



# Subjective relative deprivation is associated with poorer physical and mental health



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## ABSTRACT

Substantial epidemiological evidence has shown that income inequality and objective measures of relative deprivation are associated with poorer health outcomes. However, surprisingly little research has examined whether subjective feelings of relative deprivation are similarly linked with poorer health outcomes. The relative deprivation hypothesis suggests that inequality affects health at the individual level through negative consequences of social comparison. We directly examined the relationship between subjective feelings of personal relative deprivation and self-reported physical and mental health in a diverse community sample ( $n = 328$ ). Results demonstrated that subjective feelings of personal relative deprivation are associated with significantly poorer physical and mental health. These relationships held even when accounting for covariates that have been previously associated with both relative deprivation and health. These results further support the link between relative deprivation and health outcomes and suggest that addressing root causes of relative deprivation may lead to greater individual health.

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## 1. Introduction

Income inequality is an issue of great concern to citizens and governments worldwide for good reason: Income inequality has been associated with nearly every measurable social, health, and well-being issue (reviewed in Pickett and Wilkinson, 2015; Wilkinson and Pickett, 2006, 2007, 2009). Here, we (a) briefly review epidemiological evidence linking inequality, mental health, and physical health; (b) describe the relative deprivation hypothesis, which may account for an individual-level association between inequality and health; and (c) present research directly examining whether subjective feelings of relative deprivation are associated with self-reported physical and mental health at the individual level.

### 1.1. Inequality and health at the aggregate level

Substantial epidemiological evidence indicates that aggregate-level income inequality (i.e., income inequality measured at the society, nation, state/province, and community/census tract levels)

affects diverse health outcomes (reviewed in Subramanian and Kawachi, 2004; Pickett and Wilkinson, 2015; Wilkinson and Pickett, 2006, 2007, 2009). Income inequality has been linked with increased obesity, mental illness, and general mortality, as well as decreased cardiovascular health and life expectancy, among other negative physical and mental health outcomes (e.g., Crepaz and Crepaz, 2004; Khan et al., 1998; Pickett and Wilkinson, 2010; reviewed in Pickett and Wilkinson, 2015; Wilkinson and Pickett, 2006, 2007, 2009). These effects have been demonstrated even when controlling for individual-level socioeconomic status and such aggregate economic measures as gross domestic product (e.g., Kawachi et al., 1997; Kennedy et al., 1998; Kawachi et al., 2002; Wilkinson, 1996; reviewed in Pickett and Wilkinson, 2015; Wilkinson and Pickett, 2009). A recent review by Pickett and Wilkinson (2015) provides evidence that the aggregate-level income inequality/health relationship meets all major criteria for causality (i.e., temporal precedence, non-spuriousness, covariation, and biological plausibility). Together, the extant evidence clearly indicates that income inequality has an important influence on physical and mental health.

### 1.2. Relative deprivation and health

The relative deprivation hypothesis (also known as the relative income hypothesis or the income inequality hypothesis) offers an

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explanation of the individual-level mechanisms underlying the relationship between inequality and negative outcomes at the aggregate level (e.g., Adjaye-Gbewonyo and Kawachi, 2012; Subramanian and Kawachi, 2004; Wilkinson, 1996; Wilkinson and Pickett, 2006, 2007, 2009). This hypothesis states that inequality manifests through various forms of socioeconomic comparison (especially income inequality). These various forms of socioeconomic comparison in turn undermine social cohesion, social capital, trust, and well-being more generally, eventually leading to negative psychosocial and physical outcomes (Walker and Smith, 2001; Wilkinson, 1996).

