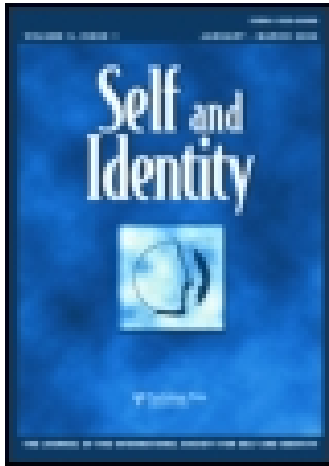


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Experimental Evidence That Low Social Status Is Most Toxic to Well-Being When Internalized

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What makes low social status toxic to well-being? To *internalize* social status is to believe the self is responsible for it. We hypothesized that the more people internalize low subjective social status, the more their basic psychological needs are thwarted. Experiment 1 randomly assigned participants to imagine themselves in low, middle, or high social status, and assessed their subjective social status internalization by independent ratings. The more participants internalized low status, the more they reported their basic psychological needs were thwarted. This effect did not appear among their higher status counterparts. Experiment 2 replicated and extended these findings using a behavioral manipulation of subjective social status and a self-report measure of internalization. We discuss implications for basic and action research.

Keywords: Social status; Subjective social status; Internalization; Basic psychological needs; Well-being.

Low social status predicts a wide array of correspondingly poor health outcomes. Across numerous studies, low social status—whether measured by education, income, employment grade, or other indices—is associated with, for example, relatively high rates of heart disease, diabetes, certain cancers, and early mortality (Adler & Matthews, 1994; Adler & Snibbe, 2003). Furthermore, deleterious outcomes appear not simply as a function of either being in or out of poverty, but in a remarkably graded fashion, with relatively worse health accompanying each incremental decrease in social status (Adler &

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Matthews, 1994). At the same time, there is a wide range of individual differences: Not everyone in adverse circumstances uniformly demonstrates adverse health outcomes (Ferrer & Palmer, 2004; Lachman & Weaver, 1998).

A persistent puzzle has been to elucidate disease etiology risk factors that could account for both social status gradients and individual differences within social strata. Psychological factors likely play a critical role in how and to what extent social environments become internalized and compromise well-being (Chen & Miller, 2012; Taylor, Repetti, & Seeman, 1997). Pinpointing such factors could have broad and cost-effective benefits for prevention programs across a host of psychological and physical health outcomes. Our interest in understanding the psychological mechanisms contributing to persistent health inequalities prompted us to test whether social status might shape basic psychological needs fulfillment, which research suggests is a key pathway to health outcomes.

The Role of Basic Psychological Needs Fulfillment in Health

A large body of evidence finds that fulfillment of core psychological needs is a key to human flourishing (Deci & Ryan, 2011). According to self-determination theory (Deci & Ryan, 2008), these basic psychological needs comprise *autonomy* (“perceiving that one’s activities are endorsed by or congruent with the self”), *competence* (experiencing “that one can effectively bring about desired effects”), and *relatedness* (“feeling . . . close and connected to significant others”; Reis, Sheldon, Gable, Roscoe, & Ryan, 2000, p. 420). These basic psychological needs are thought to be “essential nutriment for healthy development and well-being” (Deci & Ryan, 2011, p. 19), and evidence suggests that fulfilling the needs for autonomy, competence, and relatedness is each correlated with physical health in particular. Extensive, though largely separate, literatures exist on the health-promoting effects of related constructs, including control at work (Nieuwenhuisen, Bruinvels, & Frings-Dresen, 2010), self-efficacy (AbuSabha & Achterberg, 1997), and social relationships (Holt-Lunstad, Smith, & Layton, 2010). Moreover, a recent meta-analysis of 184 independent datasets found the fulfillment of these needs was associated with mental and physical health (Ng et al., 2012).

Conversely, thwarted psychological needs may result from low social status. Adverse mental and physical health outcomes are more common in populations with lower social status operationalized in a variety of ways, for example, those who are financially impoverished (Lynch, Kaplan, & Shema, 1997), less well-educated (Zhang, Chen, McCubbin, McCubbin, & Foley, 2011), with lower status employment (Hemingway, Nicholson, Stafford, Roberts, & Marmot, 1997), and racial/ethnic minorities (Williams, Yu, Jackson, & Anderson, 1997). Thwarting the needs fulfillment of autonomy, competence, and relatedness also is associated with negative health behaviors, such as smoking (Williams et al., 2006) and unhealthy eating (Verstuyf, Vansteenkiste, Soenens, Boone, & Mouratidis, 2013) which can each lead to downstream negative health outcomes.

