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A protective rung on the ladder? How past and current social status shaped changes in health during COVID-19

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ABSTRACT

An emerging body of work has started to document population health consequences of the social and economic transformations during the COVID-19 pandemic. We consider an individual's relative social position in the stratification system—subjective social status (SSS)—and assess how past (childhood) and current SSS predict change in self-rated health during the pandemic. Using two waves of data from the Canadian Quality of Work and Economic Life Study, we follow respondents between the onset of lockdown measures in March and May of 2020 (N = 1886). Drawing from the life course perspective and stress process model, we find that lower current SSS predicts a greater likelihood of being in stable poor health and reporting declining health. Lower past SSS predicts a higher chance of being in stable poor health indirectly through current SSS. And lower cumulative SSS that sums both past and present SSS also predicts stable poor health, while perceived upward mobility over time is associated with stable good health. This robust relationship between SSS and health in such a short time period of two months at the start of the COVID-19 pandemic provides an important glimpse into the influence that SSS has on population health.

1. Introduction

The early days, weeks, and months of the COVID-19 pandemic were fraught with uncertainty. Fear of the virus combined with financial uncertainty, disturbed routines, and general societal upheaval to generate a unique constellation of potential stressors. These stressors were due in part to the imposition of strict lockdown measures to curb the transmission of the virus. While these measures led to a slower spread of infection, consequences to the health of the general public were inevitable (Galea, Merchant, & Lurie, 2020). The most common threats to health during this time were the loss of income or employment—the residual consequences of economic shutdowns and sharp declines in the stock market (Hanspal, Weber, & Wohlfart, 2020). Moreover, requiring people to remain at home and avoid social gatherings also elevated the risk of social and psychological harm (Galea et al., 2020), effectively depleting individuals of the social connections central to their well-being (Bierman & Schieman, 2020). Indeed, evidence from Canada suggests that perceptions of self-rated health declined during the early stages of the pandemic, with these associations documented as early as *two months* after the beginning of the lockdown (Bierman, Upenieks, & Schieman, 2021; Bierman, Upenieks, Glavin, & Schieman, 2021).

A compelling narrative to emerge from the coronavirus pandemic is that it has amplified many existing inequalities that widen the gap between vulnerable groups, especially those of a lower social status and their more advantaged counterparts (Wanberg, Csillag, Douglass, Zhou, & Pollard, 2020). Recent scholarship has advanced the view that any health risks associated with the COVID-19 pandemic depend on prior life course exposure, including "accumulated socioeconomic drawbacks" (Settersten et al., 2020, p. 6)—that is, the extent that individuals are *continually exposed* to hardship over time. This assertion builds on tenets of the stress process model in the sociological tradition in that stressors do not affect the health of members of the population equally (Pearlin, 1989). According to this model, groups that occupy the lower rungs of the societal ladder have fewer resources at their disposal to cope with stressors, a relationship which is exacerbated during uncertain times (Pearlin & Bierman, 2013). Past research has found that the health and mental health costs of the COVID-19 pandemic were not random, but instead took the greatest toll on individuals that were more economically, mentally, and physically vulnerable *prior* to the pandemic (Bierman, Upenieks, Schieman, & Glavin, 2021).

However, one's social position is not only a reflection of the here-

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and-now reality. Rather, it encompasses processes of accumulation that occur over time (Heywood & Lyons, 2017), set in motion during the early stages of life (e.g., childhood). In a recent essay outlining the potential effects of the COVID-19 pandemic through a life course lens, Settersten et al. (2020) argue that any consequences attributed to the pandemic must be considered from subjective standpoints—that is, "how people anticipate or project their lives looking forward, and how they review, interpret, and *evaluate their lives in the present and looking backward*" (pg. 2, emphasis ours).

In the current study, we take up Settersten and colleagues' (2020) call by considering a measure of social position—subjective social status (SSS)—at two life course phases: childhood (hereafter, *past SSS*) and adulthood (*current SSS*). We suspect that SSS may take on greater importance in the face of pandemic-related adversity, as hardships accumulate and disruptions to normal routines and roles might prompt people to contemplate their social status relative to others. Beliefs that individuals hold about themselves—including perceptions of their own relative standing in society—may either be scarring or protective for health and well-being during a time of turmoil like the early period of a global pandemic. Perceptions of doing well or poorly compared to others over longer periods of the life course may (de)activate physiological stress responses and reinforce beliefs about the self and the capabilities to handle the challenges represented by the pandemic. We therefore assess how past and current SSS relate to changes in self-rated health during the COVID-19 pandemic. Self-rated health is a perceptual measure that includes elements of both physical and mental health (Dumas, Dongchung, Sanderson, Bartley, & Seligson, 2020; Leshem-Rubinow et al., 2015), though prior studies have shown that physical functioning factors more heavily into perceptions of self-rated health than mental well-being (Mavaddat et al., 2011). One's current perceptions of their relative standing in society does not directly capture where a person saw themselves starting out from, and whether high or low perceptions of position have endured through time or shifted upward or downward. Thus, current SSS and any accompanying associations with health may be a function of, or combine in unique ways, with past SSS.

To test our ideas, we use two waves of longitudinal data as part of the *Canadian Quality of Work and Economic Life Study* (C-QWELS)—a study specifically designed to study change as the COVID-19 pandemic unfolded. Our approach relies on four recognized life course models of health—*sensitive period*, *accumulation*, *pathway*, and *mobility* (Pudrovska & Anikputa, 2014)—integrated with insights from the stress process model to assess how past and current SSS combine in synergistic ways to negatively impact health or function as health-protective resources during the first few months of the pandemic.

