Construal Level Mindsets
Moderate Self and Social Stereotyping

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Abstract

Construal level theory suggests that events and objects can be represented at either a higher, more abstract level involving consideration of superordinate goals, desirability, global processing, and broad categorizations or a lower, more concrete level involving consideration of subordinate goals, feasibility, local processing, and narrow categorizations. Analogously, social targets (including the self) can be represented more broadly, as members of a group, or more narrowly, as individuals. Because abstract construals induce a similarity focus, they were predicted to increase the perceived fit between social targets and a salient social category. Accordingly, placing individuals into a more abstract construal mindset via an unrelated task increased the activation and use of stereotypes of salient social groups, stereotype-consistent trait ratings of the self, group identification, and stereotype-consistent performance, relative to more concrete construal mindsets. Thus, non-social contextual influences (construal level mindsets) affect stereotyping of self and others.

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**Construal Level Mindsets Moderate Self and Social Stereotyping**

At the core of theorizing on social identity and social perception is the notion that individuals can be represented either as persons or as members of a group (Brewer, 1988; Fiske & Neuberg, 1990; Turner, Hogg, Oaks, Reicher, & Wetherell, 1987). A key goal of research in these areas has been to identify factors that determine how social targets, including the self, are represented and how these representations will ultimately affect judgments and guide behavior. In the present work, we examine the notion that the representation of social targets and the self can be affected by construal level mindset, determined by tasks wholly unrelated to judging a target. These differences in representation should then have important consequences for stereotype-consistent judgment and behavior.

**Representation of Others: Social Categorization and Stereotyping**

Representations of persons can take the form of relatively more personalized impressions, in which the individual is judged in terms of his or her behaviors and traits, or more category-based representations, in which the individual is evaluated based on his or her membership in a group. Like other natural categories, social categories are assumed to be organized hierarchically, becoming increasingly inclusive as one moves to higher levels of abstraction within a taxonomy (Brown, 1958; Rosch, Mervis, Gray, Johnson, & Boyes-Braem, 1976). Higher-order social categories focusing on a single shared characteristic (e.g., Europeans, youth, women, or lawyers) are broad and inclusive, whereas lower-order categories and personalized impressions (e.g., Mary is a young, European lawyer) are narrow and exclusive.

Models of category-based stereotyping (Brewer, 1988; Fiske & Neuberg, 1990) suggest that perceivers categorize individuals as soon as a meaningful social category is available. More personalized or individuated impressions can also be formed, provided that the perceiver has
both sufficient motivation (Monteith, 1993) and resources available (Macrae, Milne, & Bodenhausen, 1994). Thus, level of representation is a function of processing effort.

A different perspective is offered by Self-Categorization Theory (SCT, Turner et al., 1987). According to SCT, whether individualized impressions or stereotype-based judgments are made is a matter of contextually-appropriate level of abstraction: “The difference between individuated and stereotypical impression formation is that the latter is more abstract, more inclusive, than the former” (Oakes, 2008, p. 8). For SCT, it is the context that determines whether a target is viewed in terms of his or her group membership or as an individual, with corresponding knowledge activated. Manipulations that make a group boundary salient (e.g., solo status or intergroup conflict, Sherif, 1967; Taylor, Fiske, Etcoff, & Ruderman, 1978) and that increase perceived fit between the social stimuli and the social category (Oakes, Haslam, & Turner, 1994; Oakes, Turner, & Haslam, 1991), increase category-based judgments. Perceived fit is determined not only by the actual content of the category (normative fit), but is also subject to the principle of the meta-contrast ratio (comparative fit). That is, fit is improved to the extent that differences within the groups are perceived to be minimal and differences between the groups are perceived to be maximal (Oakes et al., 1991; Turner et al., 1987). Focusing on similarities shared by individuals or groups of people should therefore result in a relatively more inclusive, higher-order categorization (e.g., Mary and Jane are both women). Focusing on differences between the same people should result in less inclusive, lower-order categorization or personalization (e.g., Mary is a young European lawyer, whereas Jane is a retired American nurse).

**Representation of the Self: Self-Categorization and Social Identity**

As with other social targets, the self can also be represented at different levels (Brewer & Gardner, 1996; Markus & Kitayama, 1991; Oakes et al., 1994). Represented at the individual
level, the self is personalized and thought about in terms of unique traits. However, the boundaries of the self-concept can be extended by considering the self on the interpersonal level. In this case, roles and relationships are incorporated into the representation of the self. At its most broad, the self can be represented at the collective level, whereby the self is extended to include social groups. As categorization of the self shifts away from the person towards the collective level, the person not only identifies with the group, but “depersonalization” occurs (Brewer & Gardner, 1996; Markus & Kitayama, 1991; Oakes et al., 1994). The individual comes to see him or herself in terms of group characteristics (Hogg & Turner, 1987; Simon, Pantaleo, & Mummendey, 1995), pursues group-level goals (Kramer & Brewer, 1984), experiences group-level emotions (Moons, Leonard, Mackie, & Smith, 2009), performs in a manner that is consistent with group stereotypes (Marx & Stapel, 2006; Spencer, Steele, & Quinn, 1999), and regulates the self based on his or her social identity (Sassenberg & Woltin, 2008).

Whether the self is represented at the individual or collective level is determined by a number of factors, including chronic use (for example, reflected in cultural emphasis on independence or interdependence, Markus & Kitayama, 1991) or situational context. For example, priming individuals with “we” versus “I” can lead to representation of the self at more collective or individual levels, respectively (Brewer & Gardner, 1996; Marx & Stapel, 2006). As described above, SCT predicts that self-categorization will be a function of perceived fit and the accessibility of social categories (Oakes et al., 1994). In other words, a focus on similarity between the self and other members of the salient group should increase collective representation of the self, whereas a focus on differences between the self and the salient group should lead to more personalized representation of the self.

**Construal Level**
The above-mentioned models of category-based stereotyping, SCT, and self-construal theories all suggest that a number of situational factors influence people’s representation of social targets, including the self. But just how indirect can these contextual effects on level of representation be?

According to Construal Level Theory (CLT; Liberman & Trope, 2008; Trope & Liberman, 2010), level of abstraction (or construal) is related to psychological distance. Objects and events that are more distant in time (Liberman & Trope, 1998), space (Fujita, Henderson, Eng, Trope, & Liberman, 2006), or on social dimensions (P. K. Smith & Trope, 2006; Stephan, Liberman, & Trope, 2010) tend to be represented more abstractly, whereas objects and events that are closer in time, space, or on social dimensions tend to be represented more concretely. Moreover, these relationships appear to be bi-directional, such that events and objects that are represented on a higher, more abstract, level tend to be seen as more temporally (Liberman, Trope, McCrea, & Sherman, 2007; McCrea, Liberman, Trope, & Sherman, 2008), socially (Bar-Anan, Liberman, & Trope, 2006; Stephan et al., 2010), and physically distant (Bar-Anan et al., 2006).

The level at which an object or event is represented has a number of important consequences for judgment and behavior. Objects and events represented more abstractly are thought about in terms of superordinate goals (i.e., why one pursues a goal, Liberman & Trope, 1998), are explained in terms of more abstract dispositional traits (Nussbaum, Trope, & Liberman, 2003), and are placed into a smaller number of broad, higher-order categories (Liberman, Sagristano, & Trope, 2002). A more abstract conceptual representation also broadens perceptual attention, as evidenced by facilitation of global, configural processing (Fürster, Friedman, & Liberman, 2004; Wakslak, Trope, Liberman, & Alony, 2006). In contrast, objects and events represented more concretely are thought about in terms of low-level behaviors (i.e., how one pursues a goal), are
explained in terms of specific behaviors, and are placed into a larger number of narrow, lower-
order categories. A more concrete conceptual representation also narrows perceptual attention, as
evidenced by facilitation of local, featural processing (Förster et al., 2004; Wakslak et al., 2006).

More recent work suggests that construal level mindsets can be induced, such that construal
level manipulations in one context can have effects on subsequent behavior in another, unrelated
context. For example, priming a more global processing style leads to judgments of greater
temporal, spatial, social, and probabilistic distance (e.g., time until a visit to the dentist; distance
to the Amsterdam central station, etc.) relative to priming a more local processing style
(Liberman & Förster, 2009). In the same manner, considering high-level superordinate goals
rather than lower-level behaviors has been shown to influence both judgments (Freitas,
Gollwitzer, & Trope, 2004) and behavior (McCrea et al., 2008) on unrelated tasks.

Of particular relevance to the current research is the notion that more abstract (as compared
to concrete) construal level is associated with a focus on similarity, more inclusive
categorization, and a broader conceptual scope (Förster, 2009). For example, priming global
processing has been shown to foster a search for similarity between stimuli (Förster, 2009) and
inclusion of more atypical exemplars into a single conceptual category (Friedman, Fishbach,
Förster, & Werth, 2003), relative to priming local processing. Greater psychological distance,
which results in more abstract representation of objects and events, also has been found to
increase focus on similarity (Förster, 2009) and more inclusive categorization (Liberman et al.,
2002). All of these findings suggest that a more abstract construal is conducive to the inclusion
of exemplars into a higher-order social category as a result of a greater focus on perceived
similarities between target and group. In other words, greater abstraction in one domain (e.g.,
more global, configural processing) should result in greater abstraction in subsequent
categorization (Brown, 1958; Rosch et al., 1976).

