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CULTURAL DIFFERENCES IN THE AUTOMATICITY OF ELEMENTAL IMPRESSION FORMATION

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Cultural differences in impression formation are well known and multiply determined. Spontaneous impressions (which occur relatively freely from conscious strategies) are basic components of impressions, and spontaneous trait transference (STT) is perhaps the most elemental form. We used process dissociation procedures to estimate the contribution of automatic and controlled processes to STT among Japanese and American participants. STT occurred in both samples, but more frequently among Americans. Controlled processes were equally important in both samples, but automatic processes were weaker among Japanese. Thus, these cultural differences in the most elemental form of impression formation were largely attributable to automatic processes. The results are discussed in terms of both stage theories of trait inference and views of culture as consisting of automatic patterns of thought and action.

CULTURAL DIFFERENCES IN TRAIT INFERENCES

Cross-cultural research on social inferences has suggested that individualistic cultures (i.e., those of Europe, Australia, and America) rely more on inner personality

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traits to explain social behaviors, whereas collectivistic cultures (i.e., those of Japan, Korea, and India) rely more on contextual factors, such as social roles and interpersonal relationships (e.g., Cousins, 1989; Miller, 1984; Shweder & Bourne, 1984). Although members of collectivistic cultures do make robust dispositional inferences that are similar to those made by members of individualistic cultures (e.g., Choi, Nisbett, & Norenzayan, 1999; McCrae, Costa, & Yik, 1996), these cultures differ in the attention paid to social contexts (e.g., Kitayama, Duffy, Kawamura, & Larsen, 2003; Masuda & Nisbett, 2001) and the degree to which they discount situational effects when making dispositional inferences (Choi & Nisbett, 1998).

In addition, some researchers (Cousins, 1989; Rhee, Uleman, Lee, & Roman, 1995) have discovered cultural differences when participants generate self-descriptions. Euro-Americans used unconditional traits (e.g., "I am generous") more frequently in their self-descriptions than did East Asians and Latinos (also collectivist), who tended to describe themselves by using conditional traits (e.g., "I am generous with my family") and social categories (e.g., "I am a student").

Cultural differences also exist with regard to spontaneous trait inferences (STIs; e.g., Na & Kitayama, 2011; Newman, 1993; Zárate, Uleman, & Voils, 2001), that is, unintentional impressions made without awareness from self-descriptions of behavior (Carlston & Skowronski, 1994; Winter & Uleman, 1984). Thus, "she returned the wallet with all the money in it" may spontaneously activate "honest," and this trait is then bound to the representation of the actor. STIs are more common among Euro-Americans than among Asian- and Latin-Americans, both of which are collectivist groups. For example, a recent study by Na and Kitayama (2011) provided behavioral and neurological evidence of cultural differences between Euro- and Asian-Americans. In Study 1, individuals' performance on a lexical decision task suggested that only Euro-Americans made trait inferences spontaneously. Study 2 confirmed this by using the N400 component of an ERP response. In addition, Zárate, Uleman, and Voils (2001) compared the STIs of Anglo- and Latino-Americans and found similar results. They argued that Anglo-Americans and Latino-Americans showed differences in the initial trait activation stage of STI. Both studies suggested that this initial stage of trait activation by behavior descriptions plays a critical role in producing the observed cultural differences in STI.

STAGES OF TRAIT INFERENCES

Perhaps the best-known model of stages in inferring traits from behavior is that of Gilbert, Pelham, and Krull (1988). In it, behaviors are first *categorized* in trait terms; then, the actor is *characterized* as having that trait; and finally, the characterization is *corrected* in light of the situation. The first two stages occur automatically, whereas the third is controlled and dependent on motivation and cognitive capacity. Subsequent research has revealed the critical roles of goals and of binding activated trait concepts to representations of actors. The explicit goal of forming an impression of the actor produces trait impressions, whereas the goal of assessing the situation

produces characterizations of the situation. Goals activate relevant concepts and shape inferences (Krull, 1993). However, trait inferences do not require impression formation goals, and they occur without them. These unintentional (often unconscious) trait inferences occur "spontaneously" when behaviors afford them (Uleman, Saribay, & Gonzalez, 2008).

