Research Report

Doing Is for Thinking!
Stereotype Activation by Stereotypic Movements

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ABSTRACT—Three studies demonstrate that stereotypic movements activate the corresponding stereotype. In Study 1, participants who were unobtrusively induced to move in the portly manner that is stereotypic of overweight people subsequently ascribed more overweight-stereotypic characteristics to an ambiguous target person than did control participants. In Study 2, participants who were unobtrusively induced to move in the slow manner that is stereotypic of elderly people subsequently ascribed more elderly-stereotypic characteristics to a target than did control participants. In Study 3, participants who were induced to move slowly were faster than control participants to respond to elderly-stereotypic words in a lexical decision task. Using three different movement inductions, two different stereotypes, and two classic measures of stereotype activation, these studies converge in demonstrating that stereotypes may be activated by stereotypic movements.

Stereotype activation and stereotypic behavior are intimately intertwined. A surge of research has demonstrated that activating a certain stereotype induces people to behave in ways that are consistent with that stereotype (for reviews, see Bargh, 1997; Dijksterhuis & Bargh, 2001; Wheeler & Petty, 2001). Activating the elderly stereotype, for example, induces people to move more slowly (Bargh, Chen, & Burrows, 1996). Such direct effects of stereotype activation on behavior are often explained by shared representational systems for perception and action (Dijksterhuis & Bargh, 2001; Prinz, 1990). Because the representation of a stereotype involves stereotypic attributes that are closely associated with specific behaviors, activating a stereotype also activates these associated behavioral representations. In line with the principle of ideomotor action (James, 1890), activating stereotypic behavioral representations induces people not only to perceive the behaviors of others as more stereotypic (Devine, 1989), but also to act more stereotypic themselves (Bargh et al., 1996). “Thinking is for doing” (Fiske, 1992, p. 877), as James explained, so that “every representation of a movement awakens in some degree the actual movement” (James, 1890, p. 526).

If stereotype activation and stereotypic behaviors are indeed so intimately linked, then not only may activating a stereotype induce people to behave in a stereotypic manner, but, vice versa, behaving in a stereotypic manner may activate the corresponding stereotype. To the extent that the mere enactment of a stereotypic behavior activates its underlying behavioral representation, this activation may spread to associated attributes and stereotypes. Just as activating the elderly stereotype activates the associated behavioral representation of slow movements and induces people to move more slowly (Bargh et al., 1996), inducing people to move more slowly may activate a behavioral representation of slow movements, which in turn may activate the associated elderly stereotype.

In the present research, I set out to examine this possibility. To do so, I unobtrusively induced participants to engage in stereotypic movements and then used two classic measures of stereotype activation (Devine, 1989; Macrae, Bodenhausen, & Milne, 1995) to examine whether the respective stereotypes had been activated. Specifically, participants engaged in movements that are stereotypic of overweight (Study 1) or elderly (Studies 2 and 3) people. They subsequently either judged an ambiguous target person along stereotypic dimensions that were not directly related to the critical behavior (Studies 1 and 2) or worked on a lexical decision task that directly assessed the accessibility of stereotypic words (Study 3). If stereotypic movements activate the associated stereotype, then participants who engage in stereotypic movements should use the activated stereotype as a basis for subsequent judgments about a target person, and compared with participants who do not engage in these movements, they should ascribe more stereotypic attributes to her. Furthermore, lexical decisions for words that are associated with the stereotype should be facilitated among participants who engage in the stereotypic movements.
STUDY 1

In Study 1, participants were or were not induced to engage in movements that are stereotypic of overweight people. While performing a number of simple physical tasks, participants in the experimental group were induced to engage in portly movements by wearing a life vest on their torso and gymnastic weights around their wrists and ankles. Participants in the control group performed the same tasks without wearing this attire. Stereotype activation was assessed with a classic measure (Devine, 1989): Participants subsequently judged an ambiguous target person with respect to a number of characteristics that are stereotypic of overweight people.

Method and Procedure

Twenty university students were recruited for individual experimental sessions and informed that they were about to take part in two ostensibly unrelated studies.

