A Life Course Approach to the Assessment of Socioeconomic Differences in Health During Adolescence

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Abstract

Health inequalities research involves the investigation of the relationship between socioeconomic position and health. A longstanding assumption that health inequalities are experienced at all stages in the life course has been challenged on a number of fronts. In particular, researchers have found that health inequalities disappear or are suppressed in the intervening years between childhood and adulthood, namely, the stage of adolescence. The purpose of this study is to investigate whether there is a lack of socioeconomic differences in health during adolescence in a Canadian population and to determine whether these differences re-emerge when adolescents reach young adulthood.

The Ontario Child Health Study (OCHS), with a follow-up (OCHS-FU) four years later, is a longitudinal study designed for the purpose of assessing the mental and physical health of children in the province of Ontario. For this study, analysis was limited to 1302 adolescents between the ages of 12 and 16 in the original survey, and 933 participants whose age at follow-up ranged from 17 to 21 years. The two waves of this survey offer the opportunity to investigate the lack of health inequalities in adolescence and re-emergence in young adulthood. Four health measures (mental disorder, self-reported mental health problem, chronic illness and general health) were analyzed using four measures of parental socioeconomic position (household income, housing tenure, and education of the male and female parent). Results for the two waves of the survey reveal that, contrary to the hypothesis, a number of measures of parental socioeconomic

position are significantly associated with health in adolescence while there are only a few significant relationships between parental socioeconomic position and health in young adulthood.

An additional aim of this study was to determine whether significant changes occurred in the relationship between parental socioeconomic position and health as adolescents made the transition to young adulthood. The pooled cross-section, which creates person-period observations (N=1866) from individuals who participate in both waves of the survey, represents an exploratory approach to this research question. The results of this analysis are inconclusive, although the overall lack of significant relationships may indicate that there are no significant differences in the pattern of health inequalities during the two developmental periods.

Given the unexpected findings of this study, it is suggested that further international research be undertaken to determine whether cultural differences explain the large discrepancies in this Canadian study compared to the findings of previous research, the bulk of which has been conducted primarily in the United Kingdom.

The author would like to acknowledge the Centre for Studies of Children at Risk at McMaster University for their permission to use the Ontario Child Health Study (OCHS) and OCHS-FU datasets for statistical analysis.

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A population health perspective utilizes research from a variety of disciplines to further knowledge about the determinants of health (Evans, Barer & Marmor, 1994). One aspect of a population health perspective contends that individual biology and lifestyle factors may be less important than one's social position in influencing health. Belonging to a privileged socioeconomic position not only allows individuals to use material resources to maintain and improve their health, but may additionally enhance psychological wellbeing, increase responsiveness of the immune system, and dissuade individuals from engaging in unhealthy behaviours such as smoking (Evans & Stoddart, 1994). Conversely, individuals who are located in lower status positions in society may lack the resources, the opportunities and the awareness or motivation to benefit their health. This area of research, known as the health inequalities field, faces challenges in linking socioeconomic differences to the broader social causes of health.

Although there has been an abundance of research on health inequalities in recent years, and indeed, for at least the past two centuries (Macintyre, 1997), there has been relatively little understanding about how social processes serve to maintain and perpetuate socioeconomic differences in health. What makes it particularly difficult to know where to begin looking, is the recognition that health inequalities have endured in the face of overwhelming changes to the very structure of our societies. For example, over the course of the last two centuries, societies have been subjected to forces of urbanization, industrialization, and technology while more recently, computerization and

globalization have fundamentally changed the world we live in. Remarkably, the pattern of health inequalities has also withstood public health measures such as sanitation, the introduction of national health insurance programs as well as other programs associated with the welfare state, significant medical advances in the treatment and prevention of illness, and the transition from infectious to chronic and degenerative diseases (Blane, Brunner & Wilkinson, 1996). As a result, researchers have concentrated their efforts on how societies are structurally and hierarchically ordered to understand the underlying processes of health inequalities.

This avenue of investigation has led to very promising results. Researchers such as Wilkinson (1996) have discovered that health inequalities are most striking in societies that have the largest differences between its wealthy and poor members. Indeed, the healthiest societies may be those which distribute their resources in a relatively equitable manner (Wilkinson, 1996). Others such as Marmot (1996) report that civil service employees at the lowest rungs of a white-collar, hierarchically organized workplace experience mortality rates that are three times higher than employees at the upper echelons. Thus, the role of hierarchical differences seems essential to an understanding of health inequalities at all levels of social organization.

One assumption that has guided researchers is that health inequalities exist at all stages of the life course. Studies which have systematically examined health inequalities in large populations were likely to use broad age groups and did not look for patterns

within these age groups (West, 1988). For example, the Black Report which examined health inequalities in Britain utilized the following age groupings: 1 - 14, 15 - 44, and 45 - 64 (DHSS, 1980). Satisfied that health inequalities were featured at every age, researchers developed new paths of inquiry which sought to answer exactly at what point in life health inequalities began to emerge and which models might best explain how health inequalities unfolded over the lifespan. As Power (1991) notes

> inequalities are not just a function of current circumstances, they develop over time and a temporal dimension needs to be incorporated into the design of studies which inquire into the causes of health inequalities (p. 415).

Initially, research concentrated on health inequalities within developmental periods using synchronous measures of health and socioeconomic position. For example, a number of studies confirm that parental socioeconomic position is strongly related to a variety of child health measures. The existence of socioeconomic differences in health during childhood has been found in mortality rates (DHSS, 1980; Nelson, 1992; Östberg, 1992; Vågerö & Östberg, 1989), chronic illness and functional limitation (Boyle, 1991; Cadman et al., 1986), infectious diseases (Reading, 1997), injury rates from motor vehicle accidents (Dougherty, Pless & Wilkins, 1990), parent's report of child health status (Bor, Najman, Andersen, Morrison & Williams, 1993) and mental disorder (Lipman, Offord & Boyle, 1994; McLeod & Shanahan, 1996).

Once the pattern of inequalities was established for parental socioeconomic position and health in childhood, researchers began the task of sorting out how socioeconomic differences in childhood health were linked to health during adulthood. Unlike the persuasive demonstration of a relationship between childhood socioeconomic status and childhood health, the relationship between childhood socioeconomic status and adult health is less clear. There is consensus that childhood environment has an effect, but its relative importance in producing health in adulthood provokes intense debate. Some support the idea that adult socioeconomic status is a powerful determinant of adult health and that childhood environment is inconsequential (Ben-Shlomo & Davey Smith, 1991; Lynch et al., 1994). Others argue that the childhood environment directly affects health in adulthood, but disagree over which aspects, economic or social conditions, contribute to adult health (Lundberg, 1993; Nyström Peck, 1994; Power, 1991; Rakhonen, Lahelma, & Huuhka, 1997; Van de Mheen, Stronks, Van den Bos & Mackenbach, 1997).

The development of a new perspective on health inequalities, labelled a life course approach, provides a theoretical framework with which to understand how health inequalities are initiated and sustained over the lifespan (Power, Bartley, Davey Smith & Blane, 1996; Wadsworth, 1997). Thus, a life course approach to the study of health inequalities addresses some of the difficulties associated with discerning the effects of time on socioeconomic differences in health. There are currently two hypothetical

models that explicate the developmental aspects of health inequalities: (1) the latency model and (2) the pathways model (Hertzman, 1994; Hertzman & Wiens, 1996).

Also known as the biological programming hypothesis, a latency model postulates that negative health outcomes are attributable to events occurring during a critical period in an individual's development. If an individual fails to navigate successfully the psychological, social or biological milestones of a developmental period, that individual will experience profound and lifelong health consequences. For example, some researchers believe that events occurring as early as intrauterine life are directly responsible for causing heart disease in mature adults (Barker, Osmond, Simmonds & Wield, 1993). This model suggests that there may be a narrow window of opportunity, normally occurring very early in life, in which to influence health in adulthood (Wadsworth, 1997). Thus, children who are born into poor homes may experience poor health in adulthood, regardless of their socioeconomic position later in life.

A pathways model emphasizes the cumulative effect of life experiences on health. Events with the ability to shape health occur at all stages of the life course, and each of these events contributes to health by either mediating or compounding the effects of prior events. For example, an alternative explanation for the relationship between birth weight and heart disease in adulthood follows a causal link in which birth weight acts as a marker for socioeconomic position during gestation, socioeconomic position in childhood often becomes one's own position in adulthood, and achieved socioeconomic

status creates the work and social environments which directly affect health (Power et al., 1996). In a similar vein, Lundberg (1993) coined the term 'unhealthy life career hypothesis' to describe how a trajectory of poverty initiated early in life creates "a chain of unhealthy living conditions which together lead to illness or premature death in adulthood" (p. 1051).

As researchers looked more closely at health inequalities at various periods of the lifespan, the notion that this relationship could be found at every age came under direct scrutiny. Researchers began to uncover evidence that socioeconomic status and health do not operate uniformly, but that the relationship is weak or nonexistent during certain periods of the lifespan. Two examples that have been reported to date include adolescence (West, 1988) and late old age (House et al., 1994).

West (1988) was one of the first researchers to demonstrate that socioeconomic differentials in mortality, chronic illness and self-rated health disappear during the adolescent period. He believed that previous research, such as the Black Report, used age groupings that were too broad, which had the effect of obscuring deviations from the expected pattern of health inequalities. West asserted that the adolescent period is a watershed point in an individual's life. During this short time span, the adolescent makes choices that may have tremendous consequences for his or her future occupation and socioeconomic position. Thus, there seems to be little justification for placing adolescents into the same category as middle aged persons who are likely to be settled in

a career and experience less fluctuation in socioeconomic position.

West's findings have been extended in a number of ways. A broader and more comprehensive conceptualization of health has led to the adoption of increasingly diverse measures. Measures of adolescent health found unrelated to occupation of the head of household include psychological wellbeing and cardiovascular functioning (West, Macintyre, Annandale & Hunt, 1990); mental health (Glendinning, Love, Hendry & Shucksmith, 1992); limiting long standing illness (Ford, Ecob, Hunt, Macintyre & West, 1994); and self reported medically attended injury (Williams, Currie, Wright, Elton & Beattie, 1996). Macintyre and West (1991) demonstrated that the lack of class differences in health during adolescence was not limited to occupationally based measures of parental socioeconomic position but also held true when other measures such as household income, paternal education, and housing tenure were utilized. One notable limitation is that, unlike the breadth of international evidence normally associated with health inequalities research, the adolescent studies are largely confined to British and Scottish populations.

Recognizing that parental socioeconomic position is a poor predictor of adolescent health, researchers have delved into alternative explanations. Some have found that gender is a better predictor of adolescent health than social class (West et al., 1990) while others report that family conflict differentiates adolescent health (Sweeting & West, 1995). Interestingly, one study finds that although parental socioeconomic

position is not linked to adolescent psychological wellbeing or self-reported health, health is differentiated by the educational attainment and current economic activity of 17 to 22 years olds (Glendinning et al., 1992).

There are several theories to explain why the adolescent period exhibits the lack of a relationship between socioeconomic position and health. It may be that the consequences of early life events have not yet accumulated to the point where they can affect adolescent health and/or that the effects of health-related behaviours (eg. smoking) which normally start in adolescence have not been in existence long enough to influence health (West et al., 1990). This line of argument seems weak in light of research that firmly connects parental socioeconomic position to health in childhood. Another theory posits that because adolescence is a relatively healthy period (ie. low mortality rates), the relationship between class and health is artificially deflated (Blane et al., 1994). However, the notion of adolescent healthiness has been soundly refuted in studies which have found a surprisingly high prevalence of physical and mental health conditions in this age group (Bennett, 1985; West & Sweeting, 1996).

Others suggest that adolescence may represent a period in the life course in which socioeconomic differences in health become diminished because of the unique developmental characteristics associated with adolescence (West, 1997). Specifically, the construction of an identity apart from the family of origin leads adolescents to immerse themselves in the school environment, the influence of peers and contemporary

youth culture. Operating through unknown mechanisms, these influences have an equalizing effect on the relationship between social class and health that dissipates when young adults begin to assume adult roles and enter the labour market. To date, none of these hypotheses have been explicitly tested.

The lack of health inequalities during adolescence has theoretical implications for a life course approach to socioeconomic differences in health. It appears that neither the latency model nor the pathways model as they are currently formulated, are able to explain the lack of socioeconomic differences in health for this short period of time. Given the importance of connecting developmental periods to an overall pattern of health inequalities, it is imperative, if the adolescent period is indeed characterized by the lack of a relationship between parental socioeconomic position and health, that existing models be adjusted to account for this finding or that new, more powerful theoretical models be generated.

There is also a need to clarify to a greater extent, exactly when health inequalities in adolescence disappear and re-emerge, and for which measures of health and parental socioeconomic position, health inequalities are not observed. For example, prior studies have not made a clear distinction between measures of psychological wellbeing and mental disorder. Furthermore, only two studies consider parental education as a measure of parental socioeconomic position, and neither treat education of the male parent separately from education of the female parent.

The Ontario Child Health Study (OCHS) and its follow-up (OCHS-FU) four years later was conducted for the purpose of assessing the physical and mental health of children living in the province of Ontario. The survey incorporates a broad range of health measures as well as comprehensive measures of parental socioeconomic position. There are also two distinct stages of the life course available for analysis: adolescence and young adulthood. The adolescent period ranges from the ages of 12 to 16, a time frame that is normally adopted by researchers to approximate this stage in the life course (West, 1997). Young adulthood follows adolescence and encompasses the ages of 17 to 21. Furthermore, the transition from adolescence to young adulthood coincides with the two waves of the survey. This allows for the evaluation of changes to the relationship between parental socioeconomic position and health to be tested across the two developmental periods.

