



Don't stereotype, think different! Overcoming automatic stereotype activation by mindset priming

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Received 21 February 2003; revised 10 September 2004

Available online 2 February 2005

Abstract

Automatic stereotype activation can be overcome intentionally and after an extensive training. However, intentions have to be tailored to a certain social category. It is hypothesized that activating the mindset “think different” by priming creativity prevents stereotypes and associations in general from becoming automatically activated. In two experiments a creative, a thoughtful or no mindset was activated. Afterwards, the activation of associations was measured using a lexical decision task with semantic priming. As predicted, the automatic activation of stereotypes (Study 1) and other associations (Study 2) was found in the control conditions but not in a creative mindset. These results suggest that people possess a mindset that allows for overcoming automatic stereotype activation without being tailored to a specific category.

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Keywords: Stereotype activation; Mindset priming; Creativity

Stereotype activation has often been described as an automatic and unintentional process that occurs despite attempts to bypass or ignore it (e.g., Devine, 1989; Dovidio, Evans, & Tyler, 1986). Research on implicit stereotype activation (Banaji & Greenwald, 1994; Bodenhausen & Macrae, 1998; Lepore & Brown, 1997; Spencer, Fein, Wolfe, Fong, & Dunn, 1998) has shown that the preconscious activation of stereotypes is part of the perceptual process and that it makes human cognition efficient (Sherman, 2001). The exposure to a category label and to (pictures of) category exemplars can lead to the activation of the respective stereotype even without one's intention or awareness (Bargh, 1996). The paradigms used in research on stereotype activation have been derived from related research in cognitive psychology on semantic priming (Neely, 1991).

Recent research has shown that even though stereotype activation occurs automatically, brakes can be put on it by human learning and intention (for a review see Blair, 2001). Stereotypes are less likely activated when counter-stereotypic exemplars are made accessible by mental imagery (Blair, Ma, & Lenton, 2001), when a counter-stereotypic intention is formed (Blair & Banaji, 1996), after being trained to respond “no” when a stereotypic target is shown after a social category prime (Kawakami, Dovidio, Moll, Hermsen, & Russin, 2000), and after having learnt that consensus about one's stereotypes is low (Sechrist & Stangor, 2001). Besides stereotype activation is reduced when it has the potential to harm self-esteem (Sinclair & Kunda, 1999). Moreover, holding a chronic egalitarian goal concerning a certain group (Moskowitz, Gollwitzer, Wasel, & Schaal, 1999; Moskowitz, Salomon, & Taylor, 2000), undermining an egalitarian goal (Moskowitz, Li, & Kirk, 2004a, 2004b), or forming concrete implementation intentions (Gollwitzer, Moskowitz, Schaal, Hammerbeck, & Wasel, 2003) reduces automatic stereotype activation.

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Taken together, even though stereotypes are activated automatically most of the time, individuals that are motivated or well trained can overcome this automatic activation. The substantial evidence for overcoming automatic stereotype activation summarized above has one weakness in common: the trainings, goals, and intentions only apply to a certain group. Hence, none of these moderators is able to undermine stereotype activation *in general*. The only exception is, when the perceiver is not dealing with the target as a social being due to other processing goals or due to cognitive load directing attention away from the target (Gilbert & Hixon, 1991; Li, 2004; Macrae, Bodenhausen, Milne, Thorn, & Castelli, 1997). However, this does not help when it comes to social interactions (for a more extensive discussion see Bargh, 1999).

The present research addresses another moderator of stereotype activation that is not limited to a specific social category but works for all social categories. Likewise, our intervention does not build upon goals, intentions, or extensive trainings but on a mindset that can be activated easily: the mindset to “think different” that is activated in individuals who are primed with creativity.

Priming creativity and the mindset “think different”

Being creative implies, by definition, the attempt to avoid the conventional routes of thinking and, therefore, the avoidance of the activation of typical associations. In the case of perceiving members of stereotyped groups, “thinking different” means one has a mindset in which one is avoiding the typical associations with those groups—one’s stereotypes. Previous research has illustrated that a variety of mindsets can influence cognitive processing. Galinsky, Moskowitz, and Skurnik (2000) for example found that exposure to events where an alternative outcome almost occurred triggered a mindset of mental simulations (counterfactual thinking) that in turn influenced subsequent judgment and behavior in a completely unrelated domain. People were more likely to consider alternatives in a subsequent person perception task (for other mindsets see Chen, Shechter, & Chaiken, 1996; Gollwitzer, Heckhausen, & Steller, 1990).

