

## **Stereotype Inoculation: An Elegant and Practical Model**

**Crystal Tse**

*Department of Psychology, University of Waterloo, Waterloo, Ontario, Canada*

**Christine Logel**

*Renison University College, University of Waterloo, Waterloo, Ontario, Canada*

**Steven J. Spencer**

*Department of Psychology, University of Waterloo, Waterloo, Ontario, Canada*

Nilanjana Dasgupta's stereotype inoculation model brings together important theorizing about identity, belonging, and achievement to propose that ingroup members can be a "social vaccine" from the negative consequences of stereotypes and other cues of non-belonging. We review highlights of the model, briefly describe two lines of new research that are consistent with it, and then pose questions that may help set boundary conditions for when the model will best predict behavior.

One exciting aspect of Dasgupta's stereotype inoculation model is her recognition of the classic social psychological insight that just because people feel they made a choice does not mean that this choice was truly unconstrained. As research in the forced compliance dissonance paradigm has demonstrated (Festinger & Carlsmith, 1959), when people believe they have freely chosen a course of action (even if it was essentially coerced), they expend considerable effort rationalizing it. As Dasgupta argues, women may well be constrained in their "choice" to abandon STEM fields, but because their action feels freely chosen, they may spend substantial effort rationalizing it. It seems probable that social forces restrict women's choices in ways that they do not recognize.

It is noteworthy that Dasgupta integrates the role of social belonging into her model by proposing that ingroup peers and experts create environments that foster social belonging. In this way, Dasgupta's research builds on the important work of Walton and Cohen that demonstrates that the achievement of minorities and women in science is enhanced when members of these groups feel they belong in the social environment (Walton & Cohen, 2007, 2011). Thus, social belonging is more than a process through which ingroup peers and experts affect minorities and women in math and science; rather, it is the crucial psychological state that allows these groups to succeed and leads to positive changes in self-efficacy, increased challenge, and decreased threat.

The stereotype inoculation model brings together social belonging research with theorizing on social

identity. It argues that identification with ingroup peers and experts moderates the degree to which these group members foster a sense of belonging—those who are highly identified with their group gain more from successful ingroup peers and experts than those who are less identified. This raises an interesting question: Does such identification always increase feelings of belonging and enhance achievement? What if there are many ingroup peers in the environment, but they are performing poorly and feeling like they don't fit in? In such a situation, identification with ingroup peers is likely to reduce belonging and undermine achievement. Indeed, we reason that the potency of ingroup experts and peers as an inoculation against stereotyping will depend at least to some extent on their success in the environment. If a woman in engineering, for example, repeatedly sees female professors denied tenure and their fellow female engineering students failing out of school, then these ingroup experts and peers are unlikely to provide a powerful inoculation against stereotyping. Thus, underperforming ingroup members may have a negative influence in some situations.

But what is the role of outgroup members in shaping the impact of ingroup experts and peers? It seems likely that outgroup members will also have a potent effect in shaping the environment and, consequently, the sense of belonging that women and minorities experience in it. Indeed, research has demonstrated that the sexism of women's male peers is a source of stereotype threat that leads to women's underachievement in STEM fields (Logel et al., 2009). Given these findings, one might expect that how outgroup members treat ingroup experts and peers may have a crucial role in the degree to which they provide inoculation against stereotyping and feelings of nonbelonging. If outgroup members treat ingroup experts and peers with respect and acceptance, then they ought to be a more effective source of inoculation against stereotypes than if they are treated with disrespect and derision.

In situations when ingroup members are successful and outgroup members do not behave in a way that undermines them, will inoculation in one environment

transfer to other environments in which there are fewer ingroup experts and peers? The answer to this question is important because it tests the limits of the analogy to an inoculation provided by ingroup experts and peers. When people are vaccinated against polio in a doctor's office, they will be protected from polio wherever they go in the world. Is the same true for the experience of being surrounded by ingroup experts and peers? If a woman attends an all-female college, will she be protected when she goes to graduate school in a field dominated by men? We hope that ingroup experts and peers will provide this sort of inoculation, and evidence is needed to test this strong and important claim.

The stereotype inoculation model begins to identify the psychological moderators and mediators of the effect of ingroup peers and experts, but important questions remain about these variables. In particular, how are these variables related? For example, how is social identity, a moderator of stereotype inoculation related to a sense of belonging, a mediator of stereotype inoculation effects? It is clear that social identity and a sense of belonging will often be related—having a strong social identity will facilitate a sense of belonging. Yet at times people who are highly identified with their group may have formed few strong bonds with other members of their group in that environment, and some people might have formed many strong bonds to other ingroup members but not be particularly identified with their group. For example, a female engineer might have many close friendships with other female engineers but might not feel very identified with women in general or female engineers specifically, or vice versa. Is social identity a moderator of the effect of ingroup peers and experts through its influence on a sense of belonging, or does social identity operate through some other mechanism?