1.1. Subjective social status over the life course

Subjective measures of social status capture how individuals *perceive* their social position relative to others, and where they think they belong on the societal ladder (Marmot, 2004; Wilkinson & Pickett, 2007). As individuals experience successes and failures in social roles, they develop a subjective sense of their place in the social hierarchy relative to others. Humans sort themselves into hierarchies based on numerous dimensions, and rank is thought to be a fundamental process of social life that also bears close linkages to health (Cundiff & Matthews, 2017). Indeed, a scientific consensus suggests that SSS is linked with health—even after statistically netting out traditional measures of socioeconomic status (Cundiff & Matthews, 2017; Demakakos, Nazroo, Breeze, & Marmot, 2008; Nobles, Weintraub, & Adler, 2013; Präg, Mills, & Wittek, 2016; Singh-Manoux, Marmot, & Adler, 2005). Perceptions of one's placement in the broader socioeconomic hierarchy may evoke physiological stress responses by degrading psychological resources such as self-esteem (Rahal, Chiang, Bower, et al., 2020) and invoking inflammatory responses to perceived threat of inferiority (Kuhlman, Chiang, Horn, & Bower, 2017). Relatedly, Eisenberger (2015) argues that painful feelings after social rejection or exclusion—in other words, feelings of inferiority—rely on some of the same neural regions that process physical pain. Feeling lower on the social status ladder also has psychological consequences, above and beyond absolute levels of material deprivation (Marmot, 2004). The additional explanatory power of subjective socioeconomic status over objective indicators of socioeconomic status may be attributable to early life characteristics, such as schooling quality, or wealth in one's extended family (Schnittker & McLeod, 2005).

Prior research provides a rationale for testing the synergistic effects of SSS from early life to adulthood and their potential consequences for health. A few studies include retrospective measures of SSS. These studies tend to combine objective measures of SES (e.g., parent's education or occupation), and subjective measures (e.g., financial ranking of one's family compared to others) to assess later-life health outcomes, and are associated with better health (Ferraro, Schafer, & Wilkinson, 2016; Singh-Manoux et al., 2005). Beyond these studies of retrospective SSS, only a few studies have examined measures of SSS at multiple points in time, but these studies tend to have relatively short lag times between measurements, ranging from 7 to 14 days (Giatti, Camelo, Rodrigues, & Barreto, 2012) to two months (Goodman et al., 2001), and at its largest, six months or more between observation points (Goodman, Huang, Schafer-Kalkhoff, & Adler, 2007; Operario, Adler, & Williams, 2004; Thompson, Gaglani, Naleway, Thaker, & Ball, 2014). Overall, these studies show that SSS measured at time lags of six months or more predict self-rated health net of demographic characteristics and objective socioeconomic status (Goodman et al., 2007; Operario et al., 2004; Thompson et al., 2014). These studies, however, are limited for three reasons. First, they rely on data from a single period of the life course for assessing SSS. Second, because of a reliance on single measurements of SSS, these studies do not test if the effects of SSS at different life course stages may accumulate to impact health. Third, past studies have not taken into account that SSS may *change* between periods of the life course. In general, research with multiple points of SSS measurement have tended to concentrate exclusively on either adolescent (Goodman et al., 2007) and adult samples (Jin & Tam, 2015; Operario et al., 2004; Thompson et al., 2014), limiting a broader life course consideration.

1.2. SSS and self-rated health: Integrating life course and stress process perspectives

We combine insights from the life course and stress process perspectives to outline how SSS, measured over the life course, could combine to influence perceptions of self-rated health. As Pearlin (2010) notes, both life course and stress process perspectives share interests in the stability or change of circumstances in individuals' lives, arguing that it is insufficient to look solely at proximal circumstances to account for health disparities. As we noted at the outset, the early months of the COVID-19 pandemic were riddled with stress and hardship as people sought to adjust to a rapidly changing work, home, and family environment. The stress process perspective posits that dimensions of social stratification shape the consequences of stressors by differentially distributing buffering resources (Pearlin & Bierman, 2013). Within this tradition, SSS has been posited as a stress buffer. Lee and Bierman (2018), for instance, argue that it is a resource to hold a privileged subjective position in society. SSS is different from mastery, a common coping resource in the stress process. Mastery refers to the perceived power that one has to act efficaciously in their pursuits, while SSS reflects how one ranks relative to others. SSS is likely to buffer the effects of stress by facilitating a sense of self-worth and social value in the face of threat and by encouraging active coping (Adler, Epel, Castellazzo, & Ickovics, 2000) and the appraisal of stress as more manageable (Derry et al., 2013). However, the stress process model, on its own, leaves an important question unanswered. Reflections about one's social standing in society may be quite fluid, as individuals assess their current predicaments continually in light of past events and looking ahead to the future (Jin & Tam, 2015). Indeed, how SSS changes over the life course

and the implications this might have for population health remain unaddressed.

Therefore, building on the insights of the stress process model, which argues that SSS should have a linear association with health, we investigate four life course models of health. We develop a series of hypotheses regarding the way past SSS might combine with current SSS to influence self-rated health during the COVID-19 pandemic: (1) early life sensitivity, (2) pathways from past SSS to current SSS, (3) accumulation, and (4) social mobility (Pudrovska & Anikputa, 2014). These life course models of health are based in research on objective indicators of socioeconomic status, such as education, occupation, or income. Much of the research that we review below adopts such a strategy. While we draw from this prior research to apply these life course models to guide our analyses, we also build on this framework by using other research to argue these models should operate in a similar way for the link between SSS and health.

The *early life sensitivity model* (also referred to as the *critical period model*) characterizes the periods of childhood and adolescence as "sensitive periods" for cognitive and biological development that help prepare the individual for future environments they might encounter (Miller, Chen, & Parker, 2011). At a cognitive level, early-life concerns about one's status may foster distrust and heightened vigilance that prepare the individual to deal with expected threats (Miller et al., 2011). According to the sensitive period model, negative exposures during childhood may result in scarring that increases the risk of health problems later in the life course (Ben-Shlomo & Kuh, 2002). Studies have shown that a low childhood SES was associated with a greater likelihood of developing new health conditions over time (Ferraro et al., 2016) and reduced the odds that older American adults remained disease-free by approximately 30% (Williams, Kemp, Ferraro, & Mustillo, 2019).