Once a trait implying a behavior activates a trait concept, it must be bound to a person representation to form an impression. If no representation of the actor is present, and a representation of a different person is present, then spontaneous trait transference (STT) occurs rather than spontaneous trait inference (STI). In STT, that other person is associated with and rated higher on the trait than s/he would be otherwise. Thus, research on STI and STT elaborates the model of Gilbert et al. (1988). Once the trait is activated by categorizing the behavior, characterizing a person in trait terms can occur through (a) goal-directed attributional processes; (b) the spontaneous binding of the trait concept to the actor (STI), in the absence of impression formation goals but in the presence of the actor; or (c) the spontaneous binding of the trait concept to a different person if the actor is not present (STT). Whichever route is followed, there is no "person impression" until the activated trait concept is bound to a person.

Skowronski, Carlston, Mae, and Crawford (1998) distinguished between STI and STT in terms of the type of binding (inference versus association). In STI, an inferred trait is "a property of" an actor, but in STT, the trait is simply associated with a person who is different from the actor. Although both STI and STT involve thinking that occupies cognitive capacity (Wells, Skowronski, Crawford, Scherer, & Carlston, 2011), Crawford, Skowronski, Stiff, and Scherer (2007) found that STI is affected by a manipulation of processing goals, whereas STT is not. Furthermore, when an actor is present, STT is less likely to occur (Crawford, Skowronski, Stiff, & Leonards, 2008).

Whereas the model of Gilbert et al. (1988) provides a useful framework for our research, Trope's (1986) model implicitly integrates situational information into the initial processing of behaviors by either enhancing or diminishing intentional trait inferences (Trope & Gaunt, 2000). The model is particularly relevant when behaviors are ambiguous. Ham and Vonk (2003) have shown that when perceivers read behavioral descriptions that afford both trait and situational inferences (e.g., "John got an A on the test"), they spontaneously make both trait (John is *smart*) and situational inferences (the test is *easy*), regardless of processing goals.

WHEN MIGHT AUTOMATIC CULTURAL DIFFERENCES FIRST APPEAR?

Cultural differences in forming person impressions from behaviors arise from many sources, including differences in habitual attentional patterns (e.g., Miyamoto, Nisbett, & Masuda, 2006), in the cultural meanings of behaviors (Miyamoto & Kitayama, 2002), and in the degree to which situations and roles rather than traits are used for social prediction (Gelfand, Spurlock, Sniezek, & Shao, 2000; see

Chiu & Hong, 2007, for a recent review). Within the model of Gilbert et al. (1988), the earliest stage at which cultural differences in impressions can appear is the second one, when traits are bound to persons.

This study was designed to test for cultural differences at this stage by using STT rather than STI. Carlston and Skowronski (2005) argued that STI is based on unconscious attributional processes, whereas STT is based on simple associations. They cited several empirical differences between STI and STT that support this distinction. There seems to be little doubt that STT processes are simpler than STI processes, even though STT also produces person impressions. If one is looking for automatic processes, by whatever definition, they are more likely to be prominent in simpler processes.

While we might have pursued automaticity in terms of Bargh's (1994) "four horsemen," which enumerate various properties of automatic processes, we prefer Jacoby's (1991) process dissociation procedure (PDP) because of its affirmative and intuitively compelling definition of control and because of its recognition that no task is purely automatic or controlled. It has not been applied to STT before, but the application is straightforward in the false recognition paradigm (McCarthy & Skowronski, 2011; Todorov & Uleman, 2002, 2003, 2004).

SPONTANEOUS TRAIT TRANSFERENCE

Carlston and Skowronski (2005), Carlston, Skowronski, and Sparks (1995, Study 4), and Skowronski, Carlston, Mae, and Crawford (1998) produced STT by presenting descriptions of trait-implying behaviors with photos of non-actors who were describing others (actors) who were not pictured. Thus, when participants read a description of an actor (e.g., "He was walking down the street one day and saw a puppy on the sidewalk. He kicked it out of his way") while viewing the photograph of a female speaker, they spontaneously associated the inferred trait, *cruel*, with the speaker. The present study addresses the effects of culture on this type of associative processing (STT) in forming impressions. Cultural differences should be seen most clearly in the relatively automatic components of the simplest person perception processes. Cultural practices are acquired slowly, over a lifetime, and are carried out relatively automatically, that is, unreflectively (Kitayama, 2002). Thus, they should be seen most clearly in STT.

