

# Stressor Frequency and Perceived Intensity as Predictors of Internalizing Symptoms: Gender and Age Differences in Adolescence

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The primary goal of the present study was to determine whether male and female adolescents experience different levels of stressful events and report different levels of internalizing symptoms over the age range from 11 to 20 years. The secondary goal was to determine whether females appraise events as more intensely stressful than males. Questionnaire measures of stress frequency and intensity, and internalizing (i.e., depression, anxiety, psychosomatic symptoms, and self-esteem) were obtained from 1012 boys and 1493 girls. Consistent with past studies, gender and age differences were found in the self-reported occurrence of everyday stressors and in levels of internalizing symptoms. Girls reported significantly more stressful events from age 12 to 17 than boys, and girls showed higher levels of internalizing from age 13. We also found that girls reported higher perceived stressor intensity than boys.

Adolescence is not an easy developmental period for many teenagers. When children enter adolescence, they are suddenly exposed to a variety of new experiences and challenges. Some of these experiences and challenges originate from within, such as dealing with pubertal changes, while others are associated with external forces such as peer pressure (Cummings, Greene, & Karraker, 1991). Consequently, how adolescents cope with these challenges and the impact this has on their adjustment has been the impetus for a large amount of research.

Research on adolescents has found that girls are less well adjusted than boys and that this gender difference varies by age (Cryanowski, Frank, Young, & Shear, 2000; Crystal et al., 1994; Nolen-Hoeksema & Girgus, 1994; Poikolainen, Kanerra, & Lonnqvist, 1995). These findings have

led researchers to suggest that boys and girls at different ages in adolescence may either face different challenges or that they may perceive them differently. The general aims of the present study were: 1) to identify the ages at which girls and boys begin to differ in the reported frequencies of stressful events as well as levels of a number of internalizing symptoms, 2) to determine whether the relationships between stressor frequency and internalizing symptoms are moderated by gender and age, and 3) to investigate whether there are gender and age differences in adolescents' perceived intensity of stressors.

## Stressors

One reason that could account for adolescent girls reporting higher internalizing scores could be the number or type of stressors they experience. Stress in adolescence has been studied

by a number of researchers (e.g., Ge, Lorenz, Conger, Elder, & Simons, 1994; Jose, Cafasso, & D'Anna, 1994; Jose, D'Anna, Cafasso, Bryant, Chiker, Gein, & Zhezmer, 1998; Tubman & Windle, 1995), and they have defined the stress process in a variety of ways. The chief goal in this study was to assess adolescents' responses to a stress measure that assessed a large number of different aspects of adolescent life. Some stress measures include relatively small numbers of items (see Aldwin, 1994; Cohen, Kessler, & Gordon, 1995), but the measure used here (from Jose et al., 1994) assessed 50 potentially stressful events.

The stress measure used in this study was based on Lazarus and Folkman's (1984) Transactional Stress Model. Lazarus (1966) has defined stress as "difficult transactions between individuals and situations" (p. 5). Lazarus and Folkman's model stipulates that when an event occurs, it is first appraised as to whether it is threatening or not; this is called primary appraisal. If the event is considered to be potentially harmful to the person's wellbeing, then secondary appraisal occurs, in which one evaluates one's resources in relation to the stressor. Resources in this instance are determined by judgments about the degree of the threat, whether the threat can be avoided, and personal coping abilities. Jose and colleagues' stress scale (1994; 1998) assesses for 50 potential events whether the event happened, whether it was judged to be

a problem or not (primary appraisal), and if it was judged to be a problem, how much of a problem it was assessed to be.

A major question here is whether gender differences in the number or type of stressful events that occur in adolescents' lives can be found. A number of recent studies (e.g., Rudolph & Hammen, 1999; Tubman & Windle, 1995; Wenz-Gross, Siperstein, Untch, & Widaman, 1997) have found gender and age differences in stressor occurrence. In short, they find female adolescents, particularly those in middle adolescence, report higher levels of stressful events. However, gender differences have not been consistently found in stressor frequency. Ge et al. (1994) conducted a longitudinal study over four years on early adolescents (aged from 9 to 12 years in the first year). They examined the longitudinal patterns of uncontrollable stressful life events and symptoms of depression over this time period, and found that girls and boys experienced approximately equal numbers of stressors. Nonetheless, when they examined the relationship between stressors and depressive symptoms they did find age differences. After age 13, girls' levels of depressive symptoms increased. Furthermore, the change in depressive symptoms was significantly related to changes in the number of stressful events experienced. Hence, the relationship between stressor frequency and depression appeared to strengthen as girls matured, whereas it decreased for males. This led Ge et al. to conclude that girls are more vulnerable to stressors than boys. These findings, viewed in relation to Lazarus and Folkman's (1984) Transactional Stress Model, suggest that girls may not necessarily experience more stressors, instead, they may appraise these events as more threatening or may feel the effect of stressors more intensely.

### *Internalizing Symptoms*

The outcome measures used in the current study were depression, self-esteem, anxiety, and psychosomatic symptoms. There has been evidence of gender and age differences in all of these measures (Baldwin & Hoffmann, 2002; Crystal et al., 1994; Hankin, Abramson, Moffit, Silva, McGee, & Angell, 1998;

Nolen-Hoeksema & Girgus, 1994; Poikolainen et al., 1995; Quatman & Watson, 2001). Results show that girls report higher levels of depression, anxiety, and psychosomatic symptoms and lower levels of self-esteem than boys.

