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Original Article

Primed Self-Construal, Culture, and Stages of Impression Formation

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Abstract. The effects of culture on impression formation are widely documented but poorly understood. Priming independent and interdependent self-construals, and focusing on particular stages of impression formation, could help remedy this because such self-construals differ across cultures. In three experiments, participants' were primed with independent or interdependent self-construals before they formed spontaneous or intentional impressions of others. In Experiment 1, lexical decision reaction times showed that both traits and situational properties were activated spontaneously, but were unaffected by self-construal priming. In Experiment 2, a false-recognition paradigm showed that spontaneous trait inferences were bound to relevant actors' faces, again regardless of self-construal priming. In Experiment 3, explicit ratings did show priming effects. Those primed with independent (but not interdependent) self-construal inferred traits more strongly than situational properties. Primed self-construals appear to affect intentional but not spontaneous stages of impression formation. The differences between effects of primed and chronic self-construals are discussed.

Keywords: culture, impression formation, self-construal, spontaneous situational inferences, spontaneous trait inferences

Cultural backgrounds affect people's perceptions of other individuals (e.g., Mason & Morris, 2010; Morris & Peng, 1994). Most research on culture and person perception examines the intentional attribution of behaviors to dispositional and situational factors, tapped by explicit measures. For instance, Westerners (more individualistic) are more prone to neglecting situational constraints in their attributions (Choi, Nisbett, & Norenzayan, 1999), whereas for Easterners (more collectivistic), taking situational constraints into account may even become automatized due to practice (Knowles, Morris, Chiu, & Hong, 2001). But little is known precisely about (1) what cultural factors influence impressions, and (2) how they affect each stage of impression formation. Examining this requires a stage conception of impression formation and a focus on intermediate stages. For example, several prominent theories (Gilbert, 1998, p. 113) describe a three-stage model in which behaviors are first identified or categorized, traits are then spontaneously inferred about the actor, and then situational adjustments or corrections occur. The first two stages are largely automatic, with the controlled processes prominent in the intentional attributions that occur last. In order to get more traction on the "how" of impression formation, along with the "what" of cultural differences, the present research focuses on intentional judgments, spontaneous trait inferences (STIs), and spontaneous situational inferences (SSIs) (Uleman, Newman, & Moskowitz, 1996; Uleman, Saribay, & Gonzalez, 2008). Primed self-construals constitute the "what" of cultural differences we focus on.

Spontaneous inferences are relatively automatic, occurring without intention and conscious awareness, simply from exposure to behaviors that imply traits and/or situational properties (e.g., Lupfer, Clark, & Hutcherson, 1990; Todorov & Uleman, 2002; Winter & Uleman, 1984). For example, "Will talks during the lecture" implies that Will is "impolite," and that the lecture is "boring" (Ham & Vonk, 2003). Forming STIs involves at least two stages: spontaneously activating trait concepts and then binding them to the actor. Distinct methods can tap each stage.

Culture influences the tendency to make STIs. For instance, in research with Anglo vs. Latino samples, only the former showed evidence of STIs (Newman, 1991; Zárate, Uleman, & Voils, 2001). Na and Kitayama (2011, Study 1) showed STIs with Euro-Americans but none with Asian-Americans. These results are consistent with the idea that STIs are more frequent in individualistic cultures. However, most research on culture and STIs does not measure individual-level factors, leaving unclear precisely what aspects of "culture" are responsible for these differences. One exception is Newman's research (Duff & Newman, 1997; Newman, 1993), which showed that idiocentrism (an individual-level construct corresponding to individualism at the cultural level) is positively correlated with trait-cued recall – an index of STIs – and negatively correlated with situation-cued recall – an index of spontaneous situational inferences (SSIs). (Those from individualistic cultures, such as the United States and The Netherlands, make both STIs and SSIs simultaneously; see Ham & Vonk, 2003;

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Todd, Molden, Ham, & Vonk, 2011.) The other exception is the recent research of Na and Kitayama (2011, Study 2), who showed that independent self-construals, as measured by the difference between independent and interdependent self-construal on Singelis's (1994) scale, partially mediated the relationship between culture and their EEG measure of STIs. Of course, such correlational-mediational evidence by itself does not prove that idiocentrism or self-construal is responsible for inferential biases.