Existing research suggests that it is not very likely for a “think different” mindset to be able to control stereotype activation and reduce the accessibility of stereotypic content following exposure to a member of a stereotyped group. Research on thought suppression (rebound effect) as well as on idea generation—two domains implying the same demand of overcoming the predominantly activated knowledge—has shown that individuals are not able to *intentionally* follow this simple processing rule. This evidence is summarized before the potential impact of the “think different” mindset will be explained.

Macrae, Bodenhausen, Milne, and Jetten (1994) have demonstrated that people can master suppressing the *application* of a stereotype (thinking differently in their conscious use of stereotypes). However, after this successful suppression the stereotype is activated even more strongly and backfires (i.e., causes more stereotypic responses) as soon as the intention to suppress is not upheld anymore. Wegner and Wenzlaff (1996) argue that suppressed thoughts become hyper-accessible, even relative to when the thought was consciously contemplated. Hence, even though “thinking different” about a single person is possible, this does not imply control over the *automatic activation* of one’s stereotypes. It may even promote thinking about those typical associations.

Research on idea generation has painted a similarly bleak picture. Despite participants being explicitly instructed to generate new, original ideas, and not to copy any feature of some examples that are provided, participants copy the given examples (or at least certain features of them). If asked to generate a novel and creative name for a new pasta while being provided with sample pasta names (e.g., spaghetti, fettuccini, and linguini), people produce names that are not creative at all, but merely a blending of the existing names (e.g., fellini). Individuals are not able to control this so-called *inadvertent plagiarism* intentionally. The conformity to given examples did not decrease when participants were explicitly instructed to create ideas that were *very* different from the provided examples, even though they were able to list the features they were asked to avoid (Marsh, Ward, & Landau, 1999; Smith, Ward, & Schumacher, 1993). Most likely the plagiarism occurs because examples are highly accessible during idea generation and this activated knowledge impacts on the generated ideas without awareness (Marsh, Bink, & Hicks, 1999) and thus beyond intentional control.

While these findings point to the fact that thinking differently *by intention* is not possible, there is evidence indicating that activating the processing rule to think differently by *priming* can successfully help to get around the predominantly activated knowledge. Sassenberg, Kessler, and Mummendey (2004) showed that participants primed with either the concept “creativity” or reminded of their earlier success in being creative were more able to overcome inadvertent plagiarism than participants in a control condition who intentionally tried to be creative. Moreover, the rebound effect (i.e., higher accessibility of features of the examples following a successful suppression of them) was found in the control condition but not after a creativity priming. Taken together, being primed with creativity allows for generating original ideas because one is able to think differently without the unwanted side effects of suppressing thoughts triggered by the intention to suppress them. Therefore, Sassenberg et al. (2004) suggest that the “think different” mindset induced by priming creativity

might operate by reducing the automatic activation of associations.

In the current research, we sought to make use of these findings and theorizing. Sassenberg et al. (2004) suggest that associations of stimuli are less likely to be activated after being primed with creativity. Here, we aimed to test whether this prediction derived from earlier findings holds for the automatic activation of stereotypes and associations in general. We expect the African American stereotype to be less likely automatically activated after seeing the face of an African American when people are primed with creativity beforehand compared to a control condition (Experiment 1) and that this effect generalizes to the underlying phenomenon: the automatic activation of any “typical” associations is expected to be reduced by priming creativity (Experiment 2).

Overview of current research

To test these predictions, we conducted two experiments in which mindset priming was varied between subjects. Participants were either primed with creativity or with thoughtfulness by asking them to report three situations in which they had behaved creatively or thoughtfully, respectively. As the thoughtfulness priming might effect on the automatic activation of associations, a second control condition without mindset priming was included in Experiment 2. After the mindset priming participants in both experiments worked through a lexical decision task with sequential priming. In Experiment 1, pictures of African Americans and European Americans were used as sequential primes. In Experiment 2, words served as primes.

Study 1

Method

Design and participants

The experiment had a 2 (mindset: creative vs. thoughtful) \times 2 (prime: African American vs. European American) \times 3 (target: stereotypic, negative control, and positive control) design. The mindset was varied between subjects whereas the prime and target were alternated within subjects. Twenty female and 18 male undergraduate students of Lehigh University with a mean age of 21 years (range 18–22) took part in the experiment in exchange for course credits.

Procedure

Participants were seated in a cubical. The experimenter asked whether they were willing to fill in a paper-pencil questionnaire that was introduced as a pretest for a graduate student’s first-year project. The questionnaire included the *mindset manipulation*. Participants had to

volunteer to fill in this questionnaire because we wanted them to believe that it was not related to the dependent measure. All participants agreed. The procedure closely followed the one employed by Sassenberg et al. (2004). In the creative condition, participants were requested to briefly describe three situations in which they had behaved creatively. In the thoughtful condition, participants were asked to describe three situations in which they had behaved thoughtfully. This open-ended questionnaire took 5–10 min. The following topics were addressed by participants in both conditions and made up the majority of the answers: term papers and preparation for exams, problem solving and planning in several domains, social situations such as conflict resolution, and handicraft work. Topics such as important decisions, shopping, traffic, and traveling were only mentioned in the thoughtfulness condition; art work, performing art, and cooking were exclusively mentioned in the creative condition.