Self-esteem, in particular, is an outcome measure in which gender and age differences have frequently been found during adolescence. Baldwin and Hoffmann (2002) used a longitudinal design to focus on self-esteem patterns in adolescence. They found that changes in self-esteem were influenced by life events, and that they differed for boys and girls. There were also significant age differences. Girls' self-esteem followed a U-shaped curve, increasing until age 12, then dropping until age 17, and then increasing dramatically to age 21. For boys the pattern was quite different, self-esteem increased until age 14, then decreased to age 16, then increased erratically until age 21. Similar results (an age by gender interaction) have been obtained by Hankin et al. (1998) and Poikolainen et al. (1995) in which girls display an inverted-U shape over age (i.e., quadratic trajectory), whereas boys tend to show a relatively linear increase over time. The present dataset derives from a large-scale cross-sectional study that encompasses a 10-year age span from age 11 to 20 years, and is therefore uniquely positioned to answer this question. Mean group comparisons will elucidate whether New Zealand adolescents yield similar patterns as obtained in overseas samples.

### *Association between Stressor Frequency and Internalizing Symptoms*

If the pattern described above (i.e., girls reporting higher stressor frequency and maladjustment than boys during middle adolescence) can be obtained for a New Zealand sample, a related question must then be answered: does increased stressor frequency account for the worse adjustment of girls during this period? No New Zealand studies have examined gender differences in stressor frequency and adjustment in a fashion that would allow for an unambiguous answer to this question. A powerful analytic tool that can be used in this context is moderation

(Baron & Kenny, 1986; Holmbeck, 1997). With this technique one can determine whether gender moderates the relationship between stressors and adjustment, in essence answering the question of whether the relationship between stressor frequency and a given internalizing symptom is similar or different for boys and girls. Numerous studies have shown that stressor frequency is positively correlated with negative adjustment (see Zeidner & Endler, 1996), however a definitive answer to the question of whether gender affects this relationship is lacking. A few studies from North America have employed this technique (e.g., Forehand, Neighbors, & Wierson, 1991; Moran & Eckenrode, 1991), and a number of these findings support the view that stressor frequency is more strongly associated with adjustment for girls than for boys. We will use this technique to determine whether moderation varies by age across the broad age range examined here.

### *Stressor Intensity*

A measure of stressor frequency does not capture the psychological appraisal of those events. We decided that we would construct a measure of stressor intensity from the answers to the present stress measure to determine whether females appraise the stressful events that happen to them as more intensely stressful than do males. Although a recent study on this issue by Kendler, Thornton, and Prescott (2001) did not find that women respond to stressors more intensely or acutely than men, other researchers (e.g., Nolen-Hoeksema, 1998) have argued that the reason that females report higher depression is because they are more responsive and reactive to a given stressful event. We chose to measure stress in such a fashion that would allow us to create a measure of stressor intensity, i.e., by separating occurrence of events from the appraisals made about them, so an examination of whether females report higher levels of stressor intensity than males and whether this purported stress intensity varies across the age range examined here will be made.

### Hypotheses

The first hypothesis was that main effects of gender and age on the frequency of everyday stressors experienced would be found, namely that girls and older adolescents would report greater stressor frequency. Second, an interaction of gender and age on stressor frequency was expected to be found, with females reporting more everyday stressors after age 13 than males (yielding a quadratic trend), whereas boys were expected to evidence a linear trend over time. The third hypothesis was that similar age and gender patterns of results would be obtained for the four internalizing symptoms. The fourth hypothesis predicted that the degree of association between stressor frequency and internalizing would be stronger for females than males. Finally, the fifth prediction was that females would evidence a greater level of stressor intensity than males, and sixth, this heightened sensitivity to stressors would be most evident among girls beginning at age 13 years.

### Method

#### Participants

Participants were 2505 New Zealand-residing adolescents aged between 10 and 20 years. The sample was composed of 1012 males and 1493 females, ranging from year 7 through to 2nd year at university. Participants were recruited from schools chosen from the Auckland, Wellington, Manukau City, Franklin, and Timaru areas using a Ministry of Education index of schools. Approximately 35 schools were approached, and 22 agreed to participate. All schools that wished to participate were sent parental consent forms which were distributed to adolescents younger than 16 years. According to APA guidelines and ethical approval, parental consent was obtained in writing for all participants under 16 years. Parental consent rates varied from school to school (20 to 70%; average of about 40%). Participants 16 years and over were able to provide their own consent. The sample was divided into nine single-year age groups from 11 to 19 years: 10 and 11 year olds were collapsed into the first category,

and all participants over 19 years were likewise combined into the ninth category.

Ethnic and socio-economic data were collected regarding the subjects. The ethnic breakdown of the sample was 69% European New Zealand/Pakeha, 7% Maori, 5% Pacific Nations, 10% Asian, and 9% Other. Participants were allowed to identify themselves in more than one category; if this occurred, the individual was coded into the less populous ethnicity. For example, if a participant ticked both European New Zealander/Pakeha and Maori, he or she was coded as Maori. Furthermore, if a participant ticked more than two categories among Maori, Pacific Nations, and Asian, they were coded in the Other category, thus, making this category larger than it otherwise might have been.

Most (73%) of the adolescents lived at home with both biological parents, and 16% lived in a single-parent family. This second category was then broken down into widowed (1%), divorced (7%), and separated (8%). There were 9% living with a natural parent and a step-parent, and 2% specified living in another arrangement by ticking the "other" category. Socio-economic status was assessed according to the New Zealand Socio-Economic Index of Occupational Status (NZSEI), which is based on New Zealand norms. This scale ranges from 10 (people who receive a benefit) through 90 (doctor) and includes prestige, education, and income factors. The average status for mothers was  $M = 44.12$ ,  $SD = 16.27$ , and for fathers it was  $M = 51.46$ ,  $SD = 19.18$ .