Research concerning the categorization of social targets supports this line of reasoning.
Individuals who tend to more chronically represent events and objects at a higher, more abstract,
level tend to see greater similarity between social targets (Levy, Freitas, & Salovey, 2002),
suggesting more broad and inclusive social categorization. Similar findings have been obtained
in studies examining the effect of temporal distance on social representation. Wakslak,
Nussbaum, Liberman, and Trope (2008) found that individuals were more likely to describe their
future-selves in terms of broad social categories (e.g., woman) and their present selves in terms
of more narrow social categories (e.g., a woman in her early 20s). Greater temporal distance also
appears to increase sex and race-based discrimination (Milkman, Akinola, & Chugh, 2010).
Milkman et al. (2010) sent faculty members an email from a supposed prospective graduate
student asking for an appointment in either the near (today) or distant (next Monday) future. The
gender and race of the student was manipulated. Faculty responded more promptly to the
requests of men and Caucasians, but only for appointments that would take place in the more
distant future. These findings imply that, in situations likely to foster an abstract construal, email
senders were more likely to be represented in terms of their race or gender (and therefore more
likely to be discriminated against), relative to situations likely to foster a concrete construal.

**Construal Level Mindsets and Stereotyping**

Building on this past work, we were interested in whether 1) a more abstract construal level
would increase stereotyping of self and other, and 2) whether such effects obtain even when
construal level is primed as part of a task completely unrelated to judging the target. We argue
that perceivers induced into a relatively more abstract (compared to a more concrete) construal
level mindset should subsequently be more amenable to the broad, inclusive categorization of individuals (others or the self) into a social group as a result of an increased focus on similarity between the individual and this group. They should therefore demonstrate a greater willingness to activate and use stereotypes about that group. Moreover, increased stereotyping should occur regardless of whether the abstract construal mindset is induced by thinking about superordinate goals rather than low-level behaviors (Freitas et al., 2004), by completing tasks that foster more abstract rather than concrete processing styles (Liberman & Förster, 2009; Wakslak et al., 2006), or by considering traits implied by behaviors rather than objects required for behaviors (Fujita, Trope, Liberman, & Levin-Sagi, 2006).

Importantly, we are not predicting that an abstract construal level mindset will directly activate stereotypes, but rather that this mindset will focus perceivers’ attention on similarities between a target and a salient social category. This cognitive orientation should encourage broader, more inclusive categorization (see also Levy et al., 2002; Wakslak et al., 2008). Which particular category dimension (e.g., gender, race, nationality, or occupation) is used, however, is determined by the relative salience of those dimensions in a given context (e.g., due to explicit references to the category, visual cues to group membership, etc.). Our perspective is thus quite similar to that of SCT (Turner et al., 1987) in that construal level should not increase the accessibility of a given social category, but rather the perceived fit of a target person to that social category by virtue of highlighting within-group similarity.

We therefore conducted a series of experiments examining the consequences of a more abstract construal level mindset for impressions of other individuals (Studies 1 and 2), trait ratings of the self (Studies 3a, 3b, and 6), and stereotype-consistent performance (Studies 4a and 4b). We then carried out several experiments (Studies 5a, 5b, and 6) focused on testing whether
manipulations of construal level directly prime stereotype content, or whether (as we propose) an abstract construal mindset increases the likelihood that individuals will be represented in terms of a salient social category.

**Study 1 – Consequences for Stereotyped Judgments of Others**

We conducted an initial study to determine whether placing individuals into an abstract construal mindset would increase stereotypic judgments relative to a concrete construal mindset. We opted to examine the negative stereotype of women in the computer field (see also Cheryan, Plaut, Davies, & Steele, 2009). For the manipulation of construal level mindset, individuals were asked to consider either increasingly higher-order superordinate goals, or increasingly lower-level behaviors that could fulfill a particular goal (Freitas et al., 2004). We predicted that inducing a more abstract construal mindset via considering increasingly superordinate goals would lead to more stereotypic judgments of the targets, such that a female candidate would be rated more negatively on dimensions relevant to an advertised software designer position compared to a male candidate. In contrast, we expected that placing individuals into a more concrete construal mindset (i.e., by considering increasingly low-level behaviors) would lead to less stereotypic judgments, such that the male and female candidates would be rated equivalently on dimensions relevant to the advertised position. We expected these effects to be limited to stereotypic judgments. Thus, we did not expect differences in overall positivity of evaluations or the adoption of fairness goals.

**Method**

**Participants and Design**
Participants were 20 male students at a German university. They received 2 Euros and a coupon for a free cup of coffee as compensation. Participants were randomly assigned to either the abstract construal condition or the concrete construal condition.

**Materials and Procedure**

Participants were told that research has shown that one’s life satisfaction is enhanced when the connection between abstract goals and concrete actions is realized, and that the next portion of the study would deal with this topic. They were then randomly assigned to one of the two construal mindset conditions, adapted from Freitas et al. (2004). Those assigned to the abstract construal condition were asked to consider why they would pursue a particular goal. They were presented with a diagram in which a behavior (participating in a psychological study) was progressively linked to higher-order goals by a series of “why” questions and answers (i.e., Why participate in a psychological study? → To learn about oneself; Why would you want to do that? → To better appraise one’s strengths and weaknesses, etc.). The diagram concluded with “feeling that is the way to a fulfilled life” as the highest-order goal. After considering this example, participants were asked to write down three important life goals that can be fulfilled by establishing and maintaining friendships. After each goal, participants were asked to indicate on a 7-point Likert scale (1 = very little to 7 = very much) the extent to which the establishment and maintenance of friendships would help in reaching this goal. They were then asked to complete a hierarchical diagram similar to the example given previously, beginning with the behavior of establishing and maintaining good personal relationships. In this manner, participants were asked to provide increasingly higher-order goals that would be served by maintaining their friendships.

Those assigned to the concrete construal condition were asked to consider how they would pursue a particular goal. They were presented with a diagram in which a higher-order goal
(“feeling that is the way to a fulfilled life”) was progressively linked to lower-level activities by a series of “how” questions (i.e., How to achieve a fulfilled life? → Get a good job or educate oneself; How would you achieve that? → University degree, etc.). The diagram concluded with “participating in a psychological study” as the lowest-level behavior. After considering this example, participants were asked to write down three behaviors that could fulfill the goal of establishing and maintaining friendships. After each behavior, participants were asked to indicate on a 7-point Likert scale (1 = very little to 7 = very much) the extent to which the behavior would help in the establishment and maintenance of friendships. They were then asked to complete a hierarchical diagram similar to the example given previously, beginning with the goal of establishing and maintaining good personal relationships. In this manner, participants were asked to provide increasingly lower-level behaviors that could serve to maintain their friendships. Thus, participants in both conditions considered the same activities, but those in the abstract construal condition were asked to focus on why one would engage in these activities, whereas those in the concrete construal condition were asked to focus on how one would engage in these activities (Freitas et al., 2004).

It was then explained that the rest of the study dealt with how people make decisions and that the next task involved evaluating various job applications. The application materials were adapted from the work of Seifert (2001). Participants first read a short description of an open software designer position and key attributes to look for in a job candidate. They then read a brief narrative of each of eight (four female and four male) candidates, including personal details, course of study, grades attained, internships completed, past work experience, and other pieces of filler information. Importantly, the first male candidate and first female candidate presented had been pretested in past work to be equally qualified (see Seifert, 2001, for details).
The remaining candidates were included merely to solidify the cover story. After reading each description, participants were asked to rate that candidate on 14 trait dimensions in a semantic-differential format. Eight of these trait dimensions were considered relevant to the advertised position (see also Seifert, 2001): ambitious - unambitious, foolish - clever (reversed), assertive - unassertive, competent - incompetent, consistent - inconsistent, timid - self-confident (reversed), technically skilled - not technically skilled, flexible - inflexible. One additional item (positive – negative) served as an overall evaluation of the candidate, allowing for an examination of the specificity of any effects on judgment. The remainder of the trait dimensions (e.g., happy - unhappy) served as filler items. All ratings were made by placing a mark on a continuous 13.6 cm scale. Next, participants were asked to rate whether they would hire the candidate (absolutely not - absolutely) and whether the candidate could take a leadership position in this field (absolutely not - absolutely). These ratings were also made by placing a mark on a continuous 13.6 cm scale. After completing the ratings of the eight candidates, participants were asked to what extent they felt committed to judging the candidates fairly, using a 7-point scale (1 = not at all to 7 = very much).

Results

Overview

We concentrated our analyses on the first male and first female candidates, as they had been pre-tested to be equivalent (see also Seifert, 2001). The job-related trait-ratings were summed for the female candidate (Cronbach’s $\alpha = .71$) and the male candidate (Cronbach’s $\alpha = .86$), such that higher scores indicate a more negative impression of the target. All dependent measures were subjected to a 2 (Construal level: Abstract vs. Concrete) between x 2 (Target gender) within mixed-measures ANOVA. Means and standard deviations by condition are presented in Table 1.
Participants did not significantly differ by condition in their commitment to make fair judgments (abstract construal condition $M = 6.20, SD = 1.48$; concrete construal condition $M = 5.50, SD = 1.35$), $t(18) = 1.11, p = .28, \eta^2 < .07$.

**Trait Ratings**

On the combined trait-rating measure, the main effect of construal level was not significant, $F(1,18) < 1, ns, \eta^2 = .01$. There was a main effect of target, $F(1,18) = 7.99, p < .05, \eta^2 = .31$, indicating that the male target was rated more positively on job-related dimensions than was the female target. This effect was qualified by a significant Construal level x Target interaction, $F(1,18) = 9.47, p < .01, \eta^2 = .35$. Whereas the targets were rated equivalently in the concrete construal condition rated, $t(9) < 1, ns, \eta^2 = .00$, the male target was rated more positively than the female target in the abstract construal condition, $t(9) = 4.55, p < .01, \eta^2 = .70$.

**Likelihood of Hiring Target**

On the measure of likelihood of hiring the target, the construal level main effect was not significant, $F(1,18) < 1, ns, \eta^2 < .01$. We did observe a main effect of target, $F(1,18) = 6.44, p < .05, \eta^2 = .26$, indicating that the male target was more likely to be hired than was the female target. This effect was qualified by a marginally significant Construal level x Target interaction, $F(1,18) = 3.68, p = .07, \eta^2 = .17$. Whereas participants in the concrete construal condition indicated that they would be equally likely to hire the male or female target, $t(9) < 1, ns, \eta^2 = .00$, those in the abstract construal condition indicated that they would be more likely to hire the male target than the female target, $t(9) = 2.96, p < .05, \eta^2 = .49$.