The remainder of the study took place on the computer. All instructions were given on the screen. The screen had a diagonal of 17 in. and a resolution of 1280 \times 1024 pixels. As a *measure of stereotype activation* a lexical decision task with pictures as primes was presented. The instructions introduced the lexical decision task as a test of word recognition speed and stated that the pictures were flashed before the word because we were interested in the impact of distractors. In each trial, first a fixation cross was shown for 750 ms in the center of the screen followed by the prime that was presented for 80 ms. Before the target appeared the screen turned blank for 15 ms. The target was shown in 18 pt. letters and participants were requested to decide whether it was a word or not. The next trial started 750 ms after the participants’ response. After 10 practice trials, participants had to work through 140 trials including 56 critical trials, 14 trials with distractor words, and 70 trials with non-words as targets. Within the critical trials the 2 (prime) \times 3 (target) design was realized. Eight stereotypic, 10 positive, and 10 negative control targets were presented (see Appendix for target words). Each critical target was preceded once by a picture of an African American and once by a picture of an European American. Likewise, distractor words and non-words were preceded half of the time by both types of pictures. The primes were black and white portrait photographs (120 \times 180 pixels). The pictures were randomly drawn from two set of 20 yearbook pictures that had been used successfully in earlier research on stereotype activation (Moskowitz et al., 2000). After completing the lexical decision, task participants were debriefed and thanked.

Outliers were eliminated from the response time data. More precisely, all responses below 150 ms and more than 2 standard deviations above the mean response time within the critical trials were omitted from the analysis reported below (1.78%). Another 2.04% of the trials

were excluded from the analysis because of wrong answers. The mean response latencies within all prime target combinations were normally distributed (Kolmogorov–Smirnov test: all $Z < 1.1$, $p > .2$) and therefore suitable for the analyses without log-transformation.

Results

Stereotype activation was predicted to be lower in a creativity mindset compared to a thoughtfulness mindset. This would be evidenced by slower responses to stereotypic targets after African American primes in a creative mindset compared to a thoughtful mindset. To test this prediction a mixed MANCOVA was computed with Prime and Target as within subject factors, Mindset as a between subject factor, and response latency as the dependent variable. The response time in distractor trials was included as a covariate in order to control for the individual response speed. In statistical terms, we expected a Mindset \times Prime \times Target interaction based on faster responses in the thoughtfulness compared to the creative condition for stereotypic targets after African American primes. The MANCOVA showed that the covariate controlled a significant amount of variance, $F(1,35) = 134.74$, $p < .001$, $\eta^2 = .794$.¹ After African American primes ($M = 581$) targets were generally recognized slower than after European American Primes ($M = 567$), $F(1,36) = 4.65$, $p = .038$, $\eta^2 = .114$. This main effect was qualified by the predicted Mindset \times Prime \times Target interaction, $F(2,34) = 3.30$, $p = .049$, $\eta^2 = .068$. All other F s < 2.2 , p s $> .10$. To explore the interaction further, we computed separate MANCOVAs for the two experimental conditions with Prime and Target as within subject factors and response speed in distractor-trials as covariate. It was expected that the Prime \times Target interaction, indicating stereotype activation, would occur in the thoughtful mindset but not in the creative mindset. Supporting this prediction, the interaction was not significant for participants with a creative mindset, $F(2,17) = 1.15$, $p = .341$, $\eta^2 = .046$. In the thoughtfulness condition the expected Prime \times Target interaction occurred, $F(2,15) = 4.33$, $p = .033$, $\eta^2 = .125$, but none of the three simple main effects of Prime were reliable, all F s < 3 , p s $> .10$. In line with the prediction the stereotypic targets were, on a descriptive level, recognized faster after African American than after European American primes, the opposite was the case for the control targets (see Table 1).

