

Testing satisfaction of basic psychological needs as a mediator of the relationship between socioeconomic status and physical and mental health

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Abstract

This research applied self-determination theory to examine the degree to which satisfaction of basic psychological needs for autonomy, relatedness, and competence explained the association between socioeconomic status and physical and mental health outcomes, while controlling for age, exercise, and smoking status. This was a survey research study with 513 full-time employees in professions representative of a hierarchal organization. The results of the structural equation model verify that psychological need satisfaction mediates the inverse association between socioeconomic status and physical and mental health. Self-determination theory contributes to understanding the psychosocial roots of the uneven distribution of health across the socioeconomic gradient.

Keywords

socioeconomic status, basic psychological needs, mediator, physical and mental health

Introduction

It is well documented that socioeconomic status (SES) is associated with physical and mental health. This association has been found to be monotonic, as every step down the social hierarchy corresponds to poorer health (Adler et al., 1994). This phenomenon continues to be prevalent in many industrialized countries and is referred to as the social gradient in health (Marmot, 2006). In the United States, socioeconomic health disparities have increased substantially over the past decades due to a rise in psychosocial and behavioral risk factors associated with sedentary lifestyles, poor diet,

smoking, alcohol use, and increased body mass. These risk factors, coupled with increasingly stressful and psychologically demanding workplace environments (Lundberg and

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Cooper, 2011), are the leading contributors to the development and progression of chronic diseases (US Burden of Disease Collaborators, 2013); these include cardiovascular disease, cancer, and diabetes, which account for approximately 70 percent of all deaths in the United States (Kung et al., 2008). Therefore, understanding the determinants of health across the social health gradient is imperative to improve quality of life for all individuals. Investigating psychosocial influences in workplace environments, more specifically, provides a critical lens for understanding the determinants of the social health gradient on a broader scale.

The emergence of health gradients is primarily attributed to differences in education, income, and social economic factors that distinguish various levels of the social hierarchy (Geyer and Peter, 2000). However, psychosocial factors also play a significant role (Adler and Snibbe, 2003). Special attention has been given to stress and its association with work demands, control over work, failed reciprocity, and social support (Marmot et al, 1999). For instance, the Whitehall II studies found that high demand and low control work environments were associated with higher levels of stress, smoking, and cardiovascular disease (Marmot et al., 1991). Similarly, individuals who experience failed reciprocity at work (high effort and low reward) are twice as likely to report physical and psychological symptoms consistent with ill-health, including high blood pressure, myocardial infarction, anxiety, psychological distress, and depression (Siegrist and Marmot, 2004; Stansfeld and Candy, 2006). Social support at work has been found to reduce the adverse effects of low control among employees, specifically for those with increased risk of cardiovascular disease (Johnson and Hall, 1994). Similar research shows the importance of social relations and control beliefs in diminishing the adverse effects of SES on longitudinal health (O'Brien, 2012). Recently, research has begun integrating the aforementioned factors with psychological approaches focused on proactive work motivation and

fulfillment of psychological needs. For instance, the availability of job resources is positively associated with psychological need fulfillment, while job demands and exhaustion is negatively associated with psychological need fulfillment (Van den Broeck et al., 2008). Taken together, this research shows the importance of psychological influences in work environments. Extending these factors to hierarchical work organization may further our understanding of psychosocial factors responsible for the social health gradient.

While notable advances in understanding the determinants of the health gradient have been made, the psychosocial mediators through which SES affects physical and mental health have not been thoroughly investigated. Examining psychosocial mediators provides information about factors that underlie the link between SES and physical and mental health, and, in turn, reveals ways of confronting health disparities. Despite the importance of this research, however, only a handful of studies have attempted to investigate this area, while even fewer have been able to identify psychosocial factors mediating the effects between SES and health outcomes (Matthews et al., 2010). Given the limited research in this area, we aimed to provide a better understanding of the role of psychosocial mediators in health outcomes by using self-determination theory (SDT; Ryan and Deci, 2000) to examine how supporting (or not supporting) the basic psychological needs for autonomy, relatedness, and competence may mediate the association between SES and health outcomes. In order to further justify the relevance of our approach, we turn to a brief review of SDT.