Substantial research evidence suggests that relative deprivation, as defined by individual-level socioeconomic comparison, is associated with poorer health (reviewed in Adjaye-Gbewonyo and Kawachi, 2012; Smith et al., 2012). In these studies, relative deprivation is almost always quantified through a relative statistical comparison of an individual's objective outcomes, experiences, or socioeconomic status relative to those in the population who score higher on such measures (using such indices as the Yitzhaki Index; Yitzhaki, 1979). That is, these studies involve the computation of an objective level of relative deprivation for each individual in a given sample relative to more privileged others (e.g., Eibner and Evans, 2005; Lhila and Simon, 2010). These indices of individual-level objective relative deprivation have been associated with poorer health outcomes in a number of domains, including increased mortality (Eames et al., 1993; McLoone and Boddy, 1994), suicide (McLoone, 1996), heart disease (Lawlor et al., 2005), and poorer mental health (Eibner et al., 2004; Walters et al., 2004; reviewed in Adjaye-Gbewonyo and Kawachi, 2012; Smith et al., 2012). However, no studies, to our knowledge, have examined whether the individual-level *subjective* experience of relative deprivation is associated with poorer physical and mental health.

Relative deprivation must necessarily manifest at the psychological level in order to influence individual level outcomes (Smith and Huo, 2014; Smith et al., 2012). Psychological relative deprivation describes subjective feelings of resentment, dissatisfaction, and anger associated with perceived deprivation of a deserved outcome relative to other persons (Bernstein and Crosby, 1980; Runciman, 1966; Smith and Huo, 2014). Surprisingly, very little research has examined whether directly measured whether subjective feelings of psychological relative deprivation are associated with health outcomes. Some individual-level studies have examined relationships between health outcomes and such non-subjective inputs as relative social status (e.g., Adler et al., 2000). Although variables like relative social status probably represent important inputs into subjective feelings of personal relative deprivation, they remain both non-subjective and domain-specific. None of the available research presents a direct test of the hypothesis that subjective personal feelings of relative deprivation are linked with individual-level physical and mental health.

### 1.3. Overview

The present research examined whether subjective feelings of personal relative deprivation are associated with poorer individual-level health. This research extends previous results in three important ways by: (1) directly measuring whether subjective feelings of personal relative deprivation are associated with physical and mental health in a diverse community sample, (2) using a general, non-domain specific psychological measure to assess individual differences in feelings of personal relative deprivation, and (3) examining whether individual differences in feelings of personal relative deprivation account for variance in physical and mental health above and beyond other variables that have been commonly associated with socioeconomic relative deprivation and

health. We predicted that subjective feelings of personal relative deprivation would be significantly associated with self-reported physical and mental health, and would account for variance above and beyond other variables that have been previously associated with socioeconomic relative deprivation.

## 2. Methods

A total of 328 participants (160 men, 165 women, 3 unreported sex; age:  $M = 31.0$ ,  $SD = 12.5$ , Range: 18 to 73) were recruited from Lethbridge, Alberta, using posters in the general community, the local university and college, homeless shelters, local employment offices, food banks, and the John Howard Society (a non-profit organization dedicated to re-integrating former prisoners into general society). Participants were recruited from these diverse sources in order to maximize variance in measures of interest, particularly relative deprivation, physical health, and mental health. Participants completed the measures below, in addition to several other personality and behavioral decision-making measures (unrelated to the present study) in random order on a computer. All participants were provided with monetary compensation for their time (\$30, plus any additional earnings from the unrelated decision-making tasks). This study was approved by the University of Lethbridge Office of Research Ethics.

### 2.1. Sources of relative deprivation

We measured several potential objective sources of relative deprivation. Age, sex, current relationship length, education level, number of children, unemployment, personal and household annual earnings in the last year, parental divorce, and total household debt were measured using single item self-reports. Education level (“Completed grade eight” to “Graduate/professional school”), unemployment status (yes/no), personal and household annual earnings (“<\$10,000” to “\$100,000+”), and parental divorce (yes/no) were measured as categorical variables.

Social support was measured using the *Multidimensional Scale of Perceived Social Support* (MSPSS; Zimet et al., 1988), a highly validated self-report measure of subjectively experienced social support involving family, friends, and significant others. Participants indicated the degree to which they agreed or disagreed with 12 statements involving social support from family (e.g., “I get the emotional help and support I need from my family”), friends (e.g., “I can count on my friends when things go wrong”), and a significant other (e.g., “There is a special person who is almost always around me”). Items were rated on a scale of 1 (*very strongly disagree*) to 7 (*very strongly agree*).