Additional support for our predictions was provided by simple main effects of the mindset for each prime-target combination. The mindset should only affect stereo-

Table 1

Mean response times in ms (standard deviations) as a function of mind

	Thoughtful mindset		Creative mindset	
	AA prime	EA prime	AA prime	EA prime
Stereotypic targets	549 (70)	567 (108)	599 (101)	563 (54)
Positive targets	553 (86)	536 (84)	562 (56)	554 (52)
Negative targets	605 (85)	587 (95)	614 (93)	593 (59)

Note. AA, African American; EA, European American.

typic targets after an African American prime, because the mindset priming was expected to exclusively affect the activation of associations and the other three prime target combinations did not include any associations. Indeed, the only difference between the mindsets occurred for this prime-target combination, $F(1,35) = 5.22$, $p = .029$, $\eta^2 = .130$. As predicted, stereotypic words were recognized faster after African American primes in a thoughtful mindset ($M = 549$ ms) than in a creative mindset ($M = 599$ ms). No such differences were found for positive and negative control words or stereotypic words after European American primes (see Table 1), all other F s < 1.4 , p s $> .25$, $\eta^2 < .05$.

To test whether participants in both conditions worked equally serious during the lexical decision task, we controlled whether they differed in the number of errors and outliers as well as in the response speed on non-critical trials. Neither the proportion of omitted trials nor the response time in distractor-trials with words as targets differed between conditions, both t s(36) $< .3$. Thus, participants in both conditions followed the instructions equally well.

Discussion

This experiment aimed to test the prediction that a creative mindset can prevent stereotype activation. In line with this prediction no evidence for stereotype activation was found for participants in a creative mindset, whereas the prime by target interaction indicating stereotype activation was found in the control condition. Unfortunately, the critical simple comparison (stereotypic targets after African American compared to European American primes) was not significant. However, simple comparisons are not the adequate follow-up analyses for interpreting an interaction in cases as the current where a main effect is given (Rosnow & Rosenthal, 1995). Moreover, the responses to stereotypic targets after African American primes differed in the expected direction between both mindset conditions.

In sum, these results provide evidence for the impact of a creative mindset on automatic stereotype activation. The African American stereotype was activated after African American primes when participants were in a thoughtful mindset but not when they were in a creative

¹ All η^2 are estimates from the GLM-procedure of SPSS12. Hence, they are partial effect sizes.

mindset. However, the evidence for the impact of the creative mindset was not unequivocal. It is not clear whether the effect stems from the thoughtfulness mindset or from the creative mindset as no baseline condition without mindset activation was assessed. Therefore, a second experiment including a baseline condition was conducted.

The deceleration after African American primes (i.e., the prime main effect) points to a phenomenon discussed by Monteith, Asburn-Nardo, Voils, and Czopp (2002). They argued and demonstrated that for low prejudiced people pictures of African Americans serve as cues for behavioral inhibition and thus lead to slower responses than pictures of European Americans, independent of which target is shown afterwards. This effect results from an inhibition process triggered by the intention to behave unprejudiced, and works against the predicted priming effect.

Experiments 2a and 2b

To address the limitation mentioned above (the lack of a control condition), and to provide evidence that the impact of the creativity priming is not limited to the activation of the African American stereotype but that it disrupts the automatic activation of associations in general, we conducted a second experiment. In this experiment the primes were neutral in valence. The advantage of using neutral materials is that no deceleration of responses is initiated by the outgroup primes because participants do not fear to appear prejudiced (i.e., there is no need to correct the effect of the activation of associations for other processes initiated by the prime as in Experiment 1). Moreover, using non-social materials permits for a test of whether the creativity mindset is an anti-conformist prime and therefore limited to social domains or whether it influences the activation of associations in general. The first part of the experiment (2a) assessed the baseline priming effect that is necessary to decide which of the two mindsets (thoughtfulness vs. creativity) drives the effect. The second part (2b) replicated the mindset manipulation of Experiment 1 using the same materials as the first part in the lexical decision task. Because the two conditions in Experiment 2b lasted about twice as long as those in Experiment 2a they were run in different sessions.

Method

Participants and design

Experiment 2a had a within design with two conditions: associated and not-associated sequential primes were presented in a lexical decision task. Six female and

nine male undergraduate students of the University of Jena (Germany) with a mean age of 24 years (range 20–29) took part in this experiment in exchange for €2.50. In Experiment 2b, the same lexical decision task was realized with the within factor Prime. Beforehand, the Mindset of the participants was manipulated as in Experiment 1 (creative vs. thoughtful). Seventeen female and 16 male undergraduate students of the University of Jena with a mean age of 21 years (range 18–33) participated in this study and also received €2.50 for compensation.

Procedure

The mindset manipulation in Experiment 2b followed the procedure of Experiment 1. Afterwards (in Experiment 2a, directly upon arrival), participants worked through a lexical decision task with semantic priming. Words served as primes and targets (see Appendix). Each trial started with a fixation cross that was presented for 400 ms followed by the prime that was replaced by the targets after 50 ms. The target remained on the screen until participants indicated whether it was a word or not. After a break of 750 ms the next trial began. Participants went through 12 practice trials before the main task started. Each of the 6 targets was shown twice preceded by the related prime and twice preceded by a control prime. Apart from these 24 trials with words as targets, 24 additional trials with non-words as targets and the words as primes were presented. The order of trials was randomized. The screen and font characteristics were the same as in Experiment 1. After completing the lexical decision task participants were debriefed, thanked, and paid.

