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Stereotypes as Stumbling-Blocks: How Coping With Stereotype Threat Affects Life Outcomes for People With Physical Disabilities

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Abstract

Stereotype threat, the concern about being judged in light of negative stereotypes, causes underperformance in evaluative situations. However, less is known about how coping with stereotypes can aggravate underperformance over time. We propose a model in which ongoing stereotype threat experiences threaten a person's sense of self-integrity, which in turn prompts defensive avoidance of stereotype-relevant situations, impeding growth, achievement, and well-being. We test this model in an important but understudied population: the physically disabled. In Study 1, blind adults reporting higher levels of stereotype threat reported lower self-integrity and well-being and were more likely to be unemployed and to report avoiding stereotype-threatening situations. In Study 2's field experiment, blind students in a compensatory skill-training program made more progress if they had completed a values-affirmation, an exercise that bolsters self-integrity. The findings suggest that stereotype threat poses a chronic threat to self-integrity and undermines life outcomes for people with disabilities.

Keywords

achievement, coping, disability, social identity, stigma

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Social psychologists have challenged the notion that minority groups underperform due to innate group weaknesses. Rather, underperformance can be partially attributed to the social context in which groups are embedded. In particular, some contexts arouse stereotype threat: a concern that one could be viewed negatively in light of stereotypes about one's group. In such contexts, stereotyped individuals may perform below their potential, as when women underperform in science and math, or some ethnic minorities underperform in school more generally (for reviews, see Aronson & McGlone, 2009; Major & O'Brien, 2005; Shapiro & Neuberg, 2007; Steele, Spencer, & Aronson, 2002). Stereotype threat impairs short-term performance through several well-examined mechanisms (for a review, see Schmader, Johns, & Forbes, 2008). However, less is known about how *chronic* experiences of stereotype threat contribute to outcomes over the *long term*. Furthermore, there is ample evidence that self-affirmations, such as reflecting on one's important values, reduce the chronic impact of stereotype threat (for reviews, see Sherman & Hartson, 2011), but it is not yet entirely clear how this occurs.

In this article, we propose that chronic stereotype threat can threaten a person's sense of self-integrity, or their perception of adaptive adequacy (Steele, 1988), and that this threat to self-integrity can exact costs for motivation, performance, and well-being. We explore a group for whom chronic experiences with stereotype threat may have particular relevance—people with permanent physical disability. A key feature of the stereotype threat for this group is that it is pervasive and chronic. It indicts their competence in a wide range of sectors in modern life, ranging from school to work to relationships to even the simple act of going out in public (Asch, Rousso, & Jefferies, 2001; Goffman, 1963; Nario-Redmond, 2010). In each of these sectors, the disabled, such as the blind, may worry about being seen as clumsy, incompetent, and not fully belonging.

To contend with such a stereotype may thus pose a chronic and pervasive threat. This threat arises from the challenge that the stereotype poses to people's fundamental desire to be seen as adaptively adequate—as able to meet the standards for worth set forth by their group or culture (Steele, 1988; see

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also G. L. Cohen & Sherman, 2014; Sherman & Cohen, 2006). Thus, the physically disabled are an ideal test group to examine the generality of stereotype threat processes beyond traditionally studied groups and, specifically, how such a ubiquitous threat to adaptive adequacy affects important life outcomes.

People may cope with the threat by avoiding situations where the stereotype could be used against them. A blind person, for example, might avoid public spaces or decline to apply for a job. To do otherwise could risk exposure to judgment or, worse, humiliation. We hypothesize that self-reported levels of stereotype threat among the disabled would be associated with a tendency to avoid stereotype-relevant situations such as using public transportation and attending social gatherings. We further expected that self-reported levels of stereotype threat would predict unemployment and lower well-being. That is, the more the disabled are worried about the stereotype, the more they should avoid stereotype-relevant situations, and this avoidance should compromise their occupational achievement. Moreover, the continual stress and social avoidance triggered by stereotype threat may undermine well-being (see also Cacioppo & Patrick, 2008). We test this model correlationally in a large sample of blind adults, examining the impact of a chronic self-integrity threat on important but understudied outcomes in the field: employment, willingness to enter stereotype-relevant situations, and subjective well-being.

We further expected that an intervention that bolsters self-integrity, known as self-affirmation, would buffer the disabled against stereotype threat by fortifying their global sense of adaptive adequacy. Better performance and learning should follow. We test this prediction in a skill-training program for the disabled, an important context because success in such programs constitutes one of the strongest predictors of occupational success and social integration for the disabled (e.g., Omvig, 2002). Taken together, our hypotheses suggest that some of the limitations of disability stem from the psychological environment rather than physical impairment, and thus are amenable to social-psychological intervention.

A Model of Stereotype Threat Impacts Over Time

Being stereotyped as lacking competence or agency conflicts with a view of oneself as an adaptive agent, evoking a state of threat (Schmader, Johns, & Forbes, 2008). Chronic stigma may challenge one's sense of adaptive adequacy in stereotype-relevant contexts (e.g., school, work, family; cf. Crocker & Major, 1989). For example, African American students who performed poorly in school experienced a dip in their sense of adequacy in school by the end of the academic term, but White American students' sense of adequacy in school was unrelated to their prior performance (G. L. Cohen, Garcia, Purdie-Vaughns, Apfel, & Brzustoski, 2009; see also Cook, Purdie-Vaughns, Garcia, & Cohen, 2012; Stangor, Carr, & Chiang, 1998). If repeated in a socially sacred domain like work or school, such threat to self-integrity could be chronic and costly.

