of indirect and physical aggression among Canadian male and female adolescents (weighted)*

| | Indirect aggression | | | | Physical aggression | | | |
| | Female | | Male | | Female | | Male | |
| Variables | Coef. | Std. Err. | Coef. | Std. Err. | Coef. | Std. Err. | Coef. | Std. Err. |
|---|---|---|---|---|---|---|---|---|
| singleparent | -0.42 | 0.41 | 0.18 | 0.34 | -0.44 | 0.41 | 0.49 | 0.36 |
| notowndwell | 0.20 | 0.44 | -0.02 | 0.36 | 0.51 | 0.48 | -0.57 | 0.43 |
| nogoodhealth | -0.15 | 0.40 | 0.87 | 0.50 | 0.75 | 0.52 | 0.71 | 0.47 |
| belowlico | 0.71 | 0.60 | 0.25 | 0.42 | 1.00 | 0.62 | .90* | 0.45 |
| agepmk | -0.02 | 0.03 | -.05* | 0.02 | 0.01 | 0.03 | -.06* | 0.03 |
| pmkfemale | 0.58 | 0.55 | -0.22 | 0.39 | -0.79 | 0.45 | 0.66 | 0.50 |
| nochildhouse | 0.10 | 0.16 | 0.12 | 0.13 | 0.17 | 0.16 | 0.16 | 0.15 |
| nounivgrad | 0.00 | 0.31 | 0.072 | 0.35 | .84* | 0.34 | 0.39 | 0.35 |
| famfunc | 0.03 | 0.03 | .09** | 0.03 | 0.04 | 0.03 | .10*** | 0.03 |
| depress | -0.01 | 0.02 | -0.02 | 0.02 | 0.01 | 0.03 | 0.01 | 0.02 |
| socsupp | -0.01 | 0.03 | -0.01 | 0.04 | 0.05 | 0.04 | 0.03 | 0.04 |
| nbhdsafe | -0.08 | 0.08 | .16* | 0.07 | -0.01 | 0.10 | 0.02 | 0.09 |
| yearsnbhd | -0.01 | 0.02 | 0.00 | 0.02 | -0.04 | 0.02 | 0.01 | 0.02 |
| _cons | 1.19 | 1.76 | 0.75 | 1.47 | -2.52 | 1.85 | -0.28 | 1.63 |
| /sigma | 2.67*** | 0.13 | 2.54*** | 0.10 | 2.88*** | 0.16 | 2.83*** | 0.13 |
| | | | | | | | | |
| Obs. | 1467 | Obs. | 1369 | Obs. | 1463 | Obs. | 1368 |
| F(13) | 0.82 | F(13) | 1.85 | F(13) | 2.57 | F(13) | 2.58 |
| Pr. > F | 0.64 | Pr. > F | 0.03 | Pr. > F | 0.00 | Pr. > F | 0.00 |

Discussion

There are several noteworthy implications that arose from this study. First, our finding that a higher proportion of adolescent females than

males assessed their own academic performance in a positive fashion bears some resemblance to other recent studies (Commonwealth Government of Australia, 2003, cited in Beaman, Wheldall, & Kemp, 2006; Demie, 2001), in which teenage females outperformed teenage males in terms of scholastic achievement. In their investigation into why female secondary students were outperforming male secondary students in the UK, Younger and Warrington (1996, cited in Beaman, Wheldall, & Kemp, 2006) found that the males reported less positive support from teachers for their classroom learning than did the females. While it would be premature to conclude in our study that a discrepancy in teachers' responses based on students' gender was a reason for the differences in reported academic achievement, this area certainly "warrants further analysis" (Beaman, Wheldall, & Kemp, 2006, p. 363).

Second, our bivariate analysis suggested a higher level of self-esteem amongst the male participants. Support for this finding is also found in the literature, such as the Bergman and Scott (2001) study discussed above. Also, in their meta-analysis, Sahlstein and Allen (2002, cited in Frost & McKelvie, 2004) noted an apparent decrease in females' self-esteem and an increase in males' self-esteem during their transition from childhood to adolescence. Furthermore, in their analysis of the self-esteem levels of elementary, high school, and university students, Frost and Mckelvie (2004) found that as the age of the participants increased, the male participants reported higher levels of self-esteem than did the female participants. In order to gain insight into this gender-based discrepancy, Frost and Mckelvie conducted regression analysis, and found that cathexis, or how participants felt about a number (21 in total) of their separate body parts, "was the most consistent predictor of self-esteem" (p. 52). Taken together, these findings suggest that as adolescents age and develop, males perceive their own body parts in a more favorable fashion than do females; a conclusion similar to that made by Benjet and Hernandez-Guzman (2001) in their study outlined above.

Third, our multivariate analysis demonstrated that the determinants of self-esteem differed by gender. For example, only family dysfunction was negatively associated with the self-esteem of males. For females, however, self-esteem was strongly associated with particular PMK characteristics, such as renting or owning one's dwelling, depression levels, and education level.