#### Materials

All participants completed the same booklet of questionnaires. All of the scales have been adapted specifically for adolescents, considering reading and competency levels.

#### Stressors

Everyday stressors were measured using Jose et al.'s (1994) Everyday Life Events Scale for Children (ELESC). This scale has 50 items. Examples are: you misplaced or lost things; you were bored; not enough fun things to do; and schoolwork was too hard. This scale

was designed to reflect aspects of Lazarus and Folkman's (1984) Transactional Stress Model. Three steps were involved in completing the scale: 1) participants were first asked to indicate whether a particular event occurred in the last month (yes or no); 2) if they indicated that an event had happened, participants were then asked to state whether they judged it to be a problem or not (primary appraisal: no or yes); and 3) finally, if they indicated that it was a problem, they were asked how much of a problem they considered it to be (0 = "not at all", 1 = "a little", 2 = "some", or 3 = "a lot"). In this study, we chose to focus on the summed "did it happen" scores and the summed "how much" scores. Scores could range from 0 to 50 on the first measure and 0 to 150 on the second measure. Reliabilities were calculated using Cronbach's alpha, and they were judged to be adequate,  $\alpha_s = .86$  and  $.88$ . Previous use of this stress measure by Jose et al. (1994; 1998) suggests that it is a valid measure because both stressor scores have been shown to be associated with various measures of negative adjustment to a substantial degree.

The measure of stressor intensity that we used in the current study was created from the two judgments described above. The total "how much" score was divided by the total number of stressor items that were ticked as having occurred during the last month (i.e., "did it happen" scores) to yield the stressor intensity score. For example, one adolescent might have reported that 4 stressful events had happened, and she also reported a total score of 6 on the "how much" scale. A boy might have reported that 4 events had happened also, but he might have reported a total score of 3 on the "how much" scale. The girl, then, is said to experience more stressor intensity (1.50) than the boy (0.75). This score represents the degree to which the individual appraises the average stressful event to be problematic. By dividing the "how much" score by the "did it happen" score, we have essentially placed all individuals on the same measuring scale: their intensity score tells us how intensely problematic a single stressful event is. The hypothetical girl apparently feels mid-

way between "a little" and "some", whereas the boy's intensity falls between "not at all" to "a little".

The questionnaire asked the adolescent to report an event if it had happened within the last month. Sometimes longer periods of time are allowed for recollection of stressors (see Cohen, Kessler, & Gordon, 1995), but these measures typically assess major life events which are easier to remember. A one-month period was deemed to be appropriate for frequently occurring and less noteworthy everyday events (e.g., losing something, not getting along with a classmate, etc.).

### Depression

The depression scale used was the Children's Depression Inventory (CDI) developed by Kovacs (1985). The scale has 27 items that offer three alternative options, signifying severity of depressive feelings. Example of a triad is: "I am sad once in a while," "I am sad many times," or "I am sad all the time." The participants are asked to select the option from the triad that best described how they have felt over the last two weeks. The options are rated from 0 to 2, with 0 being the least severe, 1 being the mid-point, and 2 being the most severe. The range of possible scores was 0 to 54, with higher scores indicating higher depression. Reliability was found to be good in the present study, Cronbach's  $\alpha = .89$ . This measure has been used extensively over the last 17 years; and considerable research evidence exists to suggest that it is a reliable and valid scale for measuring depression in children and adolescents.

### Self-esteem

Self-esteem was measured using the general self-worth items from Harter's (1982) Perceived Competence Scale for Children. This sub-factor includes 7 items, which included statements such as, "I am sure of myself," "I am unhappy about the way I am (reverse-coded)," and "I feel good about the way that I act." Items are scored from 1 to 4, with total scores ranging from 4 to 28, higher scores indicating higher self-esteem. Reliability was calculated and found to be adequate, Cronbach's  $\alpha = .81$ . This scale has been one of the most frequently used self-esteem scales over

the last 20 years, and considerable evidence exists to suggest that it is a reliable and valid measure.

### Anxiety

The anxiety scale used was a shortened version of Reynolds and Richmond's (1997) Children's Manifest Anxiety scale. The scale is composed of 23 items. Items included, "I have trouble making up my mind," "I am tired a lot," and "I get mad easily". Participants were required to mark yes or no to indicate whether they believed the statement described them or not. Affirmative answers were coded as 1 and negative answers as 0, thus scores could range from 0 to 23, with high scores signifying higher anxiety. Reliability for this scale was good, Cronbach's  $\alpha = .85$ . This scale is also considered to be a valid measure due to its extensive use in research and clinical practice.

### Psychosomatic symptoms

The psychosomatic scale was the Psychosomatic Symptoms Scale as used by Crystal et al. (1994). This scale included 13 items asking if participants had experienced any of the stated symptoms in the last six months. Items included "a headache," "overeaten," or "eye problems". The scale used was a 5-point Likert scale ranging from 1 = never to 5 = almost every day. Therefore, scores could range from 13 to 65, with high scores indicating higher psychosomatic symptoms. The scale also had adequate reliability, Cronbach's  $\alpha = .81$ . Crystal et al. (1994) found this scale to be a valid measure of psychosomatic symptoms.

### Procedure

Depending on the number of students who were to complete the questionnaire, either one or two researchers went to each school to administer the questionnaire to the participants. For the younger participants (10 to 12 years), a researcher presented overhead projections of each part of the questionnaire explaining each measure to them as they went. Participants were seated individually at desks, and were asked to remain silent while filling out the questionnaire. Questions about the meaning of a word, format, etc. were

addressed to the researchers. Participants were advised that they could stop at any stage during the session. Sessions typically took between 30-60 minutes, depending on the age of the respondents. As the questionnaire addressed sensitive items, at the conclusion of each session, participants were given contact telephone numbers of people who could assist if they wished to talk about any of the issues raised in the questionnaire. Students were debriefed at the end of the session.