SDT

SDT is a macro-theory that has received empirical confirmation for understanding the roots of human motivation, emotion, and behavior in social context (Ryan and Deci, 2000). The theory suggests that all individuals, regardless of their gender, age, ethnicity, or SES, are inherently proactive and engaged with their environment,

continuously seeking growth-oriented activities and optimum challenges. Yet SDT also recognizes that individuals are vulnerable to alienation, passivity, and interpersonal disharmony, largely as a function of social conditions that fail to be supportive of their inherent growth propensities. This dynamic between person and social context gives rise to an organismic-dialectic meta-theory that addresses how individuals' inherent growth tendencies and psychological needs interact with social factors in their impact on behavioral functioning and well-being.

SDT proposes that the origins of people's active nature are rooted in three basic psychological needs for autonomy, competence, and relatedness. These three needs underlie people's inherent tendency to explore, understand, and influence their surround and to develop and exercise their capacities. The need for autonomy is characterized by the inherent desire to experience behavior as chosen freely, volitional, and self-endorsed (Niemic et al., 2010). The opposite of autonomy is heteronomy, where behavior feels forced and controlled by external forces (De Charms, 1968). The need for relatedness refers to the need to be positively connected to others to experience mutual support (Baumeister and Leary, 1995). The need for competence expresses the inherent desire to master optimal challenges and to feel able to achieve a desired outcome (White, 1959). Satisfaction of these three basic needs fosters optimal physical, psychological, and social functioning as well as more internal motivation in a given domain of activity, whereas adverse behavioral, psychological, and motivational consequences are predicted to follow when the needs are not supported or are actively thwarted. Such outcomes have been tested and confirmed in many domains in life, including the domains of work (Gagné and Deci, 2005) and healthcare (Williams, 2002), among others.

The convergence of decades of evidence from a variety of scholarly contributions shows how satisfaction of basic psychological needs leads to improved health and reduction of risk behaviors. For instance, a recent meta-analysis of 184 data sets shows how perceived need

support from significant others such as physicians, friends, or a spouse is correlated with adaptive motivation to initiate healthy behaviors and positive mental health (Ng et al., 2012). Within the work domain, a considerable amount of empirical evidence shows the importance for supporting need satisfaction and internalization for optimal motivation and performance (Gagné and Deci, 2005). Most recently, research has linked the three basic needs to general health outcomes across different occupational ranks, thereby providing initial theoretical and empirical evidence for testing SDT across the social health gradient (González, 2012; González, Niemic and Williams, 2014). Together, these studies provide support for our research goal to confirm the basic psychological needs for autonomy, relatedness, and competence as mediators between SES and important indicators of physical and mental health.

In this study, we hypothesized that SES would have a direct effect on key indicators of physical and mental health, replicating earlier findings on the social gradient. Second, we hypothesized that the relationship between SES and physical and mental health outcomes would be mediated by basic need satisfaction at work, such that those individuals who experience higher satisfaction to their basic psychological needs should experience better physical and mental health, while controlling for the important predictors of age, exercise, and smoking.

Methods

Participants

The target population for this research included the staff from one of the largest corporate institutions in New York State with many thousands of employees. A convenience sample was used to select those professions representative of hierarchical organization, including executives, managers, supervisors, administrative personnel, accountants, mechanics, and grounds keepers. Based on their self-reported ethnicity, approximately 71 percent of these participants were

White, 21 percent Black, 3 percent Hispanic/Latino(a), 2 percent Asian, and 2 percent Other. A total of 97 percent of participants reported having health insurance. The average age was 44 years (standard deviation (SD)=9.9 years), with a final sample size of 513 full-time employees (119 women and 394 men). Participation was voluntary and confidential and the response rate to our questionnaire was approximately 96 percent. The high participation rate was attributed to the support of the managerial staff in authorizing the principal investigator to make presentations about the research during staff meetings and to answer any questions and allowing employees sufficient time to complete the survey. Those employees who participated were included in a lottery in which they could win cash prizes. All instruments and research protocol were approved by the University of Rochester Research Subjects Review Board, and exempt status was granted.