Self-construals (independent and interdependent) are widely studied individual-level factors and are thought to explain many cross-cultural differences (Markus & Kitayama, 1991). Individualistic cultures are said to foster independent self-construals – views of the self as separate from others in the social environment – whereas collectivistic cultures foster interdependent self-construals – views of the self as fundamentally related to others (Markus & Kitayama, 1991). Therefore, we decided to focus on self-construals as the psychological "whats" of culture which might cause some of the divergence between cultural groups in forming both STIs and intentional impressions.

We primed these cultural "whats" rather than relying on chronic differences between groups (e.g., Zárate et al., 2001) or individual differences (e.g., Newman, 1993; Na & Kitayama, 2011), for all the reasons spelled out by Oyserman and Lee (2008). Essentially, chronic or individual differences are inevitably confounded or correlated with other variables. Only an experimental manipulation such as priming can isolate causal effects. Following Gardner and colleagues (Gardner, Gabriel, & Lee, 1999), we primed self-construals prior to the formation of spontaneous or intentional impressions so that, if differences in spontaneous or intentional impressions followed, we could unequivocally draw conclusions about the causal role of this major aspect of cultural differences.

Our larger strategy is to contribute toward unpacking the effects of culture on impression formation by priming specific aspects of culture ("whats") in a series of studies, each focused on specific stages ("hows") of impression formation. This brief paper reports our first efforts. We conducted two experiments examining two early stages of person perception – the *activation* and *binding* of spontaneous inferences (see Zárate et al., 2001) – following priming of self-construals. Experiment 1 focused on the activation of trait and situational inferences from simple behaviors; experiment 2 focused on the binding of STIs to actors' faces. Consistent with findings that people from individualistic cultures utilize decontextualized trait (vs. situational) concepts more often, and with earlier crossethnic work on STIs (Na & Kitayama, 2011; Newman, 1991; Zárate et al., 2001), independent priming should result in more trait activation and binding than interdependent priming. In addition, independent priming may produce less SSI activation than interdependent priming.

On the other hand, if primed self-construals do not influence these early stages of person perception, this would suggest either that the differences observed in earlier research (Newman, 1991; Zárate et al., 2001) were not mediated by the self-construal aspects of culture but by other factors correlated with them, and perhaps that self-construal differences operated at later stages of impression formation. Therefore, in Experiment 3, we examined whether priming self-construals affects intentional inferences in the same way. We assume that intentional impressions are the result of spontaneous impression formation processes and deliberate, controlled reconsiderations.

Experiment 1: Activation of STIs and SSIs

In Experiment 1, we first primed independent or interdependent self-construals and then measured on-line activation of STIs and SSIs from behavioral descriptions. If self-construals affect this early stage of person perception, priming independence should make STIs particularly strong compared to SSIs and to priming of interdependence. Such a pattern would suggest that, at the earliest stages, individualists activate traits more than situational factors, whereas collectivists (while still activating traits) activate situational factors more (Choi et al., 1999). If, however, self-construals do not affect this early stage of person perception, participants should activate *both* the STIs and SSIs that are afforded by the behaviors.

Method

Participants

A group of 46 New York University students (34 females, mean age = 19.6) participated: 22 Whites and the rest from various minority ethnicities. Ten participants reported not being native English speakers. These variables did not qualify the main findings reported below.

Materials and Procedure

Self-Construal Priming

Participants were randomly assigned to priming conditions. Following Gardner et al. (1999), a short story about a trip to the city was presented to each participant. The story described an individual (using the pronouns "I, me, mine") in the independent condition and a group of individuals (using "we, us, our") in the interdependent condition. Participants circled all the pronouns in the story, ostensibly to "clear their mind" before the actual study.

Measurement of STI and SSI Activation

Participants then completed a lexical decision task (LDT), modeled closely after recent research (Todd et al., 2011, Experiment 1). Each trial consisted of a behavioral sentence followed by a series of lexical decisions. Previously, Todd et al. presented pretest participants with a larger set of behaviors and asked them to list two trait and two situational property inferences that came to mind. The eight behaviors used in this experiment were chosen by Todd et al. on the basis of high consensus among their pretest participants on these inferences. The lexical decisions included (1) the implied trait, (2) the implied situation property, (3) a control word to match the implied trait, (4) a control word to match the implied situation property, and (5) four nonwords. The trait and situational property words were those that were listed most frequently in response to the relevant behavioral sentences in Todd et al.'s pretest. The control words were chosen to match their trait and situational property counterparts as closely as possible in terms of familiarity and frequency of occurrence in English. For example, for "Phil got every test question correct," the test (control) words were "smart" ("skirt") and "easy" ("wide") and the nonwords were "pront," "drude," "denk," and "abup." The order of words and trials was randomized.

