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The Importance of Stereotype Threat Mechanisms in Workplace Outcomes

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In the focal article, Kalokerinos, von Hippel, and Zacher (2014) raise the question of whether stereotype threat is a "useful" construct for industrial–organizational (I–O) psychologists. They describe potential applications of stereotype threat beyond performance in high-stakes testing situations and call for more research outside of the laboratory. We agree with the authors that I–O psychologists should increase the breadth of examinations of stereotype threat in workplace contexts. In addition to the potential antecedents and consequences of stereotype threat described in the focal article, we propose that examination of the mechanisms, or mediators, of the stereotype threat process is critical.

Increased attention to these mediators is important for several reasons. First, even with motivation, individuals are unlikely to be able to distort or control these processes.

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Second, such processes may be particularly influential in cases of long term, or chronic, stereotype threat—an area which warrants further research attention (Kalokerinos, von Hippel, & Zacher, 2014). Third, identification of which processes operate under different conditions may reveal important moderators of the stereotype threat processes. Finally, understanding which processes seem to influence outcomes for whom and under what circumstances may lead to effective tailored interventions to prevent negative outcomes (Shapiro, Williams, & Hambarchyan, 2013).

In this response, we focus on some of the key potential mediators discussed in the literature including working memory capacity, physiological arousal or stress, vigilance processes, and thought/emotion suppression. We describe potential effects on human performance and beyond and why I–O practitioners should be concerned. Further, because evidence suggests these mediators cannot always be accurately self-reported, we briefly describe the non-self report measures that others have used to assess these constructs. Expanding our toolbox to include more cognitive and physiological measurements will help I–O psychologists more effectively investigate stereotype threat effects.

Working Memory Capacity

Schmader, Johns, and Forbes (2008) argue that stereotype threat affects performance via decreases in working memory capacity. Working memory seems to be a function located primarily in the prefrontal cortex that is responsible for directing attention toward goal-relevant stimuli and inhibiting competing information (Engle, 2002). Further, working memory capacity is thought to be limited, such that it is a finite resource that can be depleted. The types of tasks primarily examined in stereotype threat research (e.g., difficult cognitive tests) tax working memory capacity, and the added presence of stereotype threat seems to represent an additional drain on this resource, thereby exceeding working memory capacity and producing performance decrements for those under stereotype threat.

Three key mechanisms may account for stereotype threat effects on working memory capacity, including (a) physiological stress response, (b) vigilance, and (c) thought/emotion suppression. These basic processes have largely been tested in lab settings with college students; however, we anticipate that such basic psychological processes will apply across a broad range of contexts so long as threat cues are present. Further, these mechanisms may affect behaviors beyond test performance, including attention and focus, physical health, health behaviors, intergroup interactions, organizational citizenship behaviors, counterproductive work behaviors, and any other behavior which requires working memory capacity or vigilance.

Physiological Stress Response

When under stereotype threat, individuals experience physiological arousal associated with stress, which can take the form of either a threat response or challenge response (Blascovich & Tomaka, 1996). When individuals appraise their resources as meeting or exceeding environmental demands, they display a physiological "challenge" response in which the stressor is seen as an obstacle that can be overcome. In contrast, when individuals appraise their resources as insufficient for meeting the demands of the environment, they display a physiological "threat" response (Seery, 2011). A threat response is a maladaptive response in which the body tenses, through vascular constriction, but cardiac output, or blood flow, does not increase to allow individuals to deal with the threat. Essentially the cardiovascular system works against itself by increasing pressure but not increasing blood flow, which causes cumulative stress and "allostatic load" or "wear and tear" on the body (McEwen, 2000). This can result in an inability to cope with the threat and long-term damage when chronic stressors are experienced. Even

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in the short term, threat arousal impairs prefrontal cortex processing, thus impairing working memory capacity. It is the threat response, and not the challenge response, that seems to associate with performance decrements (Blascovich, Spencer, Quinn, & Steele, 2001; Schmader et al., 2008). When stereotype threat is experienced chronically and creates a physiological threat response, it negatively affects cardiovascular health, which affects organizations' bottom line via employee sick days, absenteeism, turnover, and higher health care costs (James, Lovato, & Khoo, 1994; see Williams & Mohammed, 2009). Understanding that employees experiencing stereotype threat can take a physiological threat or challenge route, and that not all stereotype threat results in performance decrements because of these mediating processes, may explain some of the "inconsistent" findings discussed in the focal article. This variability of responses also points to potentially effective interventions, such as framing tasks as challenges rather than threats (Alter, Aronson, Darley, Rodriguez, & Ruble, 2010) or providing individuals with the opportunity to affirm their self-worth or their social group's worth (Derks, Scheepers, van Laar, & Ellemers, 2011).