Measures

SES. SES was measured as a composite of education, personal wages, and occupational rank. These three factors are arguably the most important measures of SES (Ross and Mirowsky, 1995), with qualities that make them unique in predicting physical (Lynch and Kaplan, 2000) and mental health (Mirowsky and Ross, 2003). Education was measured as the level of formal schooling completed, with the respondents allowed to choose from eight categories ranging from low (1=some high school, but did not finish) to high (8=professional degree, MD, JD). Similarly, respondents were allowed to select 1 of 12 categories that corresponded with their annual personal income, ranging from low (1=less than US\$10,000) to high (12=US\$150,000 or more). For purposes of analysis and data distribution, the two highest and the two lowest annual personal income categories were collapsed, leaving 10 categories in the analysis. An occupational ranking scheme was developed to group individuals into four hierarchical categories: rank 1: executive and management; rank 2: supervisory; rank 3: clerical/skilled non-manual; rank 4: manual. In this

ranking scheme, occupations are categorized hierarchically according to specific occupational characteristics such as managerial, supervision, skills, physical labor, and occupational responsibilities. These four classifications are defined and aligned with conventional interpretations of the occupational hierarchy (Lynch and Kaplan, 2000). Occupational values were reversed in order to have all the three indicators of SES in the same direction; thus, 4=executive, 3=supervisory, 2=clerical/skilled non-manual, and 1=manual.

Need satisfaction. Three scales were used to measure psychological need satisfaction in relation to an individual's experience at the workplace consisting of a total of 13 self-reported Likert-type items. Five items measured personal autonomy support (e.g. "I have a lot of say about how my job gets done at my workplace," $\alpha = .83$); four items measured individuals' experience of relatedness at work (e.g. "I believe that people like working with me," $\alpha = .82$), and four Likert-type items measured competence in the workplace (e.g. "I am able to use my skills and competencies at work," $\alpha = .75$). These scales have been validated and shown acceptable reliability in studies associated with SDT and the workplace (e.g. Lynch et al., 2005).

Physical health. Physical health was conceptualized as a latent variable using four indicators: (1) Body mass index (BMI) was calculated from participants' weight (in pounds) and height (in inches). This approach is recognized by the U.S. Department of Health & Human Services (2012). (2) Somatization, the process by which psychological distress is manifested in bodily symptoms, was measured using the Patient Health Questionnaire (PHQ-15; Kroenke et al., 2002), which measures 15 somatic symptoms such as back pain, pain in arms or joints, fainting spells, feeling heart pound or race, and shortness of breath. Items were scored on a 3-point rating scale (1=not bothered at all, 2=bothered a little, and 3=bothered a lot, $\alpha = .84$). (3) Global self-rated health,

a self-reported response to a single item ("In general, how would you rate your overall health?") consisting of five values (1=excellent, 2=very good, 3=good, 4=fair, and 5=poor). This single item has been found to be a reliable predictor of actual health and risks of future mortality (Goldman et al., 2004). (4) Absenteeism was measured using the following question: "Over the past 6 months, how many days have you missed work because of a personal illness or for other reasons (not including scheduled vacations)?" Absenteeism was used as a proxy for overall health.

Mental health. Mental health was measured as a latent variable using four indicators: (1) Emotional exhaustion (Maslach, 2003), a subscale of five Likert-type items measured the experiences of being emotionally depleted or exhausted by one's work (e.g. "I feel emotionally drained from my work," $\alpha=.91$). (2) Stress at work (Lynch et al., 2005), understood as energy depletion, strain, or pressure from work activities, was measured using three Likert-type items (e.g. "I regularly experience too much stress at work," $\alpha=.74$). (3) Psychological vitality (Lynch et al., 2005; Ryan and Frederick, 1997), a commonly used measure in research of well-being to understand the feeling of aliveness and energy available to the self, was assessed using three items (e.g. "I feel energized when I am at work," $\alpha=.83$). (4) Intrinsic job satisfaction (Lynch et al., 2005), the feeling of contentment and finding meaning in one's work, was assessed using three items (e.g. "Most days I find my job to be extremely satisfying," $\alpha=.80$). We wish to note that values for intrinsic job satisfaction and vitality were reversed in the model to have all mental and physical health variables in the same direction such that higher values represented lower levels of health. Together, these indicators represented mental health, or well-being, in the workplace.