Participants were told that the sentences were meant to distract them from the real task of categorizing strings of letters. After each sentence, they decided as quickly and accurately as possible whether each string displayed was an English word or not, using the keys "L" ("YES") and "S" ("NO"). Preceding each behavior and each word, a row of "x"s at the center of the screen was displayed for 500 ms, and a beep was sounded simultaneously to facilitate attention. Each behavior remained on the screen for 3000 ms, and each word remained on the screen until a response occurred. The screen was blank for 500 ms following each behavior and each response. Participants completed one practice trial and eight experimental trials. The LDT RTs provided online measures of activation. If participants spontaneously inferred the implied trait and situational property words upon reading the behavioral sentence, subsequently they should have made faster lexical decisions about those words compared to matched control words. At the end of the LDT, participants were asked whether they intended to form impressions while reading the behaviors, were thanked, and debriefed. Only one person indicated that they deliberately formed impressions. Excluding this person's data from the analyses did not change the conclusions. Thus, these data reflect spontaneous, not intentional, impressions.

Data Reduction

Data from the LDT were processed and analyzed as in Todd et al. (2011). RTs outside of the 200 ms–2000 ms range (0.75% of responses) and incorrect responses (3.26% of responses) were excluded from the analysis. The remaining RTs were inverse transformed (1/x; see Ratcliff, 1993).

Results and Discussion

ANOVA results are based on the inverse-transformed RTs, but the means presented are raw RTs for ease of interpretation. A 2 (Self-Construal Priming: independent vs. interdependent) × 3 (LDT Word: trait, situation, control) mixed ANOVA, with the latter factor within-subjects, yielded a significant main effect of LDT word, $F(2, 88) = 7.697$, $p < .001$, $\eta_p^2 = .15$. Neither the main effect of self-construal priming, nor its interaction with LDT word were significant, $Fs < 1$, $\eta_p^2 = .013$ and $\eta_p^2 = .006$, respectively.

Paired samples *t*-tests showed that RTs to trait words ($M = 637.83$, $SD = 122.73$) were faster than RTs to control words ($M = 669.15$, $SD = 122.12$), $t(45) = 3.59$, $p < .001$, and likewise that RTs to situation words ($M = 643.15$, $SD = 130.78$) were faster than RTs to control words, $t(45) = 3.49$, $p < .001$. RTs to trait and situation words did not differ from one another, $t < 1$. Thus, participants, regardless of self-construal priming, made both trait and situation inferences spontaneously – and arguably made them simultaneously – replicating Todd et al. (2011).

In addition, as in Todd et al.'s (2011) results, there was a significant positive partial correlation, controlling for RTs to control words, between RTs to trait and situation words, $r_p(43) = .40$, $p < .006$, further supporting the idea that participants who made STIs were more likely to also make SSIs simultaneously.

In sum, Experiment 1 showed online evidence of activation of traits and situation properties, but no evidence that self-construals, when primed via the pronoun-circling task, affect this most basic stage of person perception. This null result for self-construal priming might be attributed to the small effect size reported in a recent meta-analysis (Oyserman & Lee, 2008) for the effect of the pronoun-circling task on self-concept measures ($d = 0.22$). But Experiment 3 (below), using this same manipulation and 10 *fewer* participants than Experiment 1, found a highly significant interaction with priming ($p < .005$). So this null result for self-construal is potentially informative and unlikely to be simply the result of low statistical power.

Experiment 2: Binding of STI to Actor's Faces

In Experiment 2, we tested whether primed self-construals affect a later stage of person perception – the binding of trait inferences to actors' faces – using a false recognition (FR) paradigm (e.g., Todorov & Uleman, 2002). This shows that STIs are not merely inferences about behaviors, but are bound to specific actors in memory. Independent

self-construal priming could produce more binding (i.e., increased STI formation) than interdependent self-construal priming. On the other hand, like Experiment 1, self-construals may turn out to not affect this stage of person perception at all.

Method

Participants

Forty New York University students (19 females, mean age = 19.8) participated in the experiment; 17 were White. Three participants reported not being native English speakers. These variables did not qualify the main findings reported below.