Related to the challenge/threat distinction is approach/avoidance goals and regulatory fit. For example, Brodish and Devine (2009) found that performance-avoidance goals mediated the effect of stereotype threat on women's math performance. Others have suggested that regulatory fit, or the match between regulatory focus and task structure, seems to moderate stereotype threat effects (see Crowe & Higgins, 1997 for a discussion of regulatory focus). Chalabaev and colleagues found that inducing stereotype threat led to higher performance when a performance-avoidance goal was also induced (Chalabaev, Major, Sarrazin, & Cury, 2012). Similarly, Grimm, Markman, Maddox, and Baldwin (2009) found that stereotype threat effects occurred when individuals with a prevention focus worked on tasks with either an explicit or implicit gains reward structure but not when the task had a losses-based reward structure. Thus, the explicit or implicit task reward structures of in-lab and external tasks may be an important moderator to consider.

It is important to note that the physiological arousal associated with threat, as opposed to challenge, cannot necessarily be self-reported by research participants (Seery, 2011). Instead, physiological measures seem to more accurately assess these responses. Measures such as heart rate variability, blood pressure, skin conductance, and neuroendocrine responses such as cortisol secretion may be more effectively used to assess threat arousal (e.g., Blascovich et al., 2001; Etgen & Rosen, 1993; Harmon-Jones, Brehm, Greenberg, Simon, & Nelson, 1996; Losch & Cacioppo, 1990; Mendes, Blascovich, Lickel, & Hunter, 2002; Townsend, Major, Gangi, & Mendes, 2011).

Vigilance

The second key mechanism that links stereotype threat to lower performance and other negative outcomes is vigilance. When under stereotype threat, individuals seem to search for information that could either confirm or disconfirm their stereotyped status, and this seems to make individuals more sensitive to cues that indicate potential failure. Vigilance may increase both in regard to external cues (e.g., performance or social feedback) and internal states (e.g., high levels of anxiety; Schmader et al., 2008). Thus, individuals seem to allocate more attention both to cues that indicate the presence of the stereotype threat and cues that indicate their ability to cope with the threat. Vigilance to potentially threatening cues in the environment can trigger stereotype threat and associated negative outcomes (Inzlicht, Aronson, & Mendoza-Denton, 2009).

In addition, stereotyped group members vary in their awareness of environmental cues that indicate that their devalued social identity may put them at a disadvantage (Inzlicht et al., 2009). People who are high in what is called "stigma consciousness"

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(Pinel, 1999) hold suspicions that they will be discriminated against, and they act cautious and uncertain in situations where their stigmatized status is salient (e.g., being the only woman in a group of men). Furthermore, these individuals may be more likely to perceive ambiguous situations as discriminatory, thus affecting their job satisfaction, engagement, and other attitudes (Holleran, Whitehead, Schmader, & Mehl, 2011; Williams & Mohammed, 2009).

Regardless of whether vigilance is induced by the situation or more trait like, vigilance is mentally and physically taxing. Because the direction and inhibition of attention in vigilance processes tax working memory, performance on a wide variety of cognitive tasks becomes impaired and attention is diverted from the task at hand to continue engaging in self- and situation monitoring. Thus employees may appear distracted and unfocused and perform poorly on tasks because they are in a high state of vigilance (Mrazek et al., 2011).

Furthermore, vigilance is stressful—chronic vigilance has also been associated with higher cortisol levels except in specific contexts (Townsend et al., 2011). Interpersonally, employees with increased vigilance may be more likely to perceive workplace interactions as stereotype-related, which may negatively affect relationships with coworkers (Pinel, 2002). Further, research suggests that individuals with greater threat vigilance more accurately perceived cues indicating hostility and showed increased reactivity to that hostility, thereby creating a cycle of increasing interpersonal hostility (Kraus, Horberg, Goetz, & Keltner, 2011). Vigilance is also associated with increased attention to any cues that might indicate goal failure (Amodio et al., 2004; Forbes, Schmader, & Allen, 2008). This increased attention to potential errors may have negative implications for employee self-efficacy, motivation, and turnover.