Self-determination theory can be applied to and integrate seemingly disparate research in a conceptually coherent framework to explain why low social status might result in thwarted needs. In short, if the basic psychological needs comprising well-being—autonomy, competence, and relatedness—are not met, it stands to reason that health will suffer. Needs for autonomy, competence, and relatedness are thought to be universal across cultures and social contexts (Deci & Ryan, 2011), though how these needs are fulfilled is context-specific. As yet, however, no empirical analysis has examined if the fulfillment or thwarting of these needs is caused by the social context of low social status. Two recent survey-based studies provide correlational evidence consistent with the notion

of social status shaping basic psychological needs fulfillment. One survey of 1139 American adults showed that higher subjective and objective socioeconomic status (SES) indices predicted higher basic psychological needs fulfillment, which in turn predicted lower levels of health complaints (Di Domenico & Fournier, 2014). Another survey of employees across the social hierarchy in one of the largest corporate institutions in New York State similarly found that psychological needs satisfaction mediated the association between objective social status and mental and physical health markers (González, Swanson, Lynch, & Williams, 2014). These correlational data suggest, though do not explicitly test, causal associations.¹

Linking Social Status and Basic Psychological Needs Fulfillment

These recent investigations notwithstanding, few studies ask if social structural-level factors cultivate or thwart basic psychological needs fulfillment, and shape its social distribution (Deci & Ryan, 2011; Link & Phelan, 1995). We hypothesize two key social status-related predictors of basic psychological needs fulfillment: *Where* people view themselves in the social hierarchy (subjective social status) and *how much they believe* the self to be responsible for this social standing (internalization). A population-based correlational study of US adults found that people with lower SES endorsed greater perceived constraints and lesser perceived mastery (Lachman & Weaver, 1998), which roughly corresponds to the fulfillment of autonomy and competence. This study also found that these factors amplified the deleterious effects of lower SES on self-reported health outcomes. Drawing from this work, our conceptual model (Figure 1) suggests that subjective social status predicts basic psychological needs satisfaction. Our model also specifies that internalization modifies this effect. Specifically, we predict that low subjective social status thwarts basic psychological needs satisfaction, and this association is amplified by internalization.

Subjective Social Status

It is important to note that not everyone in adverse circumstances uniformly demonstrates adverse health outcomes. Subjective social status may provide an avenue for explaining why not all people with similarly disadvantaged situations develop compromised health. A robust literature shows that even after controlling for objective circumstances—e.g., educational attainment or other markers of access to material resources—*perceptions* of one's rank in the social hierarchy uniquely predict a host of subclinical markers (Ghaed &

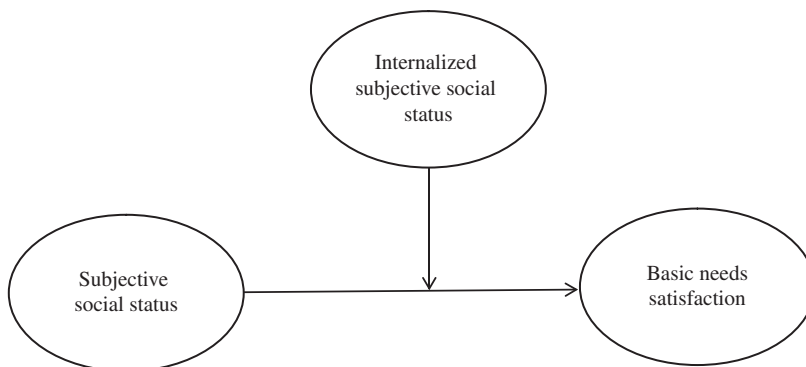


FIGURE 1 Conceptual model.

Gallo, 2007; Wright & Steptoe, 2005) and health outcomes (Adler, Epel, Castellazzo, & Ickovics, 2000; Goodman et al., 2003; Goodman et al., 2001; Singh-Manoux, Adler, & Marmot, 2003), as well as self-rated mental and physical health (Wolff, Acevedo-Garcia, Subramanian, Weber, & Kawachi, 2010).

Some scholars argue that subjective social status is a more valid yet parsimonious indicator than objective social status because subjective social status represents a summation of a range of factors (Singh-Manoux, Marmot, & Adler, 2005). For example, when someone views her social status as low, she may be implicitly accounting for a wider range of factors than is typically measured, including but not limited to her own education and income, her past and future life chances, her family of origin and current family, her race/ethnicity, her wealth, and, importantly, her relative sense of social status (Singh-Manoux et al., 2003). In fact, Gong, Xu, and Takeuchi (2012) found, in examining Asian-Americans' SES and self-rated health, evidence for a link between subjective—but not objective—social status and health.