The purpose of the present study, therefore, is to utilize data from the OCHS and OCHS-FU survey to describe the relationship between parental socioeconomic position and health at two time periods: adolescence and young adulthood, and to assess if there are changes in the relationship that occur between these developmental periods. This study contributes to a growing research interest in health inequalities in Canada (Dougherty et al., 1990; Frohlich & Mustard, 1996; Mustard, 1996; Mustard, Derksen, Berthelot, Wolfson & Roos, 1997; Wilkins, Adams & Brancker, 1989) and extends the investigation of health inequalities in adolescence to a population outside of the United

Kingdom. Additionally, the longitudinal component of this study furthers knowledge on the utility of a life course approach to health inequalities by examining changes that occur across two developmental periods.

There are two main hypotheses to be tested in this study. Firstly, this study will examine the relationship between parental socioeconomic position and health for each wave of the survey with the expectation that there will be no significant relationship when adolescents are between the ages of 12 and 16, but that the relationship will be significant in young adulthood (17 - 21 years of age). Secondly, data from each wave of the survey will be combined into a pooled cross-section so that it will be possible to test for significant changes in the relationship between class and health that occur as adolescents progress to young adulthood.

Methods

Sample

The Ontario Child Health Study (OCHS) is an epidemiologic survey designed to measure the prevalence of mental disorder and chronic health problems in children ages 4 -16 living in the province of Ontario. The sample was collected in 1983 through clustered, stratified and random sampling using the 1981 Canadian census as the sampling frame. All children living in Ontario were eligible to participate with the exception of those living on reservations, in collective dwellings such as institutions, and in dwellings built after 1981. This group of excluded children represents approximately 3.3% of the eligible population. Of those who were selected to participate in the survey, 91.1% agreed to take part while 3.9% declined with the remaining 5% not participating for various reasons such as language barriers or stressful life events (Boyle et al., 1987).

This study utilizes data from 1302 adolescents aged 12 - 16 in 1983, and 933 17 - 21 years olds who were available at follow-up in 1987. Missing data occurred in a minority of cases and were due mostly to respondent refusal or answers left blank (Boyle et al, 1987). Both parents and youth contributed information to the survey in 1983. A parent, usually the mother, responded to items concerning household variables such as family income for 1982, educational attainment of parent(s), and items relating specifically to the youth's physical and mental health. Youth were responsible for completing a questionnaire dealing with mental health problems and health behaviours

such as smoking, drinking and social activities.

In 1987, families participating in the first survey were located and asked to take part in a follow up survey (OCHS-FU). Approximately 933 participants or 71.6% of the original 1302 participants were successfully located and agreed to participate. The main informant for the follow-up survey is the young adult who is between the ages of 17 and 21. Parental information is restricted to a few questions such as household income in 1986. The follow-up survey contains items that are similar to the questions asked in the original study and includes additional items that relate specifically to changes experienced by a young adult population (eg. entry into the labour market).

Attrition occurring from the first to the second survey and item non-response for those participating in OCHS-FU substantially reduce the sample size. Boyle, Offord, Racine and Catlin (1991) reported on sample loss for the follow up of the original participants in OCHS. Although their paper analyzes only the 4 -12 year old group, the results have implications for the older group. Those not participating in the follow up study were more likely to have had a mental disorder in 1983 and to come from families that were poor and dysfunctional. However, the authors report that sample loss does not affect calculations for risk of mental disorder.

Measures

In keeping with the precautions of social scientists that health and socioeconomic position are imprecisely understood, several measures of each are utilized to ensure that

the multidimensional aspects of these variables are adequately evaluated (Liberatos, Link & Kelsey, 1988).

Health

This study utilizes four measures of health which are assessed in both waves of the survey: (1) mental disorder; (2) self-reported mental health problems; (3) chronic illness and (4) general health.

The assessment of adolescent **mental disorder** involves asking adolescents and a parent to complete checklists based on the diagnostic criteria of DSM-III (American Psychiatric Association, 1980). The adolescent is considered to have a mental disorder if either the parent's report or the adolescent's self-report of the adolescent's behaviours and emotions in the previous six months exceed the threshold for a given mental disorder. Four categories of mental disorder were assessed in the adolescent population: hyperactivity, conduct disorder, somatization and emotional disorder. These disorders are considered to be the most common chronic mental health conditions of childhood.

In the follow up study, the determination of mental disorder rests solely on the responses of the young adult. Because conduct disorder and hyperactivity disorder are not normally applicable to an adult population, it was necessary to design a new questionnaire to measure the prevalence of adult mental disorder for the follow-up study. The assessment of mental disorder in the follow-up study included the following psychopathological conditions: depression, dysthymia, bipolar (manic) disorder, panic

disorder, generalized anxiety disorder, obsessive-compulsive disorder and antisocial personality disorder.

In both the adolescent and young adult population, the measure of mental disorder differentiates between the presence or absence of any mental disorder. Dichotomous measures of mental disorder instead of categorical measures have been utilized in previous studies of the OCHS survey (Lipman et al., 1994). Issues regarding the validity of items used to identify participants who have experienced a mental disorder in the past six months have been thoroughly investigated and are reported in detail elsewhere (Boyle et al., 1987; Sanford et al., 1994).

To assess **self-reported mental health problems**, participants were asked to indicate whether they thought they had any emotional or behavioural problems in the past six months, and if yes, whether these problems were more than what their same-aged peers experience. These responses were dichotomized into no mental health problems versus any or more mental health problems. For both waves of the survey, mental health problems were self-reported and questions were phrased in an identical manner.

Chronic illness was assessed as the presence/absence of one or more of a wide range of chronic conditions including asthma, mental retardation, and diabetes as well as disabling conditions such as missing limbs, paralysis and hearing or vision problems lasting longer than six months (Table 1). Items referring to chronic illness are answered by the parent in the original survey and self-reported in the follow up survey. The

method of using dichotomous variables for chronic illness instead of categorical measures has been utilized in previous analyses of the OCHS dataset, and has precedent in other studies as well (Cadman, Rosenbaum, Boyle & Offord, 1991; Stein & Jessop, 1982).

Table 1 Chronic Health Conditions in OCHS and OCHS-FU

Illness/Condition

Blindness in one or both eyes*	Epilepsy or convulsion without fever
Vision problems even with glasses*	Heart problem
Deafness*	Kidney disease
Hearing problem but not deaf*	Missing limb(s)
Asthma	Paralysis or weakness of any kind
Arthritis or rheumatism	Physical deformity
Cancer	Other chronic health problem
Diabetes	

* of at least six months duration

General health is assessed with four questions regarding the adolescent's overall health. The questions are answered using a Likert rating and then summed to produce a scale with scores ranging from 4 to 20 with higher scores indicating better health (Table 2). As with chronic illness, a parent provides information on the adolescent's health in the original study, but in the follow up study, the young adult is the informant.

The measure of general health in this study is an improvement over other research

methods for analyzing self-rated health. First, the use of four questions may lead to more precise measures of general health and thereby, increase the ability to detect socioeconomic differences. Second, other researchers tend to treat self-rated health as a dichotomous measure by making an arbitrary distinction between poor and good health. The analysis of general health as a continuous measure preserves information and reduces measurement error (Davies & Ware, 1981).

Table 2 Items in the General Health Scale

1.	*My (youth's) health is excellent.
2.	*I (youth) seem to resist illness.
3.	I (youth) seem to be less healthy than others my (youth's) age.
4.	When there is something going around, I (youth) usually catch it.

Participants (parent in OCHS and young adult in OCHS-FU) rate each of the above statements according to the following scale: 1=definitely true 2=mostly true 3=don't know 4=mostly false 5=definitely false

* reverse scored

The prevalence of mental disorder, self-reported mental health problems and chronic illness as well as the mean score for general health are reported for both waves of the survey in Table 3. Health appears to have declined from the original to the follow-up study. It is important to note however, that there are alternative explanations for the observed differences in the measures of chronic illness, general health and mental disorder between the two time periods. Because parents were asked to assess the health

of their children in the original survey and young adults self-reported this information in the follow up study, it is possible that the apparent increase in the rate of chronic illness and a lower general health score are due to changes in the informant and not changes in health status. Similarly, the reports of both parent and adolescent were used to assess mental disorder in the original survey, but only the young adult contributed information in the follow up survey. Furthermore, the increased prevalence of mental disorder may be attributed to differences in the instruments used to assess mental disorder at each time period. The creation of a new questionnaire to capture mental disorders in young adulthood underscores the point that adult mental disorders may share several characteristics of childhood mental disorders, but are nevertheless distinct and unique to

Table 3 Prevalence of Health Measures and Mean General Health Score for OCHS (1983) and OCHS-FU (1987)

	1983 %	1987 %
Mental Disorder	18.9	27.5
Self-Reported Mental Health Problem	21.5	25.9
Chronic Illness	17.3	24.2
General Health Scale *	17.36 (2.62)	16.20 (2.82)

* (standard deviation in parentheses)

the adult population. These differences contribute to the difficulty interpreting an increase in the prevalence of poor health conditions from the first to the second survey as indicative of poorer physical and mental health in young adulthood. Only self-reported mental health problems were assessed in an identical manner, using the same questions and the same informant in both the original and follow up surveys.

Parental Socioeconomic Position

Parental measures of socioeconomic position were assessed with two measures of material resources and two education based measures (see Table 4 for sample characteristics for both 1983 and 1987). Household income for the previous year (1982 and 1986) and housing tenure directly measure material resources. These measures are available in each wave of the study, although it was necessary to make some adjustments to both housing tenure and household income for the 1987 sample. Thus, three levels of housing tenure were collapsed into two levels (rent vs. own) for the sample in 1987 as there were too few subsidized renters to make up a separate category. Two dummy variables were constructed for housing tenure in 1983 and one dummy variable was used for housing tenure in 1987 with homeowners as the reference category in both instances. In 1983, 82.1% of participants live in homes that are owned by their families, while in 1987, the proportion of homeowners increases to 86.9%. Renters make up 14.1% of the sample in 1983, with a further 3.8% classified as subsidized renters, while in 1987, 13.1% of the sample represents renters.

Table 4 Distribution of Parental Socioeconomic Position Measures in 1983 and 1987

	1983	1987
Household Income		
less than $10,000	7.3	3.1
$10,000 - 19,999	16.7	7.8
$20,000 - 29,999	23.2	12.8
$30,000 - 39,999	23.2	18.1
$40,000 - 49,999	16.3	22.7
$50,000 - 59,999	6.4	14.8
More than $60,000	7.0	20.6
N	1248	704
Housing Tenure		
subsidized rent	3.8	-
rent	14.1	13.1
own	82.1	86.9
N	1293	820
Education of the Male Parent		
primary school or less	21.5	21.9
some high school	32.1	33.3
completed high school	17.4	15.8
any postsecondary	29.0	29.0
N	1181	627
Education of the Female Parent		
primary school or less	19.0	18.6
some high school	34.3	33.0
completed high school	19.6	21.7
any postsecondary	27.0	26.7
N	1276	667

Columns may not add up to 100% due to rounding

Instead of continuous measures, household income was measured categorically. Respondents selected the category which best described their annual household income for the previous year. There are seven categories of $10,000 increments for the 1983 survey with household income of $60,000 and higher as the reference category. Household income in 1987 was reduced from seven to six categories by combining the lowest three income groups in 1983 into two: less than $15,000 and $15,000 to $29,999. It was necessary to combine some of the lower income categories because of the small number of cases in these categories. As with the 1983 survey, the highest income group served as the reference category. Dummy coding was utilized for income categories.

For presentational purposes, Table 4 displays household income in increments of $10,000. While household income in 1983 is nearly normally distributed (except for a larger tail at the upper end of the distribution), household income in 1987 is negatively skewed. As income was not adjusted for differences in the increase in the cost of living between the two time periods (at least for the separate analysis of the two waves of the survey), it is likely that this is partially responsible for skewing household income in 1987. However, researchers who have examined changes from the original to the follow-up survey, have reported that low income families were less likely to be involved with the second wave of the survey (Boyle et al., 1991).

Educational attainment of the male and female parent also measures parental socioeconomic position. This is a categorical measure with four levels: primary school

or less, some high school, completed high school and any post secondary education. Dummy variables were constructed for each level of education with any postsecondary education acting as the reference category. Although educational attainment of the parents was not assessed in the follow-up study, the relative stability of this variable over time is an adequate justification for using educational attainment in 1983 as a valid measure for both waves of the survey. The education qualifications of both parents at both waves of the survey remained quite similar. Slightly less than 22% of male parents had less than primary education in either wave of the survey; less than 20% of female parents had similar qualifications. In both waves of the survey, approximately 27% of female parents and 29% of male parents had received any postsecondary education.

Control Variables

Three control variables were added to all regression equations: gender, family size and number of parents in the household. All control variables had two levels and were dummy coded. In 1983, both sexes were equally represented; by 1987 there were slightly more males than females (51.6% versus 48.4%). Females served as the reference category for gender. Number of siblings was recorded dichotomously in this study: less than four siblings or four or more siblings. Therefore, this variable was dummy coded using less than four siblings as the reference category. The rationale for choosing four siblings as the cutoff comes from a prior study which determined that having more than four children in a household was able to discriminate most accurately families who were

living in overcrowded housing (Rutter & Madge, 1976; Offord, Boyle & Jones, 1987). Slightly more than 15% of families in 1983 were characterized as having four or more siblings which remained unchanged for the follow-up survey. In 1983, 10.8% of families were headed by a single parent with this proportion dropping to 7.0% by 1987. A two parent household was the reference category for number of parents in the household.

