

EFFECT OF SELF-EFFICACY IN STEREOTYPE ACTIVATION

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We examined whether or not self-efficacy plays a role in stereotype-activation effect. We found in Study 1 ($N = 46$) that compared to being primed with the stereotype of an occupation that required less mental effort (cleaner), participants primed with the stereotype of a highly qualified information technology expert performed better in a general knowledge test. Self-efficacy reliably mediated the effect of stereotype activation on test performance. In Study 2 ($N = 46$) we found that the group primed with the stereotype of an athlete exhibited greater endurance in a physical test than did those who were primed with the stereotype of a homeless person. These results show that self-efficacy beliefs acted as a mediator in the behavior of the participants.

Keywords: stereotype, stereotype activation, self, self-efficacy, self-efficacy beliefs.

Stereotype activation refers to the increased accessibility of the collection of attributes that are believed to feature in members of a specific social category (Wheeler & Petty, 2001). As results in previous research have shown, when a

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stereotype is activated, it influences subsequent behavior in a consistent way. For example, some people associate the category *older* with the attribute *sluggish* (Barber, Mather, & Gatz, 2015), and *females* with *gentle* and *not so good at mathematics* (Master, Cheryan, & Meltzoff, 2014). Activated stereotype contents are not always negative; they can also be positive. For instance, professors are often stereotyped as competent people, and athletes are regarded as having abundant power. Some studies indicate that activating positive stereotypes of older adults can also improve older individuals' memory subliminally (Levy, 1996). In another study, participants showed more helping behavior after the stereotype of a superhero was activated (Nelson & Norton, 2005).

Wheeler and DeMarree (2009) suggested that there are multiple mechanisms of stereotype-activation effect, including direct activation of goal, and biases in situation perception, self-perception, and person perception. In addition, in the ideomotor theory it is suggested that stereotype activation can evoke corresponding behavior automatically, just like a simple conditioned reflex of the brain (Herbort & Butz, 2012). For instance, once a perceiver thinks of professors, which can activate positive stereotypes, that individual's general knowledge test scores will be improved, whether or not the individual himself or herself is a professor. In the ideomotor theory a direct explanation is provided for the perception and the behavior. However, the change in behavior may involve a more complex process, which should be explained beyond the relationship between action and perception (Shin, Proctor, & Capaldi, 2010).

The self may play an important role between stereotype activation and subsequent behavior (Wheeler, DeMarree, & Petty, 2014; Wyer, Neilens, Perfect, & Mazzoni, 2011). According to the theory of active-self account (Wheeler, DeMarree, & Petty, 2007), self-concept is considered a moderating variable between stereotype activation and behavior. They suggested that when a given stereotype was activated, it would potentially influence the perceivers' self-representation and then this would lead to behavior consistent with this representation. The concept of active-self account has been supported by findings in some recent studies (Di Bella & Crisp, 2015; Schröder & Thagard, 2013). Participants who were primed with a stereotype under the condition of self- (but not other-) focus showed more prime-to-behavior effects (Wyer, Mazzoni, Perfect, Calvini, & Neilens, 2010). For instance, participants who were activated with an old-age stereotype walked more slowly and were forgetful more consistently than were control group members. Tellingly, these differences were mediated by the extent to which the participants attributed stereotypic traits to themselves (Wyer et al., 2011).

Hansen and Wänke (2009) found that participants who were activated with the stereotype of professor showed greater self-efficacy beliefs and performed better than did a control group who were primed with an occupation for which less mental effort was required. Thus we assumed that self-efficacy, as an important

part of self-concept, might be a mediator between stereotype activation and behavior. Activating a positive stereotype might enhance self-efficacy, which would result in a better performance by the individual. Self-efficacy plays an important role in helping people to face challenging situations, because it affects objectives, thinking mode, perseverance, and reactions to stress (Bandura, 1977).

In order to establish what role self-efficacy has in stereotype-activation, we conducted two related studies, according to the method used by Hansen and Wänke (2009). In Experiment 1, we explored whether or not—and if so, how—self-efficacy influenced the stereotype-activation effect. In order to find out whether or not self-efficacy would act as a mediator across situations, in Study 2 we tested the mediation of self-efficacy in another situation by priming the stereotypes of athlete versus homeless person, using endurance in a physical exercise as our main dependent variable.

Study 1

Method

Participants. We recruited 46 undergraduates (23 men, 23 women) between the ages of 19 and 27 years ($M = 22.8$ years, $SD = 2.8$) from a public elective course at a university in China. All participants received a notebook valued at US\$2 as compensation.

Materials. We randomly selected 82 college students (none of these people took part in the formal experiment) and asked them to write down five occupations that need a high intelligence quotient and five occupations that barely need any mental work. Through the frequency statistics, we selected highly qualified information technology (IT) expert and cleaner as the occupational stereotypes to be used in our priming manipulation for the formal experiment.

