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Running head: SELF-CONSTRUALS IN PRIME-TO-BEHAVIOR EFFECTS

Blonde Like Me: When Self-Construals Moderate Stereotype

Priming Effects on Intellectual Performance.

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Abstract

Stereotype priming can lead to assimilation or contrast effects on behavior. We argue that self-activation is a moderator of both assimilation and contrast effects. To test this hypothesis, in two studies, we activated independent or interdependent self-knowledge before priming participants with the dumb Blonde stereotype or a control category (Study 1) or no prime (Study 2). Participants then answered a knowledge test. Results support our expectations: Participants presented assimilation under interdependence (i.e., underperformance compared to control group) while they presented no assimilation (i.e., comparable performance with control group in Study 1) and contrast (better performance than control group in Study 2) under independence. We discuss implications of these findings in regards of previous research and recent models such as the Active Self Account (Wheeler, DeMarree, & Petty, 2005).

Keywords: prime-to-behavior effects, automatic behavior, priming, self-construal, Blonde stereotype, independence, interdependence, assimilation, contrast

Blonde like me: When self-construals moderate stereotype priming effects on intellectual performance

An extensive body of literature has demonstrated that increasing accessibility of stored knowledge can influence subsequent behavior (for a review, see Wheeler & Petty, 2001). These *prime-to-behavior effects* concern a large set of behaviors like motor action (e.g. Bargh, Chen, & Burrows, 1996; Follenfant, Légal, Marie Dit Dinard, & Meyer, 2005), intellectual performance (e.g. Dijksterhuis & Van Knippenberg, 1998), creativity (Förster, Friedman, Butterbach, & Sassenberg, 2005), helping behavior (Macrae & Johnston, 1998), or competition (Kay, Wheeler, Bargh, & Ross, 2004). In the present study, we focus on the effects of stereotype activation on intellectual performance. For instance, Dijksterhuis and van Knippenberg (1998, exp.1) showed that participants primed with the stereotype of professors subsequently had better performance on a knowledge test compared to control conditions (i.e., secretaries or no stereotype). They concluded that assimilation effects previously obtained on motor behavior (Bargh et al., 1996) could be extended to complex intellectual behavior. The aim of the present study is to further investigate whether self-construals (Markus & Kitayama, 1991) can moderate prime-to-behavior effects. In two experiments, we expected a behavioral assimilation effect under interdependence and a behavioral contrast effect under independence.

Priming effects can have two consequences: Behavior may be either displaced toward (assimilation) or away (contrast) from the prime. Thus, one generally refers to *assimilation* when priming a concept (e.g., elderly stereotype) leads to corresponding behavior in the perceiver (e.g., walking slowly), and to *contrast* when it leads to inverse behavior in the perceiver (e.g., walking fast). Assimilation is often considered as the default option (see Biernat & Manis, 2007). It is true that the priming paradigm most frequently elicits assimilation (see Wheeler & Petty, 2001), whereas contrast effects tend to occur only in the

presence of specific factors like exemplar priming or self-activation (Dijksterhuis et al., 1998; Dijksterhuis & van Knippenberg, 2000). However, we consider that effects of priming on behavior should be assessed only when compared with a control condition and not when compared to another experimental condition. Without such a control condition, one cannot determine where the action is: A behavioral difference between two experimental conditions does not mean that there are two effects (e.g., assimilation *and* contrast), but perhaps that there is just one effect (assimilation *or* contrast) versus no effect (i.e., equivalent to a control condition). Although several studies have shown behavioral assimilation effects compared to a control condition (Bargh, et al., 1996; Macrae & Johnston, 1998), behavioral contrast effects are usually shown relative to an assimilation effect and not relative to a control condition (e.g., Dijksterhuis, et al., 1998). We believe that an assimilation effect can be said to occur only when behavior moves toward the prime and is significantly different from a control or no prime condition. Conversely, there is a contrast effect when behavior moves away from the prime and is significantly different from a control or no prime condition (Wheeler & Suls, 2007).