Pooled Cross-Section

A pooled cross-section represents one method of assessing changes between relationships over time (Kessler & Greenberg, 1981). This procedure has been used in other research to determine if socioeconomic differences in exposure to life events differentially affects health (McLeod & Kessler, 1990) and to model the effects of income inequality and public policy on international rates of infant mortality over time (Wennemo, 1993). The purpose of a pooled cross-section in the current study is to test if there are significant differences in the relationship between parental socioeconomic position and health across the two developmental stages. In effect, an artificial cross-section is created by combining the total sample of 933 cases in 1987 and the 933 participants in 1983 for whom data were available at both time points. Therefore, the total sample size was increased to 1866 as each participant in each year of the survey counted as a separate person-period observation.

The use of the pooled cross-section method to answer the research question of whether socioeconomic differences in health change as adolescents progress to young

adulthood represents an exploratory approach. One potential weakness of this approach concerns the non-independence of observations (Allison, 1995). This problem occurs because the cases are related to each other through the creation of person-period observations. There are serious implications for significance tests when non-independence of the observations is not accounted for. Although the coefficients themselves are not affected, the standard errors of the coefficients are likely to be underestimated, so that one reports significant findings when in actuality, there are none. One way to handle the non-independence of observations is to use a correction based on the derivation of the sample; that is, to utilize information concerning the sample design to correct for the non-independence of observations. As this information was not available, the problem of non-independence of observations was not corrected and thus, there are potential problems associated with interpreting the pooled cross-section models correctly.

A dummy variable was used to represent the two separate developmental stages of adolescence and young adulthood. Participants who were between the ages of 12 and 16 during the first survey were coded as 0 (reference category) while participants who were between the ages of 17 and 21 at follow-up were assigned a value of 1. The products of the dichotomously coded age group and measures of parental socioeconomic position were included as interaction variables to model changes in socioeconomic differences in health as adolescents matured. A significant positive interaction would

indicate that socioeconomic differences in health increase as adolescents progress to a later stage in development while a negative significant interaction would imply that socioeconomic differences in health are reduced from one developmental stage to the next.

It was necessary to adjust for increases in the cost of living between 1982 and 1986 (these are the years for which parents were asked to report household income) for analysis of the pooled cross-section. Each level of household income in 1982 was assigned its median value and then multiplied by a rate of 1.19. According to the Consumer Price Index, this is an appropriate adjustment in order to make 1982 dollars equivalent to 1986 dollars (Statistics Canada, 1996). Once household income in 1982 was made equivalent to household income in 1986, income for the two time periods was collapsed into five income categories of $15,000 increments with the highest income group ($60,000 and higher) acting as the reference category.

Housing tenure in 1983 was recoded to correspond with housing tenure in the follow-up survey. Thus, there were two levels of housing tenure (rent versus own) in the pooled cross-section with homeowners acting as the reference category. There were no changes to the categorical variables representing the education of the male and female parent. As with the previous design, any post secondary education served as the reference category.

Statistical Analysis

The SAS System was used for data analysis. Logistic regression was utilized for dependent variables that were dichotomous (presence vs absence of mental disorder, self-reported mental health problems and chronic illness); ordinary least squares (OLS) regression was utilized for the measure of general health. There are slight variations in the number of cases in each regression analysis as missing information on various items made it necessary to exclude them at different times from the analysis.

Results are presented for each of the four health conditions by each of the four measures of parental socioeconomic group. The relationship between parental socioeconomic group and the presence/absence of mental disorder, self reported mental health problems and chronic illness are presented as odds ratios. An odds ratio higher than 1 indicates that there is an increased risk for a specific health condition while an odds ratio less than 1 represents a reduced risk. A relationship in either direction is said to be significant if the 95% confidence interval of the odds ratio does not contain the value of 1. The relationship between parental socioeconomic group and general health is reported using beta coefficients and standard errors. A positively valued beta coefficient translates into a increase in general health for a given level of parental socioeconomic group; a negative coefficient operates in the opposite direction.

Results

OCHS (1983)

Table 5 provides descriptive statistics on the proportion of participants in 1983 with mental disorder, self-reported mental health problems and chronic illness by household income, housing tenure, and education of the male and female parent. Mean general health score and standard deviations are similarly reported for each measure of parental socioeconomic position.

There are differences between the highest and lowest income groups which translate into higher rates of mental disorder and chronic illness as well as lower general health for those in the lowest income groups. Self-reported mental health problems are almost equally distributed among the various levels of household income. The distribution of health status by housing tenure shows some variation especially for mental disorder. Adolescents who belong to families living in subsidized rental accommodations have nearly double the rate of mental disorder than adolescents whose families who own their homes.

Both self-reported mental health problems and chronic illness display reverse relationships for education of the male parent. That is, there is an unexpected increase in the rate of both health conditions as the level of education of the male parent increases. In contrast, mental disorder and general health differ in the expected direction by education of the male parent. The results for education of the female parent are slightly

Table 5 Health Measures by Household Income, Housing Tenure and Education of the Male and Female Parent (1983)

	Percentage meeting criteria for mental disorder	Percentage reporting mental health problems	Percentage reporting chronic illness	Mean (SD) general health score
Household Income				
less than $10,000	33.7	22.2	28.0	16.21 (3.33)
$10,000 - 19,999	17.3	24.3	15.5	17.12 (2.69)
$20,000 - 29,999	21.7	21.0	16.3	17.23 (2.76)
$30,000 - 39,999	14.9	18.5	16.4	17.51 (2.49)
$40,000 - 49,999	16.9	20.7	18.2	17.51 (2.55)
$50,000 - 59,999	17.9	25.3	18.1	17.77 (2.09)
$60,000 +	18.5	21.7	11.2	18.14 (1.82)
N	1190	1212	1169	1216
Housing Tenure				
subsidized rent	32.6	28.6	16.3	16.14 (2.77)
rent	20.3	21.0	22.6	17.50 (2.75)
own	18.1	21.4	16.5	17.40 (2.58)
N	1228	1252	1210	1260
Father's Education				
primary school or less	24.2	15.5	14.1	16.82 (2.87)
some high school	18.5	21.7	17.7	17.28 (2.60)
completed high school	19.3	24.7	15.1	17.71 (2.49)
any postsecondary	14.6	22.7	18.7	17.68 (2.45)
N	1123	1141	1108	1151
Mother's Education				
primary school or less	22.8	20.4	16.3	16.74 (2.99)
some high school	19.0	21.0	18.9	17.34 (2.45)
completed high school	20.9	21.2	15.8	17.37 (2.77)
any postsecondary	8.8	13.9	12.0	17.80 (2.34)
N	1212	1236	1194	1243

different. There is a more than twofold difference in the proportion of adolescents with mental disorder between female parents who have less than primary schooling and female parents who have received any postsecondary education. General health also varies by education of the female parent, and to a lesser extent, differences exist for self-reported mental health problem and chronic illness. Overall, there appears to be noticeable differences in health status across the different measures of parental socioeconomic position.

In contradiction to the hypothesis of this study and the findings of previous research, the results of the analysis for the first wave of the survey demonstrate that the health of adolescents between the ages of 12 and 16 does indeed differ significantly by parental socioeconomic position. As Table 6 indicates, household income is a significant predictor of both mental disorder and chronic illness. Adolescents living in households with less than $10,000 reported income are at more than twice the risk for mental disorder and more than three times at risk for chronic illness compared to families reporting an income greater than $60,000. Beyond a threshold of less than $10,000 reported income, there are no further significant income differences in adolescent health status, although there is a pattern of elevated risk for chronic illness among all income levels relative to the highest income group. Table 6 also shows that household income is not significantly related to self-reported mental health problem.

Table 7 reports odds ratios for mental disorder, self-reported mental health

Table 6 Odds Ratios and 95% Confidence Intervals for Health Status of Participants by Household Income (1983)

	Mental Disorder		Self-Reported Mental Health Problem		Chronic Illness	
	OR	95% CI	OR	95% CI	OR	95% CI
Household Income (1982)						
less than $10,000	2.63	(1.21 - 5.71)	.87	(.40 - 1.88)	3.45	(1.42 - 8.42)
$10,000 - 19,999	.92	(.47 - 1.81)	1.14	(.61 - 2.12)	1.53	(.68 - 3.39)
$20,000 - 29,999	1.25	(.66 - 2.35)	.99	(.55 - 1.82)	1.62	(.75 - 3.47)
$30,000 - 39,999	.80	(.41 - 1.53)	.87	(.47 - 1.60)	1.55	(.72 - 3.34)
$40,000 - 49,999	.94	(.48 - 1.85)	1.06	(.57 - 2.00)	1.76	(.80 - 3.88)
$50,000 - 59,999	.97	(.43 - 2.18)	1.30	(.62 - 2.71)	1.74	(.70 - 4.29)
$60,000 + (reference)	1.00		1.00		1.00	
Gender						
male	.78	(.58 - 1.05)	.55	(.42 - .74)	1.02	(.75 - 1.39)
female (reference)	1.00		1.00		1.00	
Family Size						
four or more siblings	1.35	(.93 - 1.98)	1.08	(.74 - 1.57)	.70	(.45 - 1.11)
less than four siblings (reference)	1.00		1.00		1.00	
Number of Parents						
single parent household	.72	(.42 - 1.24)	1.57	(.98 - 2.48)	.84	(.48 - 1.47)
two parent household (reference)	1.00		1.00		1.00	
- 2 Log Likelihood	1133.35		1229.99		1057.13	
Model χ^2	22.31	(9 df)	23.57	(9 df)	11.62	(9 df)

Note Adjusted for Gender, Family Size and Single vs Two Parent Household

Table 7 Odds Ratios and 95% Confidence Intervals for Health Status of Participants by Housing Tenure (1983)

	Mental Disorder		Self-Reported Mental Health Problem		Chronic Illness	
	OR	95% CI	OR	95% CI	OR	95% CI
Housing Tenure						
subsidized rent	2.11	(1.06 - 4.19)	1.22	(.62 - 2.42)	1.06	(.45 - 2.51)
rent	1.20	(.80 - 1.82)	.94	(.63 - 1.40)	1.45	(.96 - 2.18)
own (reference)	1.00		1.00		1.00	
Gender						
male	.79	(.59 - 1.05)	.54	(.41 - .72)	1.09	(.81 - 1.47)
female (reference)	1.00		1.00		1.00	
Family Size						
four or more siblings	1.43	(.99 - 2.07)	1.06	(.73 - 1.54)	.76	(.49 - 1.18)
less than four siblings (reference)	1.00		1.00		1.00	
Number of Parents						
single parent household	.88	(.53 - 1.45)	1.41	(.91 - 2.19)	1.01	(.61 - 1.66)
two parent household (reference)	1.00		1.00		1.00	
- 2 Log Likelihood	1180.18		1281.42		1110.20	
Model χ^2	11.79 (5 df)		22.59 (5 df)		5.43 (5 df)	

Note Adjusted for Gender, Family Size and Single vs Two Parent Household

Table 8 Odds Ratios and 95% Confidence Intervals for Health Status of Participants by Education of Male Parent (1983)

	Mental Disorder		Self-Reported Mental Health Problem		Chronic Illness	
	OR	95% CI	OR	95% CI	OR	95% CI
Education of Male Parent						
primary school or less	1.83	(1.19 - 2.82)	.61	(.39 - .95)	.73	(.46 - 1.16)
some high school	1.30	(.87 - 1.95)	.90	(.63 - 1.30)	.95	(.64 - 1.41)
completed high school	1.40	(.87 - 2.24)	1.03	(.68 - 1.57)	.80	(.49 - 1.30)
any postsecondary (reference)	1.00		1.00		1.00	
Gender						
male	.78	(.57 - 1.05)	.47	(.35 - .63)	1.23	(.90 - 1.69)
female (reference)	1.00		1.00		1.00	
Family Size						
four or more siblings	1.36	(.93 - 2.00)	1.07	(.90 - 4.33)	.77	(.49 - 1.22)
less than four siblings (reference)	1.00		1.00		1.00	
Number of Parents						
single parent household	.72	(.24 - 2.11)	2.02	(.90 - 4.53)	.37	(.09 - 1.58)
two parent household (reference)	1.00		1.00		1.00	
- 2 Log Likelihood	1066.80		1139.89		993.73	
Model χ^2	14.17 (6 df)		35.20 (6 df)		7.89 (6 df)	

Note: Adjusted for Gender, Family Size and Single vs Two Parent Household

Table 9 Odds Ratios and 95% Confidence Intervals for Health Status of Participants by Education of Female Parent (1983)

	Mental Disorder		Self-Reported Mental Health Problem		Chronic Illness	
	OR	95% CI	OR	95% CI	OR	95% CI
Education of Female Parent						
primary school or less	1.58	(1.02 - 2.43)	.84	(.55 - 1.26)	.93	(.59 - 1.48)
some high school	1.31	(.88 - 1.93)	.91	(.64 - 1.30)	1.10	(.75 - 1.61)
completed high school	1.49	(.96 - 2.29)	.93	(.62 - 1.39)	.88	(.55 - 1.38)
any postsecondary (reference)	1.00		1.00		1.00	
Gender						
male	.80	(.60 - 1.07)	.54	(.41 - .72)	1.10	(.81 - 1.48)
female (reference)	1.00		1.00		1.00	
Family Size						
four or more siblings	1.47	(1.02 - 2.11)	1.12	(.78 - 1.62)	.74	(.48 - 1.16)
less than four siblings (reference)	1.00		1.00		1.00	
Number of Parents						
single parent household	1.15	(.72 - 1.86)	1.42	(.92 - 2.20)	1.20	(.73 - 1.97)
two parent household (reference)	1.00		1.00		1.00	
- 2 Log Likelihood	1167.37		1259.01		1102.66	
Model χ^2	12.47 (6 df)		22.20 (6 df)		4.11 (6 df)	

Note Adjusted for Gender, Family Size and Single vs Two Parent Household

problems and chronic illness by housing tenure. Living in a subsidized rental unit confers a significantly increased risk of adolescent mental disorder compared to homeowners, but there are no significant differences in risk for mental disorder between ordinary renters and homeowners. Neither self-reported mental health problems nor chronic illness are significantly associated with housing tenure.

