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Self-Esteem, Risky Sexual Behavior, and Pregnancy in a New

Zealand Birth Cohort

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RUNNING HEAD: Self-Esteem and Risky Sexual Behavior

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ABSTRACT

This study examined the relationship between self-esteem in adolescence and later risky sexual behavior and pregnancy in late adolescence and early adulthood. The investigation analyzed data from a birth cohort of over 1,000 New Zealand young adults studied to the age of 25. Lower levels of self-esteem at age 15 were associated with greater risks of engaging in unprotected sex (sexual intercourse with either an opposite- or same-sex partner) without using a condom), a greater number of sexual partners, and a greater risk of pregnancy at ages 15-25. Adjustment for potentially confounding factors including family socio economic background, family functioning, child abuse, and individual characteristics and behavior reduced the strength of these associations to statistically non-significant levels. It was concluded that the effects of self-esteem during adolescence on later risky sexual behavior and pregnancy were weak and largely explained by the psychosocial context within which self-esteem develops.

KEY WORDS: self-esteem; risky sexual behavior; pregnancy; longitudinal study.

INTRODUCTION

In the last few decades of psychological research, very few constructs have received more attention than self-esteem. Self-esteem has been named as a culprit in a wide range of adjustment difficulties at the personal level and a variety of ills at the societal level (e.g., Andrews, 1998; Banaji & Prentice, 1994; Baumeister, 1999; Colquhoun, 1997; Kahne, 1996). A major theme is that low self-esteem puts the individual at risk for engaging in problem behaviors, including risky sexual behavior. Research suggests that the individual's views of sex and sexuality are influenced by self-image (Baumeister, 1999; Tesser, 2001), implying that self-esteem difficulties may be related to issues regarding sex and sexuality. It has been suggested that low self-esteem is related to sexual risk taking, including having sex without a condom or without using birth control, and having a greater number of sexual partners (e.g., Lejuez, Simmons, Aklin, Daughters, & Dvir, 2004; Magnani, Seiber, Gutierrez, & Vereau, 2001; Preston et al., 2004; Wild, Flisher, Bhana, & Lombard, 2004). It has also been hypothesized that low self-esteem is related to the lingering consequences of such sexual risk taking, such as an increased frequency of unplanned pregnancy (e.g., Berry, Shillington, Peak, & Hohman, 2000; Cocoran, Franklin, & Bennett, 2000; Davies et al., 2003; Dixon, Schoonmaker, & Philliber, 2000).

A number of recent studies support the link between self-esteem and risky sexual behavior and the consequences of risky sexual behavior. For example, Lejuez et al. (2004) reported that low self-esteem was related to risky sexual behavior in a sample of adults residing in a residential drug-treatment program. Preston et al. (2004) found that low self-esteem predicted risky sexual behavior in a sample of rural men. Magnani et al. (2001) studied a large cross-sectional sample of adolescents in Peru, and reported that low self-esteem predicted both early onset of sexual activity and unprotected sex. Wild et al. (2004), using a large cross-sectional sample of South African adolescents, found that low self-esteem was related to a number of risk factors, including unprotected sex.

Similar findings are reported for the consequences of risky sexual behavior, including pregnancy. For example, Corcoran et al. (2000) found, in a comparison of adolescents who had or had not become pregnant, that self-esteem was a predictor of pregnancy status, with low self-esteem being associated with having been pregnant. Davies et al. (2003) reported that low self-esteem predicted lower levels of condom use and a higher desire for pregnancy amongst a sample of adolescent African-American females. Berry et al. (2000) reported that high self-esteem served as a protective factor in preventing pregnancies in a large cross-sectional sample of minority American women. Similarly, Dixon et al. (2000), in a study of pregnancy prevention, found that a program designed to increase levels of self-esteem through group affiliation reduced rates of risky sexual behavior and pregnancy in a group of adolescent African-American females.

It should also be noted some studies have failed to find a relationship between self-esteem and risky sexual behavior. West and Sweeting (1997) reported that self-esteem was not related to early sexual experience in a large cross-sectional study of Scottish adolescents. Similarly, Neumark-Sztainer, Story, French, and Resnick (1997) failed to find any relationship between self-esteem and sexual activity in a large ($n > 100,000$) cross-sectional study of adolescents in the United States.

One reason for the inconclusive findings regarding a link between self-esteem and risky sexual behavior and pregnancy may be that there are a number of limitations to this literature. The most important limitation is that the social and contextual factors leading to the development of both self-esteem and risky sexual behavior have not frequently been taken into account. For example, it has been well-documented that low self-esteem is a result of socio economic deprivation, family dysfunction, personal disadvantages and difficulties, and exposure to abuse (e.g., California Task Force To Promote Self-Esteem and Personal and Social Responsibility, 1990; Leary, Tambor, Terdal, & Downs, 1995; Mecca, Smelser, & Vasconcellos, 1989; Mruk, 1995; Parker & Benson, 2004; Rosenberg, Schooler, & Schoenbach, 1989). It is also clear that these factors are related to longer-term sexual risk taking behavior (e.g., Fergusson, Horwood, &

Lynskey, 1994; Johnson, Wadsworth, Wellings, & Field, 1994; MacLeod, 2001; Moffitt & Team, 2002; Pitzner, McGarry-Long, & Drummond, 2000; Swann, Bowe, McCormick, & Kosmin, 2003; Vanwesenbeeck, van Zessen, Ingham, Jaramazovib, & Stevens, 1999). This raises the question of whether statistical relationships between self-esteem and risky sexual behavior reflect the direct effects of self-esteem, or a more general process in which the psychosocial context of the individual leads to the development of both low self-esteem and an increased sexual risk taking.