Carlston and Skowronski (2005) suggested that STT is more likely the result of automatic than of controlled processing. In addition, Skowronski et al. (1998) indicated that STT effects could occur without awareness. However, no studies have directly addressed the extent to which STT is automatic. To explore this, we investigated cultural differences in the contributions of automatic and controlled processes to STT by using the process dissociation procedure (PDP; e.g., McCarthy & Skowronski, 2011; Payne, 2005) and the false recognition paradigm (Todorov & Uleman, 2002) among American and Japanese participants.

We hypothesized that STTs will be more frequent among American than among Japanese participants. Based on our understanding of cultural processes as more automatic than controlled processes, we expected this cultural difference to be attributable more to differences in automatic processes than to differences in controlled processes.

METHOD

PARTICIPANTS

Undergraduate students (N = 60, M_{age} = 19.83, 18 to 23 years; 33 Euro-Americans, 20 Asian-Americans, 5 Hispanics, 1 African-American, and 2 others) volunteered from the subject pool at New York University. One participant was excluded for not being fluent in English. Fifty-eight undergraduates (N = 58; M_{age} = 19.25, 18 to 23 years), all native Japanese speakers, also volunteered at Saitama University.

STIMULI

Behavioral Descriptions and Photos. We pre-tested 100 trait-implying behavioral descriptions in both America and Japan, including descriptions used in a previous study (Uleman, 1988). We selected the 40 trait-implying sentences that had (1) the highest consensus on their trait implications (> 70%) and (2) similar social desirability ratings across both American and Japanese participants.

In the main experiment, each of these 40 behavioral descriptions and an additional 10 control descriptions were displayed with photographs of different speakers. We selected 50 faces of various races (25 females) for American participants and 50 Asian faces (25 females) for Japanese participants. To emphasize that each statement described someone other than the pictured speaker, we paired the photographs with sentences that used pronouns of the opposite gender (e.g., a man's photo was paired with "*She* got an A on a chemistry test").

Three types of sentences were used in the exposure task (see below): (1) 20 trait-explicit descriptions, which explicitly stated the actors' traits (i.e., "She was *caring* and nursed the bird with a broken wing back to health"); (2) 20 trait-implying descriptions, in which traits were implied but did not appear in the descriptions (i.e., "She nursed the bird with a broken wing back to health"); and (3) 10 control sentences adopted from a previous study (Uleman, Hon, Roman, & Moskowitz, 1996) with low consensus on their trait implications. For the recognition task (below), 10 photos from the trait-explicit descriptions and 10 photos from the trait-implying descriptions were matched with traits that previously appeared or that were implied in the descriptions. The other 20 photos from these two groups were mismatched, that is, paired with traits that they did not include or imply (see Appendix A).

PROCEDURE

STTs were detected with the false-recognition paradigm (Todorov & Uleman, 2002, 2003, 2004). The experiment comprised three tasks: (1) an exposure task, (2) a filler task, and (3) a recognition task. An experimenter greeted participants upon their arrival at the lab and obtained their informed consent. After the participants were seated in front of computer monitors, they read written instructions that asked them to memorize the behavioral descriptions provided by pictured acquaintances of targets who were not themselves. The instructions did not explicitly ask the participants to form impressions.

Exposure Task. The participants were exposed to 50 photograph-behavior pairs: 20 explicit trait trials, 20 implicit trait trials, and 10 control trials. Each photograph-behavior pair was presented for 12 seconds, and the pairs were presented in a randomized order. One filler sentence was included both at the beginning and at the end of the task to mitigate primacy and recency memory effects.