Not all prime-to-behavior effects can be explained by direct perception-behavior links (Bargh et al., 1996), or by indirect link mediated by trait activation (Dijksterhuis & Van Knippenberg, 1998). Indeed, these mechanisms would predict only assimilation but not contrast effects. Rather, we argue in favor of prime-to-behavior effects moderated by self-concept. Assimilation would occur when self-concept is *congruent* with the prime. Contrast would occur when self-concept is *incongruent* with the prime. Several researchers have investigated how self-concept could influence priming effects (e.g., Dijksterhuis & van Knippenberg, 2000; Hull, Slone, Meteyer, & Matthews, 2002).

Recently, Schubert and Häfner (2003 exp.2) investigated the influence of self-activation on prime-to-behavior effects. Participants were primed with a category linked to

high (i.e., professor) or low intelligence (i.e., hussy), while flashed with self-related or other-related words prior to answering a general knowledge test and rating their perceived intelligence. Participants flashed with other-related words presented congruent performance with primes: Professor-primed participants marginally performed better than hussy-primed participants. Participants flashed with self-related words presented incongruent performance with primes: Professor-primed participants performed worse compared to hussy-primed participants. Additionally, intelligence self-ratings were consistent with behavioral performance. Self-activation produced prime-incongruent self-ratings while other-activation produced prime congruence self-ratings. Consistent with our assumption, priming influences both self-concept and behavior (See also Dijksterhuis et al., 1998).

Schubert and Häfner argued that self-activation triggered contrast effects. However, from our point of view, the absence of a control condition does not unequivocally show contrast effect (See also Dijksterhuis & van Knippenberg, 2000). Other papers indeed included a control condition when studying self-activation effects. Wheeler, Jarvis and Petty (2001) asked participants to write an essay about a student to prime Black or White stereotype. Participants next completed a math test. Participants primed with the Black stereotype subsequently performed worse compared to those primed with the White stereotype. However, a number of participants spontaneously put themselves in the shoes of the student using I-pronoun (vs. He-pronoun) when writing the essay. Additional analyses revealed that only participants who took an *I*-point of view presented the Black stereotype effects. In this paper, assimilation occurred under self-activation, with a paradigm that included a control condition but did not include a manipulation of self-activation (see also Hull et al., 2002).

As far as we know, no study concerning prime-to-behavior effects has shown that self-activation can lead to assimilation and contrast, by comparison to a control condition,

with the same prime, within the same study. Knowing whether self-activation can lead to both types of effects (i.e., assimilation and contrast) can contribute to our understanding of the underlying mechanisms of prime-to-behavior effects. Indeed, if prime-to-behavior effects are moderated by self-activation, the direct perception-behavior link would be questioned. In this case, another mechanism should be considered, for instance as proposed in the Active Self Account developed by Wheeler, DeMarree and Petty (2005). The Active Self Account proposes that behavioral assimilation to the prime follows from inclusion of prime features in the self-perception while contrast follows from inclusion of prime-incongruent features and exclusion of prime-congruent features in the self-perception (see also DeMarree, Wheeler, & Petty, 2005). Independent and interdependent self-construals could determine respectively exclusion and inclusion of target features in the self-perception (Gardner, Gabriel, & Hochschild, 2002; Stapel & Koomen, 2001). As such, in this paper, we tested whether self-construals moderate both behavioral assimilation and contrast.

People can construe their self as independent or interdependent (Markus & Kitayama, 1991). When independent, people consider themselves as being unique, autonomous, and distinct from others. They define themselves using personal, internal, and abstract features like traits, abilities, and attitudes. When interdependent, people consider themselves as being connected to others, a part of a whole. They define themselves using their social relationships, memberships, and roles (Gardner, Gabriel, & Lee, 1999; Trafimow, Triandis, & Goto, 1991). Culture and gender generally determine a chronic self-construal (Cross & Madson, 1997; Gabriel & Gardner, 1999; Markus & Kitayama, 1991). People from individualistic society and males have a relatively more independent self-construal while people from collectivist society and females have a more interdependent self-construal. Nevertheless, both construals are available in memory and can be primed by situational cues

and social demands (Brewer & Gardner, 1996; Kühnen & Hannover, 2000; Trafimow et al., 1991).

Self-construals determine a large set of emotional, cognitive, and behavioral processes (Markus & Kitayama, 1991). For instance, interdependent people rate themselves as being more similar to others than independent persons (Kühnen & Hannover, 2000). Stapel and Koomen (2001) showed that, compared to a control-self condition, interdependents tend to assimilate their self-evaluation to a comparison source while independents tend to contrast their self-evaluation away from the source (see also Gardner et al., 2002; White et al., 2005). Moreover, self-construals moderate the chameleon effect (Chartrand & Bargh, 1999): Compared to a control-self condition, interdependence enhances imitation tendency while independence decreases imitation tendency (Van Baaren, Maddux, Chartrand, de Bouter, & Van Knippenberg, 2003).