Internalization of Subjective Social Status

People differ not only in *where* they locate themselves on a social status ladder in any given setting, but, critically, also in the *meaning* they confer to their subjective social status. Beyond seeing themselves as relatively low status, in the current experiments we examined the meaning participants confer upon that status—specifically, how much they saw themselves as responsible for their social status. This is *internalization*. Taken from a self-determination theory framework (Ryan, 1995, p. 405):

Internalization represents the active assimilation of behavioral regulations that are originally alien or external to the self. To the degree that internalization is accomplished, then the individual moves away from heteronomy toward autonomy, or from external to self-regulation... In attributional terms, increasing internalization and integration of behavioral regulation represent a transition from an external perceived locus of causality to an internal perceived locus of causality (Deci & Ryan, 1985b). That which was foreign is organized into one's self. Many theorists emphasize the active, constructive nature of the internalization process, as well as its tendency to be influenced by social contexts (e.g., Deci & Ryan, 1985b; Lepper, 1983; Loevinger, 1976; Schafer, 1968).

In our conceptual model, we apply this definition of internalization to subjective social status. Imagine two people who both see themselves as on the same low rung on the social status ladder: one heartily believes that he or she is responsible for being in that subordinate position, whereas the other person does not. The former is an example of someone internalizing subjective social status to a strong degree. Internalization reflects attributions about behavior, which, we predict, contributes to the fulfillment of psychological needs. Our model suggests that the person who sees oneself as relatively low in social status, and also who feels more responsible for being in that position, would have less basic psychological needs fulfillment.²

Previous research has identified several candidate psychological factors that attenuate the low SES–poor health link, ranging from emotional regulation (Appleton et al., 2012) to cognitive and behavioral “shifting and persisting” (Chen & Miller, 2012). Here, we offer an explanation for why each of these moderators might be potent: Because variables like regulating emotion, shifting one's attention, and persisting toward realistic but meaningful life goals may afford a person—in the face of acknowledging being in low social status—the resources to *resist* internalizing it.

In survey research with a low-income community sample mostly of Latina/o adults, our group found a positive association between subjective social status and basic psychological needs satisfaction, confirming the main effect part of our proposed model

(Jackson, Richman, LaBelle, Lempereur, & Twenge, 2014). Another recent survey mostly of White adults across the US recruited online found that psychological needs satisfaction mediated the association between subjective social status and health complaints (Di Domenico & Fournier, 2014). However, both of these studies are limited as they cannot determine causal associations and did not measure internalization of subjective social status. In addition, neither survey study explored whether low subjective social status and its internalization interacted to cause decrements in basic psychological needs satisfaction. Thus, in the current laboratory-based experiments, we examined if low social status coupled with a belief that some characteristic about themselves shaped their status assignment was especially pernicious for basic psychological needs fulfillment.

The Current Research

The goal of this project is to examine (1) whether low subjective social status thwarts basic psychological needs fulfillment and (2) if this association is modified by internalization, as depicted in Figure 1. We conducted laboratory experiments to determine causal mechanisms complementing and extending past observational research. Experiments 1 and 2 tested the causal association between randomly assigned subjective social status and basic psychological needs fulfillment, operationalizing social status in two different ways.

We hypothesized that randomly assigned subjective social status would thwart self-determination, as a function of internalization of subjective social status. Also, we hypothesized that only participants who were randomly assigned to low subjective social status would be adversely affected by internalizing their status. We made no specific predictions about internalizing high subjective social status, though we explored whether this would yield protective effects.

Experiment 1

Method

Participants

We recruited on campus via an Introduction to Psychology course for credit and flyers offering participants \$5 and a chance to be entered in a drawing for a campus bookstore gift certificate. Following previous research (Jackson, Twenge, Souza, Chiang, & Goodman, 2011), we chose to focus this first test of our hypotheses on female participants as women suffer more health consequences from low status than men (Clougherty, Eisen, Slade, Kawachi, & Cullen, 2011). Inclusion criteria were being female, ages 18–22 years old, and having attended the school since first year (i.e., not a transfer student).

The initial sample included 61 female college students. Three participants misidentified their status assignment, thus failing the manipulation check, and were dropped. This final sample of 58 had a mean age of 18.7 years, $SD = 1.4$, and had completed on average 1.5 years in college, $SD = .8$. About a third of participants (29%) reported that their mother did not complete a college degree. Another third (28%) reported that their mother completed college, and the remainder (43%) reported that their mother completed some or more graduate or professional training. Nineteen percent of participants reported that their father did not complete a college degree, 19% reported that their father completed college, and the remainder (62%) reported that their father completed some or more graduate or professional training. Sixty percent of the sample identified as White, 16% Asian, 12% multiracial, 9% Black, and 3% Latina. Mean self-reported GPA was 3.38, $SD = .32$.