Filler Task. We used an anagram task to reduce the participants' ability to recall the descriptions from short-term memory. We created 22 scrambled words (e.g., EALPP) and gave the participants 5 minutes to complete them.

Recognition Task. After the filler task, the participants had two practice trials to familiarize themselves with the recognition task. In each trial, the participants indicated whether a trait word had been included in the description accompanying the photograph of the speaker by pressing the labeled "Yes" or "No" key on a computer keyboard. "Yes" responses on the 10 explicit trials were correct and provided *hit rates*. "Yes" responses on the 10 implicit trials, where the traits were only implied, were errors and provided *false recognition rates*. Participants' guessing was assessed by examining the 20 other trials in which either an explicit or implicit trait in the exposure task mismatched the photo presented in the recognition task. These were the *mismatch rates*. After completing these 40 trials in random order, the participants filled out a short questionnaire about the procedure and they were thanked and debriefed.

ANALYSES

The rate of *yes* responses for each type of trial (hit, false recognition, and mismatched) was calculated. In this paradigm, the difference between the false recognition rate and the mismatch rate estimates STI or STT occurrences (e.g., Goren & Todorov, 2009). In addition, the parameter estimates of automatic (A) and controlled (C) processes were calculated based on the participants' response rates for each of the three trial types by using a PDP (McCarthy & Skowronski, 2011; Payne, 2005).

PDP Analysis. McCarthy and Skowronski (2011) identified three types of recognition trials and scores. The first type, *hit*, occurs when participants recognize explicit traits in behavioral information and produce correct responses. These correct responses can result from both participants' recall of an exact behavioral sentence

when prompted by a photograph (via controlled processes) or from an unconscious association between a photo and a trait word (automatic processes). When controlled and automatic processes both contribute to correct responses, this is known as a PDP inclusion trial. The second type of trial and score, *false recognition*, occurs when participants claim to have seen a trait even though that trait was not present. In such a case, participants fail to recall the behavior and instead respond "Yes" because of the association of the inferred trait with the photo. When controlled and automatic processes work in opposition in this way, this is a PDP exclusion trial. Finally, participants' *guessing tendencies* on the mismatched trials reflect neither automatic processes nor controlled processes because there is no relevant behavior-photo pair. When the "Yes" response rates in the mismatched conditions are greater than 0, this indicates participants' guessing tendencies.

Most tasks involve both automatic and controlled processes. To estimate their distinct contributions in the false recognition task, one can treat hit and false recognition trials and scores as inclusion and exclusion tasks, respectively. In an inclusion task, controlled processes (C) and automatic processes (A) work in concert; in an exclusion task, the two processes work in opposition. In an inclusion task, participants recall the behavior through controlled processes (C) or, if the controlled processing fails (1 – C), respond on the basis of automatic processes (A). This can be described mathematically as Inclusion Task Performance = C + A (1 − C). In an exclusion task, performance depends on automatic processing when the controlled processing fails. This can also be expressed mathematically as Exclusion Task Performance = A (1 – C). Based on these equations, controlled and automatic processes can be calculated as follows: C = Inclusion Task Performance – Exclusion Task Performance, and A = Exclusion Task Performance / (1 – C). These C and A estimates are the *uncorrected estimates*.

When the "Yes" response rate in the mismatched condition exceeds 0, there are two procedures that can be used to correct for participants' guessing tendencies (G) on both types of trials. First, *the difference score correction procedure* also defines C as Exclusion Rate –Inclusion Rate, that is, the difference in performance when control is possible and when it is not. Guessing (G) in both cases is canceled out. However, the uncorrected A estimate (when C fails) is inflated by G and actually equals (A + G). Therefore, the difference score correction is calculated by subtracting the participants' mismatch, that is, G, rates from the uncorrected A estimates, that is, A = [Exclusion Task Performance / (1 – C)] – G.