Considering the literature reviewed above, we designed two studies in which we first activated an independent or interdependent self-construal and then the dumb Blonde stereotype or a control prime before measuring encyclopedic knowledge performance. We predicted that activation of interdependence would lead to assimilation to the Blonde stereotype (i.e., performance decrease) while activation of independence would lead to contrast from the Blonde stereotype (i.e., performance increase) relative to control condition.

Study 1

Method

The experiment was conducted on the Internet following guidelines on ethics and laws (APA, 2002; Caverni, 2007).

Participants and design

One-hundred and eight Internet surfers connected to the experiment website. Twenty-two participants dropped out mid-study (seven during self-construal manipulation task, six

during stereotype priming and nine during the general knowledge questionnaire). Drop-outs were equivalent in all experimental conditions. The final sample consisted of 86 participants (61 women, 23 men and 2 unknown; $M_{\text{age}} = 23.33$, $SD_{\text{age}} = 6.27$) randomly assigned to one of the four conditions of a 2 (self-construal: independence vs. interdependence) \times 2 (primed category: Blondes vs. control) between-subjects design.

Procedure and stimulus materials

Participants were recruited on Internet newsgroups through advertising messages. These messages invited Internet surfers to participate in 3 different psychology studies conducted by researchers from the University of Paris X. These studies were presented as concerned with personality, color perception and general knowledge. Before connecting to the website, surfers had to ask for a password. A personal and unique password was given, controlling for multiple submissions, in order to guard against multiple participations (Reips, 2002). Once connected, participants received an electronic consent form providing general information about studies and instructions about participation (e.g., anonymity and confidentiality, possibility to interrupt the experiment at every moment by clicking on “exit”, “how to use the website” rules). Participants either clicked on ‘I agree to participate’ which led to the first task or on ‘I refuse’ which led to an exit page thanking participants for their interest.

The first task presented to participants as a personality questionnaire was our self-construal manipulation. Seven items (from the meta-analysis by Oyserman, Coon and Kimmelmeier, 2002, p. 9, table 1) were presented twice (i.e., first about work and then about leisure situations) and participants had to evaluate how well each item described them on a 7-point scale (1 = *not at all* to 7 = *absolutely*). In the independence condition, participants were presented with the seven items related to independence (e.g., “I tend to do my own thing, and others do the same”; “I am unique-different from others in many respects”). In the

interdependence condition, participants were presented with seven out of the eight items related to interdependence (e.g., “to understand who I am, you must see me with members of my group”; “to me, pleasure is spending time with others”). Furthermore, we biased each item with the adverb ‘sometimes’ (e.g., I sometimes tend to do my own thing and others do the same). This procedure leads participants to agree more with the items and admit only one kind of self-knowledge as self-descriptive (Chaiken & Baldwin, 1981).

Next participants were presented with the second task, the color perception task, designed to activate a category stereotypically associated with stupidity. We chose the dumb blond female stereotype which is widely spread in France through the media (e.g., Gibaja & Mimran, 2006; Guéro & Dzack, 2005; Luketic, 2001). Blondes are usually associated with both low intelligence and ability and high beauty and femininity. We ensured those features were associated to Blondes in a pilot study. Eleven students listed the most common characteristics associated with Blondes: 40% of listed adjectives referred to stupidity and 36% were linked to seduction and beauty. Only one participant did not check off stupidity as a Blonde’s features.

In order to activate the Blonde stereotype, participants were exposed to 30 face-pictures and had to indicate each person’s hair color on a four-point color scale (i.e., black, brown, blond and red). In the Blonde stereotype condition, there were 21 pictures of non-ambiguously blond beauty queens, and nine of dark-haired beauty queens (brown, black or red). In the control category condition, there were 21 pictures of dark-haired men and nine of blond ones. We chose men as a control prime because we reasoned that this category is not particularly associated with high or low encyclopedic knowledge. The men category should not influence participants’ performance. Pictures were randomly chosen between a large set of pictures and presented in a random order. Each participant was primed with a different collection of pictures. All pictures were front-faced on a white background.