## Results

### Descriptive statistics

Means and standard deviations were calculated for each of the measures, and were found to be comparable with other samples in the literature (see Baldwin & Hoffman, 2002; Crystal et al., 1994; Jose et al., 1998): frequency of everyday life events ( $M = 17.49$ ,  $SD = 15.28$ ); depression ( $M = 10.59$ ,  $SD = 7.71$ ); psychosomatic symptoms ( $M = 28.48$ ,  $SD = 7.51$ ); anxiety ( $M = 9.00$ ,  $SD = 5.19$ ); and self-esteem ( $M = 22.02$ ,  $SD = 4.19$ ). The number of participants in each age group, broken down by gender yielded an average of 116 per cell, with a minimum of 42 and a maximum of 255. The overall gender ratio was 58% female/male, and varied from 50 to 73% for individual age groups. The total number of participants was 2090, reflecting listwise deletion for missing data. Although we intended to include about equal numbers of males and females across the nine age groups, some age groups exhibited a somewhat skewed gender ratio (e.g., 73% for 15-year-olds). Still, given the size of the entire sample and the wide range of age groups, it was hoped that these asymmetries would not exert a strong influence on the results.

Pearson's correlations were calculated to assess the relationships among stressor frequency, depression, psychosomatic symptoms, anxiety, and self-esteem, and are shown in Table 1. Significant correlations were found among the four outcome measures—they ranged from .38 to .71—and these suggest considerable overlap among these variables. However, the correlations were not in the high range (e.g., .70 to .90), which would support combination into a single variable, so

all four internalizing symptoms were treated separately in the analyses.

### Hypothesis testing

**Everyday stressors.** Hypothesis 1 proposed that gender and age differences would be found in the frequency of everyday stressors experienced. A two-way (2 x 9) ANOVA was conducted with frequency of everyday stressors as the dependent variable, age and gender as the independent variables, and socio-economic status (SES) scores as the covariate. SES scores proved to be a marginally significant covariate,  $F(1, 1972) = 2.76, p = .097, \eta^2 = .001$ . Significant main effects were found for gender,  $F(1, 1972) = 32.19, p < .001, \eta^2 = .016$ , and age,  $F(8, 1972) = 7.26, p < .001, \eta^2 = .029$ . The average frequency of everyday stressors was higher for girls,  $M = 16.97, SD = 7.37$ , than for boys,  $M = 14.63, SD = 8.06$ . A post-hoc contrast analysis showed that frequency scores generally increased in a linear fashion with age, contrast estimate = 4.54,  $p < .001$ , all other polynomial contrasts were non-significant. Hypothesis two was examined with the two-way interaction: a significant interaction was obtained,  $F(8, 1972) = 2.89, p < .01, \eta^2 = .012$ . Figure 1 shows the cell means for the interaction, adjusted by SES scores. In order to investigate the interaction further, one-way ANOVAs were conducted between genders within each age group. Significant differences between males and females were obtained for the age groups between 12 and 17 years; all other age groups yielded non-significant results. Taken together, these results

Table 1. Intercorrelations Among Stressor Frequency and Adjustment Measures

	Depression	Psychosomatic	Anxiety	Self-esteem
Stressor frequency	.35***	.45***	.48***	-.34***
Depression		.49***	.65***	-.71***
Psychosomatic			.51***	-.38***
Anxiety				-.56***

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

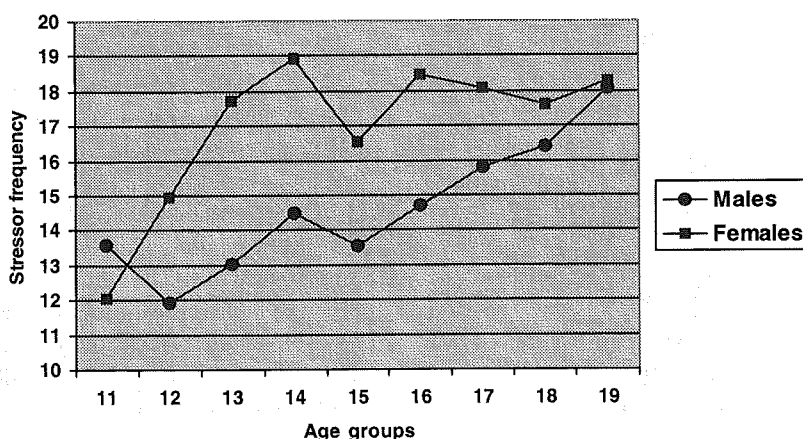
support hypotheses one and two, in that female adolescents reported higher levels of stressor frequency, a significant linear trend was obtained over this age range, and the significant interaction between age and gender showed that girls and boys manifested different developmental patterns during middle adolescence. Girls reported significantly higher stressor frequency during middle adolescence.