Though we are not measuring early life stress exposures, we believe the insights from the critical period model can be applied to understanding the effects of adult perceptions of childhood SES on health. Much like stressful experiences in childhood, some previous research has shown that past SSS—that is, from earlier life course periods—may evoke an enhanced stress response and be damaging for health. Lower SSS in early adulthood activates a stronger physiological response to stress: it predicts blunted hypothalamic-pituitary-adrenal (HPA) axis responses to stress, as well as higher resting heart rates, even net of objective social status (Adler et al., 2000; Habersaat, Abdellaoui, Geiger, Urben, & Wolf, 2018). Other experimental research suggests that stress hormone response to lower SSS can be almost immediate. For instance, one study by Derry et al. (2013) found that people with low SSS exhibited greater physiological (interleukin-6 levels) and psychological responses (i.e., perceived threat) following a short stress test. Weiss and Weiss (2016) likewise found that older adults with a low SSS had higher cortisol activity after 45 min of performing cognitively demanding tasks. Moreover, undergraduate students that were assigned to positions with low social power reported higher negative affect at the end of the study following stress (Cundiff, Smith, Baron, & Uchino, 2016; Mendelson, Thurston, & Kubzansky, 2008).

While informative, these studies assessed health outcomes at only one point in the life course; thus, whether past SSS has longer-term direct effects on health into adulthood has yet to be determined. We acknowledge here that one's *present* SSS may be an average of one's past, current, and future social position according to the cognitive averaging principle (Andersson, 2018; Singh-Manoux et al., 2005). However, since few studies have asked retrospectively about childhood SSS, we do not possess a solid understanding of how respondents interpret their subjective social position in childhood. Nevertheless, we hypothesize the following:

Sensitive Period Hypothesis: Lower past SSS will be associated with poor or declining health compared to those with higher past SSS.

The second life course model, the *pathway model*, posits that though childhood conditions may impact health, circumstances in adulthood will have a stronger association with health (Gruenewald et al., 2012; Pearlin, Schieman, Fazio, & Meersman, 2005; Pudrovska & Anikputa, 2014). While studies frequently emphasize the importance of childhood socioeconomic conditions, some scholars indicate the limits of this sensitivity period model by documenting that the effects of past conditions are mediated through adult circumstances (Pudrovska & Anikputa, 2014). In other words, current SSS is expected to influence health regardless of past SSS and may act as a mediator of the association between past SSS and health. The process of relative deprivation may work through a pathway model because it results from negative social comparisons. For instance, individuals with lower past SSS may have perceived a lack of opportunity for advancement through education, or the procurement of wealth or social prestige relative to other members of society that are the objects of comparison. This could facilitate a self-fulfilling prophecy: to the extent that a low past SSS leads people to lower their aspirations for achievement, this may cause perceptions of current SSS to be lower precisely because of a lack of achievement.

Pathway Hypothesis: Lower past SSS will be associated with poor or declining health indirectly via lower current SSS; higher past SSS will be associated with good health indirectly via higher current SSS.

The third life course model of health, the *accumulation model*, predicts that the greatest risks to health happen when people are exposed to persistent or cumulative stress over the life course (Yang, Johnson, Schorpp, Boen, & Harris, 2017). Prior studies support this model with evidence that cumulative measures of SES are stronger predictors of health risk than SES measured at any single point in the life course (Grunewald et al., 2012). In one of the few studies to assess both past and current SSS, Kingston, Sword, Krueger, Hanna, and Markle-Reid (2012) reported a weak correlation between these two measures ($r = 0.19$). While Kingston and colleagues do not explain the weak correlation, it seems plausible that individuals' points of reference may change as they enter the workforce and experience successes and failures in key social roles. What is perceived as higher or lower SSS in the past might evolve as individuals are exposed to people from different social positions (Eibner & Evans, 2005). We also posit that the weak correlation between past and current SSS does not preclude the possibility that these combine synergistically (or interact) to predict health. Recent evidence suggests that the chronic toll of low SSS among workers may portend worse health, net of objective SES (Brosschot, Verkuil, & Thayer, 2018).

Taken together, an adult who perceives themselves to have low past and current SSS may be particularly distressed in the context of the pandemic. This type of status appraisal could indicate, for instance, perceptions of being "trapped" in an inferior position within the stratification hierarchy. As Monk (2015) notes, subjective social status is a form of *embodied* social status. As Krieger (1999, pg.296) explains, "we literally incorporate biologically—from conception to death—our societal experiences and express this embodiment in population patters of health, disease, and well-being." At the onset of the pandemic, viewing oneself less favorably relative to others, both in the present *and* in the past, may be accompanied by stress coping resources wearing down, leaving people less prepared to deal with the challenges caused by such a disruption. Therefore, we hypothesize:

Accumulation Hypothesis: A lower sum of past and current SSS will predict poor or declining health, while a higher sum of past and current SSS will predict good health.