### 2.2. Subjective personal relative deprivation

Subjective perceived relative deprivation was assessed using the *Personal Relative Deprivation Scale* (PRDS; Callan et al., 2008), a four-item psychological measure of the degree to which people feel subjectively deprived relative to others. This scale was constructed to be a more general version of existing domain-specific measures of relative deprivation (e.g., Dambrium et al., 2006; Tougas et al., 2006), and to specifically focus on the affective consequences of interpersonal comparisons (Smith and Ortiz, 2001). This measure has been associated with such diverse outcomes as gambling urges, problem and pathological gambling tendencies, future discounting, antisocial conduct, criminal outcomes, risk-propensity, risk attitudes, lower conscientiousness, and lower self-esteem (Callan et al., 2008; Mishra and Novakowski, 2016). It has also been demonstrated to have acceptable internal consistency (Callan et al., 2011).

The specific items of the PRDS are: (1) “I feel resentful when I see

how prosperous other people seem to be”; (2) “When I think about what I have compared to others, I feel deprived”; (3) “I feel privileged compared to other people like me”; (4) “When I compare what I have with others, I realize that I am quite well off”. Items were rated on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Items three and four were reverse-scored. Higher total scores indicated greater subjective feelings of personal relative deprivation.

### 2.3. Outcome measures

Physical health was measured using two self-report items. The first involved participants' assessments of their own health (“How is your health in general?”; Idler and Benyamini, 1997). The second involved participants' assessments of their own health relative to peers (“How is your health compared to peers?”). Both were assessed on a scale of 1 (*poor*) to 5 (*excellent*). Single self-report items of health are the most frequently used measures of health in epidemiological and gerontological research. Such measures have been shown to be highly reliable and are regarded as useful measures of health status in populations (e.g., Lundberg and Manderbacka, 1996; Yngwe et al., 2003). These measures have also been significantly associated with important health outcomes (e.g., early mortality; Idler and Benyamini, 1997), even when controlling for objective health, age, sex, and other socioeconomic and demographic variables (Mossey and Shapiro, 1982).

Mental health was measured using the *Mental Health Inventory* (MHI-5; Berwick et al., 1991) and a self-report item of whether a participant had been previously, currently, or never diagnosed with a mental illness (“Have you ever been diagnosed with a mental illness?”). The MHI-5 is a widely used and extensively validated five-item measure of mental health used to detect affective and anxiety disorders. Participants indicated the amount of time in the last month where they experienced feelings associated with mood disorders (e.g., “Felt downhearted and blue”) or anxiety disorders (e.g., “Been a very nervous person”). Items were rated on a scale of 1 (*none of the time*) to 6 (*all of the time*). MHI-5 scores were reversed so that higher total scores indicated better mental health (consistent with the physical health measures).

### 3. Results

Missing values were observed for age ( $n = 2$ ), sex ( $n = 3$ ), education level ( $n = 4$ ), number of children ( $n = 4$ ), unemployment ( $n = 1$ ), personal earnings in the last year ( $n = 9$ ), household earnings in the last year ( $n = 12$ ), parental divorce ( $n = 2$ ); social support ( $n = 1$ ), absolute physical health ( $n = 1$ ), and mental health as measured by the MHI-5 ( $n = 1$ ). Because missing values did not comprise more than five percent of values for any variable, no imputation method was utilized, and cases involving missing values were not analyzed.

Descriptive statistics are provided in Table 1 for all continuous variables. Frequencies by income bin of personal and household earnings are provided in Table 2. Educational attainment of our sample was as follows: Completed grade eight (1.9%), some high school (13.6%), high school graduate or equivalent (14.5%), completed or currently completing vocational or trade school (6.8%), completed or currently completing community college (7.1%), completed or currently completing an undergraduate university degree (49.4%), completed or currently completing a graduate or professional (6.8%). In our sample, 22.9% of people were currently unemployed. Eighty-two percent of participants were never diagnosed with a mental illness, 7.4% had a previous diagnosis, and 9.3% had a current diagnosis.