The first study was introduced as part of a research project conducted in collaboration with the local lifeguards. The ostensibly purpose of this study was to examine how well people are able to move in emergency situations. Participants were asked to perform a number of movements designed to simulate typical movements on board a ship and in water. The instructions were carefully worded to avoid any reference to concepts associated with portliness. Experimental participants were asked to put on a life vest and a set of four gymnastic weights that were wrapped around their wrists and ankles. The experimenter explained that the weights were used to simulate water resistance. The life vest and weights unobtrusively induced participants to move in a portly manner. Control participants were not asked to put on life vests and weights. All participants then performed the same series of simple movements at a self-determined pace: swimming the breaststroke (10 times), mounting a chair with arms uplifted (5 times), bending over to the feet (5 times), walking through the lab room (5 times), and sitting down on a chair and getting up (5 times). Participants then answered three questions assessing their experienced ability to move freely during these tasks.

The second study was introduced as a pretest of materials for future studies on person perception. Participants were given a one-page description of a target person (Beate) and asked to form an impression of her. Beate was described in ambiguous terms with respect to a number of positive and negative characteristics related and unrelated to the overweight stereotype. After forming an impression of Beate, participants used 9-point Likert scales (1 = not at all, 9 = very) to rate her with respect to 15 characteristics. The 7 stereotypic dimensions (friendly, sociable, insecure, unhealthy, well-groomed, lazy, and sluggish) and 8 nonstereotypic dimensions (musical, politically interested, creative, humorous, jealous, caring, forgetful, and articulate) that were included were selected on the basis of previous research studies (Devine, 1989) and the results of an independent pretest (N = 22).

At the end of the experimental session, participants were interviewed concerning their hypotheses about the purpose of both studies and their awareness of a possible connection between them using a funneled debriefing scheme (Bargh et al., 1996). None of the participants was aware of the actual purpose or connection.

Results and Discussion

Ratings of the target were combined into two separate indices, one for stereotypic and the other for nonstereotypic characteristics. Inspection of Table 1 reveals that participants who were unobtrusively induced to move in the portly way that is associated with the overweight stereotype ascribed more stereotypic characteristics to the target than did control participants, $t(18) = 2.1, p < .05$. In contrast, the index for nonstereotypic characteristics did not differ significantly between the two groups, $t(18) = 1.4, p > .15$. In a $2 \times 2$ mixed-model analysis of variance (ANOVA), this pattern produced a significant interaction effect, $F(1, 18) = 4.28, p < .05$, $\eta^2_p = .19$.

These findings provide initial support for the hypothesis that engaging in stereotypic movements activates the corresponding stereotype. Compared with control participants, participants who were induced to move in a manner that is stereotypic of overweight people subsequently ascribed more characteristics that are indicative of this stereotype to an ambiguous target person. Following the standard interpretation of similar judgmental effects (Devine, 1989), this result suggests that the overweight stereotype was activated by the stereotypic movements.

STUDY 2

In Study 2, I attempted to replicate these initial findings using a different stereotype, namely, the elderly stereotype. Because previous research demonstrated that the elderly stereotype is closely associated with slow movements (Bargh et al., 1996), experimental participants were unobtrusively induced to move slowly. Specifically, participants in the experimental group were asked to pedal a stationary bike at a very slow speed, whereas those in the control group were asked to pedal at a normal speed.

<table>
<thead>
<tr>
<th>Movement</th>
<th>Stereotypic</th>
<th>Nonstereotypic</th>
</tr>
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<tbody>
<tr>
<td>Portly</td>
<td>6.42 (0.66)</td>
<td>4.65 (0.97)</td>
</tr>
<tr>
<td>Normal</td>
<td>5.79 (0.69)</td>
<td>5.40 (1.38)</td>
</tr>
</tbody>
</table>

Note. Standard deviations are in parentheses. Judgments were given on scales ranging from 1 to 9.
Subsequently, all participants judged an ambiguously described target person with respect to a second characteristic that is closely associated with the elderly, namely, forgetfulness (Dijksterhuis, Bargh, & Miedema, 2000; Levy, 1996). I expected that slow movements would activate the elderly stereotype, so that experimental participants would judge the target person as more forgetful than control participants would.