Procedure

Participants were run individually in laboratory sessions. Upon arrival participants signed informed consent and completed demographic questions. Next, participants were given a packet of questions that began with the social status manipulation. Participants were randomly assigned to one of three levels of status: Low, medium, and high. We followed the procedure for manipulating subjective social status from Jackson et al. (2011). Briefly, participants were asked first to contemplate a picture of a ladder representing US society, with each rung representing a person's social status. Next, they were given written instructions to picture themselves at their five-year college reunion, and randomly assigned to view themselves at the bottom, middle, or top of the social status ladder in that scenario. To help participants vividly imagine this, they were asked to write "as if to a private journal" about their reunion experiences. Still responding as if they were in that scene, participants also completed a 21-item closed-ended measure of basic psychological needs satisfaction (Gagné, 2003; Johnston & Finney, 2010). Sample items include "I feel like I am free to decide for myself how to live my life" (autonomy), "Most days I feel a sense of accomplishment from what I do" (competence), and "I really like the people I interact with" (relatedness), and were assessed on a scale from 1 (*not at all true*) to 7 (*very true*). Items were averaged and then coded to yield a score such that higher values indicate more basic psychological needs fulfillment. In this sample, the internal consistency was $\alpha = .95$. Participants then completed post-manipulation measures, including a manipulation check and filler questions. The written manipulation check asked, "Where were you asked to imagine yourself on the ladder?" and asked participants to circle bottom, middle, or top. Participants were then debriefed, given course credit or cash compensation, and thanked.

Internalization of social status was ascertained by observer ratings of the journal entries. Two research assistants unaware of the hypotheses independently rated the journal entries on how much participants believed themselves as responsible for being at the given rung on the ladder, using a scale from 1 (not at all) to 7 (completely). Interrater reliability to indicate consistency across raters was assessed using Cronbach's α (Stemler, 2004), and deemed acceptable with a value of .83. The internalization score for analyses was calculated by taking the mean score for each participant across the raters. In this sample, mean internalization was 4.9, $SD = 1.7$. Multiple regression analyses were used to test for main and interactive effects. Predictor variables were subjective social status (coded 0 = low, 1 = middle, 2 = high), internalization, and subjective social status multiplied by internalization.

Results

Participants in lower subjective social status conditions reported lower fulfillment of basic psychological needs ($M_{low} = 3.5$, $SD_{low} = 1.1$, $M_{middle} = 5.0$, $SD_{middle} = 0.9$, and $M_{high} = 5.7$, $SD_{high} = .6$; $B = -0.8$, $SE = 0.4$, 95% CI $[-1.6, -.06]$; $\beta = -.5$, $p = .04$). The more a participant internalized her status assignment, the less her basic psychological needs were fulfilled ($B = -.4$, $SE = .09$, 95% CI $[-.6, -.3]$; $\beta = -.6$, $p < .001$). The interaction of subjective social status and its internalization significantly predicted lower basic needs fulfillment ($B = .4$, $SE = .08$, 95% CI $[.2, .5]$; $\beta = .6$, $p < .001$).

To understand the nature of this statistically significant interaction, we stratified the observed variable (internalization) by levels of the manipulated variable (low, middle, high subjective social status). We then examined whether greater internalization was correlated with lesser fulfillment of basic psychological needs at low—but not at higher—levels of perceived social status. Findings confirmed the hypothesis and are

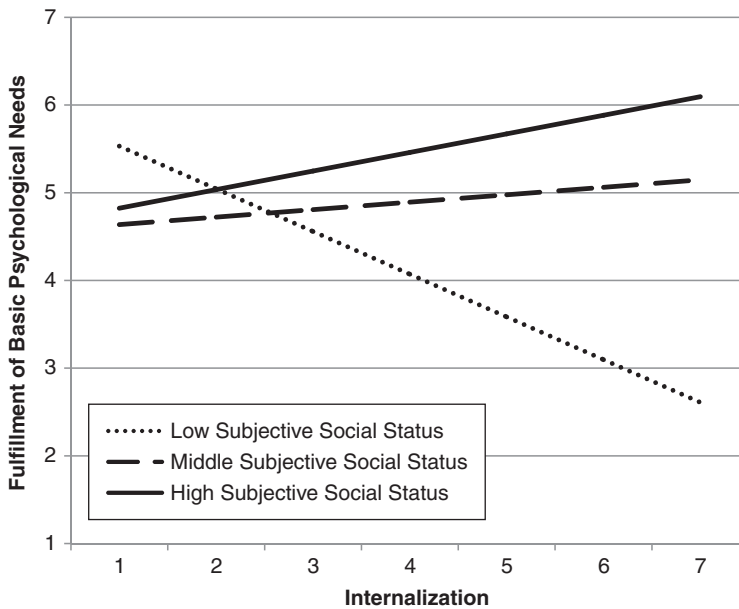


FIGURE 2 Experiment 1: Mean basic psychological needs fulfillment by randomly assigned imagined subjective social status and its internalization.