Outliers were eliminated from the response time data in a joint analysis of both experiments. All responses that were below 150 ms and more than two standard deviations above the mean response time within the critical trials were omitted from the analysis reported below (2.78% of the trials). Another 3.12% of the trials were excluded from the analysis because of wrong answers. The mean response latencies within all prime target combinations were normally distributed (Kolmogorov–Smirnov test: all $Z < 1$, $p > .3$) and therefore suitable for the analyses without log-transformation.

Results and discussion

Experiment 2a

To test the prediction that semantically related primes lead to faster recognition of targets compared to unrelated primes, a paired sample t test was computed. In line with this prediction, words were recognized faster after related primes ($M = 529$ ms) than after unrelated primes ($M = 556$ ms), $t(14) = 3.08$, $p = .008$.

Experiment 2b

It was expected that the findings of Experiment 2a would be replicated in the thoughtfulness condition but not in the creativity condition. This hypothesis was tested with a mixed MANOVA with Mindset as the between participant factor and Prime as the within participant factor. There was a main effect of Prime, $F(1, 31) = 8.86, p = .006, \eta^2 = .222$, that was qualified by a Mindset \times Prime interaction, $F(1, 31) = 5.07, p = .032, \eta^2 = .141$. Tests for simple main effects revealed the predicted pattern. There was a speed up triggered by associated primes in the thoughtfulness condition, $F(1, 31) = 13.27, p = .001, \eta^2 = .300$, but not in the creative condition, $F < 1$ (see Table 2).

Joint analysis

Even though Experiments 2a and 2b were conducted separately, it is worthwhile to test whether the Mindset \times Prime effect holds for both data sets together. Therefore, a joint MANOVA with Mindset (no mindset, thoughtfulness, creative) and Prime (associated, control) was computed. In this analysis the Prime main effect, $F(1, 45) = 18.71, p < .001, \eta^2 = .294$, was also qualified by a Mindset \times Prime interaction, $F(2, 45) = 3.22, p = .049, \eta^2 = .125$. Thus, the impact of the creativity mindset is strong enough to override a priming effect that is found after a thoughtfulness mindset manipulation as well as when no mindset was induced.

As in Experiment 1, no differences between three conditions concerning errors, outliers, or the response speed to non-words was found, indicating that participants in all three conditions worked equally thorough, all $F_s < 1$.

In sum, Experiments 2a and 2b clearly demonstrated that the activation of associations was reduced by the creativity mindset: priming effects of similar size were found when no mindset or the thoughtfulness mindset was activated, but not when the creative mindset was activated.

General discussion

The current research aimed to test whether the automatic activation of stereotypes could be overcome by activating the mindset “think different,” with support for this prediction being provided by two experiments. In

Experiment 1, African American primes facilitated the recognition of target words that belong to the African American stereotype within a “thoughtful” mindset but not within a creative mindset. In Experiment 2, the effect of the “think different” mindset was replicated in a non-social domain and also compared to a control condition without mindset activation. There is no evidence that these effects result from less thorough information processes. Hence, individuals possess a cognitive procedure allowing to exert control over automatic stereotype activation. This procedure can be activated by priming a creative mindset.

Advantages of this method of stereotype control are that (a) it is a proactive strategy of stereotype control, one that prevents stereotypes from coming to mind at all (as opposed to strategies that require one to suppress the use of stereotypes or that attempt to prevent these activated concepts from biasing one’s judgment; e.g., Devine, 1989), and (b) it is not restricted to preventing the activation of a single stereotype, but most likely undermines the automatic activation of any stereotype and other unwanted thoughts (unlike interventions using the training of new associations, goals and intentions, and developing new expectancies; e.g., Blair & Banaji, 1996; Kawakami et al., 2000; Monteith et al., 2002; Moskowitz et al., 1999, 2000; Moskowitz et al., 2004a, 2004b). The successfully undermined stereotype activation points to the possibility that stereotype application will also decrease after priming creativity. However, there is no evidence for this conclusion, yet.

The present research shows that the “think different” mindset blocks semantic associations (stereotypes), but the studies do not allow for conclusions concerning the affect associated with social categories (prejudice). In Experiment 1, no affective priming effect was found in either mindset: both positive and negative control targets were recognized faster after European American primes than after African American primes to the same extent. Thus, no prejudice was found in the control condition and therefore it could not be reduced by the creative mindset. Further research should address the impact of a creative mindset on implicit prejudice using well-established measures of implicit prejudice instead of the lexical decision task applied here.