We also suspect that other mechanisms for the effect of ingroup experts and peers will emerge, and we discuss one such possible mechanism later. Like research on stereotype threat has shown (i.e., Schmader, Johns, & Forbes, 2008), achievement effects occur through a number of psychological processes. We hope that in future research, more mechanisms will be explored and the context in which these mechanisms are most and least potent will be examined.

Clearly, the stereotype inoculation model generates fascinating questions to stimulate future research. It is also consistent with new research from our own laboratories. Dasgupta presents evidence from intervention studies that show that the presence of ingroup experts and peers can increase people's achievement. In our own new data, it is the *control condition* of an intervention study that parallels these findings. Together with our colleagues (Walton, Logel, Peach, Spencer, & Zanna, 2011), we developed an intervention in which 1st-year engineering students watched a presentation by upper-year students describing how at first they felt

they did not belong in the engineering program but in time they came to see how they did belong. Crucial for the stereotype inoculation model, some of these upper-year students were women and some were men, allowing women watching the presentation to reattribute negative experiences as common in the outgroup as well, and not as an indication of their nonbelonging. The intervention had a strong positive effect for women in engineering majors in which they were substantially underrepresented (i.e., less than 20% of the students). In the conditions in which they received no intervention, women did substantially worse than men (i.e., a full letter grade lower in grade point average). In the treatment conditions, however, they did just as well as men. Particularly relevant to the stereotype inoculation model, in engineering majors with higher representation of women (i.e., with more than 20% of the students being in the ingroup) no underperformance was evident even in the control (i.e., nontreatment) conditions. This suggests that women in majors with more ingroup members were inoculated against belonging concerns, and thus had little need for an intervention.

Our research also suggests another possible mechanism for stereotype inoculation effect. The improvement in students' grades in our intervention could be explained by increases in their implicit assessment of the environment in their engineering program. Specifically, we found that ingroup members' implicit associations between what "most people like" and "female engineers" accounted for the effect of the belonging intervention on grades (Logel, 2010). Thus the effect of the belonging intervention seems to be rather subtle and creates implicit norms (Yoshida, Peach, Zanna, & Spencer, in press) that ingroup members belong in the environment.

Based on these findings, it is plausible in our view that ingroup experts and peers might also promote an environment in which implicit norms about the ingroup are more positive and these implicit norms may account for at least some of the positive effect of such ingroup members.

In sum, the stereotype inoculation model brings together key theories to make a compelling argument that ingroup experts and peers can provide a social vaccine against stereotyping and other threats to feelings of belonging. It generates interesting questions for future research and is highly consistent with emerging research. Furthermore, Dasgupta identifies clear ways in which the model can have practical implications, such as informing social policies that encourage diversity in school and in the workplace, increasing the hiring of groups of underrepresented individuals to increase a sense of community and belonging, and instituting peer mentoring programs. We are especially impressed by the intervention studies that provide strong evidence that the presence of ingroup experts and peers can increase ingroup members' achievement and retention in

the fields in which they are underrepresented. In this way, the stereotype inoculation model is a great example of Lewin's dictum that there is nothing as practical as a good theory.

### Note

Address correspondence to Steven J. Spencer, Department of Psychology, University of Waterloo, 200 University Avenue West, Waterloo, Ontario, N2L 3G1 Canada. E-mail: sspencer@uwaterloo.ca

### References

- Festinger, L., & Carlsmith, J. M. (1959). Cognitive consequences of forced compliance. *Journal of Abnormal and Social Psychology, 58*, 203–210.
- Logel, C., Walton, G. M., Spencer, S. J., Iserman, E. C., von Hippel, W., & Bell, A. (2009). Interacting with sexist men triggers social identity threat among female engineers. *Journal of Personality and Social Psychology, 96*, 1089–1103.
- Logel, C., Walton, G. M., Peach, J., Spencer, S. J., & Zanna, M. P. (2010, June). *An intervention to improve women's grades in masculine engineering domains*. Paper presented at the 8th biennial convention of the Society for the Psychological Study of Social Issues, New Orleans, LA.
- Schmader, T., Johns, M., & Forbes, C. (2008). An integrated process model of stereotype threat effects on performance. *Psychological Review, 115*, 336–356.
- Walton, G. M., & Cohen, G. L. (2007). A question of belonging: Race, social fit, and achievement. *Journal of Personality and Social Psychology, 92*, 82–96.
- Walton, G. M., & Cohen, G. L. (2011). A brief social-belonging intervention improves academic and health outcomes of minority students. *Science, 331*, 1447–1451.
- Walton, G. M., Logel, C., Peach, J. M., Spencer, S. J., & Zanna, M. P. (2011). *An intervention to restore the performance of women in engineering programs*. Manuscript in preparation, Stanford University, Stanford, CA.
- Yoshida, E., Peach, J. M., Zanna, M. P., & Spencer, S. J. (in press). Not all automatic associations are created equal: How implicit normative evaluations are distinct from implicit attitudes and uniquely predict meaningful behavior. *Journal of Experimental Social Psychology*.

Copyright of Psychological Inquiry is the property of Taylor & Francis Ltd and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.