In consideration of the cultural and educational background of the participants in our study, we used the general knowledge test that is widely used in the State Civil Service Examination in China. We randomly recruited 20 volunteers to answer the general knowledge test set in the State Civil Service Examination in 2009, and we then selected for use 16 items from that test for which the accuracy of answers of the volunteer group was between 30% and 60%.

Procedure. Participants were randomly assigned to one of the two experimental conditions, either the stereotype of the IT expert or the cleaner. In our priming manipulation, participants were told that they would take part in a survey of occupational stereotypes. Then they were given five minutes to write down typical behaviors and personality characteristics of IT experts or cleaners. The second part of the study was introduced as another study of self-assessment. All the participants completed the general knowledge test. Then participants completed a self-efficacy measure rated on a 5-point scale (e.g., How good is your general knowledge? 1 = *very unconfident*, 5 = *very confident*). None of the

participants identified the real purpose of the study. The procedure lasted about 30 minutes.

Data analysis. First, using SPSS18, we performed an independent t test to assess the participants' accuracy in the general knowledge test and the score of the self-efficacy scale. Then we used the pairwise correlation of self-efficacy, the accuracy in the general knowledge test, and stereotype activation to obtain a correlation matrix. Finally, following the procedure recommended by Baron and Kenny (1986), we tested the mediating effect of self-efficacy.

Results

Participants in the IT expert group performed significantly better than did those in the cleaner group both in their accuracy in the general knowledge test, $M_{IT} = 0.68$, $SD = 0.19$; $M_{cleaner} = 62.25$, $SD = 50.94$; $t(44) = 3.38$, $p < .01$, and for their self-efficacy score, $M_{IT} = 4.03$, $SD = 0.41$; $M_{cleaner} = 3.64$, $SD = 0.60$; $t(44) = 2.55$, $p < .05$.

The results for the mediating effect of self-efficacy are shown in Table 1. The results of the t test between the pairwise correlations were statistically significant, which means that the mediating effect of self-efficacy in the general knowledge test was established. The standardized regression coefficient of self-efficacy to the score for the general knowledge test had declined from .454 to .256 after self-efficacy was introduced as a mediator, which indicated the mediating effect was partial and made up $0.359 \times 0.552 / 0.454 = 43.65\%$ of the total effect.

Table 1. *Mediating Effect of Self-Efficacy Between Stereotype Activation and Score for General Knowledge Test*

	Regression equation	Regression coefficients test	
Step 1	$Y = -0.454X$	$SE = 0.047$	$t = 3.381^{**}$
Step 2	$M = -0.359X$	$SE = 0.152$	$t = 2.552^*$
Step 3	$Y = 0.552M$ $-0.256X$	$SE = 0.038$ $SE = 0.042$	$t = 4.648^{**}$ $t = 2.154^*$

Note. * $p < .05$, ** $p < .01$.

Study 2

The results of Study 1 demonstrated that self-efficacy mediated the effect of stereotype activation on the behavior of the participants. With the aim of further establishing the external validity of these results, we primed the stereotype of an athlete (associated with high endurance) versus a homeless person (associated with low endurance) and recorded the length of time that participants squeezed a ball in a handgrip, to examine whether or not the mediating effect of self-efficacy would exist across situations.

Method

Participants. We recruited 46 undergraduates (22 men, 24 women) between the ages of 19 and 25 years ($M = 23.1$ years, $SD = 2.3$) from a public elective course at a university in China. All participants received a notebook valued at US\$2 for compensation. They were randomly and equally assigned to one of the two priming conditions (athlete vs. homeless person).

Materials. The materials we used were calibrated hand grips that are commonly used for physical exercise, a stopwatch accurate to 10 ms, and small soft sponge balls of 0.8 cm diameter. We adopted the self-efficacy and intention scale developed by Luszczynska, Mazurkiewicz, Ziegelmann, and Schwarzer (2007). In the present study, Cronbach's $\alpha = .796$.

Procedure. The participants were informed that they would take part in two studies, the first about stereotypes, and the second about self-assessment and endurance. In order to control individual differences, their endurance was measured before and after the formal experiment. In the endurance measure, participants were told to take hold of a hand grip in their dominant hand. A sponge ball was inserted between the two handles as they squeezed them together. The experimenter recorded the time between when the ball was inserted between the handles and when it fell out (Martijn et al., 2007).

A week after the first endurance measure, participants were invited to take part in the second stage of the experiment. First they were asked to describe typical behaviors and personality characteristics of either an athlete or a homeless person and given 5 minutes to do this. After that, their endurance was measured again with the same test that had been used the previous week. Finally, they were invited to another laboratory to complete the self-efficacy and intention scale. Participants were tested individually in a separate room, and none of them correctly identified the purpose of the study. The procedure took 25 minutes.

Data analysis. Using SPSS 16, we performed a t test with the data obtained from the two groups in both the pretest and posttest. Similarly to the procedure used in Study 1, we tested the mediating effect of self-efficacy following the procedure recommended by Baron and Kenny (1986).