The fourth life course model, *social mobility*, provides insight into how changes in past and current SSS might shape health (Harris & Schorpp, 2018). The social mobility model posits that perceived upward mobility between childhood and adulthood may offset the effect of low SSS in childhood. This model suggests that moving from low past SSS to high current SSS, or the reverse, may impact health. The perception that one's status has improved over time may spur individuals to feel more optimistic about their situation (Schafer, Ferraro, & Mustillo, 2011) and enhance a sense of personal control (Hitlin & Johnson, 2015). As Schafer et al. (2011) point out, individuals with a more challenging start to life often tend to perceive things are getting better. These findings are consistent with cumulative inequality theory, which was articulated to

acknowledge the importance of human agency (Ferraro & Shippee, 2009). For individuals who perceive an improvement in their social rank over time, the activation of these key psychosocial resources may leave them better prepared to exercise resilience in the face of pandemic related hardship given the obstacles they have already overcome. Together, this may correlate with better coping mechanisms and efforts to protect health. However, perceptions of downward mobility may initiate the opposite process, where individuals feel pessimistic about their prospects in the wake of the pandemic, and refrain from efforts to improve their social standing. Processes of coming to embody deprivation, such as through downward perceptions of one's ranking relative to others between childhood and adulthood, may be one way that epidemiological profiles of health emerge (Krieger, 2012). In a cross-sectional national sample of Chinese adults, Jin and Tam (2015) find that only perceived downward mobility in SSS from adolescence to adulthood predicts poorer self-rated physical health. These authors propose that the health effects of perceived downward mobility may linger while the effects of perceived upward mobility may dissipate, but this claim has yet to be tested with longitudinal data. It is also likely that the anger and frustration faced by such individuals during the pandemic in addition to feeling like one has regressed in their relative standing to others over time could be detrimental to health.

Mobility Hypothesis: Perceptions of downward mobility (decreased SSS) will be associated with poor or declining health: perceptions of upward mobility (increased SSS) will be associated with good health.

2. Materials and methods

2.1. Sample

We analyze data from a longitudinal national survey of Canadian workers that were collected as part of the *Canadian Quality of Work and Economic Life Study* (*C-QWELS*). This project was intended to examine social conditions and well-being among Canadians who were employed—and follow them through the early period of the COVID-19 pandemic to assess change in their experiences and perceptions. We use data collected in 2020 from March 17th to March 23rd (N = 2528) (hereafter, Time 1), and from May 17th to May 24th (N = 1886) (Time 2). An attempt was made to contact all Time 1 study participants at follow-up. The response rate for the initial sample was 43%, and there was a 75% retention rate between the March and May waves of data collection.

All study participants were drawn from the Angus Reid Forum (ARF), a built and managed panel of Canadians that have agreed to participate in research. Panel participants were recruited through a variety of online and offline channels, extensively profiled, and measured to ensure accurate representation of the diversity across Canada's adult population (http://angusreid.org). Sample selection for these surveys began with creating a balanced sample matrix of the Canadian population. A randomized sample of ARF members were then selected to match this matrix to ensure a representative sample. All results are weighted according to the most current gender, age, education, and region Census data to ensure broad representation of working Canadians.

2.2. Dependent variable: Change in self-rated health

Self-rated health was measured identically at Time 1 (March) and Time 2 (May) with a well-validated measure of self-rated health (Idler & Benyamini, 1997). Respondents were asked, "Overall, how would you describe your current state of health?" Responses were coded as follows: 1 = "Poor" or "Very Poor," 2 = "Fair," 3 = "Good," 4 = "Very good," and 5 = "Excellent." We coded self-rated health into a binary variable: 0 = *poor, very poor, or fair health*, and 1 = *good, very good, or excellent health*. This decision was made to simplify the presentation of results and minimize the number of transition categories. Our results were also consistent if we retained the full five category measure of self-rated health.

Using these binary classifications at each wave, we then created a four-category variable of change in self-rated health. Our reference category is those in good, very good, or excellent self-rated health at both Time 1 and Time 2—we label this *stable good health*. We also included in that category those with improved health over time because this group had few cases (less than 1% of our sample). Together, the *stable good health* category comprised 78% of the sample. We contrasted that group with individuals who had *stable poor health* between Time 1 and Time 2 (e.g., scores of 0 at both time points) (7% of the sample), and with those who had *declining health* between Time 1 and Time 1 (15% of the sample).

2.3. Focal independent variables

Subjective Social Status: Past and current SSS were measured at the March wave of data collection (Time 1) with the commonly used MacArthur Scale of Subjective Social Status (Adler et al., 2000). Respondents were presented with a ladder and asked to rank themselves in terms of their standing in society. For *current SSS*, respondents were asked: "Think of this ladder as representing where people stand in our society. At the top of the ladder (10) are the people who are best off—those who have the most money, most education, and best jobs. At the bottom of the ladder (1) are the people who are the worse off—who have the least money, least education, and the worst jobs or no jobs. The higher up you are on this ladder, the closer you are to the people at the very top, and the lower you are, the closer you are to the people at the very bottom. Where would you place yourself at the present time?" After this question, we immediately asked: "And if you think about the family that you grew up in, where did they fit in?" Study participants were shown the same 10-rung ladder and asked to assess their *past SSS*. On both current and past measures of SSS, the scale ranges from 1 to 10 with higher values indicate greater SSS. Several recent studies show that this measure has a high degree of convergent and discriminant validity (Andersson, 2018; Operario et al., 2004).

To test the accumulation hypothesis, we created a measure of *cumulative SSS* as the sum of one's self-placement on the ladder at childhood and adulthood (scores range from 2 to 20, since both childhood and adulthood SSS were coded on a 1–10 scale). Additionally, to test the mobility hypothesis, we assess whether individuals perceive a higher, lower, or the same level of past versus current SSS. Following the measurement procedures of Jin and Tam (2015), we created four distinct groups to measure subjective status mobility. We coded study participants who reported a score of 5 or less on both past and current SSS as 0 and refer to this group *stable low SSS*. We coded those who reported a score of 6 or higher on both past and current SSS as 1 and labeled this group *stable high SSS*. If study participants reported a current SSS score that was lower than their past SSS score, we coded them as 2 with the label *downward status mobility*. Finally, we coded those who reported a higher current SSS relative to their past SSS as 3 and refer to them as the *upward status mobility* group.