The threat posed by stereotypes can motivate people to avoid future stereotype-relevant situations to preserve an image of themselves as adaptively adequate. Consistent with this, negatively stereotyped students may disengage from threatening academic domains (Steele, 1997) or opt out of taking stereotype-relevant tests (G. L. Cohen & Garcia, 2005; Davies, Spencer, Quinn, & Gerhardstein, 2002). They may self-handicap, such as by refraining from practice so that future failure reflects less on their ability (Steele & Aronson, 1995; Stone, 2002). Indeed, poor people may forego social services to avoid the stigmatizing label of "welfare queen" (Bissett & Coussins, 1982; Kissane, 2003). Such defensive strategies shore up self-integrity in the short term but can undermine growth and learning in the long term (G. L. Cohen & Sherman, 2014; Sherman & Hartson, 2011). The continual process of guarding against negative stereotypes can also cause stress and deplete mental resources, undermining well-being and even physical health (Inzlicht, Tullett, & Gutsell, 2012; Walton & Cohen, 2011).

Chronic experiences with stereotype threat should therefore be associated with lower self-integrity, and this, in turn, should be associated with more avoidance of stereotype-relevant situations and lower performance in stereotype-relevant contexts—a prediction we test. We also expected chronic stereotype threat to predict lower well-being, consistent with research implicating stereotype threat as a chronic stressor and with research showing that chronic stress undermines well-being (e.g., Pascoe & Richman, 2009). Such findings would help explain how stereotype threat not only undermines performance in the short term but propagates negative effects over the long term.

The foregoing analysis implies that shoring up self-integrity should improve achievement under chronic stereotype threat. Self-affirmations, in which people reflect on important sources of positive identity, bolster self-integrity in the face of threat (Sherman, Cohen, et al., 2009; see also G. L. Cohen & Sherman, 2014). They do so by allowing people to find anchorage for their self-integrity in a domain beyond the provoking threat (G. L. Cohen & Sherman, 2014). A blind individual, reminded of the value he or she places on religion, for instance, might be more willing to enter a public space or practice blindness-specific skills and do so with less trepidation as a result of having bolstered his or her self-integrity in another domain. If timely, such a moment could touch off a virtuous cycle in which exposure to the stereotype meets with success, leading to greater self-integrity, prompting more exposure to challenge, in a recursive cycle (G. L. Cohen et al., 2009; G. L. Cohen & Sherman, 2014; Sherman et al., 2013; see Miyake et al., 2010, and Bowen, Wegmann, & Webber, 2013, for other affirmation replications with threatened groups in classroom settings). Such recursive

cycles are apt to occur in institutional systems, such as schools and workplaces, that reinforce positive change when it occurs and thus propel the initial effects of the affirmation through time in a series of mutually reinforcing interactions between the self-system and the social system, a "cycle of adaptive potential" (G. L. Cohen & Sherman, 2014).

The Present Research

We tested the role of self-integrity in stereotype threat, and the efficacy of affirmation in countering the effects of such threat, among an important, but understudied, minority group: people with a visible physical disability, specifically blindness. Our blind samples enabled us to investigate the effects of ongoing stereotype threat on important but understudied outcomes: employment, willingness to enter stereotype-relevant situations, and subjective well-being. Based on our model, we propose that disability-related stereotypes can undermine self-integrity among the disabled, who may protect their self-integrity by striving less in stereotype-relevant domains such as employment. Thus, stereotypes can act as stumbling-blocks that limit the achievement of the disabled. However, the present analysis suggests that a self-affirmation should improve achievement among the disabled.

The foregoing hypotheses were tested in two field studies. As a correlational study, Study 1 assessed the associations between stereotype threat on the one hand and self-integrity, work achievement, challenge-seeking, and well-being on the other, among a heterogeneous sample of legally blind adults. It was predicted that, controlling for demographic differences, self-reported stereotype threat would be associated with (a) less work achievement, (b) less global satisfaction with one's life, (c) greater stress, and (d) less frequent challenge-seeking behavior. We also explored a path model to determine whether these effects were mediated through reductions in self-integrity. We predicted that the effects of stereotype threat on each outcome would be primarily indirect, mediated through self-integrity. However, we expected the relationship between stereotype threat and stress to be both direct and indirect. In previous research, stereotype-relevant situations directly trigger physiological stress responses, such as blood pressure increases (Blascovich, Spencer, Quinn, & Steele, 2001), and long-term experiences with stigmatization are associated with stress-related health problems (Pascoe & Richman, 2009). In addition to this direct stress response, stress can arise from the process of defending self-integrity (G. L. Cohen & Sherman, 2014). Therefore, we expected stereotype threat to be associated with global stress both directly and indirectly through self-integrity threat.

Study 2 examined whether a values-affirmation could, by bolstering self-integrity, promote learning in a situation that is important, but potentially threatening: a structured training program to master blindness-related skills. Extending previous field research, we predicted that the affirmation would benefit learning and performance.