The third task was an encyclopedic knowledge test intended to give an index of intellectual performance (see Dijksterhuis & Van Knippenberg, 1998). We selected one hundred questions of diverse fields of knowledge from the Trivial Pursuit game (1993). We transformed them into three response-option questions (only one correct answer) and submitted them to a pilot study on the Internet ($N = 7590$). We considered four difficulty levels of questions as a function of quartiles for correct answers. In the present experiment, our knowledge test included five questions of each difficulty level, randomly chosen and ordered from the whole sample of questions. We expected some effects of our variables on the moderately difficult questions (i.e., about 1.99 correct answers out of 5 questions on the pilot study) because they appear to be the most sensitive (performance on other questions might be limited by ceiling or floor effects). Participants were asked to select the correct answer among the three options, with no time pressure but alone and without any help (i.e., no encyclopedia and no web search).

After knowledge test fulfillment, participants answered a set of questions to ensure they were not aware of our hypotheses and not suspicious of any link between the three tasks. Finally, participants were fully debriefed through a text presenting the whole experiment and hypotheses.

Results and discussion

We submitted the number of correct answers on the five moderately difficult questions¹ to a 2 (self-construal: independence vs. interdependence) \times 2 (primed category: Blondes vs. control) ANOVA. We only found a significant interaction², $F(1, 82) = 5.77, p < .02, \eta^2_p = .066$. Interdependence-Blonde primed participants ($M = 1.14, SD = 0.86$) performed worse compared to interdependence-control primed participants ($M = 1.93, SD = 1.11, F(1, 82) = 4.82, p < .04$). Independence-Blonde primed participants ($M = 1.90, SD = 1.29$) performed as well as those in the independence-control condition ($M = 1.5, SD = 0.73,$

$F(1, 82) = 1.38, ns$). The independence-control group ($M = 1.5, SD = 0.73$) obtained similar performance to the interdependence-control group ($M = 1.93, SD = 1.11, F(1, 82) = 1.55, ns$).

Consistent with our predictions, we found an assimilation effect to the Blonde stereotype among interdependence-primed participants: Performance was lower than after interdependence-control priming. However, the contrast effect – expected among participants primed with independence and the Blonde stereotype – did not occur. Performance was equivalent with those in the control condition. Thus, only participants primed with interdependence showed prime-to-behavior effects.

Study 2

In Study 1, experimental and control primes differed on both gender and hair color. This variable confusion might weaken our conclusions. We designed Study 2 to replicate Study 1 with a no prime control condition. Furthermore, we conducted Study 2 in lab conditions.

Method

Participants and design

Seventy-three volunteers (34 men, 39 women, $M_{age} = 25.14, SD_{age} = 10.94$) were randomly assigned to one of the four conditions of a 2 (self-construal: independence vs. interdependence) \times 2 (Blonde stereotype: activated vs. not activated) between-subjects design.

Procedure and stimulus materials

Participants were recruited on the street to participate in a study, in exchange of a free drink. The study was presented as concerned with concentration effects on performance and run by the Haute-Bretagne University. Participants followed the recruiter to a lab, where the (female) experimenter offered them a drink and settled them in a room where up to 15

persons filled in different questionnaires (the same room was used to run several different studies). Next, she gave them a questionnaire and, depending on condition, a photo booklet (or not) to use during the distractive task. She explained the questionnaire contained all the instructions about the concentration task, the distraction task (or not), and the encyclopedic knowledge test.

The concentration task, that manipulated self-construal, was the same used in Study 1, but in a paper-and-pencil version.

The distraction task allowed to activate the dumb Blonde stereotype. The priming procedure was a paper-and-pencil version of the one used in Study 1. Participants examined face-pictures of 30 beauty queens gathered in the photo booklet (21 blond and 9 dark-haired women). They had to report each person's hair color on a separate grid. Participants did not complete the distraction task in the 'no activated stereotype' condition.

The encyclopedic knowledge test measured an intellectual performance with a part of the questions used in Study 1. It included five moderately difficult questions (i.e., about 2.24 correct answers out of 5 questions on the pilot study) and five moderately easy questions (i.e., about 3.56 correct answers out of 5 questions on the pilot study). Questions were in a random fixed order. Participants had to circle the correct answer among the three options.