Method and Procedure
Thirty-seven university students were recruited for individual experimental sessions and informed that they were about to participate in several independent studies.

The first study was introduced as examining the relation between physical activation and attention. Participants were instructed to sit down on a stationary bike and to pedal for 5 min. Instructions were carefully worded to avoid any reference to concepts associated with slowness. While pedaling, participants used a Walkman to listen to a tape-recorded short story that was unrelated to the critical dimension. All participants were instructed to pedal at a constant speed, which was shown on a display. Experimental participants pedaled at a very slow speed of 30 revolutions per minute, and control participants pedaled at a normal cycling speed of 80 revolutions per minute. All participants first practiced maintaining the required speed for 2 min. For the remaining 3 min, they listened to the short story while maintaining the speed. Subsequently, participants answered five questions about the short story.

The second study was again introduced as a pretest. Participants were instructed to read a one-page description of a target person (Angelika) and to form an impression of her. Angelika was described in ambiguous terms with respect to the stereotypic dimension of forgetfulness and the nonstereotypic dimension of friendliness. After forming an impression of the target, participants judged her with respect to 12 characteristics (1 = not at all, 9 = very), of which 3 were closely related to forgetfulness (forgetful, absent-minded, scatterbrained) and 3 were closely related to friendliness (friendly, polite, courteous).

At the end of the session, participants were interviewed about their awareness of a connection between the two studies, as well as their purpose. None of the participants expressed any skepticism.

Results and Discussion
The six critical ratings of Angelika were combined into two indices, one for the stereotypic (forgetfulness) and the other for the nonstereotypic (friendliness) characteristics. As Table 2 shows, participants who were induced to engage in slow movements that are stereotypic of the elderly judged Angelika to be more forgetful than did control participants, \( t(35) = 2.1, p < .05 \). Judgments about Angelika’s friendliness, however, did not depend on participants’ movements, \( t < 1 \). This pattern produced a significant interaction effect in a 2 × 2 mixed-model ANOVA, \( F(1, 35) = 4.6, p < .04, \eta_p^2 = .12 \).

These findings are consistent with the results of Study 1 in demonstrating that engaging in stereotypic movements induces participants to ascribe more stereotypic characteristics to a target person. These effects on person judgment are indicative of stereotype activation (Devine, 1989). This conclusion is strengthened by the fact that in both studies, the judgments that showed the effect (e.g., ratings of forgetfulness) were not directly associated with the induced movement (e.g., slowness). Rather, the connection was formed via the respective stereotype (e.g., elderly).

STUDY 3
The final study was designed to provide more direct evidence for stereotype activation by stereotypic movements. Building on previous research (e.g., Macrae et al., 1995), I used a lexical decision task to measure stereotype activation after participants walked at slow or normal speed. If walking slowly activates the elderly stereotype, then lexical decisions about words that are associated with that stereotype should be facilitated after participants are unobtrusively induced to walk slowly.

Method and Procedure
Thirty-three university students were recruited in groups of up to 3, led to individual rooms where they were isolated from other participants, and informed that they were about to take part in several unrelated studies.

In the first study, participants were instructed to use a Walkman to listen to a tape-recorded short story while walking through the room at a predetermined speed for 5 min. The story and the instructions were carefully worded to avoid any reference to concepts associated with slowness. Participants put on a Walkman and started walking through the room at the speed that was indicated by a recorded ticking of a metronome. Participants in the experimental group were induced to walk at a slow speed of 30 steps per min. Participants in the control group were induced to walk at a normal speed of 90 steps per min. All participants first practiced walking at the required speed for 2 min and then listened to the short story for the remaining 3 min.

<table>
<thead>
<tr>
<th>Movement condition</th>
<th>Stereotypic</th>
<th>Nonstereotypic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slow</td>
<td>7.11 (1.12)</td>
<td>2.68 (0.86)</td>
</tr>
<tr>
<td>Normal</td>
<td>6.22 (1.44)</td>
<td>2.85 (1.33)</td>
</tr>
</tbody>
</table>

Table 2: Mean Evaluations of the Target on Elderly-Stereotypic Versus Non-Elderly-Stereotypic Characteristics in Study 2

Note. Standard deviations are in parentheses. Judgments were given on scales ranging from 1 to 9.
while maintaining their speed. Subsequently, participants answered five questions about the short story.