depicted in Figure 2. Whereas at low subjective social status internalization and needs satisfaction were inversely correlated ($r = -.78, p < .001$), at middle status there was no correlation ($r = .17, p = .479$), and at high status internalization and needs satisfaction were positively correlated ($r = .51, p = .027$). However, levels of internalization were relatively constant across subjective social status ($M_{\text{low}} = 5.2, SD_{\text{low}} = 1.8$; middle, $M_{\text{middle}} = 5.0, SD_{\text{middle}} = 1.8$; and $M_{\text{high}} = 4.5, SD_{\text{high}} = 1.5$; $F[2, 55] = .85, p = .435, \eta^2_{\text{partial}} = .030$).

The general pattern of correlations persisted when the correlation of internalization with basic psychological needs fulfillment was performed decomposing the composite basic needs satisfaction measure by subscale: Low ($r_{\text{autonomy}} = -.57, p = .008$; $r_{\text{competence}} = -.80, p < .001$; $r_{\text{relatedness}} = -.73, p < .001$), middle ($r_{\text{autonomy}} = .08, p = .749$; $r_{\text{competence}} = .05, p = .832$; $r_{\text{relatedness}} = .35, p = .148$), and high ($r_{\text{autonomy}} = .42, p = .073$; $r_{\text{competence}} = .53, p = .020$; $r_{\text{relatedness}} = .39, p = .098$). Thus, results support our model as measured by overall psychological needs fulfillment and individual subscales of autonomy, competence, and relatedness.

Discussion

Data from this experiment refine previous survey research findings that subjective social status is correlated with the fulfillment of basic psychological needs. We found that low subjective social status thwarted basic psychological needs satisfaction, especially when participants internalized their subjective social status. Besides providing causal evidence, Experiment 1 showed that the thwarting of psychological needs does not happen for everyone in a low status group: The internalization of low social status is critical. Indeed, as other scholars (Chen & Miller, 2012) have demonstrated, not everyone in low social status suffers from it. Chen and Miller showed that those in low status who “shift and persist” have a similar profile to their higher status counterparts. This is congruent with our

own findings given the interaction of social status and internalization in predicting basic psychological needs fulfillment.

One potential threat to internal validity of this study is that participants were asked to imagine their subjective social status. It is unknown whether the findings would replicate using a measure with greater external validity. A next step is to examine the effects of a behavioral measure of subjective social status on basic psychological needs fulfillment, and interactive effects with status internalization.

Experiment 2

Experiment 2 extended Experiment 1 by testing whether a behavioral induction would produce the same results. We again hypothesized that only participants who internalized low subjective social status assignment would experience thwarted basic psychological needs.

Method

Participants

Participants were recruited via paper and electronic flyers distributed throughout campus. We offered \$10 in exchange for participation. Inclusion criteria were being female, students at the college, between the ages of 18 and 25 years old.

The initial sample included 75 participants. Three ($n_{\text{low}} = 1$ and $n_{\text{middle}} = 2$) who misidentified their status assignment, and four additional participants with incomplete data, were dropped. This final sample of 68 participants, age $M = 19.9$ years, $SD = 1.2$, had completed on average 2.4 years in college, $SD = 1.1$. Similar to Experiment 1, about a third of participants (31%) reported that their mother did not complete a college degree. Thirty-seven percent reported that their mother completed college, and the remainder (32%) reported that their mother completed some or more graduate or professional training. Approximately 24% of participants reported that their father did not complete college; 28% reported that he completed college; and the remainder (49%) reported that their father completed some or more graduate or professional training. About 60% of the sample identified as White, 31% Asian, and 9% multiracial. Mean self-reported GPA was 3.48, $SD = .32$. Mean internalization was 3.5, $SD = 1.9$.

Procedure

Low, middle, and higher social status was randomly assigned. In groups of four to six, participants spent 15 minutes in a “getting to know you” task answering questions about their lives (Sedikides, Campbell, Reeder, & Elliot, 1999) used in previous research on social rejection (e.g., DeWall, Twenge, Bushman, Im, & Williams, 2010). Participants were then separated in individual rooms. Extending previous usage of this procedure to manipulate social status, participants were asked to elect a leader, an assistant, and members for the next group task. False feedback regarding the summary of the peer nominations randomly assigned participants to one of three social status conditions: Leader (high), assistant leader (middle), and member (low). Finally, participants were given a packet of questions including the same measure of basic psychological needs fulfillment used in Experiment 1; filler items; demographics; a manipulation check; an item on a scale from 1 (not at all) to 7 (very much so) about how much they believed their social status assignment was based on some aspect of themselves, to capture internalization; and debriefed, compensated, and thanked.