**Likelihood of Holding a Leadership Position**

On the measure of perceived likelihood that the target would become a leader in the field, the main effect of construal level was not significant, $F(1,18) < 1, ns, \eta^2 = .02$. We observed a
marginally significant main effect of target, $F(1,18) = 4.15, p = .06, \eta^2 = .19$, indicating that the male target was perceived to be more likely to become a leader in this field. This effect was qualified by a significant Construal level x Target interaction, $F(1,18) = 7.56, p < .05, \eta^2 = .30$.

Whereas participants in the concrete construal condition indicated that the male and female target were equally likely to become leaders, $t(9) < 1$, ns, $\eta^2 = .00$, those in the abstract construal condition indicated that the male candidate would be more likely to become a leader than would the female candidate, $t(9) = 2.66, p < .05, \eta^2 = .44$.

**Overall Evaluation**

There were no effects on the item assessing the overall evaluation (positive - negative) of the applicants, all $F$s < 1.05, ns, $\eta^2 < .06$.

**Discussion**

As predicted, participants were more likely to make stereotypic judgments about a person when placed into an abstract construal mindset than in a concrete construal mindset. In the abstract construal condition, but not in the concrete construal condition, the female applicant was judged as having lower qualifications and as being less suitable for a leadership position than a comparable male applicant. In addition, participants in the abstract construal condition (but not the concrete construal condition) tended to indicate that they would be less likely to hire the female candidate than the male candidate. These differences were not observed in the concrete construal condition. Given that we did not observe any differences in overall evaluation, it is unlikely that the consequences of the construal level manipulation can be attributed to purely evaluative processes. Furthermore, there was no evidence that individuals in the concrete condition were consciously striving to be less prejudiced, as indicated by the fairness measure. Indeed, those in the abstract condition tended to report a greater commitment to fairness than did
those in the concrete condition, although the difference was nonsignificant. Thus, we believe our effects reflect differences in social categorization of the targets, rather than differences in the adoption of a fairness goal or the evocation of more general positive or negative feelings towards the targets.

The fact that the construal level manipulation affected an unrelated task is consistent with a number of past studies of mindset effects (Freitas et al., 2004; Liberman & Förster, 2009). However, Study 1 is the first of which we are aware demonstrating mindset effects on social categorization. Study 1 also extends past work showing effects of temporal distance on social categorization (Milkman et al., 2010; Wakslak et al., 2008), demonstrating that individuals who have recently been thinking in terms of higher-order goals are more likely to subsequently consider targets in relation to their social identity.

Although these findings are intriguing, Study 1 leaves several questions unanswered. We have discussed the findings in terms of mindset effects on level of categorization, but an alternative explanation for our results could be that the consideration of why one would go about pursuing a goal is more cognitively demanding or ego-depleting than is considering how one would go about pursuing a goal. Stereotypes are more likely to be employed when the perceiver lacks cognitive resources (Macrae et al., 1994) or is depleted (Govorun & Payne, 2006). If this were the case, then one would expect that intellectual performance would generally be worse following the induction of an abstract construal mindset. We provide evidence against this alternative explanation in Studies 4a and 4b.

Our findings are also consistent with the prediction from CLT (Liberman & Trope, 2008; Trope & Liberman, 2010) that a more abstract construal level increases perceived social distance to the target. Although we did not observe differences in overall evaluation, male participants
may have been more likely to view the female candidate as an outgroup member when placed into an abstract construal mindset, leading to discriminatory judgments. Alternatively, thinking about why one would like to maintain friendships may have induced a motivation to construe the self in terms of group memberships (Pickett, Bonner, & Coleman, 2002) and to ultimately prefer the ingroup candidate. Although self-reported fairness did not provide an explanation of our results, participants may have been unwilling to admit that they were being biased against the female candidate. Thus, it is important to determine whether the effects of construal level we observed are limited to situations involving a clear ingroup-outgroup distinction. In addition, it is unclear whether our effects would extend to stereotypes other than gender.

A final alternative explanation for our findings could be that our manipulation of construal level mindsets differentially primed issues related to interpersonal relationships or gender stereotypes, particularly because women are thought to be more motivated by interpersonal concerns (Guimond, Chatard, Martinot, Crisp, & Redersdorff, 2006). We sought to rule out these possible explanations in Study 2 using outgroup occupational stereotypes and a different manipulation of construal level.

**Study 2 – Use of Occupational Stereotypes**

In Study 2, we sought to replicate our findings with targets that were both members of an outgroup. According to previous work (Slusher & Anderson, 1987), lawyers are considered to be stereotypically more aggressive and less friendly than are members of the clergy. We presented participants with a description of an individual and varied whether he was a practicing priest or lawyer. Prior to forming an impression of this person, participants were induced into an abstract or concrete construal mindset via one of two perceptual tasks. Participants in the abstract construal condition completed the Gestalt Completion Task (Street, 1931). This task requires
detecting a coherent figure or global pattern in a fragmented picture, and performance on this task has been shown to be enhanced in conditions that foster higher-level, abstract construals (Förster et al., 2004; P. K. Smith & Trope, 2006; Wakslak et al., 2006). Participants in the concrete construal condition completed the Picture Completion subtest of the WISC-IV (Wechsler, 2003). This task requires attention to features or details of a picture, and performance on this task has been shown to be enhanced in conditions that foster lower-level, concrete construals (Wakslak et al., 2006). We expected that completing these tasks would instill abstract or concrete construal mindsets without evoking group identification or occupation. We predicted that participants would ascribe more stereotypical traits to the target (i.e., view him as more aggressive and less friendly in the lawyer condition and as less aggressive and more friendly in the priest condition) when they had previously been placed into an abstract, as opposed to concrete, construal level mindset.

Method

Participants and Design

Participants were 203 (153 female) students at a German university. They received 2 Euros and a coupon for a free cup of coffee as compensation. Participants were randomly assigned to one of four conditions in a 2 (Construal level: Abstract vs. Concrete) x 2 (Target profession: Priest vs. Lawyer) between subjects design.

Materials

To ensure that our sample would be aware of these occupational stereotypes, we conducted a pilot test in which 43 participants rated the typical lawyer and the typical priest on thirteen traits. Participants rated the typical lawyer higher than the typical priest on the following traits: intelligent, unfriendly, self-confident, hostile, selfish, aggressive, argumentative, and unfeeling,
all $ts > 3.47$, $df = 42$, $ps < .01$. Participants rated the typical priest higher than the typical lawyer on the following traits: benevolent, likable, emotional, kind, and moral, all $ts > 4.91$, $df = 42$, $ps < .001$. Participants in the main study therefore rated the target on these same traits.

**Procedure**

Participants were told they would complete two separate studies. The first study was said to involve completing a perceptual task. Those assigned to the abstract construal level mindset condition were told that forming a complete picture out of its component parts is an important perceptual process and so they would complete a picture recognition task. The task required detecting the gestalt form in thirteen pictures. The items were taken from the Gestalt Completion Task (Street, 1931). The pictures were presented in the following order: a dog, a boat, a cat, a stove, a baby, a table, a soldier, a rider on a horse, a rabbit, a locomotive, a bicycle rider, a man’s face, and a person kneeling to take a photograph. Participants wrote their answer in a box below the picture. Those assigned to the concrete construal level mindset condition were told that detecting missing or incorrect features is an important perceptual process and so they would work on a picture completion task. The task required finding a missing feature in thirteen pictures. The items were taken from the Picture Completion subtest of the WISC-IV (Wechsler, 2003). The pictures were presented in the following order: a cat (missing whiskers), a girl jumping rope (missing a bow in her hair), a ladder (missing a step), a girl looking in the mirror (reflection is missing a doll she is holding), a man with a wristwatch (missing a watchband), a door (missing a hinge), a leaf (missing veins), a dresser (missing a knob), a belt (missing holes), dice (missing dots), a man with a mustache (missing eyebrows), a fish (missing gills), and a downed tree (missing tree rings). Participants provided their answer by writing the missing feature in the box below the picture. For both tasks, participants had as much time as needed.
Next, participants were told the second study would begin, and that this study involved impression formation. They were asked to read a description of Thomas. Those assigned to the priest condition were told that Thomas has been a priest for eight years, whereas those assigned to the lawyer condition were told that Thomas has been a lawyer for eight years. The descriptions of Thomas were otherwise the same and were adapted from Srull and Wyer’s (1979) “Donald” paragraph. Participants learned that Thomas engaged in a number of ambiguously aggressive and unfriendly behaviors such as demanding that his car be repaired on the same day, getting his money back from a local hardware store, and making up a lie for why he does not want to donate blood. After carefully reading the description and forming an overall impression of Thomas, participants were asked to rate to what extent each of the thirteen traits described him, using a nine-point scale (1 = not at all to 9 = very much).

**Results**

We combined the trait ratings into a single index, with higher scores reflecting more consistency with the lawyer stereotype and lower scores reflecting more consistency with the priest stereotype. Thus, ratings on the traits benevolent, likable, emotional, kind, and moral were reversed and all of the ratings summed. The trait scores were analyzed in a 2 (Construal level: Abstract vs. Concrete) x 2 (Target profession: Priest vs. Lawyer) ANOVA. The main effects of target and construal level were not significant, $F$s < 1, ns, $\eta^2$ < .01. However, the predicted interaction was significant, $F(1,199) = 4.24, p < .05, \eta^2 = .02$, see Figure 1. Within the abstract construal condition, Thomas was rated as more like a typical lawyer in the lawyer condition than in the priest condition, $t(89) = 2.09, p < .05, \eta^2 = .05$. The same comparison within the concrete construal condition was not significant, $t(110) < 1, p > .39, \eta^2 < .01$. Thus, we only found evidence for stereotype use in the abstract construal condition.
To ensure that this effect was not due to differences in the difficulty of the tasks, performance on the Gestalt Completion and Picture Completion tasks was scored. Although the Picture Completion task ($M = 12.39, SD = 0.86$) proved to be easier than the Gestalt Completion task ($M = 8.89, SD = 1.33$), $t(201) = 22.59, p < .001$, scores were not correlated with the trait rating measure ($r = -.02$) and the Construal level x Target profession interaction remained significant when controlling for task performance.