Zero-order correlations between subjective personal relative

**Table 1**

Descriptive statistics of continuous variables,  $M(SD)$ ;  $n = 328$  for all measures except for age ( $n = 326$ ), number of children ( $n = 324$ ), social support ( $n = 327$ ), physical health (absolute) ( $n = 327$ ) and mental health ( $n = 327$ ).

<i>Sources of relative deprivation</i>	
Age (years)	31.0 (12.5)
Current relationship length (months)	42.4 (82.9)
Number of Children	.66 (1.3)
Household debt (dollars)	43,612 (166,629)
Social support (MSPSS)	62.5 (15.2)
<i>Relative deprivation and outcomes</i>	
Personal relative deprivation (PRDS)	12.1 (4.9)
Physical health (Absolute)	2.8 (1.1)
Physical health (Relative)	2.9 (1.1)
Mental health (MHI-5)	13.9 (4.6)

Note: Statistics are presented as Mean (Standard Deviation).

**Table 2**

Personal ( $n = 319$ ) and household earnings ( $n = 316$ ) in the last year (frequencies by income bin).

<i>Income amount</i>	<i>Personal</i>	<i>Household</i>
<\$10,000	39.5%	16.5%
\$10,001 to \$20,000	29.5%	15.5%
\$20,001 to \$30,000	13.2%	11.4%
\$30,001 to \$40,000	6.9%	7.6%
\$40,001 to \$50,000	3.8%	5.7%
\$50,001 to \$75,000	4.1%	14.2%
\$75,001 to \$100,000	1.6%	13.0%
\$100,000+	1.6%	16.1%

deprivation and all potential objective sources of deprivation were conducted. Subjective feelings of personal relative deprivation were significantly and positively associated with age ( $r = .15$ ,  $p = .006$ ), number of children ( $r = .16$ ,  $p = .005$ ), unemployment ( $\rho = .27$ ,  $p < .001$ ), and parental divorce ( $\rho = .18$ ,  $p = .001$ ). Relative deprivation was significantly and negatively associated with education level ( $\rho = -.33$ ,  $p < .001$ ), household earnings in the last year ( $\rho = -.28$ ,  $p < .001$ ), and social support ( $r = -.40$ ,  $p < .001$ ). No significant relationships were observed between subjective personal relative deprivation and personal earnings in the last year ( $\rho = -.11$ ,  $p = .057$ ), relationship length ( $r = -.017$ ,  $p = .77$ ), or reported debt ( $r = -.042$ ,  $p = .57$ ).

#### 3.1. Physical health

Greater subjective feelings of personal relative deprivation were associated with poorer self-reported physical health measured both absolutely ( $r = -.19$ ,  $p = .001$ ) and relatively ( $r = -.29$ ,  $p < .001$ ). To examine these relationships more carefully, we conducted two hierarchical sequential regressions—one for absolute self-reported physical health and another for relative self-reported physical health. In both regressions, all sources of objective relative deprivation identified above that were significantly associated with reported subjective personal relative deprivation were included in Block 1 (so as to not unnecessarily reduce statistical power by including all variables). The measures were age, educational attainment, number of children, unemployment status, household earnings, parental divorce, and social support. Subjective personal relative deprivation scores were included in Block 2. All categorical variables with more than two levels were modeled as continuous variables. Results indicate that subjective personal relative deprivation significantly predicted both absolute physical health (Table 3) and relative physical health (Table 4) above and beyond other factors. Controlling for other factors in the model, subjective personal relative deprivation explained 3.0% of variance in reported absolute physical health and 4.5% variance in relative physical

**Table 3**

Hierarchical sequential regression of sources of relative deprivation and reported subjective personal relative deprivation on absolute physical health ( $n = 310$ ).