In the current research the creative mindset was activated without participants’ conscious intent. To make use of this powerful cognitive procedure in everyday life, and to provide for a more flexible opportunity of an intervention against stereotyping, it would be helpful if individuals could activate this mindset intentionally and still show the same effects. Further research should test the effect of the intentional activation of creativity on both stereotype activation and stereotype usage.

Why does priming creativity and the associated mindset of “thinking different” help to overcome the automatic activation of stereotypic associations whereas the

Table 2
Mean response times in ms (standard deviations) as a function of mindset and prime (Experiments 2a and 2b, $N = 48$)

	No mindset activated	Thoughtful mindset	Creative mindset
Related prime	529 (74)	529 (56)	541 (83)
Control prime	556 (88)	553 (54)	544 (73)

intention to suppress stereotyping leads to the opposite effect? According to the ironic monitoring theory of suppression (Wegner & Wenzlaff, 1996), during thought suppression individuals perform a controlled search for content that differs from the one that they should or would like to suppress. However, an automatic monitoring process simultaneously takes place that controls for the unwanted thoughts about the suppressed construct and that in turn ironically enhances the accessibility of the unwanted thoughts. Alternatively, Liberman and Förster (2000) suggested “that people may infer from the suppression instruction, from the difficulty they experience during suppression, and from suppression failures that they are motivated to use suppressed constructs” (p. 190). Both explanations stress the relevance of the intention to suppress. From these explanations one can derive that the increased activation of associations was not found after priming creativity because the mindset priming operates without an intention to suppress.

But why does priming this mindset reduce the activation of associations? At least three explanations are possible. First, the “think different” mindset might induce an inhibitory process. Inhibition serving the mindset’s function to overcome the activated knowledge might act as a counterforce against the usual activation resulting from semantic priming. Both forces could cancel-out each other so that no priming effect is found (for a similar but intention driven account for negative priming see Houghton & Tipper, 1994).

Second, the creativity priming could have a comparable effect as a similarity mindset. Dagenbach, Carr, and Wilhemsen (1989) found that effects of subliminal priming in the lexical decision task differ depending on the instruction given before the threshold-setting procedure. Subliminal primes led to facilitation when the threshold was set based on an absent/present judgment, whereas it led to inhibition when it was set based on a similarity judgment. The later finding occurred for similar prime-target pairings but not for identical ones. Carr and Dagenbach (1990) assume that “when activation of a sought-for code is in danger of being swamped or hidden by activation in other related codes, activation in the sought-for code is enhanced, and activation in related codes is dampened by the operation of the center surround retrieve mechanism” (p. 343). This means that in the process of encoding incoming information mental representations that are similar to the sensation but do not match it are inhibited to foster the retrieval of the right representation. The “think different” mindset is comparable to a similarity mindset because both imply comparisons. Moreover, the “think different” mindset might lead to the inhibition of recently encoded information. To avoid that the information is lost, the center-surround process might hinder the sensation of the target to prevent that the perception of the prime is lost.

Finally, the effect of the mindset priming can be explained based on the retrieval theory of priming (Ratcliff & McKoon, 1998). The theory assumes that the items in short term memory and the targets are used to form a compound cue and the familiarity of this cue determines the response time. The familiarity of the compound cue depends, in turn, on the retrieval structure in long term memory. Only compounds of closely related items evoke enough familiarity to trigger fast responses (i.e., priming effects). The “think different” mindset could inhibit the encoding of the prime or its storage in short term memory or impair the comparison between short term memory and long term memory. The latter would result in lower levels of familiarity leading to slower responses. Currently, these explanations remain speculative and should, thus, be tested in further research.

Conclusion

The current research demonstrates that the automatic activation of stereotypes and other associations can be overcome by mental procedures people possess: the mindset to think differently. This procedure most likely has the power to overcome stereotype activation for any social category, whereas earlier interventions and mechanisms that resolved the problem of stereotype activation were restricted to very specific category. In a “think different” mindset every typical association to any target is disrupted, as opposed to associations to a specific target being blocked. This strategy has the additional benefit of working through a simple mental task that all people are capable of implementing and that requires no special training. In fact, it is not subject to the pitfalls of conscious attempts to suppress stereotypes.

Acknowledgments

This research has been made possible by a post doc grant from the DAAD and a grant from the state of Thuringia to the first author. The authors express their gratitude to Sandra Desche, Katja Likowski, and Christine Chaplin for their assistance in data collection.

Appendix.

Targets Experiment 1

Stereotypic:

criminal, poor, lazy, violent, athletic, basketball, threatening, and aggressive.