2.4. Study covariates

To ensure that the association between SSS and health are not conflated with objective measures of socioeconomic status, we adjust for the following four measures from Time 1. *Education* is measured with the following question: "What is the highest level of education that you yourself completed?" We compare those with a university undergraduate degree or higher to those with less than a university undergraduate degree. As a measure of *occupation,* we contrast individuals in higher administrative, professional, and technical occupations to all others (e.g., sales, service, clerical, skilled labor/production). Analyses also measure *household income*, comparing individuals in the under $25,000 category to individuals in each of the following other categories: $25,000-$49,999, $50,000-$99,999, $100,000-$149,999, $150,000-

$199,999, and $200,000 or more. Finally, given that job loss was a more prevalent occurrence at the onset of the pandemic as lockdown measures came into effect, we include a binary variable of whether the respondents, all employed at Time 1 of the survey, *experienced a job loss* in the months before the Time 2 survey was fielded (0 = No, 1 = Yes). All analyses also adjust for gender, age, visible minority status, marital status, and the number of children younger than 18 residing in the household. In the interest of a parsimonious presentation of results in the main text, we do not display all of the coefficients for these control variables in our statistical tables (full results available upon request). As a side note, some readers might wonder if psychological distress might be confounded with self-rated health. To assuage that concern, we conducted ancillary analyses (not shown) that included a measure of psychological distress at study baseline (March 2020), measured by the Kessler (K6) scale (Kessler et al., 2010). The inclusion of distress in our analyses did not alter the main results, so we did not include distress in the final models presented here.

2.5. Plan of analysis

With three categories of changes in self-rated health as our dependent variable, multinomial logistic regression is appropriate for our analysis. This method allows for multiple comparisons between groups within the same model. We test stable good health as the reference category because we are interested in the change from stable good health to (a) stable poor health or (b) declining health during the pandemic. All statistical tables show relative risk ratios (RRRs), which represent the change associated with each predictor in the probability of being in either the stable poor health or the declining health categories, respectively, relative to the reference group of stable good health. We used multiple imputation with chained equations to deal with missing data in all analyses ($m = 20$).

3. Results

Table 1 lists descriptive statistics for our sample. We note that 7% of the sample reported stable poor health, while 78% reported stable good health, and 15% of the sample experienced a decline in self-rated health between Time 1 and Time 2. Of those respondents who experienced a decline in self-rated health, the majority (72.13%) reported declining from "good" to "fair" health, while 16.39% of that group experienced declines from "very good" to "fair" health. These figures from our study are fairly similar to those reported by Peters and colleagues' (2020) study of a German sample. These authors reported that 12% of respondents experienced a decline in self-rated health between April 30, 2020 and May 29, 2020, while the majority of the sample reported no change in health. It is also worth noting for comparison that a study conducted by Rechhi and colleagues (2020) on a French sample found that more people reported being in stable good health in early May of 2020 (roughly 25%) through the lockdown compared to between 2017 and 2019, when this figure was only 11%. Rechhi and colleagues argue that individuals not personally infected by the coronavirus might evaluate their health more favorably than they would under normal circumstances. Nevertheless, the results from these prior studies suggest that declines in self-rated health were a possibility during the early months of the pandemic, but certainly not inevitable, as many individuals held stable perceptions of health. Therefore, even in such a short window of time, the COVID-19 pandemic provides a unique opportunity to study changes in self-rated health.

Results presented in Tables 2–6 address our main research questions. This first set of analyses tests the *sensitive period hypothesis* by assessing the direct association between past SSS and change in self-rated health. Relative to those with stable good health, a higher past SSS predicts a lower likelihood of having stable poor health between Time 1 and Time 2 (RRR = 0.85, $p < .001$). A higher past SSS was not associated with higher or lower odds of reporting decreasing health, however. Holding all other variables at their respective means, Fig. 1 shows the predicted probabilities of being in stable poor health at three levels of past SSS: low (2), moderate (5), and high (8). These estimates are derived using

Table 1
Study descriptive Statistics, 2020 C-QWELS survey (N = 1886).

	Range	Mean/ Proportion	Standard Deviation
Change in Self-Rated Health			
Stable Poor	0.07		
Stable Good/Increasing	0.78		
Declining	0.15		
Past SSS (March)	1–10	5.53	1.88
Current SSS (March)	1–10	5.76	1.65
Cumulative SSS (March)	2–20	11.28	2.83
Social Mobility			
Stable Low SSS		0.25	
Stable High SSS		0.35	
Decreasing SSS		0.16	
Increasing SSS		0.24	
Controls			
Age	18,83	44.30	13.05
Visible Minority Status		0.14	
B.A. degree		0.47	
Household income			
<25K		0.06	
25K–50K		0.15	
50K–75K		0.34	
75K-100,000K		0.26	
100–125,000K		0.13	
>125,000K		0.06	
Number of children	0,6	1.75	1.04
Marital Status			
Single		0.23	
Married		0.62	
Previously Married		0.04	
Cohabiting		0.11	
Occupational Status			
Professional/administrative		0.41	
Clerical		0.13	
Sales		0.08	
Service/All workers categories		0.26	
Other		0.11	
Work Transitions			
Employed		0.09	
Unemployed			

Table 2
Sensitive Period Hypothesis (N = 1886)
Incident Risk Ratios (IRRs) and 95% Confidence Intervals shown.

	Stable Poor vs. Stable Good SRH	Declining vs. Stable Good SRH
Past SSS	0.85** (0.77–0.94)	1.03 (0.92–1.15)

Notes. ***$p < .001$, **$p < .01$, *$p < .05$.
Analyses adjust for age, education, household income, marital status, number of children, occupation, and work transitions from employed to unemployed over the study period.

Table 3
Pathway Hypothesis (N = 1886)
Incident Risk Ratios (IRRs) and 95% Confidence Intervals shown.

	Stable Poor vs. Stable Good SRH	Declining vs. Stable Good SRH
Past SSS	0.91 (0.81–1.01)	1.08 (0.96–1.21)
Current SSS	0.72*** (0.62–0.84)	0.78*** (0.68–0.90)

Notes. ***$p < .001$, **$p < .01$, *$p < .05$.
Analyses adjust for age, education, household income, marital status, number of children, occupation, and work transitions from employed to unemployed over the study period.