Control variables. Three important variables that predict overall general health were used as controls: (1) Self-reported age was analyzed because health is a function of age. (2) Participants' level

of strenuous and moderate physical activity in a given week was measured using the validated Godin Leisure-Time Exercise Questionnaire (Godin and Shephard, 1985). The measure defines strenuous exercise as activity that results in sweating and rapid heart palpitations (e.g. running or jogging) and moderate exercise as moderate activities that require some physical exertion (e.g. fast walking or dancing). In order to measure the intensity of physical activity and compute an overall physical activity score, participants' self-reported weekly frequencies of strenuous and moderate activities were multiplied by their estimated metabolic equivalents (METs; value of 9 for strenuous exercise and value of 5 for moderate exercise) (Godin, 2011). (3) Smoking is one of the main causes of ill-health outcomes related to cancer, stroke, heart problems, and premature death (World Health Organization, 2006). Participants were asked to report on their smoking status with respect to four interval categories: non-smoker, ex-smoker, used to smoke and still do occasionally, and current smoker.

Results

Preliminary analysis

We utilized IBM/SPSS 21.0 to organize the data, examine missing data, and provide descriptive statistics. In Table 1, we present means, SDs, Cronbach's alpha coefficients, and intercorrelations for the variables assessed in this study. As demonstrated by the pattern of associations, most correlations were statistically significant in the predicted direction, thus supporting the first hypothesis that SES would be associated with indicators of physical and mental health, and supporting the second hypothesis that basic need satisfaction would be associated with SES and physical and mental health outcomes. Structural equation modeling (SEM) via Analysis of Moment Structures (AMOS) 21 was then used to test both the measurement and structural components of our hypothesized model. Our large sample size and our theoretically driven model also supported

Table 1. Descriptive statistics and intercorrelations for the study variables (N=513).

Variables	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. AED ^a	-	.38**	.56**	.29**	.33**	.31**	-.23**	-.31**	-.15**	-.14**	-.21**	-.20**	.24**	.17**	-.07	.24**	-.30**
2. PAI ^a		-	.46**	.31**	.23**	.34**	-.07	-.28**	-.15**	-.21**	-.17**	-.12**	.27**	.27**	.28**	.17**	-.18**
3. OCR ^a			-	.39**	.39**	.42**	-.19**	-.35**	-.20**	-.14**	-.27**	-.22**	.37**	.34**	.14**	.19**	-.21**
4. PAS				-	.57**	.76**	-.19**	-.41**	-.35**	-.11*	-.57**	-.53**	.69**	.67**	.02	.20**	-.27**
5. REL					-	.68**	-.14**	-.52**	-.40**	-.11*	-.55**	-.53**	.55**	.51**	-.06	.29**	-.27**
6. COM						-	-.20**	-.48**	-.37**	-.15**	-.56**	-.45**	.70**	.67**	.04	.26**	-.31**
7. BMI							-	.39**	.18**	.04	.14**	.10*	-.17**	-.15**	.13**	-.10*	.10*
8. GS-RH								-	.54**	.16**	.48**	.44**	-.50**	-.45**	.06	-.29**	.30**
9. SOMA									-	.12**	.56**	.47**	-.46**	-.44**	-.04	-.15**	.22**
10. ABST										-	.12**	.08	-.13**	-.17**	-.02	-.03	-.06
11. EMEX											-	.70**	-.63**	-.62**	.01	-.20**	.24**
12. STS												-	-.42**	-.46**	.00	-.18**	.23**
13. VT													-	.82**	.09	.21**	-.29**
14. IJS														-	.09*	.22**	-.23**
15. AGE															-	-.04	-.03
16. EXER																-	-.08
17. SS																	-
Mean	3.5	3.8	-	3.1	3.6	3.7	29.0	2.5	6.5	3.6	2.8	2.8	3.3	3.3	44	19.9	1.9
SD	1.3	1.9	-	1.0	.97	.93	5.2	1.0	2.3	8.3	1.7	1.0	1.0	1.0	10.7	24.1	1.2
α	-	-	-	.83	.82	.75	-	-	.84	-	.91	.74	.83	.80	-	-	-

AED: amount of education; PAI: personal annual income; OCR: occupational rank; PAS: personal autonomy support; COM: competence; REL: relatedness; BMI: body mass index; GS-RH: global self-rated health; SOMA: somatization; ABST: absenteeism; EMEX: emotional exhaustion; STS: stress; VT: vitality; IJS: intrinsic job satisfaction; AGE: participants age; EXER: exercise; SS: smoking status; SD: standard deviation.