Manipulation Check

Participants were asked to confirm whether their peers collectively nominated them for the role of leader, assistant, or member.

Results

Beyond the effects of lower subjective social status on basic psychological needs fulfillment ($M_{\text{low}} = 5.0$, $SD_{\text{low}} = 0.9$; middle, $M_{\text{middle}} = 5.3$, $SD_{\text{middle}} = 0.7$; and $M_{\text{high}} = 5.2$, $SD_{\text{high}} = 0.6$; $B = -0.4$, $SE = 0.2$, 95% CI $[-.8, .1]$; $\beta = -.4$, $p = .094$), and its internalization ($B = -.2$, $SE = .1$, 95% CI $[-.4, -.1]$; $\beta = -.6$, $p = .003$), their interaction ($B = .1$, $SE = .1$, 95% CI $[.0, .2]$; $\beta = .6$, $p = .036$) significantly predicted lower basic needs fulfillment.

As with Experiment 1, we examined if greater internalization was correlated with less fulfillment of basic psychological needs at low—but not at higher—levels of subjective social status. Findings confirmed the hypothesis. As predicted, participants in the behaviorally induced low status position who internalized their social status more reported less basic psychological needs satisfaction ($r = -.56$, $p = .007$). For their higher-status peers, there was no association between the internalization of their social status and basic needs satisfaction ($r_{\text{middle}} = -.09$, $p_{\text{middle}} = .658$; $r_{\text{high}} = -.10$, $p_{\text{high}} = .616$). Levels of internalization did not vary significantly across randomly assigned subjective social status ($M_{\text{low}} = 3.7$, $SD_{\text{low}} = 1.9$; middle, $M_{\text{middle}} = 3.5$, $SD_{\text{middle}} = 1.9$; and $M_{\text{high}} = 3.3$, $SD_{\text{high}} = 1.9$; $F[2, 71] = .20$, $p = .816$, $\eta^2_{\text{partial}} = .006$). Figure 3 depicts these findings.

This general pattern of findings also appeared when the correlation of internalization was performed within each subscale, respectively, of the basic needs satisfaction measure: Low ($r_{\text{autonomy}} = -.43$, $p = .048$; $r_{\text{competence}} = -.42$, $p = .052$; $r_{\text{relatedness}} = -.54$, $p = .010$), middle ($r_{\text{autonomy}} = -.10$, $p = .648$; $r_{\text{competence}} = -.03$, $p = .871$;

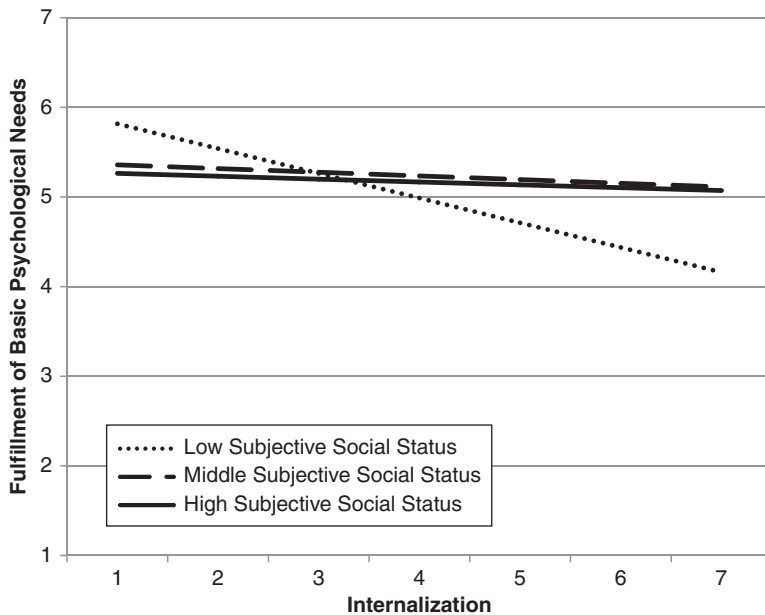


FIGURE 3 Experiment 2: Mean basic psychological needs fulfillment by randomly assigned behaviorally manipulated subjective social status and its internalization.

$r_{\text{relatedness}} = -.10, p = .626$), and high ($r_{\text{autonomy}} = -.10, p = .616; r_{\text{competence}} = .17, p = .386; r_{\text{relatedness}} = -.32, p = .106$).