There are conflicting results for the relationship between education of the male parent and adolescent health status (Table 8). Adolescents who have a male parent with primary schooling or less are nearly twice as likely to suffer from a mental disorder, but are significantly less likely to believe that they have a mental health problem. The pattern for risk of mental disorder across all levels of education for the male parent suggests an increased risk relative to the reference group of any postsecondary education. There are no significant differences in risk for chronic illness by education of the male parent.

The relationship between education of the female parent and adolescent health status is also significant (Table 9). Adolescents whose female parent has primary education or less have a significantly increased risk of mental disorder compared to adolescents whose female parent has any postsecondary education. Both self-reported mental health problems and chronic illness are unrelated to educational attainment of the female parent.

Few of the control variables in the above models are independently related to

adolescent health. Gender is not associated with adolescent health with the exception that males are significantly less likely than females to report mental health problems. In the model for education of the female parent, having four or more siblings confers a significantly increased risk for adolescent mental disorder relative to less than four siblings. Finally, none of the relationships between number of parents in the household and adolescent health status are significant.

The results of the linear regression models for general health indicate that there are significant differences by parental socioeconomic position. Table 10 shows the parameter estimates for general health by household income and housing tenure. A reported household income of less than $40,000 is associated with a significantly lower general health score compared to families with an income of $60,000 or more. There is an overall pattern of steady increases in general health as household income rises. General health is also differentiated by housing tenure. Adolescents whose families are subsidized renters have significantly poorer general health when compared to families who are homeowners, although there are no significant differences between families who are ordinary renters and homeowners.

Table 11 reports the parameter estimates for general health by education of the male and female parent. General health is significantly lower for adolescents with a male parent who has either a primary education or some high school compared to any postsecondary education. Only adolescents with male parents who have completed their

Table 10 Linear Regressions Models for General Health by Household Income and Housing Tenure (1983)

	ß coefficient	standard error	ß coefficient	standard error
Household Income (1982)				
less than $10,000	- 2.25 *	.41		
$10,000 - 19,999	- 1.08 *	.33		
$20,000 - 29,999	- .94 *	.32		
$30,000 - 39,999	- .64 *	.32		
$40,000 - 49,999	- .65	.33		
$50,000 - 59,999	- .37	.40		
$60,000 and higher (reference)				
Housing Tenure				
subsidized rent			- 1.31 *	.41
rent			.05	.21
own (reference)				
Gender				
male	.20	.15	.17	.15
female (reference)				
Family Size				
four or more siblings	- .19	.21	- .08	.21
less than four siblings (reference)				
Number of Parents				
single parent household	.66 *	.26	.23	.25
two parent household (reference)				
F	4.481		2.656	
p	.0001		.0214	
Adjusted R^2	.0252		.0065	

* significant at the $p<.05$ level

Note: Adjusted for Gender, Family Size and Single vs. Two Parent Household

Table 11 Linear Regressions Models for General Health by Education of the Male and Female Parent (1983)

	ß coefficient	standard error	ß coefficient	standard error
Education of the Male Parent				
primary or less	- .86 *	.22		
some high school	- .40 *	.20		
completed high school	.02	.23		
any postsecondary (reference)				
Education of the Female Parent				
primary or less			- 1.05 *	.22
some high school			- .46 *	.19
completed high school			- .44 *	.22
any postsecondary (reference)				
Gender				
male	.14	.15	.14	.15
female (reference)				
Family Size				
four or more siblings	- .03	.21	- .14	.20
less than four siblings (reference)				
Number of Parents				
single parent household	.40	.48	- .03	.25
two parent household (reference)				
F	3.629		4.158	
p	.0014		.0004	
Adjusted R^2	.0136		.0151	

* significant at the $p < .05$ level

Note: Adjusted for Gender, Family Size and Single vs. Two Parent Household

high school education do not have significantly different general health scores from adolescents whose male parent has any postsecondary education. This is not the case for education of the female parent. At all levels of education, there are significant differences in the general health of the adolescent when compared to any postsecondary education of the female parent. As with education of the male parent, the effect of education of the female parent on general health is strongest at the lowest levels of education.

The control variables in the models for general health are not significant. Neither gender, family size nor number of parents in the household are related to general health of the adolescent. The one exception occurs in the model for household income which indicates that single parents are significantly more likely to report that their adolescent child is in better health than two parent households.

The above results for the differences in adolescent health by parental socioeconomic position are surprising, given that other studies using similar measures of adolescent health and parental socioeconomic group, have failed to find any significant relationships. The results of this analysis clearly show that parental socioeconomic position has an effect on adolescent health.

OCHS-FU (1987)

Descriptive statistics for the proportion of participants in 1987 who report a mental disorder, self-reported mental health problem or chronic illness are cross-

tabulated by the various measures of parental socioeconomic position and displayed in Table 12. Also provided in Table 12 is the mean and standard deviation of the general health score by each level of parent socioeconomic position.

The health of young adults, who are between the ages of 17 and 21 in the follow-up survey, shows some variation by parental socioeconomic position. There is a much higher proportion of young adults with a mental disorder in families with a reported household income of less than $15,000 than in families with a household income greater than $60,000 (42.4% versus 23.6%). There are also marked differences between the lowest and highest income groups in the proportion of young adults with a chronic illness (39.0% versus 22.7%). Self-reported mental health problems and mean general health score do not differ appreciably by level of household income.

There is little variation in any measure of health status by housing tenure, with the exception of chronic illness, which has a higher proportion among young adults whose parents live in rented accommodations compared to parents who own their homes (34.0% versus 21.7%). Differences in health by education of the male parent are minimal with a slightly higher proportion of young adults with a mental disorder from the lowest education level compared to the highest education level (31.3% versus 27.7%). This seems to be true for education of the female parent as well; only the proportion of young adults with a mental disorder shows moderate differences between the highest and lowest levels of education of the female parent (37.2% versus 28.1%).

Table 12 Health Measures by Household Income, Housing Tenure and Education of the Male and Female Parent (1987)

	Percentage meeting criteria for mental disorder	Percentage reporting mental health problems	Percentage reporting chronic illness	Mean (SD) general health score
Household Income (1986)				
less than $15,000	42.4	24.4	39.0	16.19 (2.82)
$15,000 - 29,999	27.6	26.0	26.7	16.15 (2.63)
$30,000 - 39,999	33.6	28.2	26.2	15.87 (3.02)
$40,000 - 49,999	21.1	28.0	20.4	16.59 (2.65)
$50,000 - 59,999	27.6	27.8	24.5	16.32 (2.80)
$60,000 +	23.6	22.5	22.7	16.19 (2.61)
N	538	633	665	695
Housing Tenure				
rent (includes subsidized)	31.5	24.8	34.0	15.78 (3.14)
own	26.7	26.2	21.7	16.31 (2.73)
N	605	709	774	809
Education - Male Parent				
primary school or less	31.3	29.7	25.2	16.29 (2.84)
some high school	29.3	21.7	26.9	15.97 (2.94)
completed high school	29.7	23.0	19.6	16.14 (3.07)
any postsecondary	27.7	28.9	25.9	16.30 (2.77)
N	460	537	595	620
Education - Female Parent				
primary school or less	37.2	25.5	25.2	15.99 (3.10)
some high school	30.4	26.3	24.6	16.02 (2.72)
completed high school	22.3	22.8	28.0	16.22 (3.01)
any postsecondary	28.1	27.7	24.7	16.29 (2.81)
N	490	574	631	660

Compared to the differences in adolescent health by parental socioeconomic position in 1983 (shown in Table 5), the health of young adults four years later appears to show less variation by parental socioeconomic group despite some similarities. At each time period, mental disorder and chronic illness show a nearly twofold increase from the highest to the lowest income levels. While the measure of self-reported mental health problem is largely undifferentiated by household income at both time periods, general health in 1983 shows wider variation by household income than what is found in 1987. Similarly, mental disorder, self-reported mental health problems and general health show less differentiation by housing tenure in 1987 than in 1983, although this is not the case for chronic illness. In contrast to the adolescent population, education of the male parent at follow-up does not show any reverse patterns for self-reported mental health problems or chronic illness in young adults and generally indicates even less variation in health by education of the male parent. For education of the female parent, differences in mental disorder and general health persist, but are much smaller at follow-up, while self-reported mental health problem and chronic illness in 1987 are nearly homogeneous across all levels of education.

As with the analysis of the 1983 survey, logistic regression models were calculated for mental disorder, self-reported mental health problems and chronic illness to determine if there were significant differences in health by parental socioeconomic group. Models for general health were calculated using OLS regression techniques.

Similarly, all models contained the three control variables: gender, family size and number of parents in the household.

Table 13 displays odds ratios and 95% confidence intervals for mental disorder, youth mental health problem and chronic illness by household income. Risk for chronic illness is significantly increased for the lowest income group (less than $15,000) compared to the reference category of household income greater than $60,000. Young adults whose parents report a household income of less than $15,000 are nearly twice as likely to meet the criteria for a mental disorder compared to those with families in the highest income category, but the relationship falls short of statistical significance. It is likely that the reduced sample size in the follow-up survey results in a loss of power and affects the ability to detect significant differences in this analysis. There are no significant differences in self-reported mental health problems by household income.

Table 14 reports on the differences in health status by housing tenure. Young adults whose families rent are almost twice as likely to have a chronic illness than young adults whose families own their homes. There is no significant difference in self-reported mental health problem by housing tenure. Tables 15 and 16 display odds ratios and 95% confidence intervals by level of education for the male and female parent, respectively. These results demonstrate that education level of either parent does not predict risk for mental disorder, self-reported mental health problem or chronic illness.

Some of the control variables included in the above models are independently

Table 13 Odds Ratios and 95% Confidence Intervals for Health Status of Participants by Household Income (1987)

	Mental Disorder		Self-Reported Mental Health Problem		Chronic Illness	
	OR	95% CI	OR	95% CI	OR	95% CI
Household Income (1986)						
less than $15,000	1.82	(68 - 4.89)	66	(22 - 1 91)	2.78	(1.21 - 6.40)
$15,000 - 29,999	1.11	(.56 - 2.23)	1 10	(57 - 2 13)	1.31	(.69 - 2.48)
$30,000 - 39,999	1 36	(71 - 2.62)	1 30	(69 - 2 47)	1.34	(70 - 2.54)
$40,000 - 49,999	.74	(38 - 1.44)	1 15	(62 - 2 12)	.86	(.45 - 1.64)
$50,000 - 59,999	1 04	(.50 - 2 17)	1 10	(.56 - 2 20)	1 22	(.62 - 2.41)
$60,000 + (reference)	1.00		1 00		1.00	
Gender						
male	.53	(35 - 81)	.57	(38 - 85)	.70	(.47 - 1.04)
female (reference)	1 00		1 00		1 00	
Family Size						
four or more siblings	1 26	(70 - 2 26)	1 16	(66 - 2 03)	74	(41 - 1.33)
less than four siblings (reference)	1 00		1 00		1 00	
Number of Parents						
single parent household	55	(23 - 1 30)	31	(11 - 92)	47	(.19 - 1.19)
two parent household (reference)	1.00		1 00			
- 2 Log Likelihood	515 03		570 98		591.03	
Model χ^2	15 14 (8 df)		15 84 (8 df)		13 79 (8 df)	

Note. Adjusted for Gender, Family Size and Single vs Two Parent Household

Table 14 Odds Ratios and 95% Confidence Intervals for Health Status of Participants by Housing Tenure (1987)

	Mental Disorder		Self-Reported Mental Health Problem		Chronic Illness	
	OR	95% CI	OR	95% CI	OR	95% CI
Housing Tenure						
rent	1.47	(.84 - 2.58)	1.01	(.58 - 1.75)	1.83	(1.15 - 2.92)
own (reference)	1.00		1.00		1.00	
Gender						
male	.47	(.31 - .70)	.56	(.38 - .83)	.77	(.53 - 1.11)
female (reference)	1.00		1.00		1.00	
Family Size						
four or more siblings	1.43	(.83 - 2.45)	1.06	(.63 - 1.80)	.77	(.44 - 1.34)
less than four siblings (reference)	1.00		1.00		1.00	
Number of Parents						
single parent household	.67	(.29 - 1.53)	.27	(.10 - .79)	.48	(.20 - 1.19)
two parent household (reference)	1.00		1.00		1.00	
- 2 Log Likelihood	559.06		620.86		640.80	
Model χ^2	16.59 (4 df)		15.80 (4 df)		11.57 (4 df)	