^aSperman's rho correlation coefficients between study variables.

α = Cronbach's alpha for the study variables.

**p < .01; *p < .05.

using SEM. The results of the confirmatory factor analysis for each of our measurement models are available upon request via email to the first author.

Testing structural models

Four traditional statistical steps (Baron and Kenny, 1986) and a bootstrapping technique (MacKinnon et al., 2004) were utilized to test for significance of mediation, while controlling for age, exercise, and smoking status. The control variables were allowed to covary and were entered and examined in each step. Controls were also allowed to covary with each observed indicator in the composite exogenous variable (SES); however, they were not tested against the basic need support latent variable as they do not theoretically predict this outcome. The first step (model 1) examined the standardized direct effects of SES on physical and mental health. As predicted, SES was negatively associated with physical ($\beta = -.32, p < .001$) and mental

($\beta = -.30, p < .001$) health; individuals with lower SES indicated higher levels of physical and mental ill-health compared with their higher SES counterparts. The second step (model 2) examined the relationship between SES and basic need support; SES was positively associated with basic need support ($\beta = .49, p < .001$); individuals with higher SES reported higher satisfaction of their basic psychological needs and compared with their lower SES counterparts. The third step (model 3) examined the relationship between basic need support and physical and mental health; basic need support was strongly associated with physical ($\beta = -.62, p < .001$) and mental ($\beta = -.90, p < .001$) health; the greater the basic need support, the fewer ill-physical and ill-mental health manifestations were reported.

After completing the first three steps, we proceeded to examine the fit indices of the overall model to ensure model stability and evaluate mediation. Because of its oversensitivity in large sample sizes, the chi-square test of

the full model was supplemented with other fit indices (Bentler and Bonett, 1980; Jöreskog and Sörbom, 1993). The fit indices indicated that the model exhibited borderline acceptable fit, $\chi^2(97)=481.42$; comparative fit index (CFI)=.89; normed fit index (NFI)=.87; root mean square error of approximation (RMSEA)=.09; parsimony normed fit index (PNFI)=.62; thus, the model was respecified after consulting the modification indices.

We made seven respecifications based on modification indices consistent with conceptual and research-based considerations and tested the improvement of the model after each sequential respecification. Testing model fit after these respecifications then yielded acceptable results of the overall model ($\chi^2(90)=275.52$; CFI=.95; NFI=.93; RMSEA=.06; PNFI=.62). Summary of respecifications, fit indices, and standardized beta estimates of control variables are available upon request via email to the first author (M.G.G.). We proceeded to satisfy the fourth step in accordance with the recommendations of Holmbeck (1997) and examine mediation and tested the chi-square difference between a constrained full model and a non-constrained full model, including examining the reduction in the standardized beta coefficients between the predictor and the outcomes with the inclusion of basic need support as the mediator.

We estimated a constrained full model by placing constraints of zero-order coefficients between the paths of the predictor and outcomes. We then estimated a non-constrained full model and allowed all paths to be freely estimated. The chi-square difference between the constrained full model and non-constrained full model was significant ($\Delta\chi^2=18.77$, $\Delta df=2$, $p<.01$). This indicates that the second model provided a significant improvement in fit over the first model, demonstrating evidence for mediation. Additionally, the standardized coefficients for the associations between SES and physical and mental health were substantially reduced: physical health was reduced from $-.32$ to $-.10$ and mental health from $-.30$ to $-.12$, suggesting mediation. We proceeded to apply a bootstrap procedure aimed at 1000 resamples to

verify the stability of the standardized regression coefficients and to assess indirect effects between our variables. The bootstrapped indirect effects, the standard errors, and bias-corrected confidence intervals (BC CIs) provided further evidence for a significant mediation between SES and physical health (standardized indirect effect=.036, $p<.001$; 95% BC CI: $-.32$, $-.24$) and a significant mediation between SES and mental health (standardized indirect effect=.039, $p<.001$; 95% BC CI: $-.52$, $-.44$). Overall, basic need support—as measured by autonomy support, relatedness, and competence—explained 25 percent of the variance in the relationship between SES and physical and mental health, even after controlling for the effects of age, exercise, and smoking status (see Figure 1).