Discussion

Though using a different experimental manipulation of subjective social status, the findings paralleled those found from Experiment 1. A behavioral manipulation applied in a new way—to elicit subjective social status—induced changes in basic psychological needs satisfaction as a function of the interaction between subjective social status and one's internalization of that status. Internalization of one's social status thwarted basic psychological needs fulfillment, but only for participants with low status.

General Discussion

What makes low social status toxic to well-being? Beyond perception of one's social status, internalization is the belief of responsibility for one's social status. We hypothesized that the more people internalize low subjective social status, the more their basic psychological needs would be thwarted. To test these causal claims, we conducted two laboratory-based experiments. In both, subjective social status was randomly assigned, either by an imagination task (Experiment 1) or by a behavioral manipulation (Experiment 2).

Data revealed that not all participants in the low social status condition had unfulfilled basic psychological needs, and not all internalization of status responsibility was psychologically toxic. Consistent with previous literature (Jackson et al., 2011), randomly assigned low social status yielded the poorest outcomes: In this case, the least satisfaction of basic psychological needs (composed of autonomy, competence, and relatedness)—but only as a function of greater internalization of that status. Participants who felt less responsible for their low subjective social status actually reported needs satisfaction similar to their higher-status counterparts.

Basic psychological needs satisfaction is comprised by the fulfillment of specifically the needs for autonomy, competence, and relatedness. The pattern of effects across the three needs was very consistent. Furthermore, some evidence indicated that internalizing high subjective social status confers positive benefits: In Experiment 1, participants who were assigned to imagine themselves in high status reported feeling more needs satisfaction the more they believed they were responsible for their status, consistent with the conceptual model. Decomposing the analyses we found that the effect was driven by the satisfaction of the need for competence; the effects for autonomy and relatedness were marginally statistically significant, though in the same direction, suggesting with greater statistical power we might have been better able to detect those effects. This consistency across fulfillment of needs for autonomy, competence, and relatedness suggests that social status internalization may have broad effects of on psychological needs satisfaction.

While we manipulated subjective social status in both experiments, they arguably reflect different facets of this construct. In Study 1, participants imagined themselves at a randomly assigned place on a societal ladder (subjective rank in society at large). In Study 2, participants perceived their status in a more directly face-to-face peer status context (sociometric status). Data show that each of these facets of status is associated with well-being (subjective rank; Reitzel, Buchanan, Nguyen, & Ahluwalia, 2014; sociometric status; Anderson, Kraus, Galinsky, & Keltner, 2012). Given similar findings using these two facets of status, we suspect that their pathways to well-being may also be similar, i.e., through fulfillment of basic psychological needs.

This project has several notable strengths. To our knowledge, this is the first report of a causal association between internalized social status and basic psychological needs satisfaction, making the topic of study novel. Better understanding the processes by which low social status becomes part of the self helps clarify a key step in the process of how social environments come to influence health, and can guide interventions to mitigate its potentially health-damaging effects of low social status that have been documented extensively (for reviews, see Adler & Matthews, 1994; Adler & Snibbe, 2003). We examined the association across low, middle, and high subjective social status manipulating status in two different ways, reducing the possibility of shared method variance. An additional strength of our approach is that we employed different measures within these studies. In Study 1, subjective social status was measured by self-reports on the ladder measure—well established in the literature—and manipulated by a simple pen-and-paper task. In Study 2, a familiar behavioral manipulation was applied in a novel way to induce subjective social status. Internalization was ascertained by observer ratings in Experiment 1, and self-reports in Experiment 2.

Also we note several limitations. Though we randomly assigned subjective social status, internalization was not manipulated but simply measured. Experiment 1 asked participants to imagine internalized social status; perhaps people's imaginings and lived experiences are substantially different. This limitation was addressed in Experiment 2 by using a behavioral manipulation of subjective social status. Given the small sample sizes, the current findings may be idiosyncratic to our samples. Nevertheless, we found consistent effects using different manipulations. Meta-analyzing the associations of internalization and basic psychological needs fulfillment in low status across the current studies allows us to more robustly quantify the estimate and its precision. Using r as the effect size estimate ($N = 126$), the pooled correlation is $-.66$, CI $[-.75, -.55]$, suggesting that the effect is large (Cohen, 1992). If findings from these studies are replicated, then the effects could be further examined in larger samples more diverse on range of demographic factors, helping establish their generalizability. For these first studies, we focused on women only, as some evidence suggests low social status affects women's health more strongly than men's (Clougherty et al., 2011), so we cannot generalize these findings to men. And as with any research employing college student samples, the same caveats of restriction apply, in this case of age and SES.