Procedure

Participants were randomly assigned to conditions and performed the same pronoun-circling task as in Experiment 1. Immediately afterward, a false recognition paradigm was administered on computers (e.g., Todorov & Uleman, 2002). In the exposure phase, participants saw 36 actor-behavior pairs, one at a time, for 8 s each. They were accurately told that their memory would be tested later, but there was no mention of impression formation, traits, or personality. Actors were represented by facial photographs with emotionally neutral expressions. Half of the actors were female and half were male. The ethnic/racial composition of the set of actors resembled the social environment (i.e., large university in a racially diverse metropolis) the study was embedded in. Most could be categorized as White, and the remaining were from other racial groups (i.e., Black, Asian, Indian, Middle Eastern, Hispanic).

The behaviors were taken from Rim (2006).[1] Twenty-four behaviors only implied (but did not explicitly mention) a trait. For instance, the sentence "She picked a table far away from everyone else in the cafeteria" implies that the actor is "shy." The remaining 12 behaviors were created by adding the trait into the sentence, as in "He was honest and told his roommate that he broke their expensive tv at the party last night." Actor-behavior pairs were randomly divided into three blocks of 12 trials, and within each block four of the behaviors explicitly contained the implied trait and eight did not. Order of blocks was fixed and trials were randomized within the block. We counterbalanced which of the four sentences in each set of 12 explicitly contained the trait thereby creating three counterbalancing sets. Half of all behaviors implied or explicitly mentioned a positive trait (e.g., disciplined, athletic, etc.) and half implied or explicitly mentioned a negative trait (e.g., aggressive, lazy, etc.).

In the retrieval phase, participants saw the same faces, one at a time, with a trait word underneath. Faces of actors were presented in the same blocks as they appeared during the exposure phase, and the actor-trait pairs were randomized within blocks. The task was to decide whether or not the trait word had been presented with this face earlier in the exposure phase, by pressing an "OLD" (to indicate that it was presented earlier) or "NEW" (to indicate that it was not presented earlier) key, respectively. On 12 "correctly paired" trials, the trait word had been implied but not presented. On another 12 "incorrectly paired" trials, the trait word had been implied about another actor. In the remaining 12 "filler" trials, the trait word had been explicit. Three replication sets of the stimuli were created for counterbalancing purposes by switching around the pairing of specific faces with behaviors and of specific behaviors with type of trial (i.e., correctly paired, incorrectly paired, filler). That is, each face was paired with a different behavior, and each behavior was assigned to a different type of trial across the three sets, thus making it highly unlikely that our findings could be due to specific actor-behavior and behavior-type of trial pairings. These replication sets concern both the exposure and the retrieval phases, which are dependent on each other.

The proportion of "OLD" responses in correctly paired trials was examined relative to the proportion of such responses in incorrectly paired trials. In both types of trials, "OLD" is a recognition error. In correctly paired trials, an STI made in the exposure phase leads one, in the retrieval phase, to falsely recognize the trait presented with the same actor as old. In incorrectly paired trials, the presented trait is still familiar because it was implied (and was spontaneously inferred), though it was about another actor. Such a trait may be falsely recognized in the retrieval phase because of familiarity, but not due to binding with *this actor*. So the difference in false recognition rates for correctly vs. incorrectly paired trials measures the extent to which the traits were inferred at exposure and spontaneously bound in memory to the relevant actor, in a way that controls for the effects of mere familiarity with the actor and the implied trait.

Results and Discussion

False-Recognition Responses

The data were analyzed in a 2 (Self-Construal Priming: independent vs. interdependent) × 3 (FR Trial: correctly paired, incorrectly paired, filler) × 3 (Replication) mixed ANOVA, with the second factor a within-subjects. The

[1] These sentences were chosen from a prior pretest (Rim, 2006; see Rim, Uleman, & Trope, 2009), where participants were presented with a series of trait-implying sentences and asked to come up with a trait that they believed was implied by each sentence. We chose sentences that had high agreement (> 21%) across participants in terms of the implied trait. The mean consensus rate across the 36 sentences was 55%.

Replication factor had no effect. There was only a main effect of FR trial, $F(2, 68) = 184.76$, $p < .0001$, $\eta_p^2 = .85$.

Paired-samples *t*-tests showed that the proportion of "OLD" responses in correctly paired trials ($M = 0.39$, $SD = 0.23$) was higher than that on incorrectly paired trials ($M = 0.14$, $SD = 0.13$), $t(39) = 8.35$, $p < .0001$. This is evidence that participants spontaneously inferred traits and attached them to actors' faces in memory. Importantly, the Self-Construal Priming × FR Trial interaction was not significant, $F < 1$, $\eta_p^2 = .005$. Thus, STIs were activated and bound to faces regardless of self-construal priming. There was also no main effect of Self-Construal Priming, $F < 1$, $\eta_p^2 = .002$.