A closer examination of the types of stressful events noted by participants was effected by conducting a two-way MANOVA with gender and age groups as the two independent variables, SES as the covariate, and the 50 items of the ELESC as the dependent variables. All three terms proved to be significant, and were duly probed with univariate statistics. Twenty-six of the 31 significant findings for gender were found to be higher for females than males. Females reported more incidences for the following items: lost something; someone teased or avoided you; schoolwork was too hard; feeling rushed; doing chores at home; difficulty finding a quiet place at home; did something embarrassing; trying to get along with others in class; went to

doctor/dentist; a parent was mean to you; a parent told you their problems; unable to talk to others about one's feelings; not being able to see relatives because they live far away; not liking the way you look; not being liked by someone in your class; going to bed too late; taking care of younger siblings; received a lower grade than expected; not being with parents as much as you wanted; someone in your family was upset; took the bus to school; arguing with parents; arguing with siblings; weighing too much; not enough time for play or fun; and not feeling safe. Males, on the other hand, reported more incidences of: weighing too little; not enough food to eat; not able to watch TV or play videogames; gangs in the school or neighborhood; and fighting or violence in school or neighborhood.

The main effect for age groups was probed, and of 29 significant findings, 19 items showed a linear increase over time (lost something; not enough money; schoolwork was hard; you were rushed; you did something embarrassing; you thought about war; trying to get along with a classmate; you went to the doctor; a parent told you about their worries; you were unable to talk to other people about your feelings; not liking the way you look; going to bed too late; received a lower grade than expected; dealt with someone who didn't understand your culture; you took the bus to school; saw a family member drunk; too many people live in your house; being alone too much; and weighing too much), 5 showed a decrease over time (punished for something; picked last for a team; not being liked by a classmate; argued with sibling; and something stolen from you), and 5 revealed a curvilinear relationship (doing chores at home; took care of younger children; schoolwork was boring; not being with parents as much

Figure 1. Mean frequencies of everyday stressors by age group and gender.



as you wanted; and arguing with parents).

And finally, 14 significant univariate interaction patterns were identified. The chief pattern that was found for most of these items is exemplified by the finding presented in Figure 2 for "arguing with your parents". Many of these patterns showed that females and males at the youngest ages reported similar levels of stressor frequency, but beginning at about 13 years of age, girls reported strikingly higher levels, and this difference generally decreased or ceased by 19 years. Variations on this basic pattern were found, but space does

not permit a complete explication of all of these patterns.

**Internalizing symptoms.** To test hypothesis three, analyses were conducted with a two-way ANOVA to assess gender and age differences in the four internalizing symptoms. SES scores served as the covariate again. Multivariate main effects were found for both gender,  $F(4, 1682) = 15.66, p < .001, \eta^2 = .036$ , and age,  $F(32, 6740) = 2.82, p < .001, \eta^2 = .013$ . Significant univariate results for gender were obtained for all four dependent variables: females reported higher depression, anxiety, and psychosomatic complaints, and lower self-esteem than

males. Significant univariate results for age were obtained for depression, self-esteem, and psychosomatic complaints. Depression and self-esteem revealed both a linear and a quadratic trend, whereas psychosomatic complaints yielded only a linear trend. All three generally trended upward with age. A significant multivariate interaction between age and gender was also obtained,  $F(32, 6740) = 1.84, p < .01, \eta^2 = .009$ , and univariate results were obtained for depression and psychosomatic complaints. Figure 3 displays the cell means for the interaction for depression (a similar pattern was obtained for psychosomatic complaints). In order to investigate the interaction further, one-way ANOVAs were conducted between genders within each age group. Significant differences between males and females were obtained for the age groups between 13 and 16 years; all other age groups yielded non-significant results. These results were found to support hypothesis three: main effects in the expected direction were found for both gender and age, and an interaction effect was obtained, with girls showing more depression and psychosomatic complaints from age 13 to 16 years.

**Prediction of internalizing complaints with stressor frequency.** Hypothesis 4 concerned the issue of whether there was any gender difference in the degree to which stressor frequency was related to the four internalizing symptoms measured here. To examine this, we conducted four hierarchical regressions on the entire sample: the four internalizing complaints were the dependent variables and predictor variables were added in three steps: 1) stressor frequency; 2) gender; and 3) the stressor frequency by gender interaction term. For all four regressions, stressor frequency was a strong positive predictor ( $\beta_s = .353, -.333, .475, \text{ and } .453, ps < .001, R^2s = .11 \text{ to } .23$ ), and gender explained significant variance above the first term ( $\beta = .05, -.08, .17, \text{ and } .09, ps < .05 \text{ to } .001, R^2\Delta = .01 \text{ to } .03$ ) for depression, self-esteem, anxiety, and psychosomatic complaints in turn. The interaction term proved to be significant for depression ( $\beta = .168, p < .01, R^2\Delta = .004$ ) and self-esteem ( $\beta = -.102, p < .05, R^2\Delta = .001$ ). ModGraph (Jose, 2004) was used to

Figure 2. Frequency of the stressful event "arguing with parents" by age group and gender.