	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	<i>sr</i>
<b>Step 1:</b> $R = .214$ , $R^2 = .046^*$					
Age (years)	-.016	.006	-.179	-2.65**	-.149
Education Level	.021	.046	.033	.452	.025
Children (number)	-.020	.052	-.025	-.388	-.022
Unemployed (yes/no)	-.077	.167	-.030	-.463	-.026
Household Earnings	-.027	.027	-.065	-1.01	-.057
Parental Divorce (yes/no)	-.047	.138	-.020	-.338	-.019
Social Support	.002	.004	.031	.505	.028
<b>Step 2:</b> $R = .276$ , $R^2 = .076$ , $R^2$ Change = .030**					
Relative Deprivation	-.043	.014	-.200	-3.16**	-.174

Notes: Statistical significance: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . Outcome variable was self-reported absolute physical health. *B* = unstandardized regression coefficient; *SE* = standard error of coefficient;  $\beta$  = standardized regression coefficient; *t* = Student's *t*-statistic; *sr* = semi-partial correlation.

**Table 4**

Hierarchical sequential regression of sources of relative deprivation and reported subjective personal relative deprivation on relative physical health ( $n = 310$ ).

	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	<i>sr</i>
<b>Step 1:</b> $R = .262$ , $R^2 = .068^{**}$					
Age (years)	-.001	.006	-.015	-.230	-.013
Education level	.092	.045	.147	2.04*	.113
Children (number)	-.051	.052	-.063	-.990	-.055
Unemployed (yes/no)	-.072	.165	-.028	-.435	-.024
Household earnings	.017	.027	.039	.622	.034
Parental divorce (yes/no)	.045	.136	.019	.331	.018
Social support	.006	.004	.085	1.40	.078
<b>Step 2:</b> $R = .337$ , $R^2 = .114$ , $R^2$ Change = .045***					
Relative deprivation	-.053	.013	-.243	-3.93***	-.213

Notes: Statistical significance: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . Outcome variable is self-reported physical health relative to peers. *B* = unstandardized regression coefficient; *SE* = standard error of coefficient;  $\beta$  = standardized regression coefficient; *t* = Student's *t*-statistic; *sr* = semi-partial correlation.

health (derived from squaring the semi-partial correlations reported in Tables 3 and 4).

### 3.2. Mental health

Greater subjective feelings of personal relative deprivation were associated with poorer mental health as measured by the MHI-5,  $r = -.38$ ,  $p < .001$ . A one-way analysis of variance demonstrated that mental illness diagnosis (never/past/current) was associated with subjective personal relative deprivation,  $F(2,320) = 12.57$ ,  $p < .001$ ,  $\eta^2 = .072$ . Follow-up simple contrasts demonstrated that those who had never been diagnosed with a mental illness reported significantly lower levels of subjective personal relative deprivation ( $M = 11.63$ ,  $SD = 4.67$ ) compared to those who had diagnosed previously ( $M = 14.42$ ,  $SD = 3.90$ ) or those who had a current diagnosis ( $M = 15.63$ ,  $SD = 5.65$ ), both  $ps < .006$ . No significant difference in subjective personal relative deprivation was observed among those who had ever been diagnosed or those who currently held a diagnosis,  $p = .35$ .

A hierarchical sequential regression analysis was conducted for mental health (as measured by the MHI-5) as a dependent measure. The analysis was identical in structure to the regression analyses above for physical health save for the change in the dependent measure. The results indicate that subjective personal relative deprivation significantly predicted mental health above and beyond other factors (Table 5). Controlling for other factors in the model, subjective personal relative deprivation explained 6.5% of

**Table 5**

Hierarchical sequential regression of sources of relative deprivation and reported subjective personal relative deprivation on mental health ( $n = 311$ ).