Next, participants answered a set of questions to ensure they were not aware of our hypotheses and of the link between the three tasks. They were finally thanked and debriefed.

Results and discussion

We submitted the number of correct answers to moderately difficult questions³ to a 2 (self-construal: independence vs. interdependence) \times 2 (Blonde stereotype: activated vs. not activated) ANOVA. We only found a significant interaction effect⁴, $F(1, 69) = 12.82, p < .001, \eta_p^2 = .16$. Interdependence-blond primed participants ($M = 1.52, SD = 0.90$) underperformed interdependence-control primed participants ($M = 2.17, SD = 0.73; F(1, 69)$

= 5.33, $p < .03$). Independence-blond primed participants ($M = 2.37$, $SD = 0.96$) outperformed independence-control primed participants ($M = 1.53$, $SD = 0.94$; $F(1, 69) = 7.50$, $p < .01$). Independence-control primed participants ($M = 1.53$, $SD = 0.94$) underperformed interdependence-control primed participants ($M = 2.17$, $SD = 0.73$, $F(1, 69) = 4.53$, $p < .04$).

Consistent with Study 1, assimilation to the Blonde stereotype occurred under interdependence priming: Performance was lower than in the control condition. Moreover, the expected contrast effect occurred under independence priming: Performance was higher in the Blonde condition than in the control condition. These results provide support for the prediction that both assimilation and contrast can occur within the same study and to the same prime, according to the current self-construal. We did not expect the effect of self-construals on performance in control conditions but findings tell another story: Independence-primed participants performed worse than interdependence-primed participants. It seems that activation of independent self-construal can lead to lower knowledge performance. This effect was not significant in Study 1 but in Study 2, the immediate connection between self-construal manipulation and the performance test enhanced the construal effect. Still, interdependent participants are not more intelligent than independent participants. We think that self-construals influenced processes that might play a role in encyclopedic knowledge retrieval. Indeed, independence promotes context-independence processes like focal attention and inhibition of seemingly irrelevant cues whereas interdependence promotes context-dependence processes as broad attention and weak inhibition (Hannover, Pöhlmann, & Springer, 2005). It is conceivable that recalling encyclopedic knowledge requires a rather context-dependent cognitive style (i.e., less inhibition to explore widely the mental network) that disadvantaged independent-primed

participants. This is a new and promising line of research for both self-construals and prime-to-behavior.

General discussion

In two studies, we investigated self-construal moderation of the Blonde stereotype effects on encyclopedic knowledge performance. After self-construal manipulation, participants were primed with the dumb Blonde stereotype or a control category in Study 1 or not primed in Study 2. In both experiments, only participants primed with interdependence demonstrated an assimilation effect: They performed worse on the knowledge test after the dumb Blonde stereotype priming than after control or no priming. We obtained the opposite effect with an independent self-construal: Participants performed better after the Blonde priming than after control or no priming. However, the expected contrast effect occurred only in the second study.

These findings extend previous research on prime-to-behavior effects and self-construals, notably those of Schubert and Häfner (2003). Our findings provide further evidence for Schubert and Häfner's hypothesis. We replicated their "contrast" effect following independence priming in a paradigm that included a control condition. Moreover, the present study extends Schubert and Häfner findings by showing an assimilation effect after self-activation. Self-activation does not always trigger behavioral contrast but can also enhance assimilation depending on the activated self-concept. This malleability of prime-to-behavior effects after self-activation supports our assumption that direct links between perception and action cannot account for these effects, at least for encyclopedic knowledge kind of task used in the present studies. Additionally, we replicated the assimilation effect found by Wheeler et al. (2001) and by Hull et al. (2002) in a paradigm that included a manipulation of self-activation.

Our reasoning was partly based on the Active Self Model developed by Wheeler et al. (2005). The Active Self Model posits that priming influences the self-concept either in a prime-congruent or incongruent manner and that behavior follows the self-concept, leading to assimilation and contrast effects, respectively. In their empirical test of this model, DeMarree et al. (2005) only demonstrated an assimilation effect, among low self-monitor participants. Our paper completes the latter, demonstrating assimilation and contrast to the same prime. However, our studies lack self-perception measures necessary to test a mediation of behavioral priming effects via self-representation. The inclusion of self measures would allow to assess more directly the underlying mechanisms of prime-to-behavior effects. Future research should address this.