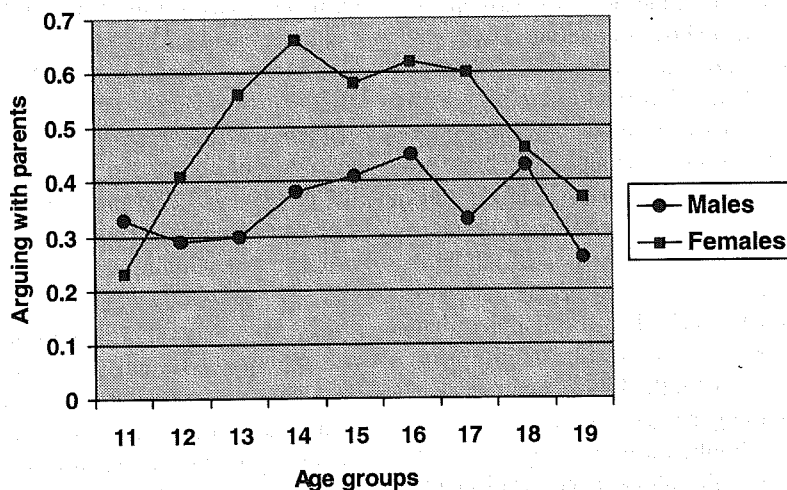
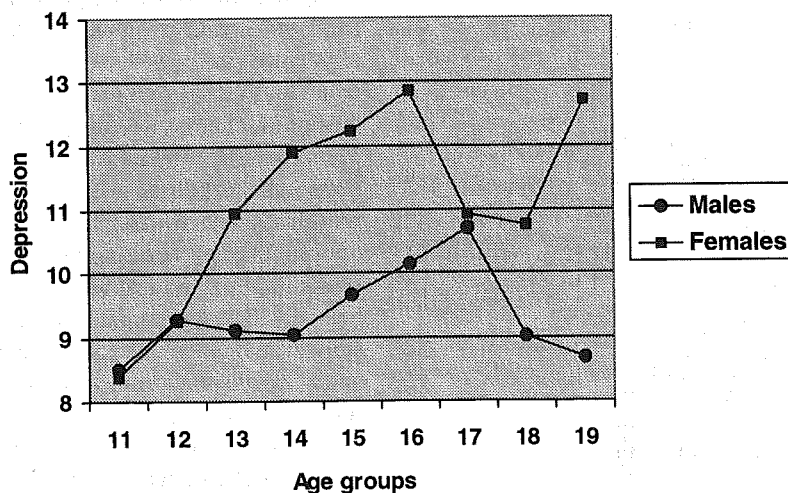


Figure 3. Mean depression scores by age group and gender.





probe these interactions. Figure 4 reveals the pattern for depression. Computation of simple slopes by ModGraph showed that females (simple slope = .40) manifested a steeper slope than males (simple slope = .27), both significantly different from zero. This result suggests that stressor frequency was more strongly related to depression for females than for males. A similar result was obtained for self-esteem, so hypothesis 4 was supported for depression and self-esteem.

A related question was whether age group moderated the relationship between stressor frequency and the four internalizing symptoms. We extended the regression noted above by including age group as a main effect, two additional two-way interactions involving age, and the three-way interaction. Age proved to be a main effect predictor only for psychosomatic complaints ( $\beta = .122$ ,  $p < .001$ ,  $R^2\Delta = .02$ ). Age group by stressor frequency was a significant predictor for depression and self-esteem ( $\beta_s = -.183$  and  $.153$ ,  $ps < .05$ ,  $R^2\Delta_s = .005$  and  $.004$ ). Age group by gender was a significant predictor for anxiety and psychosomatic complaints ( $\beta_s = .136$  and  $.278$ ,  $ps < .05$  and  $.001$ ,  $R^2\Delta_s = .004$  to  $.009$ ). The three-way interaction was not a significant predictor for any of these four dependent variables. The first two interactions were plotted with ModGraph and revealed that younger adolescents showed a stronger relationship between stressor frequency and the dependent variable than older adolescents. The third interaction showed a stronger relationship between age and anxiety for females than for males, i.e., the slope of the relationship between anxiety and age was steeper for females than for males. And the fourth interaction revealed that females reported a fairly steady level of psychosomatic complaints over this age range, but males reported lower levels with increasing age.

In sum, hypothesis four was partially supported by the present evidence: a gender moderation effect was obtained for depression and self-esteem. In addition, the regression results showed that age group also

moderated these same two relationships.

**Stressor intensity.** The question of whether differences could be found in stressor intensity was examined last. We first computed a two-way ANOVA (gender by age groupings with SES as a covariate) on stressor intensity to determine whether any reliable mean group differences could be obtained. A significant main effect for gender,  $F(1, 2049) = 10.22$ ,  $p < .001$ ,  $\eta^2 = .01$ , and a significant two-way interaction were obtained,  $F(8, 2049) = 1.94$ ,  $p < .05$ ,  $\eta^2 = .01$ . The main effect for age groups was not significant,  $p = .32$ . As predicted, females yielded a higher stressor intensity score ( $M = 1.08$ ,  $SD = .62$ ) than males ( $M = .93$ ,  $SD = .64$ ). The significant two-way interaction was graphed and is presented in Figure 5. It shows that

during the period from 13 to 17 years females yielded a significantly higher level of stressor intensity than males.

As a next step we computed a hierarchical multiple regression in order to explore the question of whether stressor intensity predicts the four internalizing symptoms. Variables were added in three blocks to predict the dependent variables in turn: 1) main effects (stressor intensity; age groups; and gender); 2) two-way interactions (intensity by age; intensity by gender; and age by gender); and 3) the three-way interaction. For depression, self-esteem, anxiety, and psychosomatic complaints in turn, stressor intensity ( $\beta_s = .382$ ,  $-.274$ ,  $.388$ , and  $.291$ ) proved to be a significant predictor, as did gender ( $\beta_s = .066$ ,  $-.063$ ,  $.203$ , and  $.136$ ) and age groups ( $\beta_s = .065$ ,

Figure 4. Moderation of stressor frequency on depression by gender.