Study 1: Stereotype Threat and Real-World Outcomes

We began with a correlational study to determine whether everyday experiences of stereotype threat are associated with underperformance, challenge avoidance, and reduced subjective well-being. We also explored the role of self-integrity as a mediator. Though the study was correlational in nature, and thus could not determine causality, this large survey enabled us to assess if the posited relationships were sufficiently robust to occur in a large, heterogeneous sample of blind participants and with meaningful real-world outcomes like employment status.

Method

Participants. Five hundred and sixty-four legally blind adults living throughout the United States completed an online survey in exchange for a raffle ticket. Of these, 67 were eliminated because they failed to complete one or more of the critical measures, resulting in a final sample of 497. We aimed to recruit at least 500 participants to maximize statistical power and to ensure that enough participants were gathered to represent multiple blindness consumer groups and the entire spectrum of impairment severity. The final sample consisted of 189 men, 290 women, and 18 individuals of unspecified gender. Most (86%) were European American. Participant age ranged from 18 to 90 years ($M = 44.36$, $SD = 14.83$). Sixty-six percent of the participants had become blind at birth or before the age of 2, 12% became blind during childhood (between ages 2 and 18), and the remaining 22% became blind in adulthood (after the age of 18). Participants were recruited from online discussion groups sponsored by the two major blindness advocacy organizations in the United States, the American Council of the Blind (ACB), and the National Federation of the Blind (NFB), as well as from registries of legally blind adults who had volunteered to participate in research studies.

Measures

Stereotype threat. We developed four items to tap experiences of stereotype threat: "In public places, I worry that people will expect less of me because I am blind"; "I often worry that sighted people will think I need help when I don't"; "In public places, I worry that sighted people will expect me to make a mistake"; and "If I make a mistake in public, I worry about making blind people look bad." Participants rated their agreement with each item on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Responses to the four items were averaged into a composite ($\alpha = .78$).

Self-integrity. Participants completed the Self-Integrity Scale (Sherman et al., 2009), consisting of eight items assessing perceptions of adaptive adequacy (e.g., "I have the ability and skills to deal with whatever comes my way"; "I

Table 1. Study 1 Zero-Order Correlations.

	Threat	Integrity	Unemployment	Challenge	Satisfaction	Stress
Threat	1.00	−.24**	.10*	−.09†	−.19**	.35**
Integrity	−.24**	1.00	−.19**	.23**	.56**	−.45**
Unemployment	.10*	−.19**	1.00	−.23**	−.30**	.17**
Challenge	−.09†	.23**	−.23**	1.00	.24**	−.15**
Satisfaction	−.19**	.56**	−.30**	.24**	1.00	−.59**
Stress	.35**	−.45**	.17**	−.15**	−.59**	1.00

†$p < .06$. *$p < .05$. **$p < .01$.

am comfortable with who I am") using the same scale as above. Responses to the eight items were averaged (α = .83).

Work achievement. We asked participants to report their current employment status by selecting one of the following options: employed full-time, employed part-time, employed on a temporary basis, student, both a student and employed, stay-at-home parent, retired, or unemployed.

Subjective well-being. Participants completed two validated scales of well-being: a Life Satisfaction Scale (Diener, Emmons, Larsen, & Griffin, 1985) and a Stress Scale (S. Cohen, Kamarck, & Mermelstein, 1983). The Life Satisfaction Scale consists of five statements assessing global satisfaction with one's life as a whole (e.g., "So far I have gotten the important things I want in life"). Participants responded to these statements using separate scales ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). The Stress Scale consists of 10 items assessing overall stress experienced during the preceding month (e.g., "In the last month, how often have you felt that you were unable to control the important things in your life?"). Participants responded to these items by indicating how frequently they had had these experiences during the preceding month, using separate scales ranging from 1 (*never*) to 5 (*very often*). Reliabilities for the scales were .89 and .90 for the Life Satisfaction and Stress Scales, respectively.

Challenge-seeking. Participants reported how often they had engaged in four potentially challenging activities during the past month: going to an unfamiliar place by themselves, using public transportation, attending a social gathering, and going outside at night, on separate 7-point scales ranging from 1 (*not at all during the past month*) to 7 (*at least once daily during the past month*). These activities were chosen because they have been described as challenging by blind people in autobiographical reports (e.g. Omvig, 2002) and because they could potentially activate stereotypes linking blindness with disorientation or general incompetence. The items were averaged into a challenge-seeking composite (α = .61).

Procedures

Participants completed a questionnaire either via the Internet or, in approximately 4% of cases, by telephone dictation. Participants first completed the subjective well-being measures (Life Satisfaction Scale and Stress Scale). They then completed a series of items assessing their beliefs about blindness, which included the four stereotype threat items. Then they completed the self-integrity scale. Finally, participants completed demographic measures, including the challenge-seeking items and the employment measure. The demographic questionnaire also assessed several potential control variables: gender, age, ethnicity, presence of additional disabilities besides vision loss, age of blindness onset (congenital vs. acquired), degree of vision loss (using a 5-point scale ranging from total blindness to still able to read print letters), and parental education level as an indicator of childhood socioeconomic status. Participants reported the educational level attained by both their father and mother using a 5-point scale ranging from 1 (*some high school*) to 5 (*post-graduate study*) and the education scores for father and mother were averaged into a parental education index (r = .56). After completing all questionnaire items, participants were thanked and debriefed.