	<i>B</i>	<i>SE</i>	$\beta$	<i>t</i>	<i>sr</i>
<b>Step 1:</b> $R = .387$ , $R^2 = .150^{***}$					
Age (years)	.048	.024	.128	2.01*	.106
Education level	-.178	.185	-.066	-.960	-.051
Children (number)	.057	.213	.016	.269	.014
Unemployed (yes/no)	-1.56	.677	-.142	-2.31*	-.122
Household earnings	.027	.110	.015	.248	.013
Parental divorce (yes/no)	-.170	.559	-.017	-.305	-.016
Social support	.111	.018	.365	6.29***	.333
<b>Step 2:</b> $R = .464$ , $R^2 = .215$ , $R^2$ Change = .065***					
Relative deprivation	-.272	.054	-.292	-5.02***	-.256

Notes: Statistical significance: \* $p < .05$ ; \*\* $p < .01$ ; \*\*\* $p < .001$ . Outcome variable is mental health as measured by the *Mental Health Inventory* (MHI-5). *B* = unstandardized regression coefficient; *SE* = standard error of coefficient;  $\beta$  = standardized regression coefficient; *t* = Student's *t*-statistic; *sr* = semi-partial correlation.

variance in mental health (derived from squaring the semi-partial correlation reported in Table 5).

## 4. Discussion

The current results demonstrate that subjective feelings of personal relative deprivation measured are associated with poorer self-reported physical and mental health at the individual level. The relationships between subjective relative deprivation and physical and mental health remained significant even when controlling for covariates that have been previously associated with both relative deprivation and health. Together, our results suggest that subjective psychological feelings of personal relative deprivation have an important influence on individual health outcomes.

A very large body of evidence has linked inequality and health outcomes at the aggregate level (reviewed in Subramanian and Kawachi, 2004; Pickett and Wilkinson, 2015; Wilkinson and Pickett, 2006, 2007, 2009). Further evidence has linked statistical indices of objective relative deprivation with poor health outcomes at the individual level (reviewed in Adjaye-Gbewonyo and Kawachi, 2012). Previous research has largely conceptualized relative deprivation in such objective socioeconomic terms as income inequality, rather than using direct measures of the subjective psychological consequences of social comparison (Morris and Carstairs, 1991). The current results provide evidence for an individual-level psychological mechanism that may help to explain the commonly observed relationships between inequality and health.

The current results also support the relative deprivation hypothesis writ large. Many researchers have argued that the observed relationship between income inequality and various social, health, and well-being outcomes is a spurious byproduct of individual differences in absolute income (e.g., Mellor and Milyo, 2002; Wagstaff and Van Doorslaer, 2000). Regardless, the results of the present study demonstrate that the subjective psychological consequences of relative comparison explain variance in physical and mental health above and beyond absolute socioeconomic factors, thus emphasizing the importance of social comparison and inequality for health outcomes.

The effect sizes in our study were not as large as those observed in most epidemiological, aggregate-level inequality/health studies. In aggregate-level analyses across several nations, income inequality explains approximately 50% of variance in mental illness (Pickett, James and Wilkinson, 2006; Pickett and Wilkinson, 2015; Wilkinson and Pickett, 2007), and approximately 25% of variance in life expectancy and obesity (Pickett and Wilkinson, 2015;

Wilkinson and Pickett, 2006), with fairly large differences in explained variance across studies. In multilevel analyses, these correlations are typically much smaller, and in many studies, not significant at all (e.g., Daly et al., 1998; Mellor and Milyo, 2002; reviewed in Kondo et al., 2009; Kondo et al., 2012; Subramanian and Kawachi, 2004). Many multilevel models control for the effects of individual income, which may underestimate the strength of inequality/health relationship. In the current study, we found that subjective personal relative deprivation at the individual level explained approximately 3%–5% of variance in physical health, and approximately 7% of variance in mental health. These results are in line with previous multilevel analyses that directly measured health at the individual level. Together, the current study and the extant literature suggest that inequality (and relative deprivation) has a real, but modest, effect on individual-level health (reviewed in Kondo et al., 2009).