**Discussion**

Replicating Study 1 and consistent with our predictions, participants were more likely to apply the occupational stereotypes of priests and lawyers to their evaluation of Thomas when they had previously engaged in a task that required more abstract construal (i.e., the Gestalt Completion task) than when they had completed a task that required more concrete construal (i.e., the Picture Completion task). Study 2 demonstrates that the use of stereotypes other than gender can be affected by manipulations of construal level mindset, and that the effects of construal level mindset on stereotype use are not constrained to situations involving ingroup-outgroup competition. One limitation to these findings is that we focused on more socially acceptable stereotypes concerning gender and occupational stereotypes, as opposed to racial or ethnic stereotypes which may be socially proscribed. We return to this issue in the General Discussion.

Taken together, our first two studies extend past work on construal level and social categorization (Levy et al., 2002; Milkman et al., 2010) in two ways. First, we demonstrate effects of construal level on the application of stereotypic traits and discriminatory judgments. Second, our studies provide evidence that construal level mindsets, invoked by unrelated tasks, can influence subsequent stereotyping. Because the same task differentially affected impressions
of Thomas in the priest and lawyer conditions, it cannot be the case that the pictures in the tasks directly primed certain traits. Moreover, none of the pictures were related to the practice of religion or law, nor is there any reason to believe that they influenced the need to affiliate with one’s ingroup. Finally, the results were not influenced by performance on the different tasks.

**Studies 3a and 3b – Consequences for Self-Stereotyping**

In addition to consequences for stereotyping others, we also expect consequences of construal level mindsets for stereotyping the self. According to self-categorization theory (Turner et al., 1987) and self-construal perspectives (Brewer & Gardner, 1996; Markus & Kitayama, 1991), individuals can either represent themselves as persons or as members of a group. When the self is represented at the collective (i.e., group) level, individuals are not only more likely to identify the self as part of a group, but also to view the self in terms of group characteristics. Depersonalization occurs, such that the self is perceived as more similar to the group prototype (Hogg & Turner, 1987; Oakes et al., 1994; Simon et al., 1995). For example, Hogg and Turner (1987) showed that placing individuals into an intergroup context increased self-stereotyping relative to placing individuals into an intragroup context. According to SCT (Hogg & Turner, 1987; Turner et al., 1987), the self is likely to be represented at the collective level to the extent that a category is made accessible and there is sufficient fit (i.e., similarity) between the target and the social category.

We believe that construal level mindsets should also determine whether the self is represented at a personal or collective level. A more abstract construal mindset should encourage a focus on similarity of the self to a salient social group, broadening the representation of the self to the collective level. In contrast, a more concrete construal mindset should encourage a more narrow, personalized representation of the self. Thus, we expected that an abstract construal
mindset would increase group identification and self-stereotyping, relative to a concrete construal mindset. We conducted two studies in which construal level mindsets were manipulated by focusing individuals on either superordinate goals (abstract construal) or low-level behaviors (concrete construal). We examined the consequences of these mindsets for both group identification and self-stereotyping. We predicted that placing individuals into a more abstract construal mindset by having them consider why they wished to achieve a goal would lead men and women to identify more strongly with their gender group and to perceive the self as more gender stereotypic, relative to placing individuals into a more concrete construal mindset by having them consider how they could achieve these goals. Because we believe that these effects also require that a category dimension be made accessible, we asked participants to indicate their gender prior to rating the self.

Method

Participants and Design

Participants in Study 3a were 100 (57 female) students at a German university. Participants in Study 3b were 65 (33 female) students at a German university. They received 2 Euros and a coupon for a free cup of coffee as compensation. Participants were randomly assigned to either the abstract (why) or the concrete (how) construal level mindset condition.

Materials

Gender-stereotypic trait dimensions were selected based on past work indicating that men are generally considered more dominant, agentic, and career-oriented, whereas women are considered more emotional, fickle, and erotic (e.g., Guimond et al., 2006; Rodler, Kirchler, & Hoelzl, 2001; Williams et al., 1979). There were twelve stereotype-relevant trait dimensions presented in a semantic differential format. For six of these dimensions, higher scores reflected
more stereotypically feminine and less stereotypically masculine traits (active – passive, ambitious – not ambitious, comradely – not comradely, violent – peaceful, macho – cowardly, emotionless - emotional). For the other six dimensions, higher scores reflected more stereotypically masculine and less stereotypically feminine traits (shy – self-confident, weak – strong, erotic – not erotic, hysterical – reasonable, gentle – rough, gossipy – tight-lipped).

We conducted a pretest to ensure that this measure would actually capture gender stereotypes. Seventeen participants were asked to rate the typical man and the typical woman on these same twelve trait dimensions using a seven-point semantic differential. The six items for which higher scores reflected more stereotypically masculine traits (shy – self-confident, weak – strong, erotic – not erotic, hysterical – reasonable, gentle – rough, gossipy – tight-lipped) were reverse-scored, and the ratings were summed to form an index of more feminine (and less masculine) stereotypicality. The typical woman (M = 52.59) was rated as more feminine (and less masculine) than was the typical man (M = 37.82), t(16) = 7.81, p < .001, η² = .79, indicating that our measure adequately reflected prevailing gender stereotypes.

**Procedure**

The manipulation of construal level was the same as in Study 1. Participants in Study 3a were asked to consider either why (abstract construal condition) or how (concrete construal condition) they would maintain their personal friendships (i.e., social domain). Participants in Study 3b were asked to consider either why (abstract construal condition) or how (concrete construal condition) they would maintain their health (i.e., non-social domain).

Participants were then told that the second experiment dealt with how various personality attributes are related and that they would therefore be asked to rate themselves on those attributes. Participants provided their gender and then rated themselves on the 12 stereotype-
relevant trait dimensions developed in the pretest described above, as well as 20 filler items (e.g., foolish-clever, happy-unhappy, funny-boring, musical - nonmusical). All ratings were made by placing a mark on a continuous 13.6 cm scale.

After completing these measures, participants in Study 3b were given an additional questionnaire. They were asked to complete a seven-item measure of identification (see Marx, Stapel, & Muller, 2005; Obst & White, 2005) with their gender group (e.g., “I identify myself with this group”; “The fact that I belong to this group has little to do with how I view myself” [reversed]; “I think it is good that I belong to this group”) using a seven-point scale (1 = does not apply to 7 = completely applies). In addition, participants were asked to indicate how close they felt to their gender group using an adapted version of the Circle Task (Aron, Aron, & Smollan, 1992). Participants responded on a seven-point scale, where 1 reflected the least overlap between self and gender group and 7 reflected the greatest overlap between self and gender group.

Results

Overview

Ratings on the stereotypic traits were combined into a single index as described above, such that higher scores reflect more stereotypically feminine, and less stereotypically masculine, ratings of the self. This index was submitted to a 2 (Construal level: Abstract vs. Concrete) x 2 (Gender of participant) ANOVA. Increased self-stereotyping in the abstract construal condition would therefore be indicated by a significant Construal level x Gender interaction in which men rate themselves as relatively more masculine and women rate themselves as relatively more feminine in the abstract construal compared to the concrete construal condition.¹

Study 3a
The main effect of construal level was not significant, $F(1,96) < 1$, ns, $\eta^2 < .01$. A main effect of gender revealed that women rated themselves as more feminine and less masculine than did men, $F(1,96) = 4.05, p < .05, \eta^2 = .04$. More importantly, the Construal level x Gender interaction was significant, $F(1,96) = 6.63, p < .05, \eta^2 = .07$, see Figure 2. Within the abstract construal condition, women rated themselves as more feminine and less masculine than did men, $t(48) = 3.02, p < .01, \eta^2 = .16$. Within the concrete construal condition, there was no effect of gender, $t(48) < 1, p > .67, \eta^2 < .01$. Thus, we observed more stereotype-consistent ratings in the abstract construal condition than in the concrete construal condition.

**Study 3b**

The main effects of construal level and gender were not significant, $Fs < 1$, ns, $\eta^2 < .01$. The predicted Construal level x Gender interaction was significant, $F(1,61) = 5.87, p < .05, \eta^2 = .09$, see Figure 3. Within the abstract construal condition, the gender difference in self ratings was in the expected direction, but was not significant, $t(31) = 1.50, p = .14, \eta^2 = .07$. Within the concrete construal condition, men tended to rate themselves as more feminine and less masculine than did women, $t(30) = 1.93, p = .06, \eta^2 = .11$. Thus, although neither of the simple comparisons achieved statistical significance, the interaction revealed relatively more stereotype-consistent ratings in the abstract construal condition than in the concrete construal condition.

We combined the gender identification and the Circle Task items into a single index (Cronbach’s $\alpha = .70$). A 2 x 2 ANOVA revealed a main effect of construal level, $F(1,61) = 4.17, p < .05, \eta^2 = .06$. Participants more strongly identified with their gender group in the abstract construal condition ($M = 42.76$) than in the concrete construal condition ($M = 39.31$). There were no other effects (all $Fs < 1$, ns, $\eta^2 < .02$).

**Discussion**
In both Study 3a and 3b, trait-ratings of the self were relatively more gender-stereotypic in the abstract construal condition than in the concrete construal condition, as indicated by a significant Construal level x Gender interaction. Furthermore, we found that an abstract construal mindset increased identification with one’s gender group, relative to a concrete construal mindset. Finally, we observed these effects for both manipulations of construal level (i.e., friendship and health), indicating that it is not necessary that the manipulation involve social relationships. Thus, it appears that in addition to increasing stereotyping of others (Studies 1 and 2), a more abstract construal mindset can also encourage higher-level self-categorizations. Our results again are consistent with the notion that social categorization is influenced by level of construal induced by unrelated tasks, and not just by characteristics of the group (Oakes et al., 1994) or direct manipulations of collective self-construal (Brewer & Gardner, 1996).