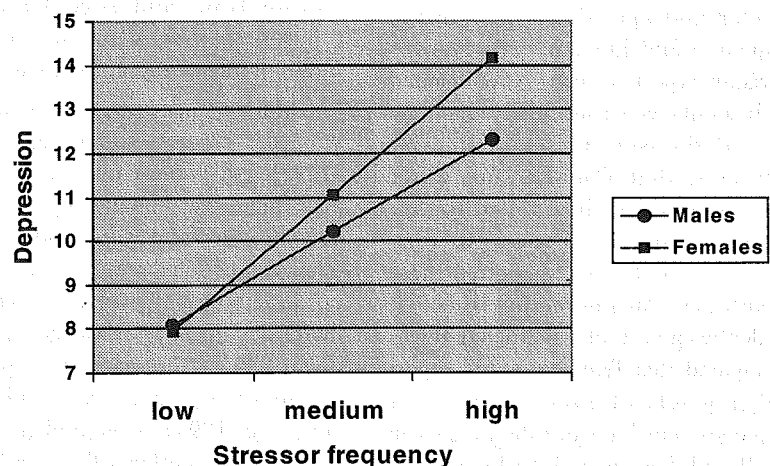
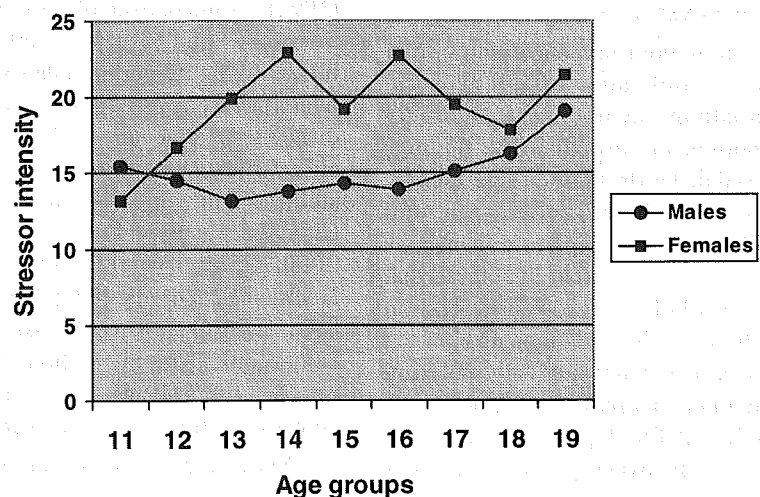


Figure 5. Stressor intensity scores by age group and gender.



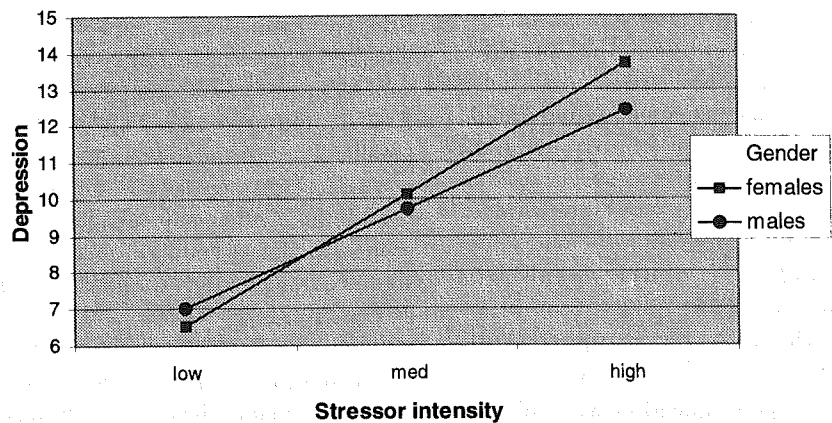
-.107, .048, and .181, all  $ps < .01$ ). The significant two-way interaction of gender by intensity for all four dependent variables ( $ps < .05$ ) qualified the main effect results however. The significant intensity by gender interaction for depression ( $\beta = .131, p < .01, R^2 = .01$ ) was probed by graphing the result (using ModGraph, Jose, 2004) and is presented in Figure 6. The differential slopes for males and females shows that females experienced a stronger relationship between intensity and depression ( $r(1171) = .396, p < .001$ ) than males ( $r(745) = .335, p < .001$ ). The same interaction for the other three dependent variables yielded a similar result. Hypotheses five and six received support from these findings because females reported higher stressor intensity than males, and further, gender moderated the relationship between stressor intensity and internalizing symptoms.

### Discussion

Gender and age differences in the frequency and intensity of everyday stressors experienced by New Zealand adolescents were anticipated in the present dataset. In particular we predicted that females and older adolescents would report higher frequency and intensity of everyday stressors. The results supported these hypotheses. An interaction effect of gender by age was also predicted. It was anticipated that females would report higher levels of everyday stressor frequency and intensity than males in middle adolescence. This hypothesis was supported: females reported significantly higher everyday stressor frequency than males after the age of 12 and greater stressor intensity after the age of 13 years.

The hypothesis concerning similar gender and age differences in internalizing symptoms was largely supported, in particular, the findings showed that girls reported significantly higher levels of depression and psychosomatic complaints than boys from 13 to 16 years. The hypothesis that there would be a gender difference in the strength of the relationship between stressor frequency and internalizing symptoms was partially supported; it was found for depression and self-esteem. An investigation of whether

Figure 6. Moderation of stressor intensity on depression by gender.



gender moderated the effect of stressor intensity revealed support for all four internalizing symptoms. Taken together, these results show that female adolescents, particularly in the critical middle adolescent period, report more stressors, higher levels of psychological dysfunction, and reveal stronger relationships between stressors and internalizing symptoms than males.