The more conservative *probability correction procedure* regards guessing as the probability that participants will answer "Yes" in the absence of controlled and automatic processes, that is, Guessing Performance = G (1 – C) (1 – A) (see Buchner, Erdfelder, & Vaterrodt-Plünnecke, 1995). It accounts for guessing both in inclusion task performance and in exclusion task performance as follows: Inclusion Task Performance = C + A (1 – C) + G (1 – C) (1 – A) and Exclusion Task Performance = A (1 – C) + G (1 – C) (1 – A). In the probability correction procedure, C estimates can be expressed mathematically as C = Inclusion Task Performance – Exclusion Task Performance, and A estimates can be expressed mathematically as A = (Exclusion Task Performance – G + GC) / [(1 – C) (1 – G)]. Because considering participants' guessing as probabilistic appears to be the most conservative approach to the data,

TABLE 1. Percentage of "Yes" Responses during the Recognition Task

	America (*n* = 59)		Japan (*n* = 58)	
Type	M	SD	M	SD
Hit	.67	.17	.59	.18
False Recognition	.46	.19	.34	.18
Mismatch	.29	.12	.27	.14
Difference	.16	.24	.07	.23

Note. Difference = False Recognition Rate – Mismatch Rate.

our discussion of the results focuses on the analyses of the probabilistic correction estimates (see McCarthy & Skowronski, 2011, for an application).

RESULTS

RECOGNITION TASK PERFORMANCE

A 2 Country (America, Japan) × 3 Trial Type (hit, false recognition, mismatched; within-Ss) ANOVA yielded simple main effects of trial type, $F(2, 230) = 130.22$, $p < .001$, $\eta_p^2 = .53$, and country, $F(1, 116) = 17.55$, $p < .001$, $\eta_p^2 = .13$. The two-way interaction approached significance, $F(2, 230) = 2.57$, $p = .08$, $\eta_p^2 = .02$.

The trial type main effect occurred because the "Yes" rate was highest for hits ($M = 0.63$, $SD = 0.18$), moderate for false recognitions ($M = 0.40$, $SD = 0.19$), and lowest for mismatches ($M = 0.28$, $SD = 0.13$). The high hit rate indicates that participants paid attention to the "memory task" and responded well above chance (0.50), $t(116) = 37.49$, $p < .001$, Cohen's $d = 1.24$. In addition, the higher rate for false recognitions than for mismatches indicates that participants formed STT, $t(116) = 22.15$, $p < .001$, Cohen's $d = 0.74$. Because the rate in the mismatched condition was substantially greater than 0, we must correct for guessing when calculating the automatic and controlled estimates.

Comparing cultural differences for each trial type showed that the American hit rate was higher than the Japanese hit rate, $F(1, 115) = 6.17$, $MSE = 3.63$, $p < .05$ (see Table 1, top row). Likewise, the American false recognition rate was higher than the Japanese false recognition rate, $F(1, 115) = 11.82$, $MSE = 3.96$, $p < .01$. However, the mismatch rates did not differ, $F(1, 115) = .7$, *ns*. Thus, participants from each culture did not differ generally in their error rates. The difference was specific to false recognition.

In the false recognition paradigm, the difference between false recognition and mismatch rates measures trait inferences (Goren & Todorov, 2009; Todorov & Uleman, 2002). This difference was significantly higher among Americans ($M = .16$, $SD = .24$) than among Japanese ($M = .07$, $SD = .23$), $t(115) = 2. 29$, $p = .024$ (see Figure 1). Equally important, participants from both cultures showed significant STT. For the Japanese, the difference score of 0.07 exceeded zero, $t(57) = 2.17$, $p = .032$. Thus, STT occurred in both cultures.

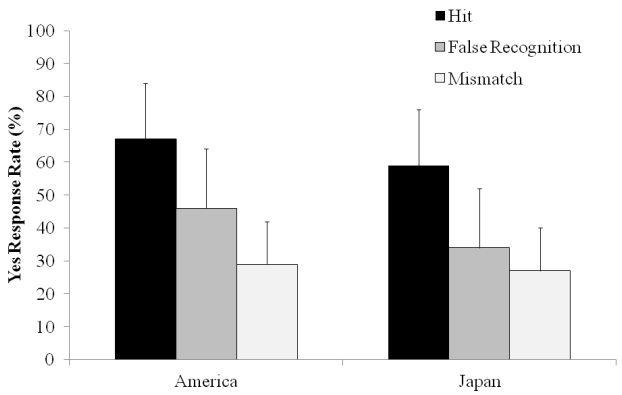

FIGURE 1. Percentage of Yes responses during the recognition task across different countries.