The proportion of correct ("OLD") responses on filler trials (where the trait word had been explicit) was overall high ($M = 0.76$, $SD = 0.16$) and did not differ between the self-construal priming conditions ($M = 0.75$, $SD = 0.18$ and $M = 0.78$, $SD = 0.14$ for independent and interdependent, respectively, $t(38) = -.50$, *ns*). It was also significantly higher than the proportion of correct responses in correctly paired trials, $t(39) = 10.74$, $p < .0001$; and incorrectly paired trials, $t(39) = 20.28$, $p < .0001$, suggesting that participants attended to the stimuli.

Reaction Times

STI activation and binding can also be evident in RTs. The average RT on trials in which participants correctly rejected implied traits ("NEW" responses, separately for correctly paired and incorrectly paired trials) was computed and analyzed in a 2 (Self-Construal Priming: independent vs. interdependent) × 2 (FR Trial: correctly paired vs. incorrectly paired) × 3 (Replication) mixed ANOVA. The Replication factor had no effect. More importantly, again, there was no interaction of self-construal priming and FR trial, $F(1, 34) = 1.34$, $p = .256$, $\eta_p^2 = .038$. RTs for correct rejections on correctly paired trials ($M = 3462.02$, $SD = 1614.12$) were slower than RTs for correct rejections on incorrectly paired trials ($M = 2952.71$, $SD = 1060.08$), $F(1, 34) = 10.24$, $p < .003$, $\eta_p^2 = .231$. This slowing of RTs when the trait word was correctly (vs. incorrectly) paired is further evidence of STIs. In short, even though RTs provided additional evidence that STIs occurred, there was no RT evidence of any effects of self-construal priming.

To summarize, upon exposure to simple behaviors, participants in Experiment 2 activated STIs and bound them in memory to relevant actors' faces. This process was unaffected by primed self-construals, as in Experiment 1.

Experiment 3: Intentional Impressions

In Experiments 1 and 2, we found no effects of self-construal priming. And in both experiments, both independent and interdependent self-construal primed groups showed significant and equivalent activation (of STIs and SSIs) and binding (of STIs). Yet there are cultural differences in STI, as noted above. Perhaps our priming of self-construal was too weak and ineffective. Or perhaps self-construal differences are not the basis for these cultural differences. Or perhaps such differences only have their effect at later stages of impression formation. Therefore we performed Experiment 3. We predicted an interaction, consistent with the literature on culture and attributions (Choi et al., 1999): Participants primed with independent self-construal should give stronger trait (vs. situational) ratings, and this should not be true of those primed with interdependent self-construal. Such a finding would demonstrate that our self-construal priming was not at fault, but simply does not affect the earliest stages of impression formation. It would also suggest that such self-construals affect only intentional, but not spontaneous inferences.

Method

Participants

A group of 36 New York University students (24 females, mean age = 19.3) participated in the experiment; 14 were White. Six participants reported being raised outside of the United States, and 7 reported not being native English speakers. Sex did not qualify the main findings reported below.

Procedure

Participants were randomly assigned to conditions and completed the same pronoun-circling task as in the first two experiments. Immediately afterward, they were told that we were interested in "measuring how people perceive what is being described" in some sentences. On the computer screen, they saw one sentence at a time, followed by a question. The eight sentences were the same ones as in Experiment 1 (e.g., "Phil got every test question correct"), presented in individualized random order. Participants saw the sentences paired once with a trait question (e.g., "How smart is Phil?") and once with a situation question (e.g., "How easy is the test?"). The trait and situation questions were blocked by question type, with order of the blocks counterbalanced. Between the blocks, participants took a short break (approximately 3 min) in which they counted backwards from 500 in intervals of 3 to prevent them from responding to the second block completely on the basis of their memory of their ratings in the first block. Participants responded to each question on a scale ranging from 1 ("not at all") to 7 ("a great deal"). After completing the ratings, participants were asked what they thought the purpose of the study was, were thanked and debriefed. None of the participants mentioned a link between the self-construal prime and the rating task.

Results and Discussion

Ratings

The ratings were averaged within blocks and analyzed in a 2 (Self-Construal Priming: independent vs. interdependent) × 2 (Rating: trait vs. situation) × 2 (Order: trait vs. situational first) mixed ANOVA with the second factor within-subjects. As predicted, there was a significant interaction of self-construal priming and rating, $F(1, 32) = 9.19$, $p < .005$, $\eta_p^2 = .22$.[2] The pattern of means are displayed in Table 1.