Many of these results are congruent with past research. Tubman and Windle (1995) and Wenz-Gross et al. (1997) also found that females reported more everyday stressful events and that these events constituted more of a problem in comparison to males. Also, the increasing linear effect of age on reports of everyday stressors agrees with past research (Ge et al., 1994; Rudolph & Hammen, 1999). This is also true for the interaction effect of gender by age. In particular, the pattern of stressor intensity found for each gender in the present study is very similar to the pattern that was found by Ge et al. (1994) for uncontrollable stressful life events. The results relating to internalizing symptoms also validate past research. The gender and age differences found here for internalizing are consistent with those found in other studies (Baldwin & Hoffmann, 2002; Crystal et al., 1994; Cyranowski et al., 2000; Hankin et al., 1998; Nolen-Hoeksema & Girgus, 1994; Poikolainen et al., 1995; Quatman & Watson, 2001). In particular, the interaction effect of gender by age on depression is consistent with Hankin et al.'s research.

Many studies have shown that

everyday stressors are strongly associated with adolescents' levels of maladjustment (e.g., Dumont & Provost, 1999; Ge et al., 1994; Hee-og, 2000; Poikolainen, Kanerva, & Lonnqvist, 1995; Rudolph & Hammen, 1999), and this general relationship was obtained here. Further, the prediction that this association would be stronger for female adolescents was supported in the present study. The present data suggest that girls during the critical middle adolescence period manifest a more extreme reaction to potentially stressful events that occur, i.e., they rate a given stressful event as more intensely problematic than males. Several other studies (e.g., Nazroo, Edwards, & Brown, 1997; Nolen-Hoeksema, 1998) have shown that girls and women react more strongly to stressful events, however there is no clear research evidence why this gender difference occurs. Kendler, Thornton, and Prescott (2001) suggest that particular events might have a differential impact on males and females, however they found no convincing evidence in their study that females are generally more reactive than males. We found evidence in this dataset that certain problems are perceived as impacting differentially depending on gender. The large majority of gender differences on stressor items found here showed an imbalance toward females. It is possible that the stress measure underrepresented events important to males, or it may be that the gender difference in stressor intensity caused this imbalance. Further research will be needed to disentangle this conundrum.



It was notable that gender was found to be a significant predictor of negative adjustment above and beyond stressor intensity for adolescents 15 years and older. This result suggests that gender stands in as a proxy variable for some underlying dynamic(s) that needs explication to further understand why we obtain the disturbing elevation of negative adjustment scores for middle adolescent girls. A number of possible constructs have been suggested, and although not measured in the present study, we will entertain one possibility here: gender role socialization. Studies have found that the effects of gender role socialisation become more salient in early adolescence (AAUW Educational Foundation, 1992; Cyranowski et al., 2000; Gilligan, 1993; Hankin & Abramson, 2001; Nolen-Hoeksema & Girgus, 1994; Pipher, 1996). Therefore it is possible that due to gender role stereotyping and socialization, children respond differently to the stressful events that they face in early adolescence. This is implied by Windle (1992) who concluded that boys are socialised towards more independent and adventurous behaviours, whereas girls are socialised towards more interpersonal behaviours. Windle uses gender role socialisation to explain why women tend to exhibit certain behaviours more than males. This is also consistent with Rudolph and Hammen's (1999) findings that particular stressors may have a greater impact on females (dependent interpersonal stressors) while others may have more of an impact on males (non-interpersonal stressors). Therefore it appears possible that gender role socialisation may influence the reactions to specific stressors that males and females experience. This would be a useful variable to examine in future studies. In this same vein, it is important to consider the measures that were used in the present study. The measures used in the present study to define negative adjustment were depression, anxiety, self-esteem, and psychosomatic symptoms, all of which are internalizing symptoms, typical of the way girls deal with stressors. If we had assessed externalizing outcomes such as fighting and crime, which are more typical of males' outcomes, different results may have been obtained.

It is suggested that future research would benefit from defining negative adjustment more broadly and by incorporating other outcomes that are better suited to masculine forms of expression. Also it would be interesting to look at the transactional nature of stress and adjustment over time, i.e., to assess the influence negative adjustment has on stressors over time. A further aspect that would be pertinent for future research is to investigate the cumulative impact of stressors on adjustment. In the present study, respondents were asked to state if a stressor had occurred in the last month, thus ignoring the impact of any other stressors that may have occurred earlier and that may not be fully resolved. And finally, ethnic group comparisons of the age and gender differences identified here would be illuminating (see Schurer & Jose, in preparation).

One limitation of the current study could be the use of self-reports. It has been suggested that self-reports are not always the most reliable or valid method of data collection (Shaffer, 2002). Pipher (1996) has noted that adolescent girls tend to report events and occurrences dramatically and emotionally. On the other hand, boys may be inhibited by social desirability bias and gender stereotypes, and may not disclose their true feelings (Shaffer, 2002). This problem could be overcome by using an alternative method to collect data, such as interviews or focus groups. The stress measure included a few items that could be considered to be strains, i.e., illness and boredom, so there may have been some overlap between the measures of stress and strain. Common method variance is another issue that should be mentioned. All measures were contained within one booklet; hence respondents may have been inclined to make their responses consistent among the scales. Self-selection is another issue that should be noted, particularly for the participants under 16 years of age whose parents were required to give consent. It is possible that parents of poorly adjusted or unhappy children may have chosen not to allow their children to participate in the survey, thus making the sample less representative of the overall New Zealand population.

In conclusion, the present study has aimed to clarify the presumed gender differences in stress and adjustment in New Zealand adolescent girls and boys. In agreement with overseas research, girls and older adolescents report greater frequencies and intensities of stressors and worse adjustment than boys and younger adolescents. In addition, the degree of association between stressor frequency and adjustment and internalizing symptoms was found to generally be stronger for females. In addition, females yielded higher stressor intensity scores than males, and this difference was most apparent during middle adolescence. More attention needs to be devoted to determining why girls in middle adolescence report more stressors, rate those stressors as more intensely stressful, and report higher internalizing symptoms than males.

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