Explaining the Social Gradient in Health in Canada: Using the National Population Health Survey to Examine the Role of Stressors

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Understanding the mechanisms that explain the pervasive association between socioeconomic status and health has been identified as an important area of research. Using the 1994–1995 National Population Health Survey, this study examines whether exposure to psychosocial stressors may be one mediating mechanism of the social gradient in health. Data were obtained including indicators of socioeconomic status (SES); exposure to recent life events and chronic stressors; and self-rated health status. Results showed a clear gradient in poor self-rated health with decreasing SES. Higher exposure to stressors across several domains was also observed with decreasing SES. Exposure to stressors was further associated with poor self-rated health, above and beyond adjusting for SES. Across income adequacy groups, exposure to stressors accounted for 16% to 26% of the relationship between income group and poor self-rated health among men and for 6% to 15% among women, suggesting that exposure to psychosocial stressors may be one of the mediators underlying the higher prevalence of poor self-rated health within lower socioeconomic groups.

Keywords: socioeconomic status, social gradient, stressors, stress, self-rated health

The social gradient in health describes the graded association observed between socioeconomic status (SES) and health status. This pervasive pattern of greater morbidity and earlier mortality associated with lower income, education, or occupational status persists for almost every disease, including heart disease, diabetes, numerous cancers, and mental illnesses (Marmot, Shipley, & Rose, 1984; Pincus, Callahan, & Burkhauser, 1987; Susser, Hopper, & Watson, 1985). Researchers have attempted to identify the causal mechanisms governing this association so that interventions can be appropriately targeted. Current explanations of the social gradient in health fall into three broad categories: material/structural, behavioral/lifestyle, and psychosocial mechanisms (Elstad, 2000).

The purpose of this article is to provide evidence for the contribution of psychosocial stressors to the social gradient in health, with consideration of the multifactorial nature of causation of patterns of health and illness.

The material/structural explanation posits that lower SES individuals are exposed to more harmful physical environments and have less access to health care and other material health-promoting resources (Lynch, Davey Smith, Kaplan, & House, 2000). The behavioral/lifestyle explanation suggests that lower SES individuals are less healthy as a result of poorer health-related behaviors such as smoking or poor eating habits (Lynch, Kaplan, & Salonen, 1997). However, evidence suggests that these two explanations can only explain part of the gradient (Adler et al., 1994; Evans, Barer, & Marmor, 1994) and considerable variance remains unexplained. The third paradigm is promising in explaining some of the residual variance between SES and health, and proposes that SES is associated with contextual social factors and resulting psychological processes that result in poor health through behavioral and psychobiological mechanisms. Although these three explanations are often presented as competing hypotheses, there is considerable overlap and potential synergy between them, as the effects of one source of health liability may compound the effects of another. For example, exposure to psychosocial stressors is associated with onset of depression (Brown & Harris, 1978), and an inability to pay for the services of a psychologist could prolong the healing period, leading the individual to smoke more (Graham, 1994). Therefore, although the primary purpose of this article is to explore the contribution of a psychosocial mechanism...
to the social gradient in health, this is not to the exclusion of other important pathways.

One of the proposed psychosocial mechanisms is through differential exposure to adverse life circumstances, including exposure to stressors arising from living contexts largely determined by socioeconomic status (Baum, Garofalo, & Yali, 1999; Pearlin, 1989). Stressors can be conceptualized as acute events or ongoing situations in the environment that would, for the average person, invoke a strong emotional reaction and that usually constitute a threat, demand, or constraint (Brown & Harris, 1978; Wheaton, 1994). Such events or situations can be regarded as stressors regardless of whether a strong emotion is indeed perceived by the individual. Several taxonomies of stressors have been articulated, including life events, chronic stressors, and work stress. Many of these stressors demonstrate a social distribution, with lower status individuals being exposed to a greater number of life events (Cohen, Kaplan, & Salonen, 1999; Gottlieb & Green, 1984; Stronks, van de Mheen, Looman, & Mackenbach, 1998; Turner, Wheaton, & Lloyd, 1995; Brown & Harris, 1978); chronic stressors (Stronks et al., 1998; Turner et al., 1995); and work stress (Karasek & Theorell, 1990; Fotinatos-Ventouratos & Cooper, 1998; Pearlin, 1989).

If exposure to stressors is to mediate the social gradient in health, then it must also be related to poor health. Exposure to stressors and resulting psychological stress have been associated with numerous negative health outcomes, and at least two mechanisms for this have been suggested. First, changes in health-related behaviors have been associated with stressor exposure, such as increased smoking during times of stress (Baum & Poslusny, 1999; Graham, 1994). Second, direct psychophysiological effects on endocrine and immune systems are biologically plausible mechanisms (Brunner, 1997; McEwen, 1998). Exposure to a wide range of life events has been associated with greater risk for numerous diseases (Brown & Harris, 1989), and job strain has been consistently associated with a greater risk for cardiovascular disease (Schnall, Landsbergis, & Baker, 1994; Hemingway & Marmot, 1999). Indeed, these pathways between stressors and health attest to the impossibility of attributing social gradients in health to solely one explanation.

Recently, Stronks et al. (1998) demonstrated an inverse association between education and several stressors, and demonstrated that stressors contributed approximately 20% of the increased risk of poor health among the lowest educational groups in the Netherlands. Similarly, Cohen et al. (1999) reported a comparable contribution of exposure to stressors to poor health in lower income and education groups in both American and Finnish samples. These studies demonstrate that even using different indicators of socioeconomic status, a similar pattern of health gradients emerges. Socioeconomic status (SES) is a complex latent concept which refers to an individual’s position in society relative to others. The relative importance of a given position is determined primarily by society’s value for the function of that position, and scarcity of individuals with requisite skills to fulfill the role (Davis & Moore, 1945). One indicator of SES is income which, when obtained through employment or social transfer, reflects to a large extent the interplay of role value and scarcity of possible incumbents. Thus, occupational prestige and education are closely related to income. In terms of functional value, income is most closely related to access to material resources. At the same time, it can act as a proxy for other important aspects of SES, such as power, status, and style of life, which, although important, are not the focus of these analyses.

The purpose of this study is to provide converging evidence for psychosocial mediation of the social gradient in health by testing whether a similar pattern of results is observed within a Canadian sample. The specific objectives of this study are to demonstrate inverse income gradients of self-rated poor health and exposure to stressors, and to test whether exposure to stressors can account for the increased prevalence of poor health among lower SES individuals.

**Data and Methods**

Data were obtained from the 1994–1995 cycle of the National Population Health Survey (NPHS; Statistics Canada, 1996) which has been described in detail by Tambay & Caitlin (1995). Approximately 17,000 participants were sampled using a multi-stage stratified sample of dwellings within clusters of dwellings. One participant per household was randomly selected as the targeted participant. Data were collected by Computer Assisted Interviewing. Within the 88.7% of households agreeing to participate, 96.1% of selected individuals agreed to provide detailed data, resulting in an overall response rate of 85.2% of individuals. Reporting on selected individuals by another person (i.e. proxy reporting) accounted for 4% of the data (Statistics Canada, 1996). In order to take into account the complex survey design of the NPHS, sampling weights were calculated based on the formula provided by Statistics Canada, for men and women separately.

Participants ranging from age 20 to 80 and older were retained for our analyses (n = 15,779), including 7,126 men and 8,653 women. Less than 9% of participants had missing data on any of the variables included in the analyses. Participants with a complete set of data included 6,351 men and 8,077 women. Due to the use of weights as described previously, the weighted sample size for these analyses was 4,852 men and 6,215