In addition to issues of confounding, there are also limitations in the extant literature in terms of sampling and measurement. For example, a number of studies have used a cross-sectional design in examining the relationship between self-esteem and risky sexual behavior, raising issues of the direction of causality in the relationship (e.g., Berry et al., 2000; Davies et al., 2003; Lejuez et al., 2004; Magnani et al., 2001; Neumark-Sztainer et al., 1997; Preston et al., 2004; West & Sweeting, 1997). Other studies have used non-representative or selected samples to examine the relationship between self-esteem and risky sexual behavior, potentially inflating estimates of the relationship (e.g., Cocoran et al., 2000; Dixon et al., 2000; Lejuez et al., 2004; Preston et al., 2004). Finally, a number of studies have failed to control for contextual factors that may be related to self-esteem and risky sexual behavior (e.g., Lejuez et al., 2004; Preston et al., 2004).

An exception to these limitations is a study by McGee and Williams (2000), who examined the relationship between self-esteem and health compromising behaviors in a longitudinal study of a representative birth cohort. It was reported that low self-esteem was related to earlier age at first sexual intercourse, but that this association was reduced to statistical non-significance after control for socio economic disadvantage, gender, family conflict, and harsh family discipline. A second exception to these limitations is a study by Hockaday, Crase, Shelley, and Stockdale (2000) who used a longitudinal design with a representative birth cohort, and failed to find a significant relationship between self-esteem and adolescent pregnancy. A further exception is a study by Fergusson, Horwood, and Lynskey (1994), who employed a longitudinal design and reported that low self-esteem was one of a number of significant factors that described a group of adolescents (a

sub group of a larger birth cohort) who displayed multiple problem behaviors, including early onset of sexual intercourse. The studies by McGee and Williams (2000) and Fergusson et al. (1994), however, employed a single measure of risky sexual behavior (age of first intercourse). It should also be noted that the studies by Hockaday et al. (2000) and Fergusson et al. (1994) did not specifically examine the extent to which self-esteem predicted risky sexual behavior. Finally, none of the studies examined the relationship between adolescent self-esteem and risky sexual behavior into adulthood. Given the often florid descriptions of the pervasive and long-term effects of self-esteem on subsequent development (e.g., California Task Force To Promote Self-Esteem and Personal and Social Responsibility, 1990; Kahne, 1996), it would seem that an important step in understanding the pervasive and long-term effects of self-esteem on risky sexual behavior would be to use a panoply of measures of risky behavior and to examine the effects of adolescent self-esteem on risky sexual behavior in adulthood.

Against this background, the present investigation attempted to address many of these issues of confounding, sampling, and measurement through use of a longitudinal design examining a representative cohort studied from birth to adulthood. In this article, we report on a study of a birth cohort of over 1,000 New Zealand young adults that have been studied from birth to age 25. This study sought to determine whether low self-esteem in adolescence was related to later risky sexual behavior. Measures of self-esteem, socio economic status, family functioning, and individual and behavioral factors were collected and used to control for covariates. These measures were then related to risky sexual behavior in later adolescence and early adulthood. The aims of the study were to determine (1) whether self-esteem at age 15 was related to sexual risk taking and pregnancy in later adolescence and early adulthood, and (2) whether a relationship between self-esteem at age 15 and later sexual risk taking and pregnancy remained after controlling for family, social, and demographic factors.

METHOD

Participants

The data reported in this investigation were gathered as part of the Christchurch Health and Development Study, a longitudinal study of an unselected birth cohort of 1,265 children born in the Christchurch (New Zealand) region over four months in mid-1977. This cohort has been studied at birth, 4 months, 1 year, at annual intervals to age 16 years, and at ages 18, 21, and 25 years and have provided a range of data on health, development, psychological functioning, and adjustment throughout this period. A detailed description of the study and an overview of study findings can be found in Fergusson, Horwood, Shannon, and Lawton (1989) and Fergusson and Horwood (2001).

The present analyses were based upon the samples having complete data on self-esteem at age 15 and on the outcome measures at each age. These samples ranged in size from 888 to 919, and represented between 70% to 73% of the initial cohort of 1,265 children. The sample was comprised of 49.8% female members, and 12.9% of the participants identified themselves as New Zealand Māori. By age 25, 94.6% ($n = 949$) of participants reported having had a sexual partner of the opposite sex, and 7.8% ($n = 80$) reported having had a sexual experience with a same-sex partner (2.8%, $n = 28$ reported having a sexual relationship with a same-sex partner, and 1.2%, $n = 12$, reported their sexual orientation as being “mostly” or “100%” gay or lesbian).

Measures

Most interviews for the study were conducted in face-to-face interview sessions. Participants who were not resident in New Zealand during a particular assessment period were interviewed via telephone. The following measures were used in these analyses.

Self-esteem (age 15)

Self-esteem was assessed at age 15 using the global scale of the Coopersmith Self-Esteem Inventory for school-aged participants (Coopersmith, 1981), obtained by summing of the four subscale scores (general, academic, social, and home). The global scale score used in these analyses was found to be reliable ($\alpha = 0.87$). The Inventory has also been shown to have both

convergent and discriminant validity (Blascovich & Tomaka, 1991; Chiu, 1985; Johnson, Redfield, Miller, & Simpson, 1983; Roberson & Miller, 1986). An earlier version of the scale was shown to have construct validity (Kokenes, 1974, 1978).