Discussion

Although prior research has established the association between SES and physical and mental health, the psychosocial pathways through which SES affects physical and mental health have not been thoroughly explained. Analyses revealed that need satisfaction mediated the associations between SES and physical and mental health in one of the largest employment hierarchies in New York State, even after controlling for age, exercise, and smoking status. Individuals with higher SES reported greater satisfaction of their basic needs and reported lower levels of physical and mental ill-health; conversely, individuals with lower SES were less likely to report satisfaction of their basic psychological needs and indicated higher levels of physical and mental ill-health. This evidence may further our understanding of the role of factors previously identified in the literature, such as control over work, reciprocity, social support, and stress; offering an understanding of “why” certain physical and mental outcomes occur among certain social class groups as opposed to only understanding “how” they occur.

An important issue in the literature is identifying a conceptual framework that integrates the social and psychological dimensions of health and well-being. This study is one of the

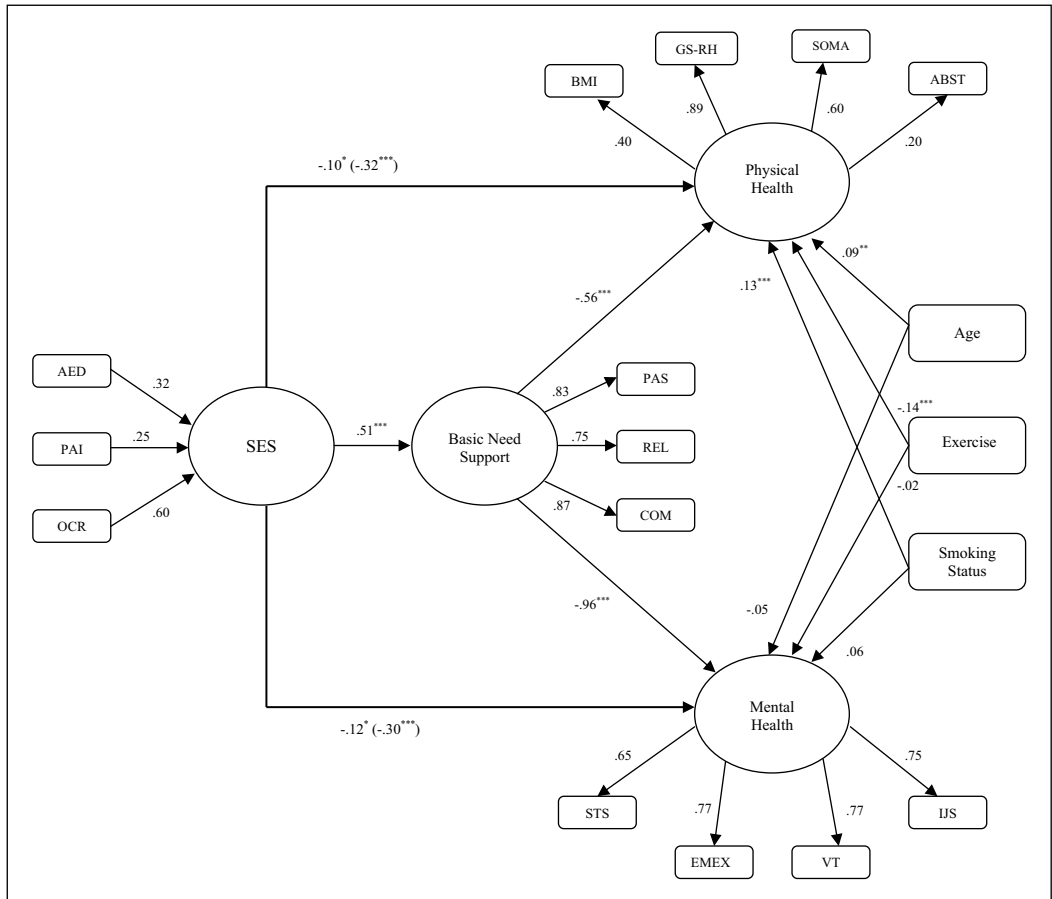


Figure 1. This structural model reflects the effects of SES and physical and mental health outcomes being mediated by basic need support, while controlling for age, exercise, and smoking status. Values in parentheses represent the beta coefficients before the mediator was entered into the model. Error terms, the covariances among controls, and the covariances between controls and the three composite indicators of SES were all omitted from the figure for the purpose of clarity.