**Study 4a and 4b – Consequences for Performance**

If individuals are more likely to represent the self at the collective level when placed into a more abstract construal mindset, then we should also observe increased stereotype-consistent performance in such conditions. Prior studies have shown that women perform worse than men on a math test when they strongly identify with their female gender (Wout, Danso, Jackson, & Spencer, 2008) and when primed to categorize themselves on a collective level (Marx & Stapel, 2006). We therefore predicted that construal level mindset would influence math performance of men and women, even when the manipulation of construal was unrelated to social categorization. This prediction also serves to critically test an alternative explanation for our results. One could argue that stereotyping increases under abstract construal because processing capacity is reduced. That is, generating reasons why one has a particular goal or engaging in the detection of Gestalt figures may be more cognitively demanding or ego-depleting than generating plans to realize a
goal or engaging in the detection of missing features. As a result, fewer cognitive or self-regulatory resources would be available for subsequent judgments. Because stereotypes are more likely to be used when cognitive resources are limited (Macrae et al., 1994) or self-regulatory resources depleted (Govorun & Payne, 2006), our findings could reflect the operation of such a process. If this alternative explanation were true, then we would expect both men and women to suffer poorer performance on a math test in the abstract condition than in the concrete condition. However, if construal level mindset affects self-categorization, we would expect a different pattern. Specifically, women should perform worse relative to men when placed into an abstract construal mindset, but not when placed into a concrete construal mindset.

Method

Participants and Design

Participants in Study 4a were 78 (44 female) students at a German university. They received 2 Euros and a coupon for a free cup of coffee as compensation. Participants in Study 4b were 60 (34 female) psychology students at an American public university. They received a half-hour of participation credit toward one of their psychology classes. In both studies, participants were randomly assigned to either the abstract or the concrete construal level mindset condition in a between-subjects design.

Materials and Procedure

The manipulation of construal level mindset in Study 4a involved considering how vs. why one would try to maintain friendships, as in Study 1 and Study 3a. In Study 4b, construal level mindset was manipulated by asking participants to complete the Gestalt Completion test or the Picture Completion test, as in Study 2.
Following the manipulation of construal level mindset, participants were told that the next portion of the study examined math performance. They were asked to indicate their gender and then attempt 25 math problems for a period of ten minutes (Study 4a) or 18 math problems for a period of five minutes (Study 4b). We shortened the test time in Study 4b in order to make the test more challenging and increase the chances that we would observe underperformance among women in the abstract construal mindset condition (see also Spencer et al., 1999). To ensure that they were fully-engaged with the task, individuals were asked to indicate how much effort they had put forth on the test, using a seven-point scale (1 = none to 7 = a great deal) scale. Finally, they were asked to indicate (yes or no) whether they had any prior knowledge of the study.

Results

Study 4a

None of the participants in Study 4a expressed prior knowledge of the study. There were no effects on the measure of self-reported effort, $F$s < 1, ns, $\eta^2 < .02$, overall $M = 5.03$, indicating that participants on the whole were engaged in the math test. Preliminary analyses revealed that controlling for effort did not change the findings on math performance. We conducted a 2 (Construal level: Abstract vs. Concrete) x 2 (Gender) ANOVA on the number of math items correctly answered. The main effect of construal level was not significant, $F(1,74) < 1$, ns, $\eta^2 = .01$. There was a main effect of participant gender such that men outperformed women on the math test, $F(1,74) = 7.68$, $p < .01$, $\eta^2 = .09$. However, this effect was qualified by the predicted Construal level x Gender interaction, $F(1,74) = 4.36$, $p < .05$, $\eta^2 = .06$, see Figure 4. Whereas men answered more items correctly than did women in the abstract construal condition, $t(36) = 3.92$, $p < .001$, $\eta^2 = .30$, there was no effect of gender in the concrete construal condition, $t(38) < 1$, $p > .66$, $\eta^2 < .01$. 
Study 4b

Nine participants (15%) expressed some prior knowledge of the study. Within the abstract construal condition, women were more likely than men to indicate that they had prior knowledge of the study (Fisher’s exact test $p = .05$). Examining our debriefing protocol more carefully, we found no evidence that participants who expressed prior knowledge were aware of the hypotheses, suggesting that they may have been referring to the description of the study posted in the online sign-up system. Nonetheless, we included the awareness item as a covariate in the analysis of math performance to be sure that our results were not due to prior knowledge of the study or differences in interest in participating in a study about math. As in Study 4a, participants reported relatively high effort, indicating that they were engaged in the task. There was a main effect of gender on the measure of reported effort, $F(1,56) = 4.58, p < .05, \eta^2 = .08$, such that men ($M = 4.96$) reported putting forth more effort than did women ($M = 4.24$). However, there were no significant effects of construal level, $Fs < 3.37, ps > .07, \eta^2 < .06$, and as a preliminary analysis revealed that reported effort did not significantly predict math performance, $F < 1, ns$, we do not consider this variable further.

We conducted a 2 (Construal level: Abstract vs. Concrete) x 2 (Gender) ANCOVA controlling for reported prior knowledge on the number of math items correctly answered. Individuals reporting prior knowledge of the study performed marginally better than did those reporting no prior knowledge, $F(1,55) = 3.64, p < .07, \eta^2 = .06$. The main effect of gender was significant, $F(1,55) = 4.43, p < .05, \eta^2 = .08$, such that men outperformed women. The main effect of construal level was not significant, $F(1,55) = 3.05, p > .08, \eta^2 = .05$. More importantly, the predicted Construal level x Gender interaction was observed, $F(1,55) = 4.10, p < .05, \eta^2 = .07$, see Figure 5. Whereas men answered more items correctly than did women in the abstract
construal condition, t(28) = 2.41, p < .05, η² = .17, there was no effect of gender in the concrete construal condition, t(28) < 1, p > .91, η² < .01.

As in Study 2, we also scored the Gestalt Completion and Picture Completion tests. There was no significant difference in time spent on the tasks (Picture Completion M = 213.03sec, SD = 129.16, Gestalt Completion M = 169.17sec, SD = 88.45, t = 1.53, df = 58, p = .13) or performance on the tasks (Picture Completion M = 8.80, SD = 4.65, Gestalt Completion M = 7.37, SD = 1.54, t = 1.60, df = 58, p = .11). Moreover, neither performance (r = -.09, p > .50) nor time spent on the task (r = -.04, p > .77) predicted math performance, and the Construal level x Gender interaction remained significant when controlling for these variables.

**Discussion**

The results of both Study 4a and 4b were consistent with our prediction that abstract construal mindsets increase stereotype-consistent performance, and contradicted the alternative explanation that the stereotyping effects observed in our prior studies were due to ego depletion or reduced processing capacity. Indeed, performance on the math test in Study 4b was unrelated to performance or time spent on the tasks used to induce construal level mindset. The results also replicate the primary findings of Studies 3a and 3b, showing increased self-stereotyping in abstract construal mindsets. All four studies support the notion that participants are more likely to represent themselves in terms of a salient social category when in an abstract construal mindset. These findings extend past work showing that making gender identity more salient results in stereotype-consistent performance (Marx & Stapel, 2006; Rydell, McConnell, & Beilock, 2009; Spencer et al., 1999). One interesting aspect of the results was that abstract construal appeared to improve the performance of men in Study 4a but impair the performance of women in Study 4b. The former effect has been labeled stereotype lift (Marx & Stapel, 2006),
whereas the latter is an example of stereotype threat (Spencer et al., 1999). We believe that this slight difference in the overall pattern of results is most likely due to the difficulty of the math exams used in these studies. We purposely shortened the length of time allowed to complete the math exam in Study 4b to increase the difficulty level of the test (Study 4a $M = 74\%$, Study 4b $M = 39\%$). Stereotype threat is most likely to occur when individuals are faced with a difficult, diagnostic test (Spencer et al., 1999). Indeed, Spencer et al. (1999) observed poorer performance among women only when the difficulty of the math test was comparable to that of the exam in Study 4b.

**Study 5a and 5b – Stereotype Activation**

Study 5a and 5b were designed to examine the process by which an abstract construal mindset leads to increased stereotyping. We were particularly interested in examining whether an abstract construal mindset directly activates stereotypes, or whether it leads to more inclusive categorization as a result of an increased focus on similarities between a target and contextually salient social categories (see also Förster, 2009). In our previous studies, we found evidence that abstract construal mindsets increased the use of a variety of stereotypes, including gender and occupation. But why were these stereotypes utilized and not others? Why did individuals make use of gender stereotypes and not stereotypes involving age or nationality? It is our contention that abstract construal mindsets foster more inclusive group-level categorizations, but that the situational context determines which dimension of categorization is utilized. In the terminology of SCT (Turner et al., 1987), abstract construal mindsets do not directly increase the accessibility of social categories; rather, they increase the perceived fit between an accessible category and the target due a focus on within-group similarity. In each of our prior studies, a cue to categorization was either explicitly provided (i.e., gender or occupation was mentioned in the
description of the target) or explicitly requested from participants prior to the administration of
the dependent measures. Thus, we expect that an abstract construal mindset would result in
greater activation of only those categories that are provided by the social context, relative to a
concrete construal mindset. In contrast, we expect construal level would have no impact on the
activation of categories that had not been made salient by the social context.