PDP ANALYSIS

The controlled (C) and automatic (A) processing estimates were calculated as described above (see Method). Table 2 displays three sets of parameter estimates, one uncorrected and two for each method for correcting for guessing. Of the two methods, treating guessing as probabilistic (*the probabilistic correction approach*) is the most conservative approach to the data. Therefore, these estimates were analyzed by using *t*-tests to compare American to Japanese participants. The results from the other estimates were similar.

Control processes (C) did not differ between Americans (M = 0.23, SD = 0.20) and Japanese (M = 0.28, SD = 0.24), $t(115) = -1.1$, *ns*. By contrast, automatic processes (A) contributed more to task performance for the Americans than for the Japanese, $t(115) = 2.55$, $p = .01$, Cohen's $d = .47$. That is, forming STTs was more automatic for Americans than for Japanese.

DISCUSSION

We investigated cultural differences in impression formation by focusing on the simplest, most elemental impression, STT. STT is thought to reflect mere associations between traits and persons rather than the more complex unconscious attributional processes that produce STI. We hypothesized that when participants read about speakers describing a third party's trait-implying behaviors, Americans would form more associations between the implied traits and the speakers than Japanese. That is, STT would be less frequent among Japanese than among Americans. We also thought that this cultural difference would occur because STT is less automatic among Japanese. Our findings were consistent with these hypotheses, as well as with earlier research showing similar cultural differences in spontaneous trait activation (Zárate et al., 2001) and inference (Na & Kitayama, 2011). Our

TABLE 2. Controlled and Automatic Process Estimates, with Two Methods of Correcting for Guessing

Estimate	Uncorrected		Difference score correction procedure		Probability correction procedure	
	America	Japan	America	Japan	America	Japan
C	.23	.28	.23	.28	.23	.28
A	.58	.44	.30	.20	.23	.14

Note. The cells represent the parameter estimates. The formulas for these calculations are found in the Method section.

findings suggest that the widely reported cultural differences in trait attributions may be due, at least in part, to cultural differences in the earliest and simplest stage of impression formation in which trait-relevant descriptions of behaviors are inferred and in which these activated concepts are associated with persons, that is, in STT.

These findings may seem to challenge the conclusion of Choi et al. (1999) in their review of cultural differences in attributions in which they adopted the classic situation versus disposition dichotomy: the "East-West split in attribution thus originates primarily from a stronger 'situationism' or belief in the importance of the context of behavior in East Asia. Consequently, East Asians are more likely than Westerners to avoid the correspondence bias as long as situational constraints are salient" (p. 47).

Three points undermine the relevance of this classic dichotomy and conclusion. First, questionnaire studies of beliefs in many cultures show that interactionism is more common than either dispositionism or situationism (Church et al., 2012; Norenzayan, Choi, & Nisbett, 2002). Second, the stimuli in our study, and in most studies of STT and STI, are designed to imply traits, and they provide little or no situational information. Thus, the affordance for situationism is minimal. Third, spontaneous dispositional and situational inferences are not mutually exclusive. They can occur simultaneously (Ham & Vonk, 2003). Thus, cultural differences in impression formation may be relatively independent of situationism (see also Malle, 2004; Miller, Smith, & Uleman, 1981).

STAGES OF TRAIT INFERENCES

If a single variable such as situationism seems to be insufficient to account for cultural differences in impression formation, a more fine-grained look at the processes of impression formation may be useful. Three papers have attempted to identify these cultural differences with particular stages of trait inferences, all using the categorize-characterize-correct model of Gilbert et al. (1988) and all focusing on the role of automatic processes.

Knowles, Morris, Chiu, and Hong (2001) compared participants from Hong Kong with participants from the U.S. They compared only two models that predict cultural differences, varied cognitive load, and used an attitude attribution paradigm (Jones & Harris, 1967). They rejected a "spontaneous default inference" model, which posits