Positive control:

clever, cheerful, kind, lively, happy, helpful, trusting, generous, wonderful, and appealing.

Negative control:

selfish, awful, bossy, nosy, foolish, neurotic, weak, deceitful, rotten, and gullible.

Distractors:

judgment, production, register, wildlife, landlord, memory, football, gymnasium, salad, computer, airplane, vacuum, truck, and window.

Targets Experiments 2a and 2b

Associated primes	Control primes	Targets
Sugar (Zucker)	Plate (Teller)	Sweet (süß)
Circle (Kreis)	Cream (Sahne)	Round (rund)
Light (Licht)	Dump-bell (Hantel)	Bright (hell)
Sun (Sonne)	Cord (Leine)	Warm (warm)
Night (Nacht)	Water (Wasser)	Dark (dunkel)
Silence (Stille)	Basin (Becken)	Quiet (ruhig)

References

- Banaji, M. R., & Greenwald, A. G. (1994). Implicit stereotyping and unconscious prejudice. In M. P. Zanna & J. M. Olson (Eds.), *The psychology of prejudice, the Ontario symposium* (Vol. 7, pp. 55–76). Hillsdale, NJ: Erlbaum.
- Bargh, J. A. (1996). Automaticity in social psychology. In E. T. Higgins & A. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 169–183). New York, NY: Guilford Press.
- Bargh, J. A. (1999). The cognitive monster: The case against the controllability of automatic stereotype effects. In S. Chaiken & Y. Trope (Eds.), *Dual process theories in social psychology* (pp. 361–382). New York, NY: Guilford Press.
- Blair, I. (2001). Implicit stereotypes and prejudice. In G. B. Moskowitz (Ed.), *Cognitive social psychology: The Princeton Symposium on the legacy and future of social cognition* (pp. 359–374). Mahwah, NJ: Erlbaum.
- Blair, I., & Banaji, M. (1996). Automatic and controlled processes in stereotype priming. *Journal of Personality and Social Psychology*, 70, 1142–1163.
- Blair, I., Ma, J. E., & Lenton, A. P. (2001). Imaging stereotypes away: The moderation of implicit stereotypes through mental imagery. *Journal of Personality and Social Psychology*, 81, 828–841.
- Bodenhausen, G. V., & Macrae, C. N. (1998). Stereotype activation and inhibition. In R. S. Wyer Jr. (Ed.), *Advances in social cognition* (Vol. 10, pp. 1–52). Mahwah, NJ: Erlbaum.
- Carr, T. H., & Dagenbach, D. (1990). Semantic priming and repetition priming from masked words: Evidence for a center surround-attention mechanism in perceptual recognition. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 16, 341–350.
- Chen, S., Shechter, D., & Chaiken, S. (1996). Getting at the truth or getting along: Accuracy- versus impression-motivated heuristic and systematic processing. *Journal of Personality and Social Psychology*, 71, 262–275.
- Dagenbach, D., Carr, T. H., & Wilhemsen, A. (1989). Task induced strategies and near threshold priming: Conscious effects on unconscious perceptions. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 15, 412–443.
- Devine, P. G. (1989). Stereotypes and prejudice: Their automatic and controlled components. *Journal of Personality and Social Psychology*, 56, 5–18.
- Dovidio, J., Evans, N., & Tyler, R. (1986). Racial stereotypes: The contents of their cognitive representation. *Journal of Experimental Social Psychology*, 22, 22–37.
- Galinsky, A. D., Moskowitz, G. B., & Skurnik, I. (2000). Counterfactuals as self-generated primes: The effects of prior counterfactual activation on person perception judgements. *Social Cognition*, 18, 252–280.
- Gilbert, D. T., & Hixon, J. G. (1991). The trouble of thinking: Activation and application of stereotypic beliefs. *Journal of Personality and Social Psychology*, 60, 509–517.
- Gollwitzer, P. M., Heckhausen, H., & Steller, B. (1990). Deliberative and implemental mind-sets: Cognitive tuning toward congruous thoughts and information. *Journal of Personality and Social Psychology*, 59, 1119–1127.
- Gollwitzer, P. M., Moskowitz, G. B., Schaal, B., Hammerbeck, H. J. P., & Wasel, W. (2003). *Implementation effects on stereotype activation*. Unpublished manuscript.
- Houghton, G., & Tipper, S. P. (1994). A model of inhibitory mechanisms in selective attention. In D. Dagenbach & T. H. Carr (Eds.), *Inhibitory processes in attention, memory, and language* (pp. 53–112). San Diego: Academic Press.
- Kawakami, K., Dovidio, J. F., Moll, J., Hermsen, S., & Russin, A. (2000). Just say no (to stereotyping): Effects of training in the negation of stereotypic associations on stereotype activation. *Journal of Personality and Social Psychology*, 78, 871–888.
- Lepore, L., & Brown, R. (1997). Category and stereotype activation: Is prejudice inevitable?. *Journal of Personality and Social Psychology*, 72, 275–287.
- Li, P. (2004). *Two types of cognitive resources and their effects on stereotype activation*. Unpublished doctoral thesis, Lehigh University, Bethlehem, PA.
- Liberman, N., & Förster, J. (2000). Expression after suppression: A motivational explanation of post-suppressional rebound. *Journal of Personality and Social Psychology*, 79, 190–203.
- Macrae, C. N., Bodenhausen, G. V., Milne, A. B., & Jetten, J. (1994). Out of mind but back in sight: Stereotypes on the rebound. *Journal of Personality and Social Psychology*, 67, 808–817.
- Macrae, C. N., Bodenhausen, G. V., Milne, A. B., Thorn, T. M. J., & Castelli, L. (1997). On the activation of social stereotypes: The moderating role of processing objectives. *Journal of Experimental Social Psychology*, 33, 471–489.
- Marsh, R. L., Bink, M. L., & Hicks, J. L. (1999). Conceptual priming in a generative problem solving task. *Memory Cognition*, 27, 355–363.
- Marsh, R. L., Ward, T. B., & Landau, J. D. (1999). The inadvertent use of prior knowledge in a generative cognitive task. *Memory Cognition*, 27, 94–105.
- Monteith, M. J., Asburn-Nardo, L., Voils, C. I., & Czopp, A. M. (2002). Putting the brakes on prejudice: On the development and operation of cues for control. *Journal of Personality and Social Psychology*, 83, 1029–1050.
- Moskowitz, G. B., Gollwitzer, P. M., Wasel, W., & Schaal, B. (1999). Preconscious control of stereotype activation through chronic egalitarian goals. *Journal of Personality and Social Psychology*, 77, 167–184.
- Moskowitz, G. B., Li, P., & Kirk, E. (2004a). *Compensatory cognition, implicit goal regulation, and the control of stereotype activation*. Manuscript under review.
- Moskowitz, G. B., Li, P., & Kirk, E. (2004b). The implicit volition model. On the preconscious regulation of temporarily adopted goals. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (vol. 36, pp. 317–413). San Diego, CA: Academic Press.
- Moskowitz, G. B., Salomon, A. R., & Taylor, C. M. (2000). Pre-consciously controlling stereotyping: Implicitly activated egalitarian goals prevent the activation of stereotypes. *Social Cognition*, 18, 151–177.
- Neely, J. H. (1991). Semantic priming effects in visual word recognition: A selective review of current findings and theories. In