Note: Adjusted for Gender, Family Size and Single vs Two Parent Household

Table 15 Odds Ratios and 95% Confidence Intervals for Health Status of Participants by Education of the Male Parent (1987)

	Mental Disorder		Self-Reported Mental Health Problem		Chronic Illness	
	OR	95% CI	OR	95% CI	OR	95% CI
Education of Male Parent						
primary school or less	1.12	(.62 - 2.02)	.98	(.56 - 1.72)	1.04	(.60 - 1.82)
some high school	.93	(.54 - 1.59)	.62	(.37 - 1.04)	1.09	(.67 - 1.79)
completed high school	.95	(.50 - 1.81)	.70	(.37 - 1.30)	.67	(.35 - 1.27)
any postsecondary (reference)	1.00		1.00		1.00	
Gender						
male	.45	(.29 - .68)	.52	(.35 - .79)	.73	(.49 - 1.08)
female (reference)	1.00		1.00		1.00	
Family Size						
four or more siblings	1.35	(.77 - 2.36)	1.15	(.67 - 1.97)	.76	(.43 - 1.33)
less than four siblings (reference)	1.00		1.00		1.00	
Number of Parents						
single parent household	1.02	(.33 - 3.12)	.14	(.02 - 1.05)	.64	(.18 - 2.29)
two parent household (reference)	1.00		1.00		1.00	
- 2 Log Likelihood	521.84		570.88		596.97	
Model χ^2	15.42 (6 df)		18.97 (6 df)		6.48 (6 df)	

Note: Adjusted for Gender, Family Size and Single vs Two Parent Household

Table 16 Odds Ratios and 95% Confidence Intervals for Health Status of Participants by Education of the Female Parent (1987)

	Mental Disorder		Self-Reported Mental Health Problem		Chronic Illness	
	OR	95% CI	OR	95% CI	OR	95% CI
Education of Female Parent						
primary school or less	1.32	(.73 - 2.38)	.83	(.46 - 1.51)	1.08	(.60 - 1.95)
some high school	.96	(.57 - 1.62)	.90	(.55 - 1.48)	1.05	(.64 - 1.72)
completed high school	.66	(.36 - 1.22)	.77	(.44 - 1.34)	1.16	(.68 - 1.99)
any postsecondary (reference)	1.00		1.00		1.00	
Gender						
male	.49	(.33 - .74)	.56	(.38 - .83)	.77	(.53 - 1.13)
female (reference)	1.00		1.00		1.00	
Family Size						
four or more siblings	1.37	(.80 - 2.36)	1.04	(.61 - 1.77)	.75	(.43 - 1.29)
less than four siblings (reference)	1.00		1.00		1.00	
Number of Parents						
single parent household	.68	(.30 - 1.57)	.28	(.10 - .79)	.49	(.20 - 1.21)
two parent household (reference)	1.00		1.00		1.00	
- 2 Log Likelihood	555.98		617.16		643.08	
Model χ^2	18.63 (6 df)		16.49 (6 df)		5.88 (6 df)	

Note. Adjusted for Gender, Family Size and Single vs Two Parent Household

related to the health of young adults. Males experience nearly half the risk for mental disorder and are half as likely to report mental health problems than females. Family size is not significantly related to health status of young adults. Young adults who come from single parent families are significantly less likely to report mental health problems.

The results of the linear regression models for general health indicate that there is little differentiation in health by parental socioeconomic position. Table 17 indicates parameter estimates for household income and housing tenure. There is no significant relationship between household income and general health in young adulthood nor is there any discernible overall pattern. The relationship between housing tenure and general health indicates that young adults whose families rent report significantly lower general health compared to homeowners. Table 18 gives parameter estimates for education of the male and female parent. As with household income, there is a lack of a relationship between general health and any level of education for either parent.

In contrast to the results of the original survey for general health, the control variables for the follow-up survey show that there is a significant effect of gender on general health. Males report significantly higher general health scores than females while, at the earlier time period, general health is largely undifferentiated by gender. Neither family size nor number of parents in the household are significantly related to general health in young adulthood.

The original hypothesis of the study proposed that parental socioeconomic

Table 17 Linear Regression Models for General Health by Household Income and Housing Tenure (1987)

	ß coefficient	standard error	ß coefficient	standard error
Household Income (1986)				
less than $15,000	- .30	.53		
$15,000 - 29,999	- .21	.38		
$30,000 - 39,999	- .51	.38		
$40,000 - 49,999	.15	.36		
$50,000 - 59,999	- .32	.41		
$60,000 and higher (reference)				
Housing Tenure				
rent			- .60 *	.30
own (reference)				
Gender				
male	.96 *	.24	.93 *	.23
female (reference)				
Family Size				
four or more siblings	.45	.34	.45	.32
less than four siblings (reference)				
Number of Parents				
single parent	.48	.48	.34	.45
two parent household (reference)				
F	3.004		5.887	
p	.0026		.0001	
Adjusted R^2	.0280		.0311	

* significant at the $p < .05$ level

Note: Adjusted for Gender, Family Size and Single vs Two Parent Household

Table 18 Linear Regression Models for General Health by Education of the Male and Female Parent (1987)

	ß coefficient	standard error	ß coefficient	standard error
Education of the Male Parent				
primary or less	.05	.34		
some high school	- .11	.31		
completed high school	.12	.37		
any postsecondary (reference)				
Education of the Female Parent				
primary or less			- .16	.36
some high school			- .05	.30
completed high school			.18	.33
any postsecondary (reference)				
Gender				
male	.92 *	.24	.93 *	.23
female (reference)				
Family Size				
four or more siblings	.37	.33	.46	.32
less than four siblings (reference)				
Number of Parents				
single parent	.78	.67	.33	.45
two parent household (reference)				
F	2.937		3.233	
p	.0079		.0039	
Adjusted R^2	.0202		.0217	

* significant at the $p < .05$ level

Note: Adjusted for Gender, Family Size and Single vs. Two Parent Household

position and adolescent health would be unrelated during the time that participants were adolescents, but that the relationship would emerge when participants were young adults. The two cross-sectional analyses suggest that the reverse may be a more appropriate characterization of health inequalities during these two developmental periods. Many of the significant relationships between measures of parental socioeconomic position and health in the first survey do not reach statistical significance in the second survey. This is especially true for general health: there are significant differences by all four measures of parental socioeconomic position in the original survey, but except for a marginally significant relationship to housing tenure, general health in the follow up survey is unrelated to parental socioeconomic position. Risk for mental disorder is associated with all measures of parental socioeconomic position in the first survey, but at follow-up, there are no significant relationships. Self-reported mental health problems are generally unrelated to parental socioeconomic position in either adolescence or young adulthood: there is just one significant relationship which translates into a reduced risk for adolescents whose male parent has less than primary education. The only evidence of a consistent increased risk at both developmental periods is the relationship between the low household income and chronic illness. In fact, there is an additional relationship between housing tenure and chronic illness that is found solely for the follow-up survey. However, the presence of fewer significant relationships between parental socioeconomic position and health in the second wave of the survey may be the result of

selective attrition. Other researchers have reported that respondents who did not participate in the follow-up survey were more likely to come from poor families and were more likely to meet the criteria for a mental disorder (Boyle et al., 1991; Sanford et al., 1994). Thus, selective attrition may explain the attenuation of the relationship between parental socioeconomic position and health from the first to the second wave of the survey.

To test whether there are significant differences that occur in the pattern of health inequalities during the two developmental periods, analysis now concentrates on models utilizing a pooled cross-section of the two surveys.

Pooled Cross-Section

The results of regression analyses of health on the measures of parental socioeconomic position are presented in models with main effects and models that include interaction variables. To reiterate briefly, the purpose of interaction variables is to test whether class differences in health show significant changes as adolescents progress to a later stage in development. Interaction variables with an odds ratio greater than one indicate that socioeconomic differences in health increase as adolescents progress to young adulthood. In contrast, interaction variables that are less than one suggests that socioeconomic differences in health decrease between developmental periods. If the 95% confidence intervals of the odds ratios for the interaction variables contain the value one, it can be concluded that there are no significant changes in the

relationship between parental socioeconomic position and health across these two periods. Models which utilize beta coefficients and standard errors for interaction terms are interpreted similarly: changes in the relationship over time are said to be significant if the value zero does not lay within two standard errors above and below two standard errors of the beta coefficient. Model comparisons using -2 Log Likelihoods for the logistic regression and F values for OLS regression will be utilized to test whether the inclusion of interaction variables significantly improves the overall fit of each model. Given that the cross-sectional results of the two surveys indicate that the relationship is less obvious during the follow up survey, it now seems plausible to expect that the direction of the interaction variables will indicate a pattern of reduced socioeconomic differences in health as adolescents mature into young adulthood.

The three control variables that were used in each of the two waves of the survey (gender, family size and number of parents in the household) are also included in all pooled cross-section models and reported in the following tables. Overall, there are significant gender differences in the pooled cross-section for mental disorder, self-reported mental health problems and general health with males enjoying better health than females. A large family size (four or more siblings) is not a significant predictor for any measure of health. Because results varied within each measure of health, number of parents in the household proved to be a more ambiguous predictor; however, those with single parents were more likely to be in better health relative to two parent households.

Finally, a dichotomous variable for age group is included in all models as a measure of the changes in health status as adolescents make the transition to young adulthood.

Results are reported separately for each health condition to allow main effects models and models with the interaction variables included to appear side by side. Table 19 provides odds ratios and 95% confidence intervals for mental disorder by household income. None of the interaction terms for household income and age group are significant. Furthermore, the difference in log likelihoods for the two models suggests that the main effects model is a better overall fit [$\Delta \chi^2$ 2.73 < $\chi^2_{4\,df,\,p\,.05}$ = 9.48].

Table 20 provides odds ratios and 95% confidence intervals for mental disorder by housing tenure. These results are similar to what is found for the pooled cross-section analysis of risk for mental disorder by household income. An interaction term for rent and age group is not significant and does not improve the fit of the main effects model [$\Delta \chi^2$ 0.01 < $\chi^2_{1\,df,\,p\,.05}$ = 3.84].

Tables 21 and 22 report on the relationship between mental disorder and education of the male and female parent respectively. There is a significant interaction between primary education of the male parent and age group. Thus, as adolescents make the transition to young adulthood, risk for mental disorder decreases significantly if the male parent has primary level schooling compared with any postsecondary education. Risk for mental disorder over time also decreases for the other levels of male education, but none are significantly different from the reference category (interaction of any

Table 19 Odds Ratios and 95% Confidence Intervals for Mental Disorder by Household Income, Pooled Cross-Section

	Main Effects	With Interactions
Household Income		
less than $15,000	1.93 (1.04 - 3.58)	2.18 (.95 - 4.97)
$15,000 - 29,999	1.43 (.87 - 2.34)	1.63 (.80 - 3.33)
$30,000 - 44,999	1.06 (.67 - 1.67)	.97 (.48 - 1.96)
$45,000 - 59,999	1.22 (.75 - 2.00)	1.59 (.74 - 3.39)
$60,000+ (reference)	1.00	1.00
Age		
12 - 16 years (reference)	1.00	1.00
17 - 21 years	1.89 (1.40 - 2.55)	2.13 (.99 - 4.59)
Interaction Terms		
(less than $15,000) x Age		.77 (.22 - 2.70)
($15,000 - 29,999) x Age		.77 (.28 - 2.09)
($30,000 - 44,999) x Age		1.21 (.47 - 3.06)
($45,000 - 59,999) x Age		.63 (.23 - 1.72)
($60,000+) x Age (reference)		1.00
Gender		
male	.63 (.47 - .84)	.62 (.46 - .83)
female (reference)	1.00	1.00
Family Size		
four or more siblings	1.22 (.81 - 1.83)	1.20 (.80 - 1.80)
less than four siblings (reference)	1.00	1.00
Number of Parents		
single parent household	.69 (.38 - 1.24)	.68 (.38 - 1.23)
two parent household (reference)	1.00	1.00
- 2 Log Likelihood	1097.89	1095.16
Model χ^2	33.21 (8 df)	35.94 (12 df)

Note: Adjusted for Gender, Family Size and Single vs. Two Parent Household

Table 20 Odds Ratios and 95% Confidence Intervals for Mental Disorder by Housing Tenure, Pooled Cross-Section

	Main Effects	With Interactions
Housing Tenure		
rent (including subsidized rent)	1.44 (.97 - 2.12)	1.46 (.85 - 2.51)
own (reference)	1.00	1.00
Age		
12 - 16 years (reference)	1.00	1.00
17 - 21 years	1.84 (1.39 - 2.45)	1.85 (1.36 - 2.52)
Interaction Terms		
rent x Age		.97 (.45 - 2.11)
own x Age (reference)		1.00
Gender		
male	.62 (.46 - .82)	.62 (.46 - .82)
female (reference)	1.00	1.00
Family Size		
four or more siblings	1.41 (.96 - 2.06)	1.41 (.96 - 2.06)
less than four siblings (reference)	1.00	1.00
Number of Parents		
single parent household	.77 (.45 - 1.34)	.77 (.44 - 1.34)
two parent household (reference)	1.00	1.00
- 2 Log Likelihood	1173.59	1173.58
Model χ^2	35.02 (5 df)	35.02 (6 df)