Unprotected sex (ages 17-18, 20-21, 24-25 years)

As part of the assessment at ages 18, 21, and 25, years participants were questioned about their involvement in incidents of unprotected sex in the previous 12 months. In order to assess sexual activity and unprotected sex, participants were asked the following specific questions: (1) “How often would you have had sexual intercourse over the last year (with a partner of the opposite sex)?” (2) “During the last year when you had sex, how often did you use the following methods of contraception?” (the response choices were provided were “condom only”, “pill only”, “condom and pill”, “other methods of contraception”) and (3) “During the last year, on how many occasions would you have had sex without using contraception?” In addition, male participants who reported same sex sexual partners were asked “when you have had sexual relations with a same sex partner, how often have you or your partner used a condom?” For the purposes of the present analysis, participants were classified as having engaged in unprotected sex during the time interval if they reported either (1) having engaged in sex with an opposite sex partner without using a condom (that is, responding either “pill only” or “other methods” to item 2 above, or one or more times to item 3 above) on one or more occasions in the past 12 months; or (2) any episode of sex with a same sex partner without using a condom (that is, responding to the question by indicating that they had not used a condom on each occasion). Of the participants, 23.3% ($n = 234$) reported having had unprotected sex with an opposite-sex partner, and 0.8% ($n = 8$) reported having had unprotected sex with a same sex partner (these were all males).

Number of sexual partners (ages 15-18, 18-21, 21-25 years)

At ages 16, 18, 21 and 25 years, participants were questioned about aspects of their sexual behavior over the interval since the previous assessment. We asked the following questions: (1) how many sexual partners have you had during the last year?” (2) “Since you turned (age at

previous assessment) how many sexual partners of the opposite sex have you had (including the past year)?” (3) “How many partners of the same sex have you had since you were (age at last assessment)?” For the purposes of the present analysis, these measures were summed to provide an overall count measure of the total number of sexual partners reported for each of the intervals 15-18 years, 18-21 years and 21-25 years. Of the participants, those reporting opposite sex partners reported on average 4.8 partners at age 18, 5.5 partners at age 21, and 5.7 partners at age 25. Those reporting same sex partners reported an average of 3.8 partners at age 18, 2.8 partners at age 21, and 2.3 sexual partners at age 25.

Pregnancy (ages 15-18, 18-21, 21-25 years)

At each assessment from 16-25 years, participants were questioned about the incidence of pregnancies occurring in the interval since the previous assessment. Female participants were asked: “In the last (number of years since previous assessment) years, have you become pregnant?” and male participants were asked “Have you ever got someone pregnant?” Using these data, participants were classified on three dichotomous measures reflecting whether the young person reported a pregnancy in each of the intervals 15-18, 18-21, and 21-25 years. Thus, for the purposes of this classification, male and female reports of pregnancy were treated as equivalent. All participants who reported a pregnancy were included in these analyses as it proved impossible to distinguish planned from unplanned pregnancies. Furthermore, participants who reported sexual experiences with a same-sex partner were included in these analyses, as a relatively small percentage of individuals reported exclusively same-sex relationships (see above). Of the participants, 39.0 % ($n = 208$) of females and 32.0% ($n = 169$) of males reported a pregnancy by age 25.

Confounding factors

To assess the extent to which associations between self-esteem at age 15 and later risky sexual behavior and pregnancy could be explained by the effects of confounding factors, a range of measures was chosen from the database of the study for inclusion in analyses. These measures

were selected on the basis of (1) a review of the literature identifying factors that previously have been found to be associated with self-esteem; and (2) factors that were found to be correlated with both self-esteem and with measures of risky sexual behavior or pregnancy. The covariate factors chosen for inclusion were as follows:

Measures of family socio economic background

Family living standards (0-10 years).

At each year to age 10 years, a global assessment of the material living standards of the family was obtained by means of an interviewer rating. These ratings were summed over the 10 year period and divided by 10 to give a measure of typical family living standards during this period. Ratings were made on a five point scale that ranged from “very good” to “very poor”.

Maternal education.

This was assessed at the time of the survey child’s birth using a three point scale which reflected the highest level of educational achievement attained. This scale was: 1 = mother lacked formal educational qualifications (had not graduated from high school); 2 = mother had secondary level educational qualifications (had graduated from high school and may have attended university or the equivalent); 3 = mother had tertiary level qualifications (had obtained a university degree or equivalent qualification).

Family socioeconomic status.

This was assessed at the time of the survey child’s birth using the Elley-Irving (Elley & Irving, 1976) scale of socio economic status (SES) for New Zealand. This scale classifies SES into 6 levels on the basis of paternal occupation, ranging from 1 = professional occupations to 6 = unskilled occupations.

Family functioning

Parental attachment (age 14).

This was assessed from the participants' perspective at age 14 using the parental attachment scale developed by Armsden and Greenberg (1987). The full parental attachment scale was used in this analysis and was found to have good reliability ($\alpha = 0.91$).

Parental criminal offending and illicit drug use.