- D. Besner & G. W. Humphreys (Eds.), *Basic processes in reading: Visual word recognition* (pp. 264–336). Hillsdale, NJ: Erlbaum.
- Ratcliff, R., & McKoon, G. (1998). A retrieval theory of priming in memory. *Psychological Review*, 95, 385–408.
- Rosnow, L. R., & Rosenthal, R. (1995). “Some things you learn aren’t so”: Cohen’s paradox, Asch’s paradigm, and the interpretation of interaction. *Psychological Science*, 6, 3–9.
- Sassenberg, K., Kessler, T., & Mummendey, A. (2004). *When creative means different: Activating creativity as a strategy to initiate the generation of original ideas*. Unpublished manuscript, Friedrich-Schiller University, Jena, Germany.
- Sechrist, G. B., & Stangor, C. (2001). Perceived consensus influences intergroup behavior and stereotype activation. *Journal of Personality and Social Psychology*, 80, 645–654.
- Sherman, J. W. (2001). The dynamic relationship between stereotype efficiency and mental representation. In G. B. Moskowitz (Ed.), *Cognitive social psychology: The Princeton Symposium on the legacy and future of social cognition* (pp. 177–190). Mahwah, NJ: Erlbaum.
- Sinclair, L., & Kunda, Z. (1999). Reactions to a Black professional: Motivated inhibition and activation of conflicting stereotypes. *Journal of Personality and Social Psychology*, 77, 885–904.
- Smith, S. M., Ward, T. B., & Schumacher, J. S. (1993). Contrasting effects of examples in a creative generation task. *Memory & Cognition*, 21, 837–845.
- Spencer, S. J., Fein, S., Wolfe, C. T., Fong, C., & Dunn, M. A. (1998). Automatic activation of stereotypes: The role of self-image threat. *Personality and Social Psychology Bulletin*, 24, 1139–1152.
- Wegner, D. M., & Wenzlaff, R. M. (1996). Mental control. In E. T. Higgins & A. W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 466–492). New York, NY: Guilford Press.