Results

Analytic overview. Table 1 presents the zero-order correlations between stereotype threat, self-integrity, unemployment (coded as 1 for unemployed and 0 for all other employment categories), life satisfaction, stress, and challenge-seeking. All correlations were significant ($p < .05$) except the zero-order correlation between threat and challenge-seeking, which was nearly significant ($p = .056$). Consistent with predictions, stereotype threat was negatively related to self-integrity, r (495) = −.24, $p < .01$. Consistent with the posited negative effects of stereotype threat, stereotype threat was associated with higher unemployment, lower life satisfaction, higher stress, and less frequent challenge-seeking. Self-integrity, on the other hand, showed the reverse pattern, with higher self-integrity being associated with lower unemployment, higher life satisfaction, lower stress, and more frequent challenge-seeking.

We first tested the associations between threat and each outcome using separate regression analyses, controlling for several demographic factors that could potentially act as third variables: gender, age, parental education level, ethnicity (White vs. non-White), degree of vision loss, onset of

blindness (congenital vs. acquired), and presence of additional disabilities besides vision loss (yes vs. no). Then, we tested the mediating role of self-integrity using a path model. We predicted that these effects would be mediated through self-integrity.[1]

Unemployment. We hypothesized that stereotype threat would be associated with a greater likelihood of unemployment among blind adults of working age. Of the 457 participants aged 18 to 65 years, 95 (21%) reported being unemployed (i.e., neither employed nor a student nor a stay-at-home parent nor retired). We tested the association between stereotype threat and unemployment odds by performing a logistic regression analysis with unemployment (1 = yes, 0 = no) as the outcome variable and stereotype threat as the predictor variable, controlling for gender, age, ethnicity, parental education, degree of vision loss, timing of blindness onset, and presence of additional disabilities. Stereotype threat emerged as a significant predictor of unemployment, $\Delta\chi^2(457) = 3.86$, $p = .049$, odds ratio (OR) = 1.17, 95% confidence interval (CI) = [1.00, 1.38].

To verify that this effect was robust to the exclusion of students and stay-at-home parents (coded as 0 in the above analysis), we conducted the same analysis after excluding 109 participants who reported being either students, stay-at-home parents, or retirees, so the remaining 348 participants were either employed or unemployed. Stereotype threat was associated with higher unemployment odds (or lower employment odds) in this sample too, $\Delta\chi^2(348) = 5.02$, $p = .025$, OR = 1.21, 95% CI = [1.04, 1.40].

Life satisfaction, stress, and challenge-seeking. Controlling for demographic factors, stereotype threat predicted lower levels of global life satisfaction, $F(1, 490) = 17.66$, $p < .01$, $r^2 = .04$; $b = -.21$, 95% CI = [−.12, −.30]. Threat also predicted higher levels of global perceived stress, $F(1, 490) = 60.53$, $p < .01$, $r^2 = .12$; $b = .15$, 95% CI = [.11, .19]. Finally, higher threat was associated with less frequent challenge-seeking behavior, $F(1, 490) = 4.08$, $p = .044$, $r^2 = .01$; $b = -.07$, 95% CI = [−.14, −.00]. Table 2 presents the predicted values of life satisfaction, stress, and challenge-seeking frequency for people low in threat (1 *SD* below the mean), average in threat (at the mean), and high in threat (1 *SD* above the mean; Aiken & West, 1991).

Self-integrity as a mediator. We have theorized that chronic stereotype threat could depress self-integrity and that in turn, this could contribute to the negative outcomes illustrated above. We tested this prediction using path analyses conducted in Mplus Version 7.11. We began by testing a path model that specified indirect paths between threat and all four outcomes through self-integrity as the mediating variable. Inspection of the standardized residuals showed that, as predicted, there was an additional direct path between threat and stress unrelated to self-integrity, $t = 5.52$, $p < .01$, so we re-specified the model with this direct path between threat and stress included. The final path model is presented in Figure 1. Inclusion of demographic variables did not influence the model fit or the significance level of any direct or indirect effect, so we report the more parsimonious model without these covariates.

Table 2. Study 1 Outcomes by Threat Level.

	Low threat	Average threat	High threat
Unemployment	16%	21%	26%
Life satisfaction	4.96	4.67	4.38
Stress	2.22	2.44	2.66
Challenge	3.15	3.05	2.95

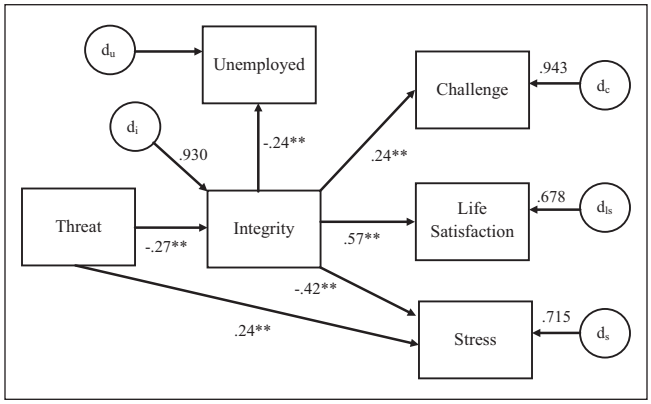

Figure 1. Study 1: A path model of stereotype threat's associations with work achievement, challenge-seeking, and well-being.