Note Adjusted for Gender, Family Size and Single vs. Two Parent Household

Table 21 Odds Ratios and 95% Confidence Intervals for Mental Disorder by Education of the Male Parent, Pooled Cross-Section

	Main Effects	With Interactions
Education of Male Parent		
primary school or less	1.85 (1.22 - 2.81)	3.09 (1.68 - 5.68)
some high school	1.18 (.80 - 1.74)	1.52 (.84 - 2.76)
completed high school	1.26 (.79 - 2.00)	1.71 (.86 - 3.41)
any postsecondary (reference)	1.00	1.00
Age		
12 - 16 years (reference)	1.00	1.00
17 - 21 years	1.89 (1.41 - 2.54)	3.12 (1.70 - 5.70)
Interaction Terms		
(primary school or less) x Age		.37 (.16 - .85)
(some high school) x Age		.64 (.29 - 1.42)
(completed high school) x Age		.57 (.22 - 1.45)
(any postsecondary) x Age (reference)		1.00
Gender		
male	.59 (.44 - .79)	.59 (.43 - .79)
female (reference)	1.00	1.00
Family Size		
four or more siblings	1.30 (.88 - 1.92)	1.30 (.88 - 1.93)
less than four siblings (reference)	1.00	1.00
Number of Parents		
single parent household	1.22 (.54 - 2.75)	1.31 (.58 - 2.98)
two parent household (reference)	1.00	1.00
- 2 Log Likelihood	1084.94	1079.31
Model χ^2	43.19 (7 df)	48.81 (10 df)

Note: Adjusted for Gender, Family Size and Single vs. Two Parent Household

Table 22 Odds Ratios and 95% Confidence Intervals for Mental Disorder by Education of the Female Parent. Pooled Cross-Section

	Main Effects	With Interactions
Education of Female Parent		
primary school or less	1.74 (1.14 - 2.66)	2.41 (1.27 - 4.57)
some high school	1.32 (.90 - 1.93)	1.92 (1.06 - 3.45)
completed high school	1.16 (.76 - 1.78)	2.07 (1.10 - 3.89)
any postsecondary (reference)	1.00	1.00
Age		
12 - 16 years (reference)	1.00	1.00
17 - 21 years	1.89 (1.42 - 2.51)	3.39 (1.84 - 6.24)
Interaction Terms		
(primary school or less) x Age		.57 (.24 - 1.35)
(some high school) x Age		.51 (.23 - 1.12)
(completed high school) x Age		.33 (.14 - .80)
(any postsecondary) x Age (reference)		1.00
Gender		
male	.65 (.49 - .86)	.64 (.48 - .86)
female (reference)	1.00	1.00
Family Size		
four or more siblings	1.33 (.91 - 1.94)	1.34 (.91 - 1.96)
less than four siblings (reference)	1.00	1.00
Number of Parents		
single parent household	.84 (.48 - 1.47)	.84 (.48 - 1.48)
two parent household (reference)	1.00	1.00
- 2 Log Likelihood	1163.31	1156.87
Model χ^2	39.56 (7 df)	45.99 (10 df)

Note: Adjusted for Gender, Family Size and Single vs. Two Parent Household

postsecondary education of the male parent and age group). The difference in log likelihoods for the two models however, suggests that the inclusion of the interaction variables does not improve the overall fit of the model and that the simpler model is preferable [$\Delta \chi^2 = 5.62 < \chi^2_{3\ df,\ p=.05} = 7.81$].

For education of the female parent there is only one significant interaction variable: completed high school x age group. The direction of effects for the other interaction variables for education of the female parent suggests that risk for mental disorder decreases for all levels of education of the female parent relative to the reference category of any postsecondary education x age group. The addition of the interaction terms does not improve the fit of the model and therefore, the main effects model for education of the female parent remains the most appropriate model [$\Delta \chi^2 = 6.43 < \chi^2_{3\ df,\ p=.05} = 7.81$].

Tables 23 to 26 report odds ratios and 95% confidence intervals for self-reported mental health problems by household income, housing tenure, education of the male parent and education of the female parent respectively. During separate analyses of the periods of adolescence and young adulthood, self-reported mental health problems consistently showed the lack of a relationship to parental socioeconomic position. It is not surprising therefore, that the odds ratios for the interaction terms for household income, housing tenure and education of the male and female parent are not significant. As with mental disorder, none of the models with interaction terms improve the overall

Table 23 Odds Ratios and 95% Confidence Intervals for Self-Reported Mental Health Problem by Household Income, Pooled Cross-Section

	Main Effects	With Interactions
Household Income		
less than $15,000	.57 (.29 - 1.10)	.51 (.22 - 1.18)
$15,000 - 29,999	.95 (.60 - 1.50)	.87 (.46 - 1.63)
$30,000 - 44,999	.92 (.61 - 1.40)	.74 (.41 - 1.33)
$45,000 - 59,999	1.00 (.64 - 1.57)	.83 (.42 - 1.64)
$60,000+ (reference)	1.00	1.00
Age		
12 - 16 years (reference)	1.00	1.00
17 - 21 years	1.39 (1.05 - 1.85)	1.08 (.55 - 2.09)
Interaction Terms		
(less than $15,000) x Age		1.19 (.31 - 4.61)
($15,000 - 29,999) x Age		1.14 (.46 - 2.83)
($30,000 - 44,999) x Age		1.56 (.68 - 3.54)
($45,000 - 59,999) x Age		1.39 (.56 - 3.44)
($60,000+) x Age (reference)		1.00
Gender		
male	.51 (.39 - .68)	.51 (.39 - .68)
female (reference)	1.00	1.00
Family Size		
four or more siblings	1.12 (.75 - 1.66)	1.10 (.74 - 1.64)
less than four siblings (reference)	1.00	1.00
Number of Parents		
single parent household	.94 (.54 - 1.62)	.94 (.54 - 1.62)
two parent household (reference)	1.00	1.00
- 2 Log Likelihood	1202.17	1200.82
Model χ^2	32.97 (8 df)	34.82 (12 df)

Note Adjusted for Gender, Family Size and Single vs. Two Parent Household

Table 24 Odds Ratios and 95% Confidence Intervals for Self-Reported Mental Health Problem by Housing Tenure, Pooled Cross-Section

	Main Effects	With Interactions
Housing Tenure		
rent (including subsidized rent)	.94 (.63 - 1.39)	.90 (.51 - 1.57)
own (reference)	1.00	1.00
Age		
12 - 16 years (reference)	1.00	1.00
17 - 21 years	1.35 (1.03 - 1.77)	1.34 (.99 - 1.79)
Interaction Terms		
rent x Age		1.09 (.50 - 2.38)
own x Age (reference)		1.00
Gender		
male	.51 (.39 - .67)	.51 (.39 - .67)
female (reference)	1.00	1.00
Family Size		
four or more siblings	1.03 (.70 - 1.51)	1.03 (.71 - 1.51)
less than four siblings (reference)	1.00	1.00
Number of Parents		
single parent household	.77 (.45 - 1.30)	.77 (.45 - 1.31)
two parent household (reference)	1.00	1.00
- 2 Log Likelihood	1281.54	1281.49
Model χ^2	29.18 (5 df)	29.23 (6 df)

Note: Adjusted for Gender, Family Size and Single vs. Two Parent Household

Table 25 Odds Ratios and 95% Confidence Intervals for Self-Reported Mental Health Problem by Education of the Male Parent, Pooled Cross-Section

	Main Effects	With Interactions
Education of Male Parent		
primary school or less	.83 (.56 - 1.24)	.76 (.43 - 1.34)
some high school	.70 (.49 - 1.00)	.80 (.48 - 1.33)
complete high school	.81 (.52 - 1.24)	1.02 (.56 - 1.84)
any postsecondary (reference)	1.00	1.00
Age		
12 - 16 years (reference)	1.00	1.00
17 - 21 years	1.36 (1.03 - 1.81)	1.54 (.93 - 2.55)
Interaction Terms		
(primary school or less) x Age		1.22 (.55 - 2.70)
(some high school) x Age		.76 (.37 - 1.56)
(complete high school) x Age		.62 (.26 - 1.46)
(any postsecondary) x Age (reference)		1.00
Gender		
male	.46 (.35 - .62)	.46 (.35 - .62)
female (reference)	1.00	1.00
Family Size		
four or more siblings	1.10 (.75 - 1.62)	1.10 (.75 - 1.62)
less than four siblings (reference)	1.00	1.00
Number of Parents		
single parent household	1.05 (.48 - 2.31)	1.03 (.46 - 2.27)
two parent household (reference)	1.00	1.00
- 2 Log Likelihood	1182.78	1180.15
Model χ^2	34.41 (7 df)	37.04 (10 df)

Note: Adjusted for Gender, Family Size and Single vs. Two Parent Household

Table 26 Odds Ratios and 95% Confidence Intervals for Self-Reported Mental Health Problem by Education of the Female Parent, Pooled Cross-Section

	Main Effects	With Interactions
Education of Female Parent		
primary school or less	.78 (.52 - 1.18)	.77 (.43 - 1.36)
some high school	.84 (.60 - 1.20)	.79 (.48 - 1.29)
complete high school	.70 (.47 - 1.04)	.64 (.36 - 1.13)
any postsecondary (reference)	1.00	1.00
Age		
12 - 16 years (reference)	1.00	1.00
17 - 21 years	1.41 (1.07 - 1.85)	1.30 (.78 - 2.15)
Interaction Terms		
(primary school or less) x Age		1.04 (.46 - 2.35)
(some high school) x Age		1.14 (.57 - 2.29)
(complete high school) x Age		1.18 (.53 - 2.61)
(any postsecondary) x Age (reference)		1.00
Gender		
male	.49 (.37 - .65)	.49 (.37 - .65)
female (reference)	1.00	1.00
Family Size		
four or more siblings	1.03 (.70 - 1.15)	1.03 (.70 - 1.51)
less than four siblings (reference)	1.00	1.00
Number of Parents		
single parent household	.61 (.34 - 1.09)	.61 (.34 - 1.09)
two parent household (reference)	1.00	1.00
- 2 Log Likelihood	1258.43	1258.20
Model χ^2	36.35 (7 df)	36.58 (10 df)

Note. Adjusted for Gender, Family Size and Single vs. Two Parent Household

fit, so that the most appropriate models are those with main effects only.

The main effects model and model with interaction variables for chronic illness by household income appear in Table 27. The interaction terms for household income are not statistically significant. The results from each of the two waves of the survey indicate that low household income is a significant predictor of chronic illness in both adolescence and young adulthood. This is supported by the results of the pooled cross-section which indicates that there are no significant changes in the relationship between household income and chronic illness as adolescents make the transition to young adulthood. Further, a comparison of the two models indicates that the best fitting model for chronic illness by household income is the main effects model [$\Delta \chi^2$ 1.46 < $\chi^2_{4\,df,\,p=.05}$ = 9.48]. The interaction terms for the model of chronic illness and housing tenure also do not reach statistical significance (Table 28). As with household income, the best fitting model is the parsimonious model with main effects [$\Delta \chi^2$ 2.19 < $\chi^2_{1\,df,\,p=.05}$ = 3.84].

The results of interaction terms for education of the male and female parent appear in Tables 29 and 30 respectively. None of the odds ratios for the interaction terms are significant. As education of the male and female parent was not related to chronic illness in either adolescence or young adulthood, the lack of changes in the relationship is not unexpected. This is confirmed with comparisons of models with main effects and interactions for both education of the male and the female parent which indicate that the best fitting models are the models with main effects only.