Table 4
Accumulation Hypothesis, Additive Specification (N = 1886)
Incident Risk Ratios (IRRs) and 95% Confidence Intervals shown.

	Stable Poor vs. Stable Good SRH	Declining vs. Stable Good SRH
Cumulative SSS	0.83*** (0.77–0.90)	0.95 (0.99–1.03)

Notes. ***$p < .001$, **$p < .01$, *$p < .05$.
Analyses adjust for age, education, household income, marital status, number of children, occupation, and work transitions from employed to unemployed over the study period.

Table 5
Accumulation Hypothesis, Multiplicative Specification (N = 1886)
Incident Risk Ratios (IRRs) and 95% Confidence Intervals shown.

	Stable Poor vs. Stable Good SRH	Declining vs. Stable Good SRH
Childhood SSS	0.91 (0.69–1.21)	0.98 (0.72–1.32)
Adulthood SSS	0.73* (0.52–0.99)	0.70* (0.49–1.00)
Childhood X Adulthood SSS	1.00 (0.94–1.06)	1.02 (0.96–1.08)

Notes. ***$p < .001$, **$p < .01$, *$p < .05$.
Analyses adjust for age, education, household income, marital status, number of children, occupation, and work transitions from employed to unemployed over the study period.

Table 6
Mobility Hypothesis (N = 1886)
Incident Risk Ratios (IRRs) and 95% Confidence Intervals shown.

	Stable Poor vs. Stable Good SRH	Declining vs. Stable Good SRH
Social Mobility		
Stable High SSS[a]	0.29*** (0.16–0.52)	0.72 (0.40–1.29)
Decreasing SSS[a]	0.65 (0.39–1.10)	1.27 (0.71–2.26)
Increasing SSS[a]	0.45** (0.26–0.80)	0.60 (0.31–1.18)

Notes. ***$p < .001$, **$p < .01$, *$p < .05$.
Analyses adjust for age, education, household income, marital status, number of children, occupation, and work transitions from employed to unemployed over the study period.
[a] Relative to Stable Low SSS.

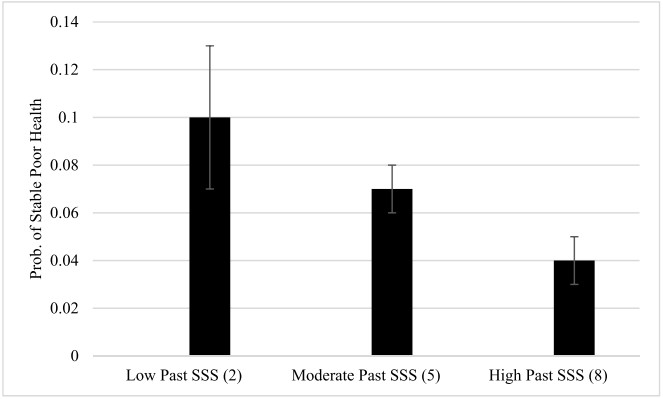

Fig. 1. Predicted Probability of Being in Stable Poor Health, by Past SSS (95% confidence intervals shown).

the *mimrgns* command in Stata 14, with 95% confidence intervals shown. Individuals with a low past SSS are 2.5 times more likely to experience stable poor health (10%) during the pandemic, compared to only 4% for those with high past SSS. High past SSS is also associated with a lower likelihood of having stable poor health relative to those with moderate levels of SSS (7%).

The results from our test of the *pathway hypothesis* are shown in Table 3, with the simultaneous inclusion of past and current SSS. This inclusion of current SSS reduces the association between past SSS and stable poor health to statistical non-significance, suggesting that current SSS mediates the relationship between past SSS and changes in self-rated health at the outset of the pandemic. These patterns support the life course pathway hypothesis. Compared to those with low SSS, people with a higher current SSS reported lower odds of stable poor health (RRR = 0.72, $p < .001$). Moreover, those with high current SSS also report lower odds of experiencing a decline in health between Time 1 and Time 2 (RRR = 0.78, $p < .001$) relative to those with low current SSS.

Fig. 2 displays predicted probabilities of having stable poor health and Fig. 3 shows the risk of having declining health across levels of current SSS. We use the same values for low, moderate, and high SSS as Fig. 1. A low current SSS is associated with a 15% chance of having stable poor health between Time 1 and Time 2, which is five times higher than high current SSS (3%), and more than twice as high as moderate SSS (7%). We observe a similar pattern when examining the probability of having declining health over time. Individuals with a low current SSS have a 10% probability of declining health—more than three times higher than those with high adulthood SSS (3%).

We show the results of our test of the *accumulation hypothesis* in Tables 4 and 5 with the two different operationalizations of accumulation described above. First, in Table 4, we assess cumulative SSS (a sum of past and current SSS)—an additive specification of life course accumulation. We observe that high cumulative SSS is associated with a lower risk of having stable poor health (RRR = 0.83, $p < .001$). Cumulative SSS did not, however, significantly predict the risk of declining health between Time 1 and Time 2. Fig. 4 displays predicted probabilities of having stable poor health across low, moderate, and high cumulative SSS. It shows that a low cumulative SSS was associated with an 11% chance of stable poor health—nearly four times a greater risk experienced by individuals with a high cumulative SSS (3%).

In Table 5, we test the life course accumulation hypothesis—highlighting the multiplicative term (past SSS x current SSS); this model tests whether the effect of current SSS depends on past SSS. For both comparisons in our model, we do not observe a significant interaction term (RRR = 1.00, $p = .98$ for consistently poor health and RRR = 1.02, $p = .51$ for declining health).

Lastly, we test the *mobility hypothesis* in Table 6. We find only limited support for the mobility model. Relative to individuals with stable low SSS from past to current levels, those with stable high SSS over time had a lower risk for having stable poor health (RRR = 0.29, $p < .001$). Moreover, individuals that reported an increase in SSS between past and present have a lower risk of stable poor health (RRR = 0.45, $p < .01$).