When participants were aged 11, their parents were questioned about their own use of illicit drugs including cannabis, cocaine, stimulants, hallucinogens, and opiates. At the 15 year assessment, parents were further questioned concerning their history of criminal offending. All individuals who reported either the use of illicit drugs or criminal offending on at least one occasion were classified as having used illicit drugs or committed a criminal offence. On the basis of this questioning, 12.4% of the sample were classified as having a parental history of criminal offending, and 24.9% as having a parental history of illicit drug use.

Changes of parents.

At each assessment from birth to 15 years, information was obtained on changes in the child's family situation since the previous assessment. Using this information, an overall measure of family instability was constructed on the basis of a count of the number of changes of parents experienced by the child up to age 15. Changes of parents included all changes resulting from parental separation/divorce, reconciliation, remarriage, death of a parent, fostering, and other changes of custodial parents.

Child abuse

Childhood sexual abuse.

At ages 18 and 21 years, participants were questioned about their experience of sexual abuse (< 16 years) (Fergusson, Horwood, & Lynskey, 1996). Questioning spanned an array of abusive experiences from episodes involving non-contact abuse (e.g., indecent exposure) to episodes involving attempted or completed intercourse. Participants who reported an abusive episode were then questioned further about the nature and context of the abuse. Using this information, a 4-level scale was devised reflecting the most extreme form of sexual abuse reported by the young person at

either age. This classification was: no sexual abuse; non-contact abuse only; contact sexual abuse not involving attempted or completed intercourse; attempted/completed oral, anal, or vaginal intercourse. Sexual abuse was assessed at two time periods due to issues regarding the unreliability of participants' reports of such events (Fergusson, Horwood, & Woodward, 2000).

Parental use of physical/corporal punishment (childhood physical abuse).

At ages 18 and 21, participants were asked to describe the extent to which their parents used physical or corporal punishment during childhood (Fergusson & Lynskey, 1997). Separate questioning was conducted for mothers and fathers. This information was used to create a 4-level scale reflecting the most severe form of physical punishment reported for either parent: parents never used physical punishment; parents rarely used physical punishment; at least one parent used physical punishment on a regular basis; at least one parent used physical punishment too often or too severely, or treated the respondent in a harsh or abusive manner.

Individual characteristics and behavior

IQ.

Cognitive ability was assessed at ages 8 and 9 using the Revised Wechsler Intelligence Scale for Children (WISC-R: Wechsler, 1974). Total scores were computed on the basis of results on four Verbal and four Performance subscales. The split half reliabilities of these scores were .93 at age 8 and .95 at age 9. For the purposes of these analyses, the observed WISC-R total IQ scores at age 8 and 9 were combined by averaging over the two administrations.

Neuroticism (age 14).

This was assessed at age 14 using a short form version of the neuroticism scale of the Eysenck Personality Inventory (Eysenck & Eysenck, 1964). The alpha reliability of this scale was .80.

Child behavior problems (ages 7-9; conduct problems and anxious/withdrawn behavior).

Information on child behavior problems was obtained from parental and teacher report when participants were aged 7, 8, and 9 years. Parental reports were obtained from an interview with the child's mother using a behavior questionnaire that combined items from the Rutter, Tizard, and Whitmore (1970) and Conners (1970) parental questionnaires. The child's class teacher was asked to complete a combined version of the Rutter et al. (1970) and Conners (1969) teacher questionnaires. Factor analysis of the item-level report data showed that it was possible to select items from these reports that formed uni dimensional scales reflecting the extent of parent-reported and teacher-reported conduct problems and anxious/withdrawn behavior (Fergusson & Horwood, 1993; Fergusson, Horwood, & Lloyd, 1991). The scales measured the extent to which the child exhibited aggressive, oppositional, and conduct-disordered behaviors and the extent to which the child displayed a tendency to behave in a shy, anxious or withdrawn manner. The alpha reliabilities of these scales were .97 and .87, respectively.

Conduct problems (age 14).

At age 14, maternal and child reports of conduct and oppositional/defiant behaviors were gathered from participants. Maternal reports were generated using the Rutter et al. (1970) and Conners (1970) parental questionnaires mentioned above. Child reports were gathered using a series of questions derived from the Diagnostic Interview Schedule for Children (Costello, Edelbrock, Kalas, Kessler, & Klaric, 1982) for the assessment of conduct and oppositional defiant behaviors. For the purposes of the present analyses, the parent and child item reports were summed to provide an overall scale measure reflecting the young person's tendencies to conduct problems and oppositional behavior in adolescence (Fergusson, Horwood, & Lynskey, 1993). The alpha reliability of this scale was .90.

Deviant peer affiliations (age 14).

At age 14, participants were questioned using a series of custom-written items that assessed the extent to which their friends were involved in a range of behaviors, including the use of tobacco, alcohol, or illicit drugs, criminal offending, and related behaviors. These items were combined to form an overall scale measure reflecting the extent to which the young person affiliated with delinquent and substance-using peers (Fergusson, Lloyd, & Horwood, 1991). The alpha reliability of this scale was .76.

Procedure**Statistical Analyses**

The unadjusted associations between self-esteem at age 15 and later risky sexual behavior and consequences (Table I) were tested by fitting a logistic regression model (in the case of incidence of unprotected sex and pregnancy, both dichotomous measures) and a negative binomial regression model (in the case of number of sexual partners, as these data were highly skewed) to the data for each outcome.