Table 1. Mean trait and situational ratings (*SD*) by self-construal priming condition (Exp. 3)

	Type of rating	
Priming condition	Trait	Situational
Independent	5.04 (0.65)	3.99 (0.62)
Interdependent	4.79 (0.57)	4.46 (0.53)

Follow-up tests on the Priming × Rating interaction supported our predictions: Participants in the independent condition rated traits significantly higher than situational properties, $t(17) = 7.35$, $p < .0001$. On the other hand, ratings of traits and situational properties did not differ significantly for participants in the interdependent condition, $t(17) = 1.71$, $p = .105$. Furthermore, trait ratings did not differ significantly between independent and interdependent conditions, $t(34) = 1.23$, *ns*. But situational properties got significantly lower ratings in the independent than the interdependent condition, $t(34) = -2.43$, $p < .025$.[3]

These results suggest that self-construal priming does influence impressions when those impressions are formed intentionally. This influence is seen primarily in terms of independent self-construal priming decreasing the extent to which participants view the situation as possessing a property that could explain the actor's behavior. Whereas results from Experiment 3 by themselves are not nearly sufficient to reveal the full extent of self-construal influences on various aspects of impressions, they stand in contrast to the first two experiments measuring spontaneous impressions in showing some (vs. no) influence of the same self-construal priming procedure.

General Discussion

There are cultural differences in impression formation (e.g., Choi et al., 1999; Knowles et al., 2001; Mason & Morris, 2010), but these are not well understood for two reasons. First, they are "cultural differences," and even such well-researched dimensions as individualism and collectivism have multiple components. Second, it is unclear where in the processes of impression formation these differences have their effects. In an initial attempt to explore the intersection of these "what" and "how" issues, we examined the effects of experimentally manipulating (priming) a particular aspect of culture (self-construals) on three distinct stages of impression formation.

In Experiment 1, participants read short behavioral sentences that implied both traits and situational properties. We measured spontaneous on-line activation of implied traits and situational properties. Participants clearly inferred both traits and situational properties, responding faster in a lexical decision task, replicating Todd et al.'s (2011) recent evidence on the co-activation of STIs and SSIs. But self-construal priming had no effect, suggesting that cultural differences in self-construal do not operate at this earliest stage of impression formation.

Experiment 2 examined the binding of activated trait inferences to relevant actors' faces in memory. Participants saw behaviors that either implied or contained traits and later judged whether or not the implied trait word had been shown with the relevant actor's face (Todorov & Uleman, 2002). Once again, the results clearly showed that participants had made trait inferences upon exposure to the behavior and had bound the inference in memory to the actor's face. Importantly, this finding was not qualified by self-construal priming, suggesting that this second, relatively automatic binding stage of impression formation is

[2] There were also two uninterpretable interactions with rating order. First, a Priming × Order interaction, $F(1, 32) = 3.97$, $p = .055$, $\eta_p^2 = .11$, showed that order marginally moderated the overall effect of primes. Second, there was a four-way interaction when an Ethnicity (of participant) factor (White vs. minority) was introduced: $F(1, 28) = 8.04$, $p < .01$, $\eta_p^2 = .22$. Looking at each level of this factor showed that among minority participants, the 3-way interaction was not significant, $F(1, 18) = 1.17$, $p = .293$, $\eta_p^2 = .06$. But among the smaller sample of Whites, this 2 × 2 × 2 interaction was significant, $F(1, 10) = 5.88$, $p < .05$, $\eta_p^2 = .37$, because trait ratings were particularly high when made first by participants primed with interdependence ($M = 5.21$). In the other 7 cells, means differed as predicted, although not significantly so because of small cell sizes.

[3] The time participants took to give a rating to each question (starting from the time the sentence and the question appeared on the screen) was also recorded and analyzed in the same way as the ratings. This analysis revealed two significant effects: A main effect of Rating, $F(1, 32) = 9.52$, $p < .005$, $\eta_p^2 = .23$, showed that participants took less time to make trait ratings ($M = 6168.96$, $SD = 1935.42$) than situation ratings ($M = 7163.58$, $SD = 2245.25$). This was qualified by an interaction of Rating and Order, $F(1, 32) = 37.58$, $p < .0001$, $\eta_p^2 = .54$, which showed that participants rated traits ($M = 6943.79$, $SD = 1484.75$) slower than situations ($M = 5962.41$, $SD = 1338.86$) in the trait-first order whereas they rated traits ($M = 5394.13$, $SD = 2058.21$) faster than situations ($M = 8364.74$, $SD = 2351.79$) in the situation-first order. While this analysis was of potential interest, we refrain from overinterpreting its findings because it is not clear how much of the time spent to give a rating reflects reading and comprehension of the sentence and the question, the formulation of an answer, and indicating it on the rating scale; and because the second block always presented the same behaviors as the first block, an additional factor contributing to the speed of these ratings. Importantly, no effect of self-construal priming was evident in these rating times.