Table 27 Odds Ratios and 95% Confidence Intervals for Chronic Illness by Household Income, Pooled Cross-Section

	Main Effects	With Interactions
Household Income		
less than $15,000	3.08 (1.70 - 5.57)	4.02 (1.60 - 10.11)
$15,000 - 29,999	1.37 (.83 - 2.27)	1.59 (.66 - 3.83)
$30,000 - 44,999	1.29 (.81 - 2.04)	1.67 (.74 - 3.80)
$45,000 - 59,999	1.31 (.80 - 2.15)	1.95 (.79 - 4.78)
$60,000- (reference)	1.00	1.00
Age		
12 - 16 years (reference)	1.00	1.00
17 - 21 years	2.03 (1.50 - 2.74)	2.83 (1.20 - 6.68)
Interaction Terms		
(less than $15,000) x Age		.66 (.19 - 2.26)
($15,000 - 29,999) x Age		.84 (.28 - 2.47)
($30,000 - 44,999) x Age		.68 (.25 - 1.85)
($45,000 - 59,999) x Age		.56 (.19 - 1.64)
($60,000-) x Age (reference)		1.00
Gender		
male	.86 (.64 - 1.16)	.86 (.64 - 1.16)
female (reference)	1.00	1.00
Family Size		
four or more siblings	.70 (.45 - 1.10)	.70 (.45 - 1.10)
less than four siblings (reference)	1.00	1.00
Number of Parents		
single parent household	.58 (.32 - 1.09)	.58 (.31 - 1.08)
two parent household (reference)	1.00	1.00
- 2 Log Likelihood	1111.98	1110.52
Model χ^2	36.26 (8 df)	37.71 (12 df)

Note: Adjusted for Gender, Family Size and Single vs. Two Parent Household

Table 28 Odds Ratios and 95% Confidence Intervals for Chronic Illness by Housing Tenure, Pooled Cross-Section

	Main Effects	With Interactions
Housing Tenure		
rent (including subsidized rent)	1.47 (1.02 - 2.13)	1.03 (.55 - 1.92)
own (reference)	1.00	1.00
Age		
12 - 16 years (reference)	1.00	1.00
17 - 21 years	1.73 (1.30 - 2.30)	1.56 (1.14 - 2.14)
Interaction Terms		
rent x Age		1.78 (.82 - 3.87)
own x Age (reference)		1.00
Gender		
male	.93 (.69 - 1.23)	.93 (.70 - 1.24)
female (reference)	1.00	1.00
Family Size		
four or more siblings	.74 (.48 - 1.12)	.74 (.48 - 1.13)
less than four siblings (reference)	1.00	1.00
Number of Parents		
single parent household	.64 (.35 - 1.15)	.67 (.37 - 1.21)
two parent household (reference)	1.00	1.00
- 2 Log Likelihood	1191.58	1189.39
Model χ^2	23.05 (5 df)	25.25 (6 df)

Note: Adjusted for Gender, Family Size and Single vs. Two Parent Household

Table 29 Odds Ratios and 95% Confidence Intervals for Chronic Illness by Education of the Male Parent, Pooled Cross-Section

	Main Effects	With Interactions
Education of Male Parent		
primary school or less	.99 (.64 - 1.52)	.88 (.45 - 1.73)
some high school	1.16 (.80 - 1.68)	1.23 (.70 - 2.15)
completed high school	.86 (.53 - 1.38)	1.10 (.55 - 2.21)
any postsecondary (reference)	1.00	1.00
Age		
12 - 16 years (reference)	1.00	1.00
17 - 21 years	1.80 (1.33 - 2.42)	1.91 (1.10 - 3.33)
Interaction Terms		
(primary school or less) x Age		1.22 (.51 - 2.93)
(some high school) x Age		.91 (.43 - 1.91)
(completed high school) x Age		.64 (.25 - 1.65)
(any postsecondary) x Age (reference)		1.00
Gender		
male	.91 (.68 - 1.23)	.91 (.68 - 1.23)
female (reference)	1.00	1.00
Family Size		
four or more siblings	.74 (.48 - 1.15)	.74 (.48 - 1.15)
less than four siblings (reference)	1.00	1.00
Number of Parents		
single parent household	.40 (.12 - 1.33)	.39 (.12 - 1.32)
two parent household (reference)	1.00	1.00
- 2 Log Likelihood	1101.52	1099.92
Model χ^2	21.60 (7 df)	23.21 (10 df)

Note: Adjusted for Gender, Family Size and Single vs. Two Parent Household

Table 30 Odds Ratios and 95% Confidence Intervals for Chronic Illness by Education of the Female Parent, Pooled Cross-Section

	Main Effects	With Interactions
Education of Female Parent		
primary school or less	.92 (.59 - 1.45)	.73 (.35 - 1.50)
some high school	1.12 (.85 - 1.77)	1.46 (.85 - 2.52)
completed high school	.99 (.66 - 1.50)	.79 (.41 - 1.52)
any postsecondary (reference)	1.00	1.00
Age		
12 - 16 years (reference)	1.00	1.00
17 - 21 years	1.76 (1.32 - 2.35)	1.71 (.98 - 3.00)
Interaction Terms		
(primary school or less) x Age		1.49 (.59 - 3.76)
(some high school) x Age		.72 (.35 - 1.50)
(completed high school) x Age		1.48 (.64 - 3.46)
(any postsecondary) x Age (reference)		1.00
Gender		
male	.92 (.69 - 1.23)	.93 (.70 - 1.23)
female (reference)	1.00	1.00
Family Size		
four or more siblings	.72 (.47 - 1.11)	.72 (.47 - 1.10)
less than four siblings (reference)	1.00	1.00
Number of Parents		
single parent household	.74 (.41 - 1.34)	.72 (.40 - 1.31)
two parent household (reference)	1.00	1.00
- 2 Log Likelihood	1187.98	1183.52
Model χ^2	21.26 (7 df)	25.72 (10 df)

Note: Adjusted for Gender, Family Size and Single vs. Two Parent Household

OLS regression results of the pooled cross-section for general health by household income appear in Table 31. The interaction term for the lowest income level by age group is significant. The interpretation of this coefficient indicates that during transition to young adulthood, participants from the lowest income levels report significantly higher increases in general health compared to participants who are in the highest income bracket. A comparison of the two models using the F statistic shows that the obtained value of 1.53 does not exceed the critical value of $F_{4\ df.\ 1186\ df.\ p=.05} = 2.37$ and therefore, the main effects model is the better fit.

Table 32 reports on the main effects model and interaction model for general health by housing tenure. The interaction term for rent x age is not statistically significant. A comparison of the two models suggests that the main effects model provides the best fit [$2.92 < F_{1\ df.\ 1261\ df.\ p=.05} = 3.84$].

Table 33 displays the results for the model of general health by education of the male parent. Only one interaction term reaches significance. There is a large increase in general health occurring between the two time periods for participants whose male parent received primary level schooling relative to any postsecondary education of the male parent. No other interaction variables are significant. A comparison of the two models using the F statistic indicates that the model of best fit is the model with main effects only [$2.18 < F_{3\ df.\ 1167\ df.\ p=.05} = 2.60$].

Table 34 reports on the pooled cross-section model for general health by

Table 31 Linear Regression Models of General Health according to Household Income, Pooled Cross-Section

	ß coefficient	standard error	ß coefficient	standard error
Household Income				
less than $15,000	- 1.20 *	.32	- 1.83 *	43
$15,000 - 29,999	- .42	.25	- .66	36
$30,000 - 44,999	- .26	.23	- .46	33
$45,000 - 59,999	- .40	26	- 53	38
$60,000+ (reference)				
Age				
12 - 16 years (reference)				
17 - 21 years	- 1.22 *	15	- 1 61 *	38
Interaction Terms				
(less than $15,000) x Age			1 56 *	65
($15,000 - 29,999) x Age			42	51
($30,000 - 44,999) x Age			35	46
($45,000 - 59,999) x Age			24	51
($60,000+) x Age (reference)				
Gender				
male	65 *	15	61 *	15
female (reference)				
Family Size				
four or more siblings	- 07	22	- 06	22
less than four siblings (reference)				
Number of Parents				
single parent household	59	29	64 *	29
two parent household (reference)				
F	11.16		7 96	
p	.0001		.0001	
adjusted R^2	.0637		0654	

* significant at the $p < .05$ level

Note Adjusted for Gender, Family Size and Single vs. Two Parent Household

Table 32 Linear Regression Models of General Health according to Housing Tenure, Pooled Cross-Section

	ß coefficient	standard error	ß coefficient	standard error
Housing Tenure				
rent	- .28	21	08	.29
own (reference)				
Age				
12 - 16 years (reference)				
17 - 21 years	- 1.17 *	.15	- 1.05 *	16
Interaction Terms				
rent x Age			- 70	41
own x Age (reference)				
Gender				
male	56 *	.15	56 *	15
female (reference)				
Family Size				
four or more siblings	- .05	21	- 05	21
less than four siblings (reference)				
Number of Parents				
single parent household	.38	28	34	28
two parent household (reference)				
F	15.68		13.58	
p	.0001		.0001	
adjusted R^2	.0548		.0563	

* significant at the $p < .05$ level

Note Adjusted for Gender, Family Size and Single vs. Two Parent Household

Table 33 Linear Regression Models of General Health according to Education of the Male Parent, Pooled Cross-Section

	ß coefficient	standard error	ß coefficient	standard error
Education of Male Parent				
primary or less	- .51 *	.22	- 1.02 *	.31
some high school	- .33	.20	- .52	.28
completed high school	.04	.25	01	.34
any postsecondary (reference)				
Age				
12 - 16 years (reference)				
17 - 21 years	- 1.15 *	16	- 1.52 *	.29
Interaction Terms				
(primary or less) x Age			1.08 *	.45
(some high school) x Age			.39	.40
(completed high school) x Age			08	.49
(any postsecondary) x Age				
Gender				
male	.52 *	.16	.52 *	16
female (reference)				
Family Size				
four or more siblings	01	.22	01	.22
less than four siblings (reference)				
Number of Parents				
single parent household	.58	.45	.51	.45
two parent household (reference)				
F	10.36		7.93	
p	.0001		.0001	
adjusted R^2	.0529		.0557	

* significant at the p< 05 level

Note: Adjusted for Gender, Family Size and Single vs. Two Parent Household

Table 34 Linear Regression Models of General Health according to Education of the Female Parent, Pooled Cross-Section

	ß coefficient	standard error	ß coefficient	standard error
Education of Female Parent				
primary or less	- .45	.23	- .74 *	.32
some high school	- .25	.20	- .46	.27
completed high school	- .19	.22	- .52	.30
any postsecondary (reference)				
Age				
12 - 16 years (reference)				
17 - 21 years	- 1.20 *	.15	- 1.60 *	.29
Interaction Terms				
(primary or less) x Age			.59	.46
(some high school) x Age			.41	.39
(completed high school) x Age			.69	.44
(any postsecondary) x Age (reference)				
Gender				
male	.54 *	.15	.54 *	.15
female (reference)				
Family Size				
four or more siblings	- .02	.21	- .02	.21
less than four siblings (reference)				
Number of Parents				
single parent household	.37	.29	.35	.29
two parent household (reference)				
F	11.60		8.42	
p	.0001		.0001	
adjusted R^2	.0559		.0559	

* significant at the $p<.05$ level

Note: Adjusted for Gender, Family Size and Single vs. Two Parent Household

education of the female parent. None of the interaction terms are statistically significant. As with the other comparisons, the model with main effects only is the model of best fit [$0.99 < F_{3 \text{ df. } 1245 \text{ df. } p=.05} = 2.60$].

In summary, analysis of parental socioeconomic differences in health using a pooled cross-section of the two developmental periods leads to equivocal conclusions. The interaction terms do not have a consistent interpretation even in the rare instances where they are found to be statistically significant. For example, it is difficult to interpret a significantly reduced risk for mental disorder during the two periods, for participants whose female parent has completed high school relative to any postsecondary education, given that none of the other levels of education for the female parent are significant. Although not significant, other results suggest an increased risk for low parental socioeconomic position between the two time periods eg. renters have a higher risk for chronic illness compared to homeowners. Other evidence supports a lessening of socioeconomic differences in general health between the two periods for the lowest income level compared to the highest income category and primary education of the male parent compared to any postsecondary education. Thus, the mixed nature of these results prevents any meaningful conclusions about the pattern of change in socioeconomic differences in health as adolescents make the transition to young adulthood.

Discussion

The results of this study are inconsistent with what researchers have previously reported about health inequalities during the adolescent period. During the first wave of the survey, it was expected that the health of adolescents who were between the ages of 12 and 16 would be unrelated to the socioeconomic position of their parents. Yet, the results of the first wave indicate that adolescent health is strongly connected to parental socioeconomic position.

Risk for mental disorder, chronic illness and general health are significantly associated with measures of household income during the adolescent period. The pattern of the relationship for mental disorder and chronic illness is indicative of a threshold effect. That is, relative to the highest income level, only adolescents with families from the lowest income category have a significantly higher risk for mental disorder and chronic illness. In contrast, the pattern of the relationship between household income and general health is in the form of a stepwise gradient. As household income increases, there are steady improvements in general health. The underlying processes which are assumed to produce either threshold effects or stepwise gradients are increasingly a focus of health inequalities research (Macintyre, 1997). To date, researchers are likely to attribute threshold patterns in the relationship of health and socioeconomic position to the effects of absolute deprivation and to link stepwise gradients to relative position in the social structure (Adler et al., 1994; Marmot, Ryff, Bumpass, Shipley & Marks, 1997).

Other significant differences in the health of adolescents by parental socioeconomic position were also found. Families who live in subsidized rental accommodations are associated with a higher risk for mental disorder and lower general health for adolescents relative to families who own their homes. Adolescents whose male parent has less than primary education are at increased risk for mental disorder and lower general health compared to any postsecondary education of the male parent, but unexpectedly, are less likely to report any mental health problems. Adolescents whose female parent has less than primary education also have a significantly higher risk for mental disorder compared to any postsecondary education of the female parent, while all levels of education of the female parent relative to any postsecondary education result in significantly lower ratings of general health

It is unclear why the results of this study find clear differences in adolescent health by parental socioeconomic position while other studies have reported the lack of a consistent relationship. The four measures of parental socioeconomic position: income, housing tenure and education of the male and female parent do not differ substantially from measures used by other researchers. For example, Macintyre and West (1991) report an overall lack of differences in adolescent health by housing tenure (own versus other), weekly household income (three levels) and paternal education (college, high school, less than high school). Moreover, the indicators of health in this study approximate what has been done in previous research on health inequalities, both during

adolescence and other stages in the life course.

A follow-up to the original survey, when adolescents had progressed to the stage of young adulthood, provided the opportunity to assess whether socioeconomic differences in health re-emerged at a later time. This study hypothesized that parental socioeconomic differences in health were likely to be evident in young adulthood. This had been the finding for some studies (eg. West, 1988; West et al., 1990), although at least one other study reported that socioeconomic differences in health could also be diminished in this age group (Glendinning et al., 1992).

Again, the results differ from the hypothesis. Although there were a few significant relationships between parental socioeconomic position and health in young adulthood, many of the relationships found during the first time period simply disappeared in the follow-up survey. This was most clearly seen for general health: all four measures of parental socioeconomic position were strongly related to adolescent health; four years later, only housing tenure was associated with general health. Similarly, there was a relationship between risk for mental disorder and all measures of parental socioeconomic group in the first wave of the survey, but no significant relationships in the second wave. If there are any similarities between the two time periods, it would be for the measure of self-reported mental health problems which consistently showed the lack of a relationship to parental socioeconomic position at both time periods.