The associations between self-esteem and covariate factors (Table II) were tested for significance using the Mantel-Haenszel χ^2 test of linearity. To adjust the observed associations between self-esteem and outcome measures for confounding factors, the regression models were extended to include the set of covariates for each individual. In fitting these models, all covariates were scored in their natural metrics as described above, rather than in the dichotomous form shown in Table II. Adjusted associations between each of the outcome measures and self-esteem are presented in Table III. In addition, the fitted regression results (on which the probability values in Table III are based) were derived from models in which self-esteem was scored in continuous form rather than in quintiles as shown in Tables I, II, and III (analyses using the quintile measure of self-esteem produced essentially identical conclusions). Finally, the regression models were further extended to incorporate interaction terms to test for self-esteem x gender interactions.

RESULTS

Sample loss and sample bias

To examine the effects of sample losses on the representativeness of the sample, the obtained samples with complete data at each age were compared with the remaining participants on a series of socio-demographic measures collected at birth. This analysis suggested that there were statistically significant ($p < .01$) tendencies for the obtained samples to under represent individuals from socially disadvantaged backgrounds characterized by low parental education, low socioeconomic status, and single parenthood. To address this issue, the data weighting methods described by Carlin, Wolfe, Coffey, and Patton (1999) were used to examine the possible implications of selection effects arising from the pattern of missing data. These analyses produced essentially the same pattern of results to those reported here, suggesting that the conclusions of this study were unlikely to have been influenced by selection bias.

Associations between self-esteem at age 15 and later sexual outcomes ages 15-25

Table I displays the cohort divided into quintiles on the basis of the distribution of scores at age 15 on the global subscale of the Coopersmith Self-Esteem Scale (Coopersmith, 1981). The quintiles are arranged in decreasing levels of self-esteem. For each quintile, the table shows percentages of participants reporting unprotected sex, the mean number of sexual partners during the age interval in question, and the percentage of participants reporting a pregnancy. Each comparison was tested for significance using a negative binomial regression model for continuous measures (number of partners) or a logistic regression model for dichotomous measures (unprotected sex and pregnancy).

insert table I here

Unprotected sex

Self-esteem at age 15 was significantly associated with self-reported unprotected sex during age intervals 17-18 ($B = .07, SE = .01, p < .0001$), 20-21 ($B = .03, SE = .01, p < .05$), and 24-25 ($B = .02, SE = .01, p < .05$). Lower levels of self-esteem were associated with a greater risk of reporting unprotected sex during each age interval.

Number of sexual partners

Self-esteem at age 15 was significantly associated with self-reported number of sexual partners reported for age intervals 15-18 ($B = -.04, SE = .01, p < .0001$), and 18-21 ($B = -.02, SE = .01, p < .001$), but not with number of sexual partners reported in age interval 21-25 ($B = .00, SE = .00, ns$). Lower levels of self-esteem were associated with higher numbers of sexual partners at ages 18 and 21.

Pregnancy

Self-esteem at age 15 was significantly associated with self-reported pregnancy experienced/caused at age intervals 15-18 ($B = .06, SE = .02, p < .01$), 18-21 ($B = .07, SE = .01, p < .0001$), and 21-25 ($B = .05, SE = .01, p < .0001$). Lower levels of self-esteem were associated with greater risk of becoming or causing pregnancy during each age interval.

Associations between socio economic, childhood, family, and related factors and self-esteem at age 15

Table II displays the associations between self-esteem at age 15 and measures of socio economic, childhood, family, and related factors. For the purposes of data display, all measures were dichotomized and the associations between the variables and self-esteem at age 15 were tested for significance using the Mantel-Haenszel χ^2 test of linearity. It can be seen that decreases in self-esteem were significantly associated with increasing rates of socio economic disadvantage, family dysfunction, child abuse, and child behavior problems prior to age 15. The table also shows that self-esteem at age 15 was lower for females, as demonstrated by an increasing percentage of females in the lower self-esteem groups. The results clearly indicate that low self-esteem at age 15

was more common amongst those who had suffered from multiple social, economic, and personal difficulties, disadvantages, and stresses.

insert table II here

Associations between self-esteem at age 15 and later sexual outcomes (ages 15-25) after adjustment for family context and personal background

One possibility raised by the preceding analyses is that the increased risks for later unprotected sex, higher numbers of sexual partners, and pregnancy for those reporting low self-esteem at age 15 may be explained by the childhood and family factors identified in Table II, rather than the direct effects of self-esteem on later risky sexual behavior. To address this issue, further analyses were conducted that adjusted the associations between self-esteem at age 15 and later risky sexual behavior for the factors identified in Table II. The analyses used negative binomial regression models for the continuous outcome variables (number of sexual partners), and logistic regression models for dichotomous outcome variables (unprotected sex and pregnancy). In both cases, model fitting was conducted using both forwards and backwards methods of variable elimination to identify the best fitting model. The results of these analyses are shown in Table III, including estimates of the relationships between self-esteem at age 15 and unprotected sex, number of sexual partners, and pregnancy after adjustment for the relevant confounding factors. Table III also reports on the significance of the adjusted relationship and identifies for each equation those covariates that were found to be statistically significant in the fitted models. For all the models, the adjusted rates for each outcome were computed by the method described by Lee (1981).

insert table III here

In all cases, adjustment for confounding reduced the strength of the association between self-esteem and later outcomes, and in 7 of the 8 comparisons the adjusted association was statistically non-significant. The one exception was the association with unprotected sex at age 17-18; for this outcome, the adjusted association with self-esteem at age 15 remained just significant ($p = .044$). It is unclear, however, whether this significant result may have arisen by chance as a result of using multiple tests of significance. One way of addressing this issue is to use a Bonferroni p -value (Grove & Andreasen, 1982). In this instance, the association between self-esteem at age 15 and unprotected sex at age 17-18 was not statistically significant using the Bonferroni correction ($p < .005$).