The model showed good fit: $\chi^2(3) = 4.65$, $p = .200$; closeness-of-fit index (CFI) = 0.996; root mean square error of approximation (RMSEA) = .034. The model accounted for 5.8% of the variance in unemployment, 5.7% of the variance in challenge-seeking, 7% of the variance in self-integrity, 32.2% of the variance in life satisfaction, and 28.5% of the variance in stress. Figure 1 presents the standardized regression coefficients for all paths in the model. All were significant, *p*s < .01. Coefficients marked with a D represent disturbance (error) variances for each outcome.

We tested the indirect effects of stereotype threat on each outcome, mediated through self-integrity. To do this, we multiplied the unstandardized regression coefficient for the threat-integrity relationship and the unstandardized coefficient for the relationship between self-integrity and each outcome, using the Sobel procedure to estimate standard errors for each effect (Klein, 2010). All indirect effects were significant ($Z = 3.74$, −5.44, 4.09, and −3.83 for unemployment, life satisfaction, stress, and challenge-seeking, respectively; all *p*s < .01). The additional direct effect of threat on stress was also significant, $t = 5.60$, $p < .01$.

We also analyzed the fully identified model which included all direct paths between threat and the outcomes, to determine whether threat had a direct effect on any of the

other outcomes besides stress. No other direct effect of threat reached significance, ts < 1.64, ps > .10. This suggests that self-integrity fully mediated stereotype threat's effects on all outcomes except stress.

Discussion

Stereotype threat is associated with meaningful life outcomes for stigmatized individuals in a naturalistic field setting. To the extent that participants worried about being stereotyped or judged negatively because of their disability, they reported lower levels of self-integrity. They also experienced more stress, less global satisfaction with their lives, engaged in less frequent challenge-seeking, and were more likely to experience unemployment, and such associations were mediated through reductions in self-integrity. This suggests that stereotype threat can promote underachievement in the long term, in part, by motivating people to protect their self-integrity by avoiding stereotype-relevant situations. Under chronic threat, people may defend their self-integrity against further damage by avoiding threatening or evaluative situations, such as interviewing for jobs, which can lead to underperformance. However, this pattern suggests that if self-integrity is bolstered, stereotype threat should exert less of a negative impact on life outcomes.

Importantly, as the findings from Study 1 are correlational, there are multiple causal interpretations of the results. For example, it is possible that blind people who are unemployed due to hiring discrimination are more vigilant to potential threat and stigma, or that unemployment itself depresses self-integrity. Alternatively, third variables could play a role, though we tried to control for some of them. In study 2, we tested whether an experimental manipulation of self-integrity—a values-affirmation—could improve learning and performance outcomes for blind students at a skill-training center.

Study 2: Values-Affirmation and Compensatory Skill Training

To be successful in the world, people with disabilities must often master compensatory skills for accessing information, communicating, and traveling through their environment. For example, blind people must learn to read and write Braille and to walk with a cane or guide dog to be self-sufficient and employable (Dodds, Bailey, Pearson, & Yates, 1991; Omvig, 2002). Though important, mastering these skills can be threatening, because it usually requires tools that publicly present the self as having a disability (e.g., the white cane). Furthermore, like any learning process, compensatory skill training requires repeated practice and involves the potential for temporary failure and frustration (e.g., mis-measuring ingredients while preparing a simple meal). Such struggles could arouse self-as-source stereotype threats (Shapiro & Neuberg, 2007), as students may wonder if their struggles serve as evidence for the accuracy of negative stereotypes about blind people. Such threats could undermine motivation and learning (Nussbaum & Steele, 2007; Taylor & Walton, 2011). However, if self-integrity is affirmed in another domain, experiences of stereotype threat exert less impact on the overall self-concept (G. L. Cohen & Sherman, 2014; Sherman & Hartson, 2011; Sherman et al., 2013). Therefore, after self-affirmation, people are less defensive and better able to persist under threat (G. L. Cohen et al., 2009; Creswell et al., 2005; Martins, Johns, Greenberg, & Schimel, 2006; Sherman et al., 2009; Silverman, Logel, & Cohen, 2013; see G. L. Cohen & Sherman, 2014, for a review).

We hypothesized that blind students in the midst of skill training would show better training progress if their self-integrity was affirmed. To test this, we conducted a randomized, controlled field experiment at a private residential rehabilitation center for blind students. The center provides blind adults with comprehensive training in Braille, assistive technology, cane travel, and daily living skills (home management). The 9-month curriculum is designed for adult students who have either experienced recent sight loss or who did not master these essential skills during childhood (because of gradual sight loss or a lack of educational services). Students take four courses: Braille, computer, home management, and travel.