Results

The two groups did not differ in initial handgrip endurance, $M_{\text{athlete}} = 69.68$, $SD = 65.15$; $M_{\text{homeless}} = 62.25$, $SD = 50.94$; $t(44) = 0.431$, $p = .67$. A main effect of stereotype activation was significant, $M_{\text{athlete}} = 14.14$, $SD = 11.9$; $M_{\text{homeless}} = -5$, $SD = 10.7$; $t(44) = 5.94$, $p < .01$. In the group primed with the athlete stereotype, the results in the posttest were significantly better than those in the pretest, $M_{\text{pretest}} = 69.68$, $SD = 65.15$; $M_{\text{posttest}} = 83.82$, $SD = 66.67$; $t(22) = -5.72$, $p < .01$, but there was no significant difference between the results for the two tests in the group primed with the homeless person stereotype, $M_{\text{pretest}} = 62.24$, $SD = 50.94$; $M_{\text{posttest}} = 58.72$, $SD = 48.87$; $t(22) = -1.29$, $p > .05$.

The mediating effect of endurance self-efficacy was established (Table 2). The standardized regression coefficient of stereotype activation to endurance test performance declined from .667 to .376 after self-efficacy was introduced, which indicated self-efficacy was a partial mediator and its mediating effect made up $0.7 \times 0.47 / 0.667 = 49.33\%$ of the total effect.

Table 2. *Mediating Effect of Self-Efficacy Between Stereotype Activation and Endurance*

	Regression equation	Regression coefficients test	
Step 1	$Y = -0.667X$	$SE = 3.331$	$t = -5.94^{**}$
Step 2	$M = -0.7X$	$SE = 0.757$	$t = 6.49^{**}$
Step 3	$Y = -0.47M$ $-0.376X$	$SE = 0.615$ $SE = 4.322$	$t = 2.86^{**}$ $t = -2.59^{**}$

Note. $^{**} p < .01$.

Discussion

We confirmed that activating the stereotype of a given occupation affected individuals' self-efficacy, which mediated the stereotype-activation effects on the behavior of those individuals. The results we obtained in Study 1 show that participants primed with the stereotype of an IT expert outperform participants primed with the stereotype of a cleaner in a general knowledge test, and the participants' self-efficacy beliefs mediated the stereotype activation and their general knowledge test performance. The findings in Study 2 extend those in the first study by showing that self-efficacy beliefs acted as a mediator between stereotype activation and endurance performance. The individuals with high self-efficacy had greater access to the target, which, in turn, improved their endurance. Results showed that there was a similar mediating effect of self-efficacy under two different scenarios.

Hansen and Wänke (2009) were the first to prove that self was a regulator of stereotype-activation effect on an individual's behavior, which is consistent with our findings. Our results can be explained by the active-self account (Wheeler et al., 2007); self plays a significant role in affecting prime-to-behavior effects. When a stereotype is activated, it can influence people's behavior by temporarily converting the activated self-concept. In a longitudinal study, Stout, Dasgupta, Hunsinger, and McManus (2011) found that women who were primed with the image of female expertise, and who internalized this to their self-concept, then performed better in the fields of science and engineering. In the current study, when participants were primed with the stereotypes of IT expert or athlete, the relevant perceptual representations would be elicited and internalized to the participants' self-concept, which increased their self-efficacy and their motivation to improve their performance.

This raises the question of why greater self-efficacy leads to better performance. Previous studies indicate that self-efficacy positively correlates with the self-determination motivation, making goals easier to achieve and improving the results of the behavior (Brown, 2014). In our study, we asked participants about their feelings after the experiment. Some of them said they were inspired by the combatant spirit and endurance of athletes, so that they were motivated and felt they could perform the task. From this perspective, stereotype activation does not directly influence people's behavior. It affects an individual's self-efficacy and motivation, both of which moderate behavior.

The results of our studies showed that stereotypes can affect self, and also further confirmed the role of stereotype activation in self-efficacy. We evaluated participants' self-confidence to measure their self-efficacy and examined the mediating effect of self-efficacy on stereotype activation and behavior. These methods may have limitations that may have resulted in the differences between the experiments. As Bandura (1977) pointed out, an effective measure of self-efficacy should be developed according to the research field, and it is important to carry out a careful analysis of related functions in that field. In our study, the scale we used was possibly inadequate in this respect. Moreover, in a study about religious stereotype conducted by Walker, Diliberto-Macaluso, and Altarriba (2011), when participants were activated with either a religious exemplar (Jesus) or a religious stereotype (Christian), their results were different when they were primed with self-reference, which differed to some extent from the results we obtained in our study. In further studies, researchers should explore which priming—with the exemplar or the stereotype of group—makes participants internalize the stereotype features more easily, thus influencing their subsequent behavior. In addition, other types of stereotypes and a larger sample size should be used in future studies to confirm our findings.

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