#### 4.1. Limitations

The results of the current study have limitations that provide directions for future research. First, our results do not allow for any causal conclusions to be made about the direction of the relationship between subjective personal relative deprivation and physical and mental health. People who experience poorer health outcomes may feel relatively deprived as a consequence of such outcomes. However, Pickett and Wilkinson (2015) provide compelling aggregated evidence that inequality causes poor health outcomes. Further research at the individual level is required to examine whether subjective feelings of personal relative deprivation precede or follow poor health.

Our study only included self-report measures of subjective relative deprivation and health. Self-report of feelings of personal relative deprivation is a key strength for the current study because almost all other studies examining relative deprivation and health have relied on such objective socioeconomic indices as relative income to assay relative deprivation. By measuring subjective feelings of personal relative deprivation directly, we assessed participants' own perceptions of their present situation. Self-reports of health are more problematic, although we do note that the measures used in the current study have demonstrably high internal and external validity (e.g., Berwick et al., 1991; Idler & Benyamini, 1997; Lundberg and Manderbacka, 1996; Yngwe et al., 2003), and have been extensively used as quick screening measures and as easily deployable epidemiological measures.

Feelings of relative deprivation must be derived from comparisons with others. In previous epidemiological research, comparators or peer groups have been largely defined by geographic or urban boundaries (e.g., state, county, neighborhood, census tract). Other multilevel studies have used more sophisticated constructions of peer groups (often using the Yitzakhi Index; e.g., Eibner and Evans, 2005; Kondo et al., 2008; Lhila and Simon, 2010). For example, Eibner and Evans (2005) constructed reference groups based on a combination of state, race, educational attainment, and age. A key strength of the present study is that participants' self-reports of feelings of relative deprivation would have involved participants identifying their own salient and relevant comparators. Future studies should examine whether inducing participants to focus on different comparator groups influences the relative deprivation/health link.

Somewhat surprisingly, personal income in the last year and education were not consistent significant predictors of health. The results may be due to the undergraduate and college student participants in our sample. Most students only have part-time employment, which would produce relatively low individual incomes without considering familial affluence; indeed, household

income was associated with subjective personal relative deprivation. Similarly, students would self-report relatively low education levels, even though they are in the process of obtaining higher education credentials. In any case, the current results further evidence relative deprivation as an important predictor of physical and mental health above and beyond absolute outcomes as consistently demonstrated at the population level (reviewed in Wilkinson and Pickett, 2009). Not surprisingly, social support was associated with positive mental health consistent with substantial previous research (reviewed by the Canadian Institute for Health Information, 2012).

The generalizability of our findings is an open question given that the demographics of our sample differed somewhat from the demographics of Canada at large. Compared to the Canadian population, people in our sample were younger (median age in Canada = 40.2; median age in sample = 26.0), had fewer children (mean number in Canada = 1.9; mean number in sample = .66), were slightly more likely to be single (mean proportion in Canada = 40%; mean proportion in sample = 43.6%), had lower personal income (median personal income in Canada = \$31,400; median personal income in sample = \$10,001 to \$20,000), and had lower family income (median family income in Canada = \$76,550; median family income in sample = \$30,001 to \$40,000). All aforementioned data were obtained from Statistics Canada. Estimated twelve-month prevalence of mental illness in Canada is approximately 20% (Smetanin et al., 2011). In our sample, 16.7% of participants reported a previous or current diagnosis of a mental illness. The demographics of our sample reflect the relatively large proportion of students and indigent individuals recruited for the study, and it is likely that levels of subjective personal relative deprivation in our sample are higher than in the general population as a consequence. Further research examining the link between subjective feelings of relative deprivation and health in more representative populations is necessary to determine the generalizability of our findings.

#### 4.2. Conclusion

We demonstrated that subjective feelings of personal relative deprivation are linked with poorer physical and mental health. These results provide further evidence for the relative deprivation hypothesis. The results also support a large and compelling body of evidence suggesting that income inequality and its downstream consequences have immense and wide-reaching impacts on physical and mental health. Recent public attention on income inequality is well placed: Any policies designed to reduce inequality, and by extension, relative deprivation, are likely to deliver significant return on investment with regards to public health.

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