The residential training program includes challenging learning activities that have the potential to arouse stereotype threat. For example, students are frequently assigned to find their way to a local business that they have not previously visited, using only the business's address. They must rely on their knowledge of the city's layout and also ask directions from bystanders to find their destination non-visually, while using a cane and wearing a prominent blindfold to prevent them from using any residual vision. In another class, students are ultimately required to prepare a complete meal for 50 people by themselves, and in a third class, students may be expected to prepare and format PowerPoint presentations independently. While excellent learning opportunities, these assignments could present the risk of confirming negative stereotypes either in the student's own eyes (self-as-source stereotype threats) or in the eyes of others, such as those being asked for directions (other-as-source stereotype threats; Shapiro & Neuberg, 2007). Furthermore, as completion of training assignments is self-paced, successful progress in the training courses is highly dependent on students' motivation to complete the assigned tasks.

In an intervention modeled after previous field research (G. L. Cohen et al., 2009; Cook et al., 2012; Sherman et al., 2013), students completed either a values-affirmation or a control writing exercise as an assignment for their computer class. One month later, their instructors evaluated their course progress, without being aware of students' condition assignments. We predicted that affirmed students would show better course progress than would control students,

consistent with previous research showing that such values-affirmations can, by bolstering self-integrity, promote the achievement of groups under stereotype threat (G. L. Cohen, Garcia, Apfel, & Master, 2006; G. L. Cohen et al., 2009; Martens, Johns, Greenberg, & Schimel, 2006; Sherman et al., 2013). Such interventions are brief, but can have long-lasting effects if they interrupt a recursive cycle in which poor performance breeds threat, which further worsens performance and motivation (G. L. Cohen & Garcia, 2008; G. L. Cohen et al., 2009; Cook et al., 2012). For example, a student who struggles to prepare a simple meal in the home management class could find the experience threatening and be less motivated to practice cooking outside of class, resulting in poorer skill mastery. The threat experience could also cause stress that "spills over" into other classes (Inzlicht, et al., 2012), distracting the student from exerting full effort in those courses, too. However, values-affirmation could, by bolstering self-integrity, interrupt defensive avoidance responses, so the student remains persistent even after struggling, resulting in a positive learning trajectory. Over time, increased engagement could launch the student into a cycle of adaptive potential that further improves learning and performance (G. L. Cohen & Sherman, 2014). Thus, a values-affirmation could improve progress across courses that sustains itself over time (G. L. Cohen et al., 2009; Sherman et al., 2013).

Method

Participants. We made a great effort to recruit as many participants as possible across 2 years. As a consequence, 80% of the total students enrolled in the center participated. The total sample encompassed 35 adult students (21 women, 14 men). Two participant cohorts took part in consecutive years (*n*s = 19 and 16, respectively). Sample age ranged from 18 to 64 years (M = 27.24, SD = 13.56), with 51% European American, 17% African American, 9% Hispanic/Latino(a), 9% Middle Eastern, and 14% reporting other ethnic backgrounds. All participants were legally blind; 47% reported being blind from birth or before age 2, 29% first became blind in childhood, and 24% became blind in adulthood.

Procedures. Prior to the first cohort's participation, we held several meetings with the center director and course instructors to obtain permission, negotiate timing of the intervention, and develop the intervention materials. We worked with them to adapt the intervention materials used in past values-affirmation research so that they were accessible to blind students. During these preparatory meetings, we thoroughly trained the computer instructors to administer the intervention, which was carefully scripted to maximize both impact and control in the chaotic environment of the center. The importance of this initial preparation for maintaining experimental control cannot be underestimated and it required extensive cooperation and engagement with the program staff.

Approximately 1 month before the intervention, we visited the center to obtain informed consent from students, to administer demographic measures, and to obtain baseline performance measures from instructors (see below). Then, students completed the writing exercises, embedded as a typing assignment in their computer class. Finally, 1 month after the intervention, course instructors provided post-intervention progress evaluations of their students (see below).

Values-affirmation intervention. Each student was randomly assigned to complete either a control or a values-affirmation exercise during their computer class as a class project. We asked instructors to place the exercises in students' electronic course folders. To keep instructors unaware of students' condition assignments, we gave the two exercises arbitrary titles and did not inform the instructors about the research purpose of the exercises or the differences between them. Instructors were asked to distribute the exercises to students' course folders without reading them, and they returned the completed exercises to us without reviewing their content. Instructors circulated the writing exercises to students in the researchers' absence. The writing activity was framed as an ordinary typing assignment, so students were unaware that they were receiving an intervention, a step that helps to lessen any stigmatizing message that assistance might send (Sherman et al., 2009; Sherman et al., 2013; Silverman et al., 2013).

The exercises were adapted for electronic completion from previous research (G. L. Cohen et al., 2006; G. L. Cohen et al., 2009; McQueen & Klein, 2006). Both exercises began by presenting participants with a list of 11 values (e.g., relationships with friends and family, music, religious values). The values-affirmation instructed students to type an X next to the two or three values on the list that were most important to them, and then to "write a few sentences about why these values are very important to you." By contrast, the control exercise instructed students to type an X next to the two or three values that were least important to them, and then to "write a few sentences about why these values would be important to someone else, like another student at the center." At the end of each exercise, students were instructed to review the values they had selected and to state their agreement or disagreement with three items that reinforced the manipulation: "These values have influenced my life [some people]," "I [Some people] try to live up to these values," and "These values are an important part of who I am [important to some people]."