SES: socioeconomic status; AED: amount of education; PAI: personal annual income; OCR: occupational rank; PAS: personal autonomy support; COM: competence; REL: relatedness; BMI: body mass index; GS-RH: global self-rated health; SOMA: somatization; ABST: absenteeism; EMEX: emotional exhaustion; STS: stress; VT: vitality; IJS: intrinsic job satisfaction.

*** $p < .001$, ** $p < .05$.

few to incorporate a psychosocial and motivational framework, and the first to suggest that basic need satisfaction is a mediator between SES and physical and mental health outcomes. As such, our framework and evidence may provide a deeper understanding of the psychosocial determinants of health. For instance, individuals who experienced frustration of their basic psychological needs reported lower levels of intrinsic job satisfaction and

psychological vitality and higher levels of emotional exhaustion and stress. In turn, passive activity along with emotional exhausting and stress has been found to increase physical inactivity and thereby contributing to the development of ill-health conditions (Gimeno et al., 2009; Kouvonen et al., 2013). Stress may also be exerted through the lack of need support for relatedness at work, which may subsequently increase somatic symptoms and

influence perceptions of global health. Indeed, studies have shown that supporting basic needs in the workplace plays a role in the stress and wellness pathway, with individuals reporting lower anxiety, depression, and burnout (Lynch et al., 2005). Overall, the associations between SES, basic need support, and physical and mental health are likely to involve multiple behavioral and physiological pathways. Understanding these pathways in relationship with psychological need satisfaction is beyond the focus and scope of this study.

The interpersonal contexts formed in hierarchical organizations may provide a slightly different interpretation of the inverse patterning of basic psychological needs and physical and mental health. It may be that the patterning is contingent, in part, upon the degree to which bosses and managers support subordinates' self-determination versus control their behaviors by means of external coercion or inducement. From an SDT perspective, supporting subordinates' self-determination means supporting their autonomy by offering choice of workplace tasks and involving them in the decision-making process. In contrast, using external contingencies to induce performance reduces an individual's sense of autonomy and competence, in turn producing amotivation and ill-being. One way authority figures can support autonomy is by acknowledging the other's perspectives and ideas and, in doing so, stimulate reflection and further interest in the task at hand. Indeed, a study by Deci et al. (1989) showed in an intervention that subordinates who experience autonomy and affordance of self-determination from their bosses were more likely to report higher levels of trust in the organization, work satisfaction, and positive affect at work. A similar study conducted in both United States and Bulgaria shows how the application of a management autonomy support model predicted task motivation, and higher work performance and psychological adjustment (Deci et al., 2001). Taken together, this evidence indicates that understanding the interpersonal context may further explain the patterning of basic psychological needs throughout the different levels of the occupational hierarchy.

Limitations and future directions

There are limitations in our study that can be addressed in future research. First, because this study was cross-sectional, causal inferences cannot be drawn. Interventions to alter need supportiveness in the workplace might be created and tested in longitudinal and randomized controlled studies to determine whether need satisfaction improves physical and mental health, as we would predict. Second, our research was limited to self-reported data. Future research should include the use of objective health measures to avoid self-report bias. Finally, future research should examine whether other aspects of the social hierarchy (e.g. gender, ethnicity, marital status, and generational factors) may be associated with provision of need support in the workplace, particularly in relation to physical and mental health. Similarly, other aspects of motivation such as levels of internalization, autonomous self regulation, and causality orientation can also be examined along with aspects of the social hierarchy.

In summary, our study provides support for the integration of individuals' basic psychological needs into the social health gradient. This integration will likely provide an improved framework for describing motivation for healthy behavior among social class groups, although more work is needed to examine these dynamics more thoroughly and systematically over time and with psychological interventions that include provisions of need satisfaction. Understanding this research in the context of the social health gradient may not only have implications for policy matters related to employment, social mobility, and health, but help eliminate health disparities.

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