Further inspection of the table suggests that, after covariate adjustment, the associations between self-esteem and later sexual outcomes were modest at best and, in number of instances, the association appeared to be totally explained by confounding factors. For the measures of unprotected sex and pregnancy, significant covariates included gender, deviant peer affiliation age 14, anxious/withdrawn behavior ages 7-9, childhood physical abuse, IQ, average standard of living ages 0-10, and parental history of illicit drug use ($p < .05$). For number of sexual partners, these factors spanned a wider array of covariates relating to compromised family socio economic circumstances, family dysfunction, parental adjustment problems, exposure to child abuse and childhood behavioral adjustment.

A possibility raised by the preceding analyses was that the associations between self-esteem at age 15 and subsequent risky sexual behavior were dependent upon the gender of the participant. It was demonstrated in Table II that females in the cohort were more likely to report lower self-esteem, which could suggest that the effects of self-esteem on rates of risk taking behavior and pregnancy differ according to gender. This was examined by extending the regression models described in Table III to include gender x self-esteem interaction terms. In no case was a significant interaction found, suggesting that the associations between self-esteem at age 15 and risky sexual behavior were similar for males and females.

DISCUSSION

Risky sexual behavior is an issue that has received a great deal of attention from researchers, due in no small part to the serious nature of the personal and societal consequences of such behavior. The research literature has identified a wide range of causes of such behavior, including exposure to economic disadvantage and personal difficulties in childhood (e.g., Fergusson et al., 1994; Johnson et al., 1994; MacLeod, 2001; Moffitt & Team, 2002; Pitzner et al., 2000; Swann et al., 2003; Vanwesenbeeck et al., 1999). Self-esteem, long thought to be a determinant of poor developmental outcomes (e.g., Colquhoun, 1997; Kahne, 1996), has also been examined in this context, and some support has been generated for a relationship between low self-esteem and risky sexual behavior. The evidence, however, linking self-esteem with risky sexual behavior has been relatively weak, and is characterized by a variety of limitations including problems of using cross-sectional designs (e.g., Berry et al., 2000; Davies et al., 2003; Lejuez et al., 2004; Magnani et al., 2001; Preston et al., 2004), the use of non-random or selected samples, (e.g., Cocoran et al., 2000; Dixon et al., 2000; Lejuez et al., 2004; Preston et al., 2004) or a failure to control for the psychosocial context in which self-esteem develops (e.g., Lejuez et al., 2004; Preston et al., 2004). In this study, we attempted to address many of these issues by using data gathered from a 25-year longitudinal study to examine the relationship between adolescent self-esteem and later risky sexual behavior and consequences of risky sexual behavior. These analyses led to the following general conclusions.

First, the present study found evidence of an association between self-esteem at age 15 and a range of measures of risky sexual behavior and consequences. Low self-esteem was related to higher rates of reporting unprotected sex, a larger number of sexual partners (excluding the age interval 21-25), and a higher risk of becoming pregnant or causing a pregnancy. There is little doubt on the basis of these findings that individuals with low self-esteem in adolescence can be considered to be at risk for subsequent involvement in sexual risk taking and its consequences.

At the same time, it was evident that low self-esteem tended to be more common in those who had experienced multiple social disadvantages, family dysfunction, and personal difficulties. It could, therefore, be suggested that any relationship between self-esteem at age 15 and later risky sexual behavior or the consequences of risky sexual behavior could be due to the psychosocial context in which self-esteem developed rather than the direct effect of self-esteem on later behavior. This conclusion was supported by further analyses that revealed that, after controlling for social, family, and personal factors, the relationship between self-esteem at age 15 and later risky sexual behavior and pregnancy was largely eliminated. This conclusion appears to hold for both males and females, despite females having lower levels of self-esteem at age 15.

The findings of the present study were consistent with those of Hockaday et al. (2000), Neumark-Sztainer et al. (1997), and West and Sweeting (1997), all of which failed to find a relationship between self-esteem and various measures of risky sexual behavior. The current study, however, had the added advantages of a longitudinal design with a representative birth cohort, having employed a range of measures of risky sexual behavior and pregnancy, and has focused specifically on the effects of self-esteem on later risky sexual behavior. Thus the current study has been able to address the extent to which self-esteem itself predicts a variety of later risky sexual behaviors, suggesting that background and contextual factors may be more important causes of risky sexual behavior (and the consequences of such behavior) than self-esteem per se.

The results of the study are most directly comparable with the study by McGee and Williams (2000) who used a longitudinal design and a representative birth cohort to study whether low self-esteem predicted health compromising behavior in adolescents. McGee and Williams reported that controlling for social and personal background factors reduced the association between self-esteem and early onset of sexual intercourse to statistical non-significance. The current study found a similar pattern of results, but extended these in two notable ways. First, the current study extended the findings to a wider range of risky sexual behavior and consequences, including unprotected sex, number of sexual partners, and pregnancy. Second, the present study examined the

effects of adolescent self-esteem on risky sexual behavior in late adolescence and early adulthood, a developmental period in which a larger proportion of individuals are sexually active and are making choices about their sexual behavior.