unaffected by this particular aspect of cultural differences.[4] Overall, the first two experiments suggest that primed self-construals do not affect spontaneous impressions. There was no evidence that these two cultural "whats" (independent and interdependent self-construals) affect these two impression formation "hows" (activation and binding).

We next asked whether the failure of self-construal priming to affect these early stages of impression formation would extend to intentional inferences. In Experiment 3, participants explicitly rated the same behaviors on the same traits and situational properties used in Experiment 1, i.e., for how much each behavior implied that the actor possessed the trait and the situation possessed the property. In clear contrast to the first two experiments, self-construal priming influenced these ratings. Independent self-construal priming led to stronger trait (vs. situational) inferences, whereas interdependent self-construal priming did not. Thus, self-construals do indeed matter when people deliberate about the inferences they are drawing from others' behaviors. Taken together, these studies suggest, with some qualifications (see below), that self-construals (when primed by pronoun-circling) affect only intentional but not spontaneous impressions.

Implications

Beyond our specific findings, we hope these three studies persuasively illustrate the utility of a general approach to understanding the effects of culture on a variety of social psychological phenomena. This approach experimentally manipulates specific elements (the "whats") of important cultural differences, to assess their impact on specific processes (the "hows") underlying phenomena of interest. In the present case, we primed self-construals, which are central to many conceptions of individualism and collectivism, and examined their impact on three important stages of impression formation. We hope that this general approach becomes more common and characterizes the next generation of research on cultural differences. "Culture" is a broad, multifaceted, and inherently "complex variable," in urgent need of unpacking. A growing array of experimental methods, including priming (e.g., Oyserman & Lee, 2008), is available to isolate the impact of specific whats of culture. At the same time, process models of the hows of important psychological phenomena are increasingly available. Combining these can only increase our understanding of the impact of culture on social behavior.

Interestingly, our results stand in apparent contrast to some of the literature on culture and person perception. It has been suggested that cultural differences are more profound when perceivers are cognitively busy (e.g., Knowles et al., 2001) or have to rely on chronically accessible constructs or processes (Hong & Chiu, 2001), as they are thought to do when making spontaneous inferences. Consistent with this, Zárate et al. (2001) found that Anglos and Latinos made the same intentional trait inferences from behaviors, but only Anglos showed evidence of STI activation (in a lexical decision task). However, we found the opposite. Self-construal differences were observed only for intentional and not for spontaneous inferences. How do we explain this contrast?

The research just cited relied on groups of participants from different cultures, whereas we primed self-construals. While culture and self-construals are related (Markus & Kitayama, 1991), culture is a much broader construct. Cultural groups may differ on a number of dimensions not captured by the researchers' preferred explanations for their findings. Participants in our experimental groups differed only in terms of situationally activated self-construals, because we randomly assigned them to the priming groups. Thus, our results underline the need to clarify the origin of person perception differences between cultural groups found in earlier studies (e.g., Zárate et al., 2001). The current results provide no indication that those differences stem from differences in self-construals. This is perhaps the most important implication of our findings.

The current results may also support the idea that, unlike intentional inferences, "spontaneous impressions are more sensitive to the influence of chronically accessible constructs" (Zárate et al., 2001, p. 300; see also, Uleman, 1999) in that there was no effect of priming on spontaneous impressions. Na and Kitayama (2011) found partial mediation of STI by chronic self-construals. However, recent evidence by Rim, Uleman, and Trope (2009) demonstrated that participants' tendency to make STIs can be affected by other experimental manipulations. Further research is needed to achieve a better understanding of when contextual factors influence spontaneous impressions and when they do not.

Finally, our choice of these three stages of impression formation was not based on the belief that these are the only stages of importance – or even that they always unfold in this order. We suspect that the "stages" of most complex social processes are dynamically related to each other, and flexibly deployed depending on such things as goals and the information provided.