In Study 5a, we manipulated construal level mindset and subsequently measured the
activation of gender and age stereotypes. Importantly, categorizing by gender (but not by age)
was made salient prior to the measure of stereotype activation. Therefore, we expected construal
level to increase the activation of gender stereotypes, but not the activation of age stereotypes.
We measured the activation of both ingroup and outgroup stereotypes to capture the effects of
manipulating construal level when making a particular category dimension salient (i.e., by asking
participants to classify themselves rather than by priming group membership directly). In line
with both SCT (Haslam, Turner, Oakes, & McGarty, 1992) and cognitive models (Markman &
Gentner, 1993), we assume the categorization process is comparative in nature and so knowledge
concerning both the ingroup and the outgroup should be more accessible under an abstract
construal mindset. Thus, our measure was not intended to assess self-stereotyping, but rather the
activation of the category dimension. Construal level mindset was manipulated by priming
global or local processing (Förster, 2009; Liberman & Förster, 2009). As discussed earlier,
priming global processing has been found to lead to judgments of greater psychological distance
(Liberman & Förster, 2009), greater focus on similarity (Förster, 2009), and more inclusive
categorization (Friedman et al., 2003), relative to priming local processing. We reasoned that a
more global, abstract construal mindset would lead individuals to more quickly identify gender-
stereotypic traits, compared to a more local, concrete construal mindset. In contrast, we did not
expect the construal level manipulation to affect the speed with which individuals identified age-
stereotypic traits.

Study 5b was designed to replicate and extend these findings. First, we sought to examine
whether similar effects would be observed with a different category dimension, namely age.
Second, we sought to replicate our findings with a different manipulation of construal level.
Based on past work showing that abstract construals involve a greater focus on dispositional
traits than on low-level behaviors (Nussbaum et al., 2003), we manipulated construal level
mindset by focusing individuals on either traits implied by engaging in various activities or the
objects required to engage in those activities (see also Liberman et al., 2007). Third, we sought to
provide a stronger test of our hypothesis that an abstract construal level mindset would only
result in greater activation of a currently salient category dimension. We therefore manipulated
whether categorizing by age was made salient before or after the lexical decision task. We
predicted that participants would respond more quickly to age-stereotypic traits when placed in
an abstract construal mindset than when placed in a concrete construal mindset, but only when
they had previously encountered an age-related cue. In contrast, we predicted that we would not
find evidence for the activation of gender stereotypes in either abstract construal condition,
because there would be no contextual cue related to gender.

Method

Participants and design

Participants in Study 5a were 60 (38 female) students at a German university (age $M = 18$
years). One additional participant was excluded as an extreme outlier on both performance and
reaction time in the lexical decision task. They received 2 Euros and a coupon for a free cup of
coffee as compensation. Participants were randomly assigned to one of two construal level
mindset conditions in a between-subjects design.

Participants in Study 5b were 99 (62 female) students at a German university (age $M = 20$
years). They received 2 Euros and a coupon for a free cup of coffee as compensation.
Participants were randomly assigned to conditions in a 2 (Construal level: Abstract vs. Concrete)
x 2 (Age identification: Prior to lexical decision task vs. Subsequent to lexical decision task)
between-subjects design.

Materials

Global vs. local processing task (Study 5a). Participants completed an adapted version of
the global-local processing task (Navon, 1977; see also Liberman & Förster, 2009). A given trial
consisted of presenting a fixation cross for 500ms followed by a large letter (e.g., A) comprised
of a small letter (e.g., E). Participants had to identify either the large or the small letter as quickly
as possible. All possible combinations of the letters A, E, H, O, and S with each other and
themselves (i.e., 25 combinations) were presented twice each, for a total of 50 trials.

Participants assigned to the local processing task (i.e., concrete construal condition) were told
to ignore the large letter and to press the key corresponding to the small letter as quickly as
possible. Participants assigned to the global processing task (i.e., abstract construal condition)
were told to ignore the small letter and to press the key corresponding to the large letter as
quickly as possible. Thus, when presented with a large letter A made up of small letter Es,
participants completing the local processing task were to press the E-key, whereas those
completing the global processing task were to press the A-key. The latency with which
participants pressed the correct key was measured, and the computer only advanced to the next
trial upon the correct response. Participants completed three practice trials, were reminded of the instructions, and completed the main block of 50 trials with order of presentation randomized.

**Object vs. Trait-listing task (Study 5b).** Participants were asked to complete a questionnaire that supposedly contained a pretest for a future study. On the questionnaire was a list of ten activities: keep a diary, call a friend from high school, engage in a sport, paint their apartment, wash their hands, study for a test, play the piano, surf the internet, read a book, and help a friend move. Participants assigned to the concrete construal condition were asked to write a sentence or two listing objects that would be required to complete each task, whereas participants assigned to the abstract construal condition were asked to write a sentence or two describing the traits that would be implied by engaging in each task (see also Nussbaum et al., 2003).

**Lexical decision task.** Participants were asked to classify words and non-words by pressing the right control-key as soon as a word appeared on the screen, and the left control-key as soon as a non-word appeared on the screen. They were given instructions on how to perform the task and then could practice ten trials. Each trial began with the presentation of a fixation cross for 500ms, followed by the presentation of the target. The main block consisted of 192 trials. There were four trait words in each target category, two positive and two negative in valence. The control category consisted of eight words, four positive and four negative. Each trait word was presented four times in the main block. Order of presentation was randomized. The trait categories were as follows: young stereotypic (imaginative, spontaneous, frivolous, erratic), old stereotypic (wise, calm, old-fashioned, obstinate), female stereotypic (erotic, emotional, hysterical, gossipy), male stereotypic (goal-oriented, comradely, brutal, violent), and control (happy, funny, content, joyful, non-musical, greedy, negative, boring) traits. The young and old
stereotypic traits were adapted from Sassenberg and Wieber (2005), who likewise examined age stereotypes among German university students. The gender stereotypic traits were taken from our previous studies. Finally, 24 non-words matched for length were presented four times each.

**Procedure**

Participants were told the study concerned verbal processing tasks. They were randomly assigned to either the concrete or abstract construal mindset condition. In Study 5a, those assigned to the concrete construal condition completed the local processing task, whereas those assigned to the abstract construal condition completed the global processing task. Next, all participants provided their gender and completed the lexical decision task. Participants provided their age only at the end of the study.

In Study 5b, participants were randomly assigned to complete the object or trait-listing task. Next, participants assigned to the prior age identification condition provided their age. All participants then completed the lexical decision task. Finally, participants in the subsequent age identification condition were asked to provide their age, and all participants indicated their gender.

**Results**

**Study 5a**

Only reaction times for trials in which participants made the correct response (95% of all trials) were included in the analyses. Furthermore, responses greater than two standard deviations from the overall mean (i.e., greater than 1250ms, encompassing an additional 4% of responses) were excluded. The average response time within each category was then calculated. A 2 (Construal level: Abstract vs. Concrete) x 2 (Participant gender) ANOVA conducted on the stereotype-neutral control words revealed a marginally significant sex difference, such that
women tended to respond more quickly than did men, \( F(1,56) = 2.89, p = .09 \). There were no effects of construal level, \( F_{s<1} ps > .75 \).

**Gender stereotypes.** We conducted a 2 (Stereotype target: Female vs. Male stereotype) x 2 (Construal level: Abstract vs. Concrete) x 2 (Participant gender) mixed-measures ANCOVA on average response latency, including average response latency to the control words as a covariate to account for individual differences in speed of response.\(^3\) Response times to the control words predicted response times to the stereotypic traits, \( p < .001 \). More importantly, the main effect of construal level was significant, \( F(1, 55) = 4.33, p < .05, \eta^2 = .07 \). Participants were faster to identify the gender-stereotypic traits in the abstract construal condition (\( M = 683.61 \) ms, \( SD = 94.82 \)) than in the concrete construal condition (\( M = 692.94 \) ms, \( SD = 88.34 \)). There were no effects of participant gender, \( F_{s<1} p > .16, \eta^2 < .04 \), or target \( F_{s<2.90} p > .09, \eta^2 < .05 \), indicating that the abstract construal resulted in greater activation of both ingroup and outgroup stereotypes.

As in prior studies, we also examined whether differences in the difficulty of the global-local processing tasks could explain our findings. However, there was no difference in average reaction time performance between the global (\( M = 873.51 \) ms, \( SD = 148.78 \)) and local (\( M = 834.64 \) ms, \( SD = 111.77 \)) processing tasks, \( F(1,58) = 1.14, p = .26 \). Moreover, the construal level effect on reaction times to the gender stereotypic words remained significant when including this variable as a covariate in the analysis.

**Age stereotypes.** We next conducted a 2 (Stereotype target: Young vs. Old stereotype) x 2 (Construal level: Abstract vs. Concrete) x 2 (Participant gender) mixed-measures ANCOVA on average response latency, including average response latency to the control words as a covariate. There were theoretically uninteresting effects of response times to the control words, \( p < .001 \), a
marginal effect of Target, $p < .09$, and a significant Target x Control word interaction, $p < .02$. Importantly, no effects of construal level occurred and there were no other effects, $Fs < 2.68, ps > .10, \eta^2 < .05$. Thus, there was no reliable evidence of increased accessibility of either age stereotype as a result of construal level mindset. Controlling for performance on the global-local processing task did not alter these results.

**Study 5b**

Only reaction times for trials in which participants made the correct response (97% of all trials) were included in the analyses. Furthermore, responses greater than two standard deviations from the overall mean (i.e., greater than 1270ms, encompassing an additional 4% of responses) were excluded. The average response time within each category was then calculated. A 2 (Construal level: Abstract vs. Concrete) x 2 (Age identification: Prior to lexical decision task vs. Subsequent to lexical decision task) x 2 (Participant gender) ANOVA conducted on the neutral control words revealed no significant differences across condition, all $Fs < 2.09, ps > .15$.