Fig. 5 shows predicted probabilities of having stable poor health

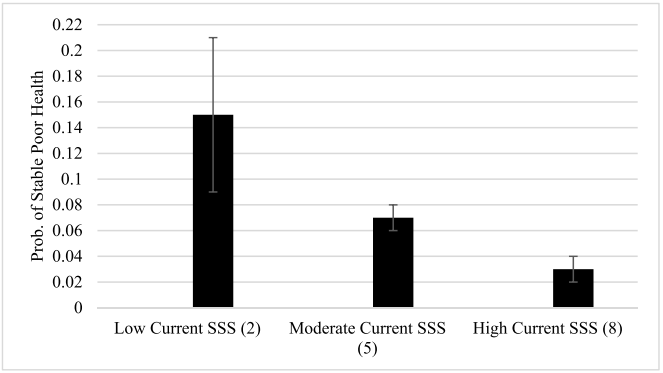

Fig. 2. Predicted Probability of Stable Poor Health, by Adulthood SSS (95% confidence intervals shown).

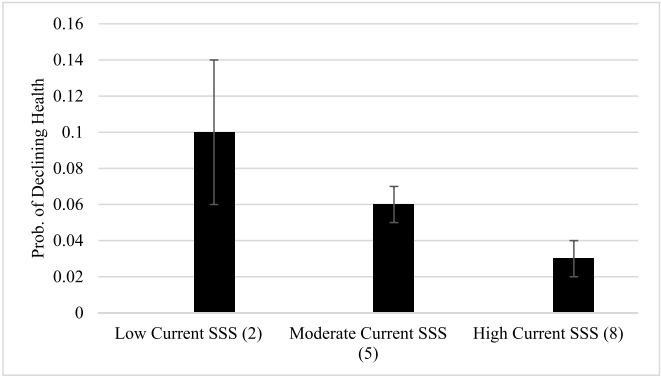

Fig. 3. Predicted Probability of Declining Health, by Adulthood SSS (95% confidence intervals shown).

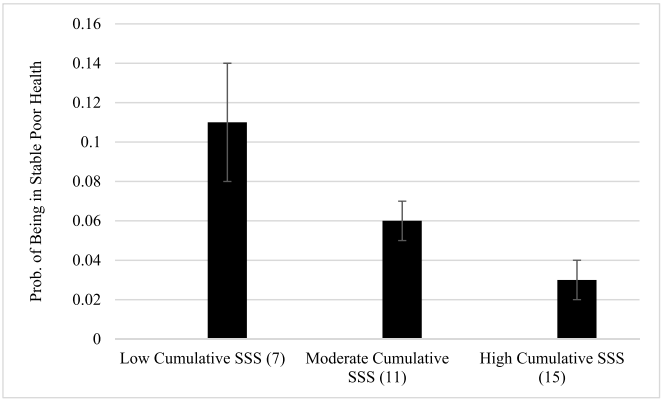

Fig. 4. Predicted Probability of Stable Poor Health, by Cumulative SSS (95% confidence intervals shown).

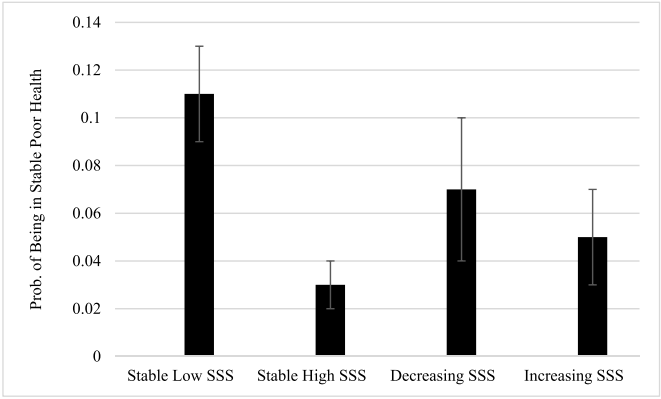

Fig. 5. Predicted Probability of Stable Poor Health, by SSS Mobility from Childhood to Adulthood
(95% confidence intervals shown).

across past and current levels of SSS. Individuals with stable high SSS had the lowest risk of stable poor health (3%), while that those with stable low SSS had the highest risk of stable poor health (11%). However, individuals whose SSS increased over time report a lower risk of having stable poor health (5%) than those with stable low SSS, which is also statistically indistinguishable from the stable high SSS group. Finally, social mobility in SSS is not significantly associated with declines in health between Time 1 and Time 2.

4. Discussion

In the present study, we sought to test how SSS shapes self-rated health during the first few months of the COVID-19 pandemic. We selected this period because of the rapid and pervasive social and economic changes that reverberated throughout the society. Drawing from two waves of a national survey of Canadian workers from the beginning of the COVID-19 lockdown period (March 2020) and followed-up two months later (May 2020), we tested how SSS as a stress-buffering resource—both past and current SSS—shaped changes in self-rated health.

One central finding was that current SSS (but not past SSS) held associations with being in consistently poor health, and also predicted a greater likelihood of people reporting *declining health* during the pandemic. The effect sizes for current SSS were quite large; indeed, those with a lower current SSS were five times more likely to have consistently poor health during this period of the COVID-19 pandemic, and over three times as likely to have declining health between March and May 2020 than those with higher current SSS. We interpret this as evidence for the role of current SSS in predicting health, because both of these associations held net of education, income, occupational status, and job loss.

The association between low current SSS and worse self-rated health might be due to physiological stress responses (Habersaat et al., 2018). Feeling undervalued in society, or one's immediate community, may lead those with lower SSS to become preoccupied with stressors (Chen & Paterson, 2006). Perceiving chronic stress or threat can more frequently activate the psychological and physiological stress response (Rahal, Chiang, Bower, et al., 2020), thereby widening the gap in health outcomes between people of low and high SSS.