The finding that health inequalities are diminished in the 17 to 21 age group can be reconciled with the literature to date, as Glendinning and his colleagues (1992) report in their study that the suppression of health inequalities in adolescence extends as far as the age of 22. What remains problematic is a reasonable explanation for parental socioeconomic differences in health during the first wave of the survey that can be linked to the transition to relative equality in health four years later. One possible explanation may lie in the change in informant during the two waves of the survey. Parents who report on the health of their adolescent children may perceive the health of their offspring through class-coloured lenses. Instead of objectively reporting their child's health status, parents from a lower socioeconomic position may view their child's health less positively than parents from a higher socioeconomic position. In the follow-up survey, young adults who report on their own health status may be less conscious of their socioeconomic position than their parents. This may explain why socioeconomic differences in health exist in the first wave of the survey (when parents report) and why they are less likely to exist in the follow-up survey (when young adults report). This is further bolstered by the finding that for self-reported mental health problem, the only measure that is self-reported in both waves of the survey, there are no significant differences by parental socioeconomic group in either time period (except a reversed relationship for primary education of the male parent in the first wave). There is also some evidence to support the theory that the characteristics of the informant may

influence perceptions of mental disorder. Offord (1995) notes that parents who are depressed are more likely to identify their child as mentally disordered and cautions that the assessment of mental disorder in children and adolescents varies depending on whether information is supplied by a parent or teacher or is self-reported.

Nonetheless, there is evidence that the identity of the informant is not a compelling explanation. West and his colleagues (1990) asked both 15 year old adolescents and their parents whether the adolescent suffered from a longstanding illness or disability. The results indicate that, regardless of informant, there are no differences in health by an occupationally based measure of parental socioeconomic position. Furthermore, West (1988) finds that, when parents assess chronic illness in their 12 to 16 year old offspring, there are no significant differences by parental socioeconomic position. Thus, the explanation that parents are more likely to be influenced by their own socioeconomic position, rather than an objective evaluation of the health of their adolescent children, may correspond with the results of this study, but disagrees with the findings of other researchers.

A second, possible explanation for the finding of socioeconomic differences in the adolescent period proposes that there may be cultural differences between Canada and the United Kingdom. Thus, the period of adolescence (and the characteristics of this period in the life stage that apparently suppress socioeconomic differences in health) may vary internationally in terms of its commencement and termination. An equalizing

effect of socioeconomic differences in adolescent health may occur earlier in the United Kingdom and later in the Canadian population, thus explaining why socioeconomic differences in Canada are more likely to be found in the 12 to 16 year old group, and less likely to be found in the 17 to 21 year old group. The lack of a developed body of research, encompassing work from a wide range of countries, appears to be a severe weakness of the literature on adolescent health inequalities in general. As a result, it is difficult to argue whether cultural differences are responsible for differing patterns between Canada and the United Kingdom, given that comparative international studies on which one could base such a qualification have yet to be conducted.

The final aim of the study was to test whether there were changes in the relationship between parental socioeconomic status and health over time, by combining the two waves of the survey into a pooled cross-section. Although a simple comparison of the two time periods suggests that there is a trend towards a weakened relationship between parental socioeconomic position and health as adolescents mature into young adulthood, the results of the pooled cross-section are more ambiguous. There is evidence that socioeconomic differences in health decrease during the transition to young adulthood, but there is also evidence that the reverse is true. Very few of the measures actually achieve statistical significance and of those that do, not all have a meaningful or straightforward interpretation. It would be difficult to find a theoretical framework that explains why there is an increase in risk for mental disorder between the two

developmental periods for participants whose female parent completed high school relative to any postsecondary education, while none of the other levels of education are significantly related. Therefore, the indeterminate results of the pooled cross-section prevent the researcher from drawing any firm conclusions as to whether or not significant changes occur in the relationship between health and parental socioeconomic position during the transition from adolescence to young adulthood.

There are several limitations to the present study. One limitation of the study is the level of ambiguity associated with defining discrete age limits within which adolescence is said to occur. The design of the two surveys guided the choice of assigning the specific age ranges to developmental periods. This study specifies the ages of 12 to 16 for adolescence and designates the ages of 17 to 21 for young adulthood. West (1997) suggests that, because 12 to 16 year olds are normally engaged in secondary education, this age group appropriately defines the adolescent period. Nonetheless, these are artificial boundaries and there may be a persuasive argument for either expanding or restricting the limits for both age groups. It is also possible that significant changes in the relationship between parental socioeconomic group and health may have been found had there been a larger gap of time between the two surveys.

A second limitation of this study involves the problem of the non-independence of observations for the pooled cross-section analysis (Allison, 1995). There has been no attempt to control for the fact that the cases in the pooled cross-section are related to

each other through the creation of person-period observations. Failure to take account of the non-independence of observations in the models does not affect estimation of the coefficients, but does exert a strong influence on the standard errors of the coefficients. Therefore, results of the test statistics are biased upwards so that one is more likely to find statistical significance when in fact, there are no significant differences. The finding that there were very few interaction terms that were significant in the pooled cross-section models, calls into question the validity of their significance and more importantly, suggests that the changes in socioeconomic differences in health during the transition from adolescence to young adulthood may be even more negligible than what has been estimated. As discussed earlier, the use of the pooled cross-section method represents a preliminary and exploratory approach to studying changes in health inequalities over developmental periods.

A third issue concerns the comparability of the measure of mental disorder in the pooled cross-section given the use of different instruments to assess mental disorder in the two surveys. The four categories of mental disorder that were evaluated in the original survey were intended to measure the prevalence of common mental health problems in childhood. The categories of mental disorder that were assessed in the follow up questionnaire are characteristic of mental health problems in the adult population. Despite some similarity in diagnostic categories, one cannot conclude that the two measures of mental disorder are equivalent. Therefore, the use of mental

disorder in the pooled cross-section to determine if there are changes in the relationship may be inappropriate. Of course, this argument may apply as well to the use of different informants for measures of chronic illness and general health in the two surveys.

The present study makes several broad contributions to the literature. First, this study incorporates more specific measures of health and parental socioeconomic position than previous research into adolescent health inequalities. This is accomplished by distinguishing between mental disorder and self-reported mental health problems. Other researchers have focused on psychological wellbeing as a measure of mental health, and have reported that there are no differences by parental socioeconomic position. This study has highlighted the importance of making a clear distinction between self-reported mental health problems and meeting the criteria for mental disorder. Self-reported mental health problems showed little differentiation by parental socioeconomic position; in contrast, there were strong socioeconomic differences for mental disorder in the adolescent period. Further, many of the previous studies used occupationally based measures of socioeconomic position. There are few studies which examine the effects of income, housing tenure or education on adolescent health, and there are no studies which differentiate between education of the male and female parent.

A second area in which this study makes a valuable contribution to the literature, concerns the utilization of broader age ranges. A number of the studies use only 15 year olds to represent the adolescent period (Ford et al., 1994; Macintyre & West, 1991; West

et al., 1990); however, in this study, 12 to 16 year olds belong to the adolescent period. As well, the study by Glendinning and colleagues (1992) which extended the lack of health inequalities to the age of 22, did not consider participants below the age of 15, while the current study encompasses all ages between 12 and 21. Previous studies which have integrated a longitudinal component have used smaller age ranges than this study (Sweeting & West, 1995).

Finally, this study is the first to test for changes in the relationship between parental socioeconomic group and health during the transition from adolescence to young adulthood. Although the confusing nature of the results in this study precluded any firm conclusions about actual changes in health inequalities from one developmental period to the next, it is anticipated that these issues will become a target for investigation in future research. The findings of this study highlight the need to develop more sophisticated statistical and theoretical methods that will adequately address the issue of health inequalities within the context of developmental change.

The finding of this study that adolescents from families with a lower socioeconomic position experience poorer health than adolescents from families with a higher socioeconomic position has implications for a life course approach to health inequalities. Specifically, socioeconomic differences in the health of adolescents lend support to the pathways model. The pathways model suggests that events occurring throughout the life course can affect health and proposes that interventions designed to

alter the trajectory of future health events can be instituted at all stages of the life course (Hertzman & Wiens, 1996). If the adolescent period represents a continuation of the relationship between socioeconomic position and health, one can assume that adolescence is an opportune time in the life course to alleviate socioeconomic differences in health. Indeed, given that the adolescents are in the process of assuming their own socioeconomic position as they prepare to enter the labour market, it may be that interventions at this stage in the life course may have a substantial impact on their future health. This will be an area for future researchers with an interest in disentangling the effects of intergenerational mobility on health inequalities during the transition to adulthood and across the life course.

Other areas in adolescent health inequalities research that require further elaboration include the continued development of more specific measures of adolescent health and parental socioeconomic position. This will aid in the understanding of the specific pathways through which health is influenced by parental socioeconomic position. Further, there is a shortage of international studies which examine health inequalities during the adolescent stage. This need is readily apparent as the results of this Canadian study differ greatly from what has been reported in studies from the United Kingdom. To resolve these seeming contradictions, further research in a variety of countries should be undertaken.

A life course approach to the health inequalities field has the potential to provide

a strong theoretical foundation with which to examine the processes that create, sustain and possibly suppress socioeconomic differences in health. This study addresses two progressive areas in the health inequalities field: the lack of socioeconomic differences in adolescence and changes in health inequalities across developmental periods. Research which pursues these important issues and elucidates their respective roles within the health inequalities framework will have a positive impact on the direction of research and policy in the years to come.

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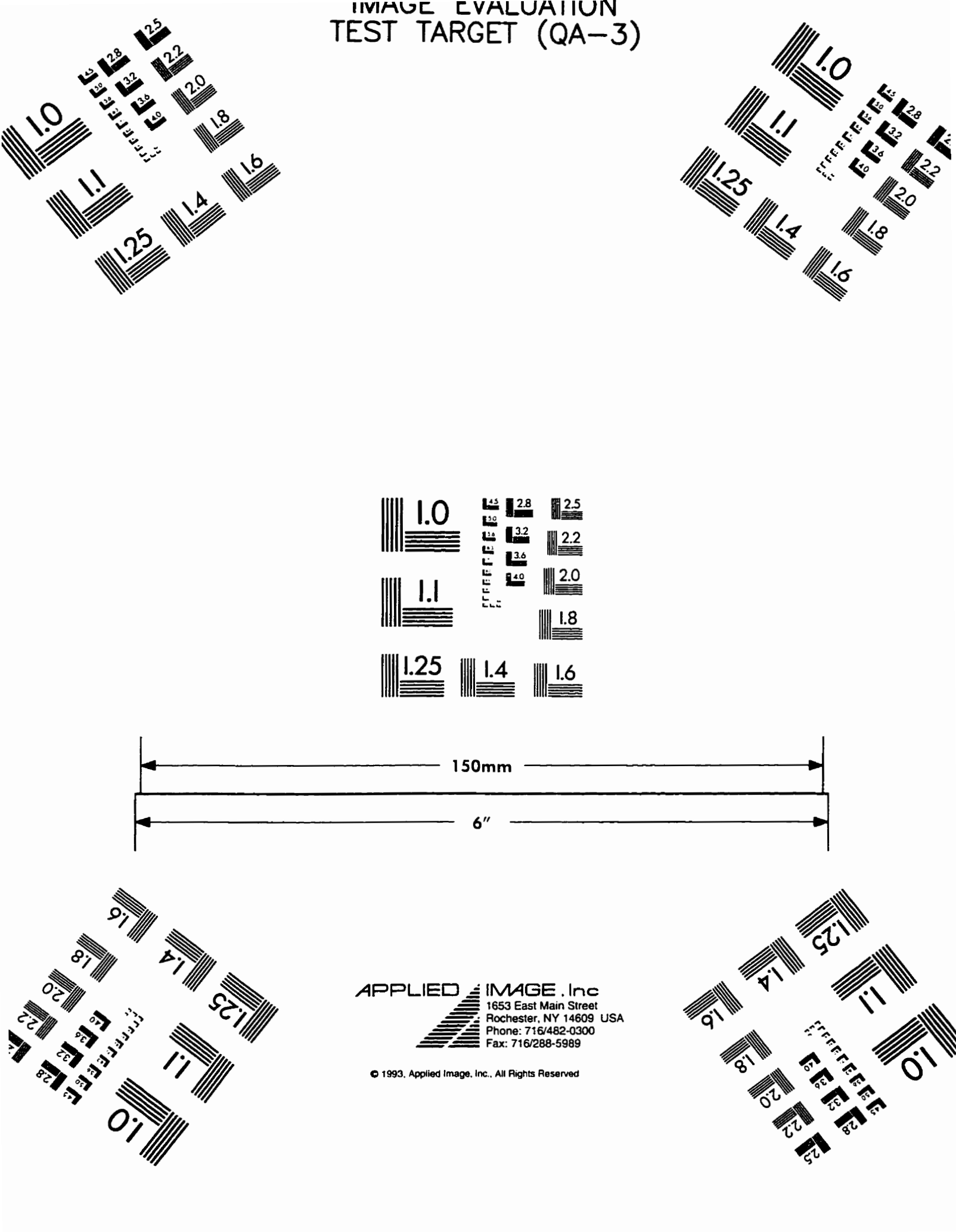
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