**Age stereotypes.** We conducted a 2 (Stereotype target: Young vs. Old stereotype) x 2 (Construal level: Abstract vs. Concrete) x 2 (Age identification: Prior to lexical decision task vs. Subsequent to lexical decision task) x 2 (Participant gender) mixed-measures ANCOVA on average response latency, including response times to the control words as a covariate. There were theoretically uninteresting effects of response times to the control words, $p < .001$, Target x Control words, $p < .05$, and a marginal Age identification x Participant gender interaction, $p < .06$. More importantly, the predicted Construal level x Age identification interaction was significant, $F(1, 90) = 5.44, p < .03, \eta^2 = .06$, see Figure 6. We conducted follow-up analyses within each construal condition, controlling for response latencies to the control words. Within the abstract construal condition, individuals responded faster to the age stereotypic targets when
asked to provide their age before lexical decision task than when asked to provide their age after
the task, $F(1,47) = 5.80, p = .02, \eta^2 = .11$. Within the concrete construal condition, the age
identification effect was no longer significant, $F(1,46) = 2.60, p = .11, \eta^2 = .05$. There were no
other effects of age identification, gender, or construal level, $Fs < 2.02, p > .15, \eta^2 < .03$.

**Gender stereotypes.** We conducted a 2 (Stereotype target: Female vs. Male stereotype) x 2
(Construal level: Abstract vs. Concrete) x 2 (Age identification: Prior to lexical decision task vs.
Subsequent to lexical decision task) x 2 (Participant gender) mixed-measures ANCOVA on
average response latency, including response times to the control words as a covariate. There
were theoretically uninteresting effects of response times to the control words, $p < .001$, target, $p
< .05$, participant gender, $p < .06$, and an Age identification x Participant gender interaction, $p <
.01$. More importantly, there were no significant effects of construal level, all $Fs < 1, ps > .44, \eta^2
< .01$, overall $M = 682.15\text{ms, } SD = 106.36$. Thus, there was no evidence of increased
accessibility of either gender stereotype as a result of construal level mindset.

**Discussion**

Studies 5a and 5b extend our previous findings by demonstrating that abstract construal
mindsets increase the activation of a category dimension relative to a concrete construal mindset,
but only when that category dimension has already been made salient (i.e., gender but not age in
Study 5a; age but not gender in Study 5b). When no categorization cue is present, there is no
increase in the activation of corresponding stereotypes. These results clarify why we observed
the use of certain stereotypes (e.g., women, lawyer, priest, etc.) and not others (e.g., European,
college student) in our previous studies.

Consistent with SCT (Haslam et al., 1992) and cognitive models (Markman & Gentner,
1993) which hold that categorization is a comparative process, we found activation of both
ingroup and outgroup stereotypes as a result of abstract construal and the provision of a categorization cue. However, the reader might wonder what we would expect to occur if we instead measured self-stereotyping either implicitly (e.g., by priming the self prior to measuring the accessibility of stereotypic traits, Mussweiler & Bodenhausen, 2002) or via trait ratings of the self, as in our prior studies. In this case, we would have expected greater activation and application of ingroup-stereotypic traits, but only when a cue to categorization had been provided. In other words, we would expect individuals in an abstract construal mindset to view the self more stereotypically only after the relevant social category had been made salient. Study 6 was designed to test this prediction.

Study 6 was also intended to address a potential alternative explanation for the results of Study 5b. Although we selected activities we did not expect to relate in any direct way to age stereotypes, it is possible that generating traits associated with activities primed participants to generate traits associated with age when prompted to consider age. Contrary to this view, we found quite similar results in Study 5a with a manipulation of construal level that was unrelated to the generation of traits (i.e., global vs. local processing). However, given the importance of demonstrating that abstract construal only increases stereotyping along those dimensions made previously salient, we conducted a final study to address the possibility that the results of study 5b were in some way related to the construal level manipulation.

**Study 6: Self-stereotyping Revisited**

We therefore sought to replicate our previous trait-rating studies (Studies 3a and 3b), but manipulated whether participants provided their gender before or after completing the self-ratings. We predicted that a more abstract construal mindset would result in greater self-
stereotyping than would a more concrete construal mindset, but only when participants had previously been asked to provide their gender.

**Method**

**Participants and design**

Participants were 60 (35 female) students at an American public university. They participated in return for course credit or $3 payment. Participants were randomly assigned to conditions in a 2 (Construal level: Abstract vs. Concrete) x 2 (Gender identification: Prior to trait ratings vs. Subsequent to trait ratings) between-subjects design.

**Materials and procedure**

Participants were asked to complete several unrelated tasks as part of the study. Construal level was manipulated via the Picture Completion and Gestalt Completion tasks, as in Studies 2 and 4b. Participants in the prior identification condition provided their gender. Next, all participants rated the self on a series of gender-stereotypic traits. The trait dimensions were the same as in Study 3a and 3b. However, participants rated themselves on each trait separately, rather than using a semantic-differential format. Ratings were made using a seven-point scale (1 = *not at all descriptive of me* to 7 = *very descriptive of me*), and were comprised of twelve stereotypically masculine traits (e.g., macho, strong), twelve stereotypically feminine traits (e.g., weak, emotional), and eight neutral (e.g., boring, musical) traits. Following this task, participants in the subsequent identification condition provided their gender.

**Results**

As in prior studies, ratings on the stereotypically masculine traits were reverse-scored and the sum of all 24 gender-stereotypic traits calculated. Thus, higher scores reflect relatively more feminine and less masculine ratings of the self. A 2 (Construal level: Abstract vs. Concrete) x 2
(Gender identification: Prior to ratings vs. After ratings) x 2 (Gender of participant) ANOVA on
the trait-rating measure revealed a significant gender effect, $F(1,52) = 15.37, p < .001$, indicating
that women rated themselves as more feminine and less masculine than did men (as in Study 3a).
More importantly, this effect was qualified by a significant Construal level x Gender
identification x Gender interaction, $F(1,52) = 5.36, p < .05, \eta^2 = .09$, see Figure 7. Simple-effects
tests within each experimental condition were conducted to explore the nature of this interaction.

When individuals provided their gender prior to the trait-rating task, a significant gender
effect was observed in the abstract construal condition, $t(13) = 3.11, p < .01, \eta^2 = .43$, but not in
the concrete construal condition, $t(15) = 1.15, p > .26, \eta^2 = .08$. When individuals had been
placed into an abstract construal mindset and gender had been made salient, women rated
themselves as more feminine and less masculine than did men. When individuals had been
placed into a concrete construal mindset and gender had been made salient, men and women did
not differ.

This pattern was not observed when gender was provided only after the trait rating measure.
As predicted, women did not rate themselves differently than did men when in an abstract
construal mindset, $t(12) < 1, p > .69, \eta^2 = .01$. Women did rate themselves as more feminine and
less masculine than did men when in a concrete construal mindset, $t(12) = 3.50, p < .01, \eta^2 = .51,$
although this comparison was not directly relevant to our hypotheses.

As in prior studies, we scored performance on the Gestalt Completion and Picture
Completion tasks to rule out the possibility that task difficulty could account for our findings.
Although the Picture Completion ($M = 10.74, SD = 1.93$) task once again proved easier for
participants than did the Gestalt Completion task ($M = 8.41, SD = 1.43$), $t(58) = 5.28, p < .001$,
performance was not correlated with the trait rating measure ($r = .02$). Moreover, the Construal
level x Gender identification x Gender interaction on the trait rating measure remained significant when task performance was included as a covariate. There were no other significant effects in either analysis, all $F$s < 1, $ps > .35$.

**Discussion**

Replicating Studies 3a and 3b, an abstract construal mindset led to greater self-stereotyping than did a concrete construal mindset, but only when gender had been previously made salient. When gender had not been previously made salient, an abstract construal mindset did not result in greater self-stereotyping. This finding is consistent with the results of Studies 5a and 5b, demonstrating that an abstract construal only results in the greater activation of stereotypes made salient in the current context. Thus, Study 6 supports our contention that an abstract construal fosters more inclusive categorization as a result of a focus on within-group similarity, rather than directly priming stereotype content. In the language of SCT (Turner et al., 1987), an abstract construal increases the perceived fit of a target (e.g., the self) to a previously activated social category (e.g., gender group).

We also replicated our previous findings with regard to gender-stereotypic ratings of the self (i.e., Studies 3a and 3b) with yet another manipulation of construal level. Thus, it is unlikely that the results of these studies are due to an artifact of the manipulation such as picture content, task difficulty, or priming group aspirations vs. individual behaviors. Were that the case, we would have expected to find a main effect of construal level rather than finding that self-stereotyping depended on the presentation of a gender cue. Moreover, task performance was unrelated to the measure of self-stereotyping.

**General Discussion**
We observed repeatedly that manipulating construal level mindset via an unrelated task moderated stereotyping of self and others. Relative to a more concrete construal level mindset, a more abstract construal level mindset increased the activation and use of relevant stereotypes in both judgment and behavior. Specifically, participants who had been placed into a more abstract construal mindset were more likely to make stereotypic judgments of a job applicant, apply occupational stereotypes in an impression formation task, report greater identification with their group, assign more stereotypic traits to the self, show more stereotype-consistent performance, and activate stereotypic traits. Consistent with our view that a more abstract construal mindset does not directly prime stereotypes, but rather focuses perceivers on within-group similarity and promotes more inclusive categorization, these effects were limited to cases in which a relevant categorization cue was provided. Importantly, our findings generalized across several different stereotypes (i.e., gender, priest vs. lawyer occupations, and age) as well as across construal manipulations both conceptual (i.e., considering how vs. why one tries to maintain friendships, considering how vs. why one tries to maintain health, and listing objects required for vs. traits implied by various tasks) and perceptual (i.e., Gestalt Completion vs. Picture Completion tasks, global vs. local processing tasks). Task performance and persistence were unable to account for our findings. Given the breadth of manipulations, stereotypes, and dependent measures assessed across these nine studies, we do not believe the results can be attributed to the activation of affiliation motives, ingroup-outgroup concerns, or the inadvertent priming of stereotypic concepts.