This suggests that the self-esteem of female adolescents is much more dependent on the status of the PMK. In other words, female adolescents are apparently more likely to assess their own self-esteem on the basis of particular attributes of the PMK. Given that approximately 91% of the PMKs were female, it is not surprising that the female

adolescents were more apt than the males to so closely identify with the PMK in this fashion. We suggest that this tendency of female adolescents to assess their own self-esteem on the basis of their mother's attributes should be taken into consideration when planning programs/interventions aimed at increasing the self-esteem of female adolescents. When striving to boost the self-esteem of male adolescents, however, it appears that particular attention should be paid to the functioning of their families.

Fourth, as outlined in the results section, the determinants of the youths' perceived academic performances were identical for both genders. It is noteworthy that the education level of the PMK was a significant predictor; perhaps in situations where at least one parent has a university education there tends to a strong emphasis on academic achievement within the home. Moreover, the likelihood of university-educated parents having the financial capability to provide their children with an intellectually-stimulating home environment (e.g., copious amounts of reading material, access to a computer, etc.), which could translate into a high level of academic achievement, is quite high.

Fifth, our finding of a positive association between the number of children in the home and perceived academic performance warrants attention, particularly when one considers the sizeable body of evidence which supports the resource dilution hypothesis. This hypothesis postulates that with more children in a family there is a greater dilution of resources, not only financial but also cultural and intellectual, which can impede the likelihood of the children's academic success (Steelman, Powell, Werum, & Carter, 2002). Nevertheless, along with our findings, there have been other studies (Downey, 1995; Rodgers, 2001, cited in Steelman et al., 2002), which call into question the resource dilution hypothesis. It is possible that the presence of more siblings, through activities such as tutoring and the sharing of information, provides greater opportunities for the intellectual stimulation of children/youth, thus boosting their academic achievement. More research in this area is needed.

In addition, our multivariate analysis of the determinants of indirect and direct aggression yielded some interesting results, such as the positive association between perception of neighborhood safety and indirect aggression amongst the male participants. A possible explanation for this is that in safer neighborhoods males channel their physically aggressive impulses into indirectly aggressive behavior, since directly aggressive behavior would not be rewarded through the same acquisition of power and influence as it would be in more dangerous neighborhoods. Rather, youths engaging in directly aggressive behavior in safer neighborhoods would be more subject to punitive responses from authority figures and

ostracism.  While this is plausible, more research is necessary to verify this hypothesis.

In terms of direct aggression, the PMK's status of not graduating from university was a significant predictor for the female participants. As for the male participants, those living in homes where total family income was below the poverty threshold were more likely to engage in directly aggressive behavior.

This finding is in accord with general strain theory (GST), which predicts that youths living in poverty, frustrated by their difficulty or inability to secure the material goods deemed so important within an individualistic, capitalist society, may adapt to this strain in a variety of ways.  For males in particular, one form of adaptation may be engaging in aggressive acts and/or violent crime (Broidy & Agnew, 1997).  This suggests that when planning interventions aimed at decreasing physical aggression amongst youth, the impact of poverty should also be taken into account, particularly when one considers the declining capacity of the Canadian safety net to reduce familial and individual hardship (Habibov & Fan, 2007).

Slep and O'Leary (2007) reported a negative association between parental age, for both mothers and fathers, and their level of physical and psychological aggression toward their children.  Given that one of the consequences of parental aggression is aggressive behavior exhibited by the children (Winton & Mara, 2001), it is reasonable to assume that children of older parents may be less inclined toward engaging in physically aggressive behavior due to the fact that they are less likely to be recipients of parental aggression. This may partially explain our finding of a negative association between age of PMK and direct aggression for male youth.

In conclusion, a noteworthy strength of this study was the nationally representative sample that allowed us to generalize our results to the total population of Canadian adolescents between 10 – 15 years of age. Moreover, the multi-level nature of our independent variables, whose selection was predicated on the ecological systems model, allowed us to consider the determinants of adolescent well-being in a comprehensive manner.  Our finding of differences between female and male youth in regards to their levels and determinants levels of well-being suggest that program planners should consider the adoption of gender-specific interventions when designing and implementing human service programs for adolescents.

Finally, the limitations of this study should also be noted.  First of all, the cross-sectional nature of the survey used in this study inhibits the establishment of causal inferences.  Hence, further investigation on this

topic should be conducted in which longitudinal data are analyzed. Second, the variables selected for analysis in this study are based on western views of adolescent development. Future studies should incorporate variables that reflect nonwestern views of youth development, such as Afrocentricism (Schiele, 2001) and First Nations perspectives (Barter, 2009; Mckenzie, 2005). Lastly, the data set used in this study did not allow for comparisons based on cultural variation and immigration status when identifying variables that influence youth functioning. Hence, future studies should also make comparisons on these above-mentioned factors when ascertaining the determinants of adolescent well-being.

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Authors' notes

Robert D. Weaver, PhD, Assistant Professor, and Nazim N. Habibov, PhD, Assistant Professor, are at the School of Social Work, University of Windsor.

Address correspondence to: Robert D. Weaver, School of Social Work, University of Windsor, 401 Sunset Avenue, Windsor, Ontario, Canada N9B 3P4 (email: rdweaver@uwindsor.ca).