Students were told that the exercise was a typing assignment and that the exercises themselves would not be evaluated. Because the exercises were given as a typing assignment, students were encouraged to type their essays. However, newer students who had not yet mastered basic typing skills were given the option to complete the exercises in Braille or hand-written print if they chose. One student in the control condition completed the exercise in Braille; two

students in the affirmation condition completed the exercises in print; and the remaining students completed the exercises electronically.

Student progress measures. The center does not issue formal grade reports for students. However, instructors informally evaluate their students' progress to provide feedback and to tailor students' instruction to individual strengths and challenges. We believed that instructors' reports would serve as the best gauge of students' progress, especially because instructors and students share a great deal of individualized contact (class sizes at the center range from 2-6 students each).

Before the intervention, the center instructors for each of the four courses students took (Braille, computers, home management, and travel) rated each student's baseline performance using a conventional grading scale (A-F). One month after the intervention, the same instructors completed a questionnaire assessing students' progress over the preceding month. They indicated how much they believed each student's performance in their class had changed during the preceding month on a scale from 1 (*has gotten much worse*) to 4 (*has not changed at all*) to 7 (*has gotten much better*) and how much their students' attitudes toward blindness had changed on a scale from 1 (*has become much more negative*) to 4 (*has not changed at all*) to 7 (*has become much more positive*). As disability acceptance is a stated goal of many rehabilitation programs (Dodds et al., 1991; Dodds & Ferguson, 1994), improvement in attitude toward one's disability was an important indicator of progress. In addition, instructors indicated the grade they would give their students for their cumulative course performance since beginning training, using a conventional grading scale (where A+ = 4.33, A = 4.00, etc.). These three items were standardized to equate their metrics, and then averaged (α = .74). Again, instructors were unaware of the students' condition assignments.

Results and Discussion

There were no differences between conditions on baseline performance, $t < 1$. Cohort proved a significant covariate, as the first cohort received higher progress scores from their instructors than did the second cohort, $t(33) = 2.62$, $p = .013$, so it was controlled in analysis. Baseline performance was also controlled. There was no interaction between either cohort or baseline performance and condition, $Fs < 1$.

As predicted, affirmed students progressed more in their courses overall (adj. $M = .25$) than control students (adj. $M = -.25$), $F(1, 31) = 4.71$, $p = .038$, $d = .64$; $b = .27$, 95% CI = [.02, .52].[2]

In summary, this study provides experimental evidence that a manipulation of self-integrity can improve achievement, complementing the path analyses presented for Study 1. Blind students attending a training center to learn compensatory skills showed better progress in the following month if they had completed a values-affirmation intervention, as evaluated by their condition-blind course instructors. Results were observable 1 month after the affirmation, perhaps because the affirmation helped to counter a recursive cycle between stereotype threat, training setbacks, and disengagement from training (G. L. Cohen et al., 2009).

These results also contribute to a growing body of values-affirmation field research (G. L. Cohen et al., 2009; Miyake et al., 2010; Sherman et al., 2013; Thomaes, Bushman, De Castro, & Reijntjes, 2012). They suggest that affirming important values can benefit people's adjustment to a permanent disability, perhaps by mitigating barriers to adjustment, such as stereotype threat. The results also offer further evidence that self-integrity may mediate the association between stereotype threat and defensive underperformance, as an affirmation of self-integrity allowed students to learn and progress in the face of potential threat.

General Discussion

In two field studies, we examine the consequences of coping with stereotype threat for meaningful life outcomes, and the role of self-integrity in mediating stereotype threat's effects. In Study 1, stereotype threat was associated with reduced challenge-seeking, well-being, and employment in a heterogeneous sample of blind Americans. Path analyses suggest that identity threat can threaten one's sense of self-integrity, or adequacy in the environment, and in turn, this can be associated with avoidance of challenge and lower well-being. In addition to this, a direct relationship between stereotype threat and global stress was observed, consistent with research linking stigma-related concerns with chronic stress and associated health problems (Inzlicht, et al., 2012; Pascoe & Richman, 2009). In Study 2, we tested whether an affirmation of self-integrity could mitigate the impact of stereotype threat in an important learning situation. The intervention benefited blind students' performance in a potentially identity-threatening situation: a skill-training program. The field nature of these samples allowed us to explore less well-examined processes and consequences of stereotype threat in natural settings, complementing previous laboratory research.

On a broad theoretical level, these findings suggest that stereotype threat can contribute to underperformance in the long term by catalyzing defensive avoidance processes. Stereotype threat experiences threaten self-integrity, and people may defend their self-integrity by avoiding future situations that could arouse stereotype threat. This may manifest as academic disengagement or disidentification (Nussbaum & Steele, 2007; Steele, 1997). We suggest that this defensive process could also affect employment and non-academic challenge-seeking. However, affirmations of self-integrity reduce the self-defense motive (Sherman & Cohen, 2006) and can thus mitigate the long-term effects of stereotype threat on achievement.