We believe these findings have a number of important and interesting implications for understanding stereotyping of the self and others. First, this work extends past research by demonstrating that, beyond cultural differences in self representation (Markus & Kitayama,
1991) or situational primes of self-construal (Brewer & Gardner, 1996), salience of social
categories (Sherif, 1967; Taylor et al., 1978), or the context provided by social groups (Haslam
et al., 1992), categorization of social targets can also be influenced by construal level mindsets
induced via unrelated tasks. Past work has found that individuals who tend to more chronically
represent events and objects at a more abstract level tend to see greater similarity among social
targets (Levy et al., 2002), and that increased temporal distance leads to representations of the
self (Waksal et al., 2008) and others (Milkman et al., 2010) in terms of broad social categories.
Our work extends these findings by directly demonstrating effects on stereotype-relevant
judgments and behavior, by showing that these effects obtain even as a result of mindsets
induced by unrelated tasks, and by demonstrating that an abstract construal mindset does not
directly activate stereotype content, but rather promotes inclusion of exemplars into a salient
social category. Concerning models of category-based stereotyping, the present work
demonstrates that cognitive variables beyond processing effort, as moderated by cognitive
capacity (Macrae et al., 1994) or motivation (Monteith, 1993), can influence categorization of
social targets. At a practical level, the present work also suggests that inducing a more concrete
construal mindset facilitates the avoidance of stereotypes in the evaluation of others and reduces
the influence of stereotypes on one’s own performance. Given the wide-spread and ongoing
interest in finding ways to reduce discrimination (e.g., Devine & Sharp, 2008) and the
underperformance of minorities and women (e.g., Spencer et al., 1999), we believe these effects
deserve further research.

**Limitations and Future Directions**

**Control of prejudice and socially proscribed stereotypes.** We attempted to demonstrate
that our effects are not limited to certain stereotypes, but additional work is needed in this area.
Much of the work in the stereotyping and prejudice literature has focused on racial and ethnic stereotypes (Devine & Sharp, 2008). Particularly because these stereotypes are socially proscribed, they are subject to social desirability concerns and motivations to avoid prejudice. Thus, one could question whether similar effects of construal level would be observed for these types of stereotypes.

On the one hand, the results of Milkman et al. (2010) showing that temporal distance affects discriminatory behavior towards minorities suggests that construal level would similarly influence the use of racial stereotypes. On the other hand, we suspect that individuals can overcome these effects with sufficient motivation and resources available (Fazio & Dunton, 1997; Macrae et al., 1994; Monteith, 1993). Moreover, there is precedent in the literature to suggest that abstract construal mindsets would increase commitment to avoid prejudiced responding. For example, past work suggests that temporal distance (and thus more abstract construal) increases judgments of immorality for transgressions (Eyal, Liberman, & Trope, 2008) and improves self-control (Fujita, Trope, et al., 2006). From this perspective, when individuals are more cognizant that their behavior could be seen as discriminatory, an abstract construal could actually decrease stereotyping. Given that our participants in Study 1 reported strong commitment to the goal of being fair, one might ask how our results comport with these previous findings. The difference may lie in the relative salience of these two factors in our studies. Information concerning fairness goals was only assessed as part of a separate questionnaire completed at the conclusion of the study. However, asking this question prior to the judgment task may have resulted in increased commitment to the avoidance of stereotype use. Thus, future research should examine whether the relative salience of group membership information
fairness goals moderates the consequences of abstract construal level mindset for the use of socially proscribed stereotypes.

**Determinants of categorization.** We argue that abstract construal mindsets increase the tendency to more broadly categorize individuals, but this leaves open the question of along which dimension individuals will be categorized. Indeed, it is often possible to categorize individuals in multiple ways. Variables that determine the salience of various categories should therefore further moderate the consequences of a more abstract construal mindset for categorizing others and the self (see also Rydell et al., 2009). Some social categories are so commonly used as to be considered “basic” and likely to be noticed automatically (Brewer, 1988). In our studies, we provided an explicit cue to the target’s social identity. In more naturalistic settings, visual cues to categories of age, gender, and race are readily noticed and so we would expect abstract construal mindsets would result in greater spontaneous use of these basic categories. Alternatively, automatically activated attitudes might guide the categorization process (E. R. Smith, Fazio, & Cejka, 1996). Social context, including intergroup conflict (Sherif, 1967), minority status (Taylor et al., 1978), and the desire for positive social identities (Turner et al., 1987) should also influence which categories are accessible and thus likely to be used by individuals in an abstract construal mindset.

These considerations also emphasize the point that abstract construal mindsets should not inevitably lead to greater discrimination. Depending on the level of the category dimension made salient, an abstract construal could foster the categorization of social targets into even more broad, superordinate categories (see also Levy et al., 2002; Wakslak et al., 2008) As a result, intergroup conflict would be minimized (see also the common ingroup identity model, Gaertner & Dovidio, 2000). For example, given the categorization cue of “European,” an abstract
construal mindset would likely result in the representation of individuals as “European” instead of as “German” or “English,” thereby minimizing intergroup stereotyping and discrimination. Future research should therefore continue to explore variables that determine how targets are categorized by those in an abstract construal mindset.

Effects of stereotyping on construal level. Assuming there is a general association between construal level and broader categorization of social targets, an interesting question for future research is whether this link is bi-directional, as has been found with other dimensions of construal (McCrea et al., 2008; Stephan et al., 2010). That is, would factors that increase group-level representation also impact construals of subsequent tasks? For example, might priming individuals with “we” lead to greater considerations of why one would pursue a goal, whereas priming individuals with “I” leads to greater considerations of how one would pursue a goal? Along these lines, an interdependent self-focus has been found to evoke a context-dependent cognitive mode, whereas an independent self-focus evokes a context-independent cognitive mode (Kühnen, Hannover, & Schubert, 2001; Kühnen & Oyserman, 2002). These remain exciting directions for future research.

Conclusion

Construal level mindsets affect stereotyping of self and others. Abstract construal mindsets increase the use of group-level representations of social targets and the self, relative to more concrete construal mindsets. More generally, the current results emphasize the importance of non-social contextual influences on self- and other-related judgment and behavior. Construal level mindsets induced by tasks wholly unrelated to social identity nonetheless impact the way we represent social targets.
References


Footnotes

1. Although conducting the analyses in this manner allows for a more intuitive understanding of the dependent measure, a more direct test of our hypothesis would involve creating an index of gender stereotypicality by reversing the scoring for men, such that higher scores reflect more stereotype-consistent trait ratings for both genders. For both Study 3a and 3b, these analyses revealed main effects of construal level ($F_s > 5.41, p_s < .05, \eta^2 > .06$) and no interaction with gender ($F_s < 1, ns, \eta^2 < .01$). Thus, the finding that construal level increased stereotype-consistent trait ratings was statistically significant in both studies 3a and 3b and was not moderated by gender.

2. The reader may ask whether differences in group identification mediated the construal-level effects on trait ratings. Conversely, one might suggest that abstract construal led to greater group identification because of self-perception effects. In this case, trait ratings should mediate the effects on group identification. We argue that an abstract construal mindset increases the likelihood that individuals will represent themselves in terms of a salient group identity, leading to both more stereotype-consistent trait ratings and greater identification with this group. The design of the study precludes the possibility of determining which effect, greater identification or more stereotypic trait ratings, comes first, and neither mediation model revealed a significant indirect effect. We more directly examine the process underlying the construal level effect in Studies 5a and 5b.

3. A preliminary analysis of the gender-related words including valence as a factor did not reveal any significant effects of this variable (all $F_s < 1.94, p > .16$). Similarly, including valence as a factor in the analysis of the age-related words revealed theoretically
uninteresting Valence x Control word \((p = .05)\) and Target x Valence x Control word \((p < .05)\) interactions, but no other significant effects (all \(F < 3.46, p > .06\)). We therefore dropped this term from the analyses.

4. Including valence as a factor in the analysis of the age-related words revealed a theoretically uninteresting Valence x Control word interaction \((p = .05)\), but no other significant effects (all \(F < 2.65, p > .10\)). Likewise, a preliminary analysis of the gender-related words including valence as a factor did not reveal any significant effects of this variable (all \(F < 3.17, p > .07\)). We therefore dropped this term from the analyses.
Table 1

Target ratings by target gender and construal level mindset condition (Study 1)

<table>
<thead>
<tr>
<th>Measure</th>
<th>Concrete</th>
<th>Abstract</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male target</td>
<td>Female target</td>
</tr>
<tr>
<td>Negative trait ratings</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( M )</td>
<td>409.50</td>
<td>403.50</td>
</tr>
<tr>
<td>( SD )</td>
<td>98.46</td>
<td>94.08</td>
</tr>
<tr>
<td>Hiring likelihood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( M )</td>
<td>64.00</td>
<td>59.40</td>
</tr>
<tr>
<td>( SD )</td>
<td>11.82</td>
<td>25.39</td>
</tr>
<tr>
<td>Leadership position likelihood</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( M )</td>
<td>55.70</td>
<td>60.50</td>
</tr>
<tr>
<td>( SD )</td>
<td>16.28</td>
<td>25.77</td>
</tr>
<tr>
<td>Overall evaluation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>( M )</td>
<td>43.20</td>
<td>42.50</td>
</tr>
<tr>
<td>( SD )</td>
<td>16.52</td>
<td>21.83</td>
</tr>
</tbody>
</table>

Note. Higher scores on the negative trait rating measure indicate more negative impressions of the target. Higher scores on the likelihood of hiring, likelihood of holding a leadership position, and overall evaluation measures indicate more positive impressions of the target.
Figure 1. Trait ratings of target (Study 2)

Figure 2. Trait ratings of self (Study 3a)

Figure 3. Trait ratings of self (Study 3b)

Figure 4. Math performance (Study 4a)

Figure 5. Math performance (Study 4b)

Figure 6. Average response latency to age-stereotypic target words by construal level mindset and age identification condition (Study 5b)

Figure 7. Trait ratings of self by construal level mindset, gender, and timing of gender identification (Study 6)