The lack of an enduring association between self-esteem and risky sexual behavior in the current study was inconsistent with the findings of a number of studies and some of the claims in the literature about the pervasive and lingering effects of low self-esteem. The discrepancies arising from these and other well-designed studies (cf. Hockaday et al., 2000; McGee & Williams, 2000) suggest the need for a reconceptualization of self-esteem away from the view of low self-esteem as an important cause of maladaptive behavior, to a more balanced view of low self-esteem as being but one of a number of factors arising from exposure to a variety of difficult economic, family, and personal adversities. The results would also suggest that efforts to provide a panacea for personal and social ills through the programs designed to raise self-esteem (e.g., California Task Force To Promote Self-Esteem and Personal and Social Responsibility, 1990) would most likely be ineffective in reducing levels of risky sexual behavior. Indeed, West and Sweeting (1997) commented that "...although the aim of fostering self-esteem is a worthy one, it is unlikely to have the secondary effect of reducing the likelihood that young people will adopt unhealthy lifestyles..." (p. 161). The results of the present study suggest that instead of focusing on self-esteem, those interested in improving lifestyle outcomes should look to improve the psychosocial conditions under which individuals develop.

It should also be noted that the rates of pregnancy in the present cohort were consistent with those in the New Zealand population in general (Statistics New Zealand, 1998, 2000; Woodward, Horwood, & Fergusson, 2001). While it is unclear how the mean number of sexual partners, and reported rates of unprotected sex compare to New Zealand averages, research suggests that rates of these behaviors have increased in New Zealand over the last fifteen years (Jackson, 2004).

Although the present study has a number of advantages that accrue to studying the effects of self-esteem using a longitudinal design employing a representative birth cohort, there are limitations

to the research that may pose some threat to the validity of the findings. One possible limitation of the present investigation was that self-esteem was measured at age 15 only and that this single measurement was related to outcomes at ages 18, 21, and 25. This method can reveal the association between adolescent self-esteem and later risky sexual behavior and pregnancies, but it leaves unclear what effects any intervening processes (after age 15) may have had on these outcomes. Further, the investigation cannot address the question of whether self-esteem after age 15 was associated with risky sexual behavior and later outcomes. The use of a longitudinal design with several measurements of self-esteem and risky sexual behavior would be able to address the question of the dynamic relationship between self-esteem and risky sexual behavior across time.

Another potential limitation of the study is that all pregnancies were included as an outcome measure, rather than focusing solely on unplanned pregnancies. This was due to the fact that it was impossible to determine in any reliable manner whether pregnancies were planned or unplanned. The result of this limitation is that the observed pregnancy rates will include some pregnancies that were intended by the parents, a consequence that cannot be described as an outcome of risky sexual behavior.

Other potential limitations include the fact that the assessment of rates of unprotected sex, number of sexual partners, and pregnancies was based upon self-report at ages 18, 21, and 25. It is possible that errors or omissions in the reporting of these outcomes may have attenuated the associations with self-esteem at age 15. Furthermore, the fact that outcomes were assessed retrospectively at ages 18, 21, and 25 raises the possibility of recall bias amongst participants. Finally, the wording of the questions assessing these outcomes may have led to a lack of precision in assessing sexual behavior; for example, asking participants whether they had had “any kind of sexual experience with a partner of the same sex” may have failed to differentiate between oral sex and anal intercourse.

A third potential limitation of the current study is cultural context. Although the observed associations between adolescent self-esteem and later risky sexual behavior adequately describe the

present cohort (a birth cohort in New Zealand), but interpretation and generalization of these findings should take into consideration the cultural (i.e. national) context in which these outcomes were observed. It is possible that sexual mores differ in New Zealand as compared to other countries, affecting overall rates of different sexual behaviors. Apparent relationships between self-esteem and later risky sexual behavior may differ cross-nationally as a function of relative prevalence of risky sexual behavior.

The results of the present study suggest that, for this cohort, the effects of adolescent self-esteem on later risky sexual behavior and the consequences of such behavior were weak to non-existent, and were largely explained by the psychosocial context in which self-esteem developed. These findings are at odds with the popular portrayal of self-esteem as being a major cause of a range of social ills and personal misfortune, including risky sexual behavior, and in the portrait of sexual risk-taking individuals as suffering from low self-esteem. Indeed, the findings suggest that self-esteem plays a limited role in the understanding of sexual risk taking, and that the search for the causes of risky sexual behavior needs to concentrate on the contextual factors that appear to be pertinent to maladaptive developmental outcomes in general.

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Table I. Associations Between Self-esteem at Age 15 and Later Reports of Unprotected Sex, Number of Sexual Partners, and Pregnancies at Ages 18, 21, and 25.