A second takeaway from our study involves the results that support the life course accumulation hypothesis (the additive specification) (Ferraro & Morton, 2018). Indeed, a *higher cumulative SSS* (a summation of past and current measures of SSS) was associated with a nearly four times lower risk of reporting consistently poor health during the pandemic. This suggests that the additive total of higher perceptions of social rank—that is, a higher cumulative SSS—functioned as a protective resource during the first few months of the COVID-19 pandemic. There are several explanations for the association between SSS and health that have been offered in the literature, and it is increasingly evident that there are multiple possible explanations. However, one explanation involves health-related behavior: Those with high SSS tend to exercise more frequently, are less likely to smoke, are less likely to have unhealthy eating practices (D'Hooge, Achterberg, & Reeskens, 2018), and have better sleep quality (Goodin et al., 2010). Perceptions of "doing well" compared to others over longer periods of the life course may also lead to feelings of satisfaction and promote higher self-esteem (e.g., Schubert et al., 2016). Equipped with such confidence, high cumulative SSS may reinforce perceptions that an individual can avoid or handle the challenges that unfolded in the early months of the pandemic, and have greater access to health-enhancing resources.

Compared to current SSS, which had associations with stable poor health and declining health, low cumulative SSS only predicted higher odds of remaining in stable poor health over the study period. This result aligns with prior research which has found that people with chronically low SSS have differences in their psychological and physiological stress responses and is associated with worse health over time (Brosschot et al., 2018). Our results did not show that past and current SSS interacted with each other to produce differential patterns of self-rated health. Finally, we also found support for the social mobility hypothesis. Individuals who perceived upward mobility between childhood and adulthood had less risk of stable poor health. Perceptions of downward mobility, however, were not associated with health. Taken together, findings from our study are suggestive that some of the predictive power of SSS at any point in time may also be capturing the cumulative effects of past social status with present.

4.1. Limitations and future directions

As a first limitation, our sample was intended to be representative of Canadian workers, which underrepresented the larger population of other Canadians. However, those without jobs at the onset of the pandemic may have perceived even lower social status during this time. Therefore, the risk to self-rated health of past or current SSS are likely even stronger than those reported here.

Second, we also recognize the limits to the causal claims made in this study. We argued that SSS affects health, but the alternative direction is also possible (health predicts perceptions of social status) (Garbarski, 2010). Future studies with several waves of data can be used to sort out these questions of causal ordering. In addition, it would be helpful to include more objective measures of health as outcome variables, including biomarker data. This would allow future research on this topic to explore whether physiological stress responses are a pathway linking SSS over the life course to poorer health.

Third, the measure of past SSS is based on a person's recall of their childhood family environment when they were growing up. Ideally, a more specified time frame in retrospective measures of SSS would have been preferable to gain assurance that respondents are indeed recalling the same life course period. Prior research has addressed this concern to some extent. For instance, von Fintel and Posel (2016) analyzed reports of recalled childhood socioeconomic position from the same sample of adults, collected two years apart. They found that recall of past SSS was fairly consistent (63% agreement), a figure similar to retrospective recall of a more objective measure, parental education (72% agreement). Moreover, using data from the nationally representative MIDUS sample from the United States, Ward (2011) also reported 60% concordance between childhood SSS among twins raised in the same household. Other work by Hardt, Vellaisamy, and Schoon (2010) suggests that the relationship between perceived financial hardship during childhood and adult distress does not significantly differ when assessed retrospectively versus prospectively. Finally, it is also important to note that there are negligible differences in recall of childhood SSS across demographic characteristics. Recall does not vary by gender, race/ethnicity, or age (von Fintel & Posel, 2016; Ward, 2011). All told, this body of work suggests that recalled measures of SSS should be valid indicators of perceptions of social position in early life. However, future research should collect prospective measures of subjective and objective SSS as well as early life indicators of objective SES measures (e.g., parent's education, occupation, income) to establish greater precision surrounding the relationships among past and current SSS and health.

5. Conclusion

This study showed that past and current SSS combined in synergistic ways over the first two months at the start of the COVID-19 pandemic to predict patterns of population health. Indeed, a lower current, past, and cumulative SSS raised the risk of remaining in poor health. These robust patterns of results provide an important glimpse into the influence that SSS has on population health. It will become ever more important for researchers to pay attention to mechanisms that might mitigate the influence of low SSS on health. It is clear that widescale efforts will be needed to combat the negative health consequences of the pandemic moving forward. Our study suggests that individual perceptions of their social rank over the life course also play a crucial role in understanding health disparities during this period of crisis alongside more objective indicators of social position.

Author statement

L. Upenieks: Conceptualization; Data curation; Formal analysis; Methodology; Roles-writing-original draft; Writing; review and editing. S. Schieman: Conceptualization; Project administration; Writing; review and editing. **R. Meiorin**: Conceptualization; Writing; review and editing.

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Conflicts of interest/Competing interests

not applicable.

Availability of data and material

Data are not publicly available.

Code availability

not applicable.

Ethical statement

Hereby, I LAURA UPENIEKS/consciously assure that for the manuscript/**A Protective Rung on the Ladder?**

How Past and Current Social Status Shaped Changes in Health During COVID-19/following is fulfilled:

1) This material is the authors' own original work, which has not been previously published elsewhere.
2) The paper is not currently being considered for publication elsewhere.
3) The paper reflects the authors' own research and analysis in a truthful and complete manner.
4) The paper properly credits the meaningful contributions of co-authors and co-researchers.
5) The results are appropriately placed in the context of prior and existing research.
6) All sources used are properly disclosed (correct citation). Literally copying of text must be indicated as such by using quotation marks and giving proper reference.
7) All authors have been personally and actively involved in substantial work leading to the paper, and will take public responsibility for its content.

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