Other mechanisms can also be considered. Van Baaren et al. (2003) have findings that concur with ours but they argue in favor of a mechanism based on context-dependence. Independents seem to be less “sensitive” to situational variations than interdependents (Kühnen & Oyserman, 2002). Indeed, van Baaren and colleagues found more mimicry under interdependence self-construal and less mimicry under independence self-construal. Can context-dependence account for our findings, better than the Active Self Model? The context-dependence mechanism would imply the Blonde stereotype was activated only among interdependence-primed participants, not among independence-primed ones. In line with this reasoning, in Study 1, independence-blond primed participants displayed neither assimilation nor contrast effect. However, in Study 2, independence-primed participants displayed a contrast effect, which implies they were influenced by the stereotype. Thus a mere context-dependence explanation cannot fully account for our results. However, we admit that both mechanisms could interact to modulate prime-to-behavior effects. Context-dependence could enhance the influence of the prime on the self-concept while context-independence would decrease the influence of the prime on the self-concept. As such, an

assimilation effect would occur when the prime is processed and included in the self-concept. A contrast effect would occur when the prime is processed but excluded from the self-concept. However, priming should not influence behavior whenever the prime is not processed, for instance under a context-independent cognitive style (Kühhnen & Oyserman, 2000). Context-dependence and self-perception mechanisms could be integrated to predict and explain prime-to-behavior effects.

Stapel and van der Zee (2006) developed a Self Salience Model of other-to-self effects that considers different predictions according to the self-construal level. This model, though focused on evaluative outcomes more than on behavioral ones, has implications for prime-to-behavior effects. Our findings support this model in a standard prime-to-behavior paradigm. As such, our research contributes to the literature about self-construals, supporting the Self Salience Model, and about prime-to-behavior effects, extending this model to behavioral outcomes⁵.

If our account of prime-to-behavior is correct, one may wonder why Bargh et al. (1996) and others found main assimilation effects of primes. Indeed, most of these studies were conducted in individualistic cultures (i.e., the US), then contrast should have emerged rather than assimilation. However, studies are also generally conducted with mostly women and/or psychology students which are groups known to be more interdependent than the average population (Gabriel & Gardner, 1999, Cross & Madson, 1997). That is, participants in these studies might have been mostly interdependent. As a result, assimilation occurred. Consistent with this analysis, it is worth noting that usually priming studies involving a moderator (e.g., level of prejudice, Brown et al., 2003, Kawakami et al., 1998; degree of contact with the social group, Dijksterhuis et al., 2000; self-focus, Dijksterhuis & van Knippenberg, 2000; self-prime comparability, Aarts & Dijksterhuis, 2002) show no main effect of the prime.

To conclude, our studies demonstrate that self-construals can moderate assimilation and contrast in prime-to-behavior effects. Based on the findings in social comparison research and the Active Self Model, we argued that this moderation follows a prime-congruent or incongruent self-perception. However, self-construals also differ on context-dependence degree which could partly account for our findings. Future research should provide evidence of mediation of prime-to-behavior effects by self-perception.

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Footnotes

1. As expected, our variables did not have any effects on other blocks of questions (i.e., easy, moderately easy and difficult questions).
2. Because of the primes (i.e. blondes and men) we controlled for gender. No effect involving gender was significant.
3. As in Study 1, only moderately difficult questions were sensitive to our manipulations.
4. Symmetrically with Study 1, we controlled for gender. Again, no effect involving gender was significant.
5. We thank an anonymous reviewer for outlining this contribution of our paper.

Table 1

Mean number of correct answers as a function of self-construal and category, Study 1.

Category	Independent self-construal		Interdependent self-construal	
	M	SD	M	SD
Blonde	1.90 _a	1.29	1.14 _b	0.86
Control	1.50 _a	0.73	1.93 _a	1.11

Means that do not share subscripts differ at $p < .05$

Table 2

Mean number of correct answers as a function of self-construal and stereotype priming, Study 2.

Stereotype	Independent self-construal		Interdependent self-construal	
	M	SD	M	SD
Blonde	2.37 _a	0.96	1.52 _b	0.90
No prime	1.53 _c	0.94	2.17 _d	0.73

Means that do not share subscripts differ at $p < .05$