Limitations and Future Directions

The current research was conducted on a very heterogeneous sample, and there was little evidence that sex or native language influenced these results, suggesting they have some generality. There was some indication in Experiment 3 that participants' ethnic background may influence intentional inferences (see footnote 2). That we did not aim

[4] Of course, other priming manipulations may affect false recognition rates. Our evidence simply suggests that the activation and binding stages are not affected by primed self-construals. For a priming manipulation (concerning psychological distance) that does affect false recognition rates and STI, see Rim, Uleman, and Trope (2009).

to, and were not able to, test this more rigorously is a clear limitation since ethnicity is known to influence impressions (e.g., Newman, 1991, 1993; Zárate et al., 2001) and responsiveness to self-construal priming (Gardner et al., 1999).

There are other grounds for caution as well. First, we relied on only one method of manipulating self-construals. Replications using other methods would be useful, especially in revealing whether the failures to find an interaction involving the self-construal priming factor (in Experiments 1 & 2) are due to the particular priming procedure we employed in these experiments. While we think it is more parsimonious to assume that self-construals affect only intentional, but not spontaneous, inferences, it is possible that only the *particular* manipulation we used had this effect.

Second, because of time and participant constraints, we omitted a control (e.g., no-priming) group from our self-construal priming procedure in these experiments. While such a control group might bring its own interpretive ambiguities, it could shed light on where exactly self-construal priming has its effects. For instance, in Experiment 3 we cannot tell whether it was independent priming, interdependent priming, or both that influenced inferences.

Third, whereas we measured activation of both trait and situational inferences in Experiment 1, we only measured trait binding in Experiment 2. We had difficulty conceptualizing the binding of situational inferences (to what?). To our knowledge, only Ham and Vonk (2003, Experiment 2) have studied the binding of situational inferences (to random grid cells). Future research could adapt their approach, or use photos of situations to test whether self-construals influence the binding of situational inferences. This is worth pursuing because past findings are mixed as to whether dispositional (e.g., Zárate et al., 2001) or situational inferences (e.g., Choi et al., 1999; Knowles et al., 2001) differentiate independent and interdependent perceivers better.

Finally, the data from Experiment 3 are open to interpretation in terms of demand effects. However, as mentioned above, none of the participants verbalized a link between the priming and rating parts of the experiment in their thoughts about the experiment's purpose. Thus, it seems unlikely that the findings were driven by participants' thoughts about how they were expected to behave in the experiment.

Beyond overcoming these limitations, future research could extend our findings in other important ways. Chronic self-construal differences, stemming from actual participation and long-term socialization in a culture, might produce larger differences in spontaneous inferences than primed self-construals, because they and the cultural practices that support them produce larger and more elaborated cognitive (and affective) networks. Thus, testing whether spontaneous trait and situational inferences differ between people with chronically independent and interdependent self-construals would shed further light on the current results and extend other recent work (Na & Kitayama, 2011). For instance, if such a test showed reliable differences in STI/SSI between chronically independent and interdependent people, that would limit the scope of our conclusions to *primed* self-construals, rather than to self-construals *in general*. But it would also encourage research on the ways that primed vs. chronically accessible cultural constructs might have different effects. In addition, chronic self-construals can interact with priming in interesting ways (e.g., Gardner et al., 1999) and the current domain presents another opportunity to increase our understanding of this interaction.

More generally, studies with richer, more complex stimuli (and/or in real world vs. laboratory settings) would be valuable. If chronically activated concepts generate more elaborated networks, they might have larger effects with more complex stimuli. It is noteworthy that Zárate et al. (2001, Study 2) observed more binding of STIs in Anglo than Latino participants only for multiple-sentence (vs. single-sentence) behaviors. We used single-sentence behaviors in all our studies, and like Zárate et al. we observed no binding differences between independent and interdependent self-construal. However, the question of whether our findings would replicate with multiple-sentence stimuli remains for future research.

Conclusions

We have provided the first experimental test of the role of primed self-construals in spontaneous and intentional inferences about other people, based on identical stimulus information across studies. Based on our findings, primed self-construals do not appear to influence spontaneous trait and situational inferences, but they do produce more explicit emphasis on traits than situational factors in intentional impression formation by independent (vs. interdependent) perceivers. In addition, our research strategy of priming one specific aspect of cultural differences at a time, to examine its effects on multiple stages of an important social information processing task, points to the need for continued research on several issues. In spite of the limitations of the present research, we hope our findings represent a beginning. Continued research using this kind of approach should yield important insights into "what" about culture affects impression formation and precisely "how" such effects come about.

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