Variable	Self-esteem Quintile					p^1
	1 81-100	2 61-80	3 41-60	4 21-40	5 1-20	
% Reporting unprotected sex						
Age 17-18	11.7	11.6	23.1	25.9	30.4	<.0001
N	197	215	173	170	181	
Age 20-21	20.5	16.4	32.2	26.3	26.3	<.05
N	195	207	174	167	179	
Age 24-25	20.6	26.2	25.4	25.6	28.8	<.05
N	189	210	169	164	180	
Mean (<i>SD</i>) number of sexual partners						
Age 15-18	2.1 (3.1)	2.1 (2.8)	3.0 (4.4)	3.5 (5.3)	3.7 (6.1)	<.0001
N	197	215	173	169	180	
Age 18-21	4.1 (4.4)	4.2 (5.6)	5.9 (11.1)	4.6 (6.6)	6.4 (13.8)	<.001
N	195	207	174	167	179	
Age 21-25	5.5 (8.2)	5.2 (5.7)	6.3 (11.4)	5.6 (9.9)	5.5 (10.4)	<i>ns</i>
N	188	210	169	164	180	
% Reporting pregnancy						
Age 15-18	2.5	3.7	8.0	6.4	9.6	<.01
N	201	217	175	172	187	
Age 18-21	10.7	11.6	14.4	22.2	24.6	<.0001
N	195	207	174	167	179	
Age 21-25	23.8	21.0	26.0	32.7	40.0	<.0001
N	189	210	169	165	180	

¹ Logistic regression for percentage reporting unprotected sex and percentage reporting pregnancy experienced/caused; negative binomial model for number of sexual partners.

Table II. Associations Between Self-esteem at Age 15 and Rates of Social, Family, Personal Difficulties, and Related Characteristics.

Variable	Self-esteem Quintile					p^1
	1 81-100	2 61-80	3 41-60	4 21-40	5 1-20	
<u>Family Socio economic Background</u>						
% in lowest decile of average family living standards (0-10 years)	3.0	6.0	3.4	13.5	16.3	<.0001
% mother lacked formal educational qualifications	41.8	42.7	46.6	53.9	64.7	<.0001
% family of semi-skilled/unskilled SES at birth	16.4	24.8	25.3	26.4	32.6	<.001
<u>Family Functioning</u>						
% in lowest decile of parental attachment age 14	1.5	5.1	5.1	11.9	27.0	<.0001
% in highest decile of parental history of criminal offending	7.0	8.7	13.5	19.8	19.2	<.0001
% in lowest decile of parental history of illicit drug use	21.5	18.1	26.3	30.9	29.0	<.01
% in highest decile of family changes	3.5	6.4	10.7	21.4	21.6	<.0001
<u>Individual Characteristics</u>						
% in lowest quartile of child IQ	16.9	20.2	21.9	33.7	38.4	<.0001
% in highest decile of neuroticism age 14	1.0	3.2	7.4	13.0	31.4	<.0001
% female	42.3	41.7	51.7	52.3	65.8	<.0001
% in highest decile of conduct problems ages 7-9	4.5	6.0	10.1	10.8	17.2	<.0001
% in highest decile of anxiety/withdrawal ages 7-9	4.5	7.4	8.4	10.2	9.7	<.05
% in highest decile of conduct problems age 14	2.5	4.2	8.5	13.6	23.2	<.0001
% in highest quartile of deviant peer affiliations age 14	10.6	18.1	21.0	32.2	33.0	<.0001

Child Abuse

% exposed to child contact sexual abuse	8.0	4.6	6.2	14.6	22.6	<.0001
% exposed to regular or severe physical punishment	11.6	12.4	17.5	18.4	27.5	<.0001

¹ Mantel-Haenszel χ^2 test of linearity.

Table III. Associations Between Self-esteem at Age 15 and Later Reports of Unprotected Sex, Number of Sexual Partners, and Pregnancies at Ages 18, 21, and 25 After Adjustment for Covariates.

Variable	Self-esteem Quintile					<i>B</i>	<i>SE</i>	<i>p</i> ¹	Significant Covariates
	1 81-100	2 61-80	3 41-60	4 21-40	5 1-20				
% reporting unprotected sex									
Ages 17-18	16.4	17.7	1.1	20.8	25.2	.04	.02	.05	6,11,16
Ages 20-21	24.3	25.0	25.7	26.5	28.4	.01	.02	<i>ns</i>	6,8
Ages 24-25	22.8	23.9	25.0	26.4	29.7	.02	.02	<i>ns</i>	1,6,14
Mean number of sexual partners									
Ages 15-18	2.8	2.8	2.9	2.9	3.0	-.00	.01	<i>ns</i>	3,4,6,8,10,13,16
Ages 18-21	4.2	4.2	4.2	4.1	4.1	.00	.01	<i>ns</i>	1,2,3,5,8,10,12,15
% reporting pregnancy									
Ages 15-18	4.6	4.7	4.7	4.8	4.9	.00	.03	<i>ns</i>	6
Ages 18-21	16.6	16.5	16.3	16.2	15.9	.00	.02	<i>ns</i>	1,6,8,11,12
Ages 21-25	24.9	26.1	27.4	28.9	32.5	.02	.02	<i>ns</i>	6,11

Covariates

- | | | | |
|----------------------------|---|--|--|
| 1. Gender | 5. Parental attachment age 14 | 9. Family changes age 15 | 13. Neuroticism age 14 |
| 2. Maternal education | 6. Deviant peer affiliation age 14 | 10. Childhood sexual abuse | 14. IQ |
| 3. SES category at birth | 7. Conduct problems ages 7-9 | 11. Childhood physical abuse | 15. Parental history of criminal offending |
| 4. Conduct problems age 14 | 8. Anxious/withdrawn behaviour ages 7-9 | 12. Average standard of living ages 0-10 | 16. Parental history of illicit drug use. |

¹ Logistic regression for percentage reporting unprotected sex and percentage reporting pregnancy; negative binomial model for number of sexual partners