Our findings also have an important implication for disability research: They suggest that values-affirmations and other means of boosting self-integrity can allow people with disabilities to derive greater benefit from rehabilitation programs. This is consistent with correlational research linking self-worth with positive coping strategies among people with disabilities (Dodds & Ferguson, 1994; Smedema, Catalano, & Ebener, 2010). Our work extends this literature by experimentally bolstering self-integrity through intervention. A brief, timely social-psychological intervention can substantively improve adjustment outcomes for people with disabilities, just as it can for others experiencing chronic identity threat (G. L. Cohen et al., 2009; Sherman & Hartson, 2011; Sherman et al., 2013). Other types of social-psychological interventions may also be beneficial for this population, such as those that encourage people with disabilities to reconstrue their social identity in a positive way, affiliate with other members of their disability ingroup, or participate in social action on behalf of their disability ingroup (Crocker & Major, 1989; Nario-Redmond, Noel, & Fern, 2013). Of course, these social-psychological interventions act as catalysts, not panaceas (Silverman & Cohen, in press; Yeager & Walton, 2011). Thus, they must be accompanied by material and human resources for opportunity and growth, of the sort provided by the rehabilitation center featured in Study 2.

In this work, we conceptualize stereotype threat as a broad construct, encompassing concerns about being judged negatively because of disability (e.g., patronized or held to low expectations) as well as concerns about acting stereotypically ("making blind people look bad"). We acknowledge that people with disabilities likely face distinct types of stereotype threat, just as other stigmatized groups do (Shapiro, 2011; Shapiro & Neuberg, 2007), and that individuals may differ in which type of threat they experience. For example, people who are more identified with their disability may worry more about confirming disability stereotypes, whereas those who are less identified may be more concerned about how they themselves are viewed by others, independent of their ingroup (Shapiro, 2011).

A limitation of the present research is that we did not directly manipulate stereotype threat, so some uncertainty still remains about the causal relations between threat, self-integrity, and outcomes. One alternative explanation is that higher self-integrity causes people to perceive less stereotype threat in the environment, which in turn promotes positive outcomes. Our model is derived from past self-affirmation research, which has generally shown that affirmations of self-integrity weaken the link between threat and outcomes rather than reducing absolute levels of perceived threat (G. L. Cohen et al., 2009; G. L. Cohen & Sherman, 2014; Cook et al., 2012; Sherman et al., 2013). Nonetheless, future experimental research is needed to clarify these causal relations. Furthermore, since stereotype threat was not manipulated in Study 2, values-affirmation could have worked through another mechanism besides mitigating the impact of stereotype threat. For example, the values-affirmation could have reduced training-related stress (Creswell et al., 2005; Sherman et al., 2009). However, we hope that these limitations are somewhat offset by our investigation of a heterogeneous sample of disabled individuals, which is a difficult-to-reach and understudied population in social psychology, and by the test of a theory-driven intervention in a randomized field experiment using meaningful real-world outcomes.

These findings underscore the vital role of the social environment in affecting outcomes for people with disabilities (Smart, 2001; Wright, 1983). In environments characterized by stigmatization, stereotyping, and discrimination, people with disabilities may find themselves stumbling to reach their potential. However, in environments characterized by inclusion and acceptance, where people with disabilities can affirm an image of themselves as a whole, adequate person rather than an individual defined by his or her disability, they can persevere in the face of challenges. Our results suggest that some of the limitations posed by a physical disability are social-psychological rather than physical in their source. Though many impairments cannot be medically eradicated, they can be rendered less threatening—and thus less limiting—through wisely-crafted, timely social-psychological interventions.

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Notes

1. We tested whether the relationships between stereotype threat and each outcome were moderated by degree or onset of vision loss. Neither of these factors interacted with stereotype threat to predict self-integrity, $F < 1$, or any of the outcome measures, all Fs < 2.75, ps $> .098$. It appears that the associations between stereotype threat, self-integrity, and outcomes are relatively constant across the spectrum of blindness.
2. Across the four courses, the ratings of performance improvement, attitude improvement, and course grades loaded on a single factor (all factor loadings $> .7$) suggesting that these three items tapped a single progress construct. However, examining

the reported grades separately, analyses indicate that the intervention had a significant effect on grades in the computer course, $F(1, 31) = 4.45$, $p = .043$, $d = .76$, and in the home management course, $F(1, 31) = 4.40$, $p = .044$, $d = 0.75$, but did not affect grades in the other two courses, Fs < 1. Consequently, the intervention's effect on grades averaged across the four courses was in the predicted direction but was not significant, $F(1, 31) = 2.03$, $p = .16$, $d = .51$. We do not know the reason for this heterogeneity. As noted previously, instructors did not typically assign grades for the course, so the teachers' estimated grades for students may have been anchored on the pre-intervention estimated grade they had provided earlier ($R = .43$, $p < .01$). However, examining the other two progress indices separately, analyses indicate that students were rated across all their courses as showing more positive change during the post-intervention month both in terms of their course performance, $F(1, 31) = 4.29$, $p = .046$, $d = .73$, and in terms of their attitudes toward their disability, $F(1, 31) = 4.84$, $p = .035$, $d = .79$. As the factor analysis suggests, the three performance measures together tap into the same underlying progress construct, and they are best regarded together, with each contributing to a holistic picture of students' progress.

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