Future research could take several directions. Individuals embody multiple, intersecting axes of social status (Williams et al., 2012), including but not limited to SES, gender, and race/ethnicity (Purdie-Vaughns & Eibach, 2008). The effects of internalizing multiple identities on basic psychological needs fulfillment warrant further study, guided by emerging methodologies on studying intersectionality (Cole, 2009; Purdie-Vaughns & Eibach, 2008; Shih, Sanchez, & Ho, 2010). For example, if one has a stigmatized identity and a non-stigmatized one, does the internalization of each act additively or synergistically in shaping needs fulfillment, and in which contexts? Interestingly, the behavioral manipulation of social status did not itself robustly predict basic psychological needs satisfaction, suggesting a key role for internalizing social status. Studies extending these causal but laboratory-bound findings are warranted. Some recent research has explored the dynamics among needs for autonomy, competence, and relatedness, finding that autonomy and relatedness predict competence (Talley, Kocum, Schlegel, Molix, & Bettencourt, 2012). While the current studies provide initial evidence that internalized social status causally shaped basic needs satisfaction, more complex causal chains ought to be examined in future research among internalized social status,

these needs, and health behaviors (e.g., eating, physical activity), markers (e.g., inflammation, lung function), and outcomes (e.g., breast cancer, diabetes), with community samples examined over time. Future experiments could randomly assign not only subjective social status, but also internalization.

An important question for future research is to clarify the nature of the association between internalized social status and psychological needs satisfaction. For example, some might argue that the very definition of higher social status comprises fulfillment of basic psychological needs, and low status comprises thwarting basic psychological needs. Is basic psychological needs satisfaction simply a marker for, or rather a true outcome of, social status? Our experimental data showed that random assignment to low, middle, or high subjective social status resulted in correspondingly higher levels of needs satisfaction, as a function of internalization. Thus, our strong preliminary evidence suggests a causal association. More research is required to better characterize the complexity of these processes (e.g., in addition, is reverse causality operating?).

These data have implications for our understanding of health disparities and suggest promising interventions. Basic psychological needs satisfaction has a potential explanatory role in health disparities, if it is thwarted by low social status, and, in turn, affects health. Our data suggest that cultivating basic psychological needs satisfaction among low status groups is possible to the extent that an intervention deflects the internalization of that low status. Other research (Chen & Miller, 2012) on resilience among people in low status—of which SES is one operationalization—reveals that using "shift-and-persist" strategies buffer negative health effects of low status. Our research suggests a mechanism for why: Because such strategies might help minimize internalizing a sense of responsibility for one's situation.

If the current findings are replicated in larger samples across different demographics, there will be implications for features to include when designing interventions to promote health and resilience, especially among those in low social status, given the host of interventions that effectively create autonomy-supportive environments on the microlevel (Su & Reeve, 2011). In fact, because cultivating autonomy-supportive environments increases psychological needs fulfillment for individuals in them, this might be a key social inoculation against widening health disparities by social status. Another way to promote basic psychological needs fulfillment could be through distal upstream changes in the distribution of social status. For example, economic policy reducing disparities in wealth and education could be justifiably framed as health policy. Other scholars have stated as much (Phelan, Link, & Tehranifar, 2010; Woolf & Braveman, 2011) and the current findings help delineate a key mechanism—basic psychological needs satisfaction—for why this is the case.

To conclude, we found that the interaction of low subjective social status and its internalization is linked to less fulfillment of basic psychological needs. What is it about low social status that is toxic to well-being? Beyond perception of one's own social status, internalization is one's belief in self-responsibility for that status. Our data suggest the more someone internalizes one's low—but not higher—status, the more that person's basic psychological needs are thwarted. This finding illuminates a promising path for future research with broad implications for health and well-being. Indeed, rather than addressing individual-level psychological states and related health behaviors piecemeal, understanding the upstream factors that shape them—what some scholars term "fundamental causes" of disease (Link & Phelan, 1995)—promises to be an efficient way to design interventions on the population level (Colditz, 2007).

Notes

1. Both of these recent survey studies linking social status and health outcomes via basic needs satisfaction (Di Domenico & Fournier, 2014; González et al., 2014) were published after the conceptualization and completion of our experiments. While the studies in this report are unique in their experimental methods and focus on within strata (i.e., low status) differences, it is also notable that each of our three independently developed papers come from very different but complementary subfields: Social indicators, health psychology, and self and identity research. This speaks to the wide appeal and application of the general idea that basic needs satisfaction may be a key mechanism in health disparities, and we expect this to be a fruitful area of research.
2. Sharpening the content validity of internalization remains a project for future research. For example, it would be useful but remains to be understood how the construct of internalization overlaps with and differs from other related constructs, such as explanatory styles (attributing negative events to internal versus external, stable versus unstable, and global versus situational causes; Peterson, 1991) or entity beliefs (believing that self-attributes are fixed; Dweck, 2008).

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