In the second study, participants worked on a standard lexical decision task (Neely, 1977), which was introduced as a task assessing cognitive ability. Participants were instructed to indicate as fast and as accurately as possible whether or not each presented letter string constitutes a word in the German language. Forty letter strings were presented in random order; 24 were nonwords (e.g., krump, tulten), 8 were elderly-stereotypic words, and 8 were words that are not elderly-stereotypic. Stereotypic and nonstereotypic words were selected on the basis of previous research (Bargh et al., 1996; Kawakami, Moll, Hermens, Dovidio, & Russin, 2000). The elderly-stereotypic words were the German equivalents of forgetful, lonely, absent-minded, church, old, wise, sorrow, and knit. The non-elderly-stereotypic words were the German equivalents of unclear, basement, robber, right, rough, disturbing, separate, and unnerve.

After completion of the lexical decision task, participants were interviewed about their awareness of a connection between the ostensibly unrelated studies, as well as their purpose. None of the participants expressed any skepticism.

Results and Discussion
Response latencies that exceeded 1,500 ms were classified as outliers and excluded from further analyses. For ease of interpretation, I report the untransformed means, although I used log-transformed means for statistical analyses. Participants’ latencies in responding to the stereotypic and nonstereotypic words were combined into two indices. As Table 3 shows, participants were faster in responding to elderly-stereotypic words after engaging in slow rather than normal movements, \( t(31) = 2.5, p < .02 \). There was no difference between groups, however, in responding to the non-elderly-stereotypic words, \( t < 1 \). This pattern produced a significant interaction effect in a 2 x 2 mixed-model ANOVA, \( F(1, 31) = 7.53, p < .01, \eta^2_p = .2 \).

These findings demonstrate that engaging in slow movements that are stereotypic of elderly people renders words that are associated with the elderly stereotype more accessible. Such an acceleration of lexical decisions for stereotypic words is typically interpreted as a trace of stereotype activation (Macrae et al., 1995).

### TABLE 3

**Mean Response Latencies for Lexical Decisions to Elderly-Stereotypic Versus Non-Elderly-Stereotypic Words in Study 3**

<table>
<thead>
<tr>
<th>Movement condition</th>
<th>Stereotypic</th>
<th>Nonstereotypic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slow</td>
<td>607 (99)</td>
<td>797 (177)</td>
</tr>
<tr>
<td>Normal</td>
<td>701 (115)</td>
<td>812 (141)</td>
</tr>
</tbody>
</table>

*Note. Standard deviations are in parentheses. Response latencies are given in milliseconds.*

**GENERAL DISCUSSION**

Using three different methods to induce movements, two different stereotypes, and two classic measures of stereotype activation (Devine, 1989; Macrae et al., 1995), these three studies provide converging support for the notion that stereotypic movements may directly activate the corresponding stereotype. Participants who were induced to move in the portly manner that is stereotypic of overweight people ascribed more overweight-stereotypic characteristics to an ambiguous target than did control participants. Similarly, participants who were induced to move in the slow manner that is stereotypic of elderly people ascribed more elderly-stereotypic characteristics to a target, and responded faster to elderly-stereotypic words in a lexical decision task, than did control participants. Thus, not only does activating the elderly stereotype induce people to walk slowly (Bargh et al., 1996), but walking slowly activates the elderly stereotype.

These findings supplement the literature on perception-behavior links (Dijksterhuis & Bargh, 2001) by demonstrating that the link between perception and behavior in general (Mussweiler & Förster, 2000) and between stereotypes and behavior specifically is bidirectional. Thinking may be for doing, as James (1890) explained to us. But it seems equally true that doing is for thinking.

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Dijksterhuis, A., Bargh, J.A., & Miedema, J. (2000). Of men and women: The link between perception and behavior in general (Mussweiler & Förster, 2000) and between stereotypes and behavior specifically is bidirectional. Thinking may be for doing, as James (1890) explained to us. But it seems equally true that doing is for thinking.

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