Like the challenge/threat response, vigilance processes may operate automatically and subconsciously and may therefore be inaccessible to self-report. However, event-related potential (ERP) and functional imaging techniques have been used to identify such processes (e.g., Amodio et al., 2004; Forbes et al., 2008; Gehring, Goss, Coles, Meyer, & Donchin, 1993; Johns, Inzlicht, & Schmader, 2008; Mangels, Good, Whiteman, Maniscalco, & Dweck, 2012). Furthermore, dot-probe tasks in which participants are required to direct attention either toward or away from threat-related stimuli can be used to assess threat vigilance (Johns et al., 2008; Mogg, Bradley, de Bono, & Painter, 1997). The degree to which response times are longer when participants are required to direct attention away from threat-relevant stimuli indicates the degree to which participants are threat vigilant.

Thought and Emotion Suppression

The third mechanism that seems to explain stereotype threat's effect on performance and other outcomes is thought and emotion suppression. Because of their desire to perform well, individuals attempt to suppress unwanted thoughts or emotions (e.g., stereotypes or anxiety) in performance contexts. Thought suppression is known to tax working memory capacity, and because of this, it may ironically *increase* the accessibility of stereotype-relevant thoughts (Wheeler & Petty, 2001). Individuals may also experience stereotype rebound following suppression attempts (MacRae, Bodenhausen, Milne, & Wheeler, 1996). This suggests that even if individuals are able to suppress stereotype threat effects in the short term (e.g., during a high-stakes assessment), they may exhibit increased stereotypical behavior following the assessment. Such effects were found by Logel and colleagues, who found stereotype rebound for women following a math test and who also provide suggested strategies for reducing such effects (Logel, Iserman, Davies, Quinn, & Spencer, 2009).

Similar to the other processes, research attempting to measure thought suppression using self-reports has produced mixed results (cf., Wheeler & Petty, 2001). It is possible that individuals are unable to

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report suppression of unwanted thoughts when such suppression was effective. Alternatively, people seem to have a tendency to deny experiencing threat, so self-report responses might be intentionally distorted (von Hippel et al., 2005). However, functional neuroimaging has supported the role of the prefrontal cortex in thought suppression (Mitchell et al., 2007), and attempts to suppress attention to anxiety-related words have also been found on a dot-probe task (Johns et al., 2008).

Across four studies, Johns et al. (2008) provided evidence that individuals under stereotype threat suppress their expression of anxiety and that this suppression is associated with performance decrements on cognitive ability tests. An intervention focused on cognitive reappraisals of anxiety moderated the effects, suggesting that reappraisals may be an effective tool that I–O psychologists might leverage in interventions.

Effects of thought and emotion suppression may also be evident beyond test performance. The cognitive load induced by thought or emotion suppression may deplete individuals' self-regulatory capacity. If individuals have lower self-regulation when under stereotype threat, they may be more likely to give up on difficult tasks more quickly (Inzlicht, McKay, & Aronson, 2006), which has clear implications for work performance. Decreased self-regulation can also lead to engaging in riskier behavior, such as increased risky decisions. Increased impulsive behavior in the workplace, such as counterproductive work behavior or impulsive quitting, may also result.

Conclusion

In summary, stereotype threat triggers a chain of cognitive, affective, and physiological processes that can impair not only performance but other behaviors relevant to the workplace. We believe that the question of how "useful" the stereotype threat construct might be cannot be answered without accounting for the physiological and psychological processes that mediate stereotype threat effects on outcomes. Incorporating these mediators is likely to reveal information about which workplace behaviors might be most affected by stereotype threat, what moderators of the processes may exist, and how to best target interventions to reduce stereotype threat effects.

In order to do so, I–O psychologists may need to increase their use of cognitive and physiological assessments, as many of these processes may operate at subconscious levels and be inaccessible to self-report measures. The need for greater integration of such measures is perhaps another argument for increased application of stereotype threat research beyond high-stakes testing scenarios. Although the application of techniques such as ERP or blood pressure monitoring may be considered invasive in a high-stakes testing situation, it may be perceived as more acceptable and even interesting in other contexts. Taking a more holistic picture of how stereotype threat affects individuals on a broader scale shows clear implications for workplace outcomes, such as psychological well-being and physical health. These effects on individuals can be costly to organizations through outcomes such as higher turnover, absenteeism, and higher healthcare costs. Thus, increased attention to stereotype threat processes in organizations may yield gains for both employees and organizations across a broad array of metrics. Although the question of stereotype threat's utility in organizations is an empirical one, we hope that I–O psychologists will increase their attention to examining stereotype threat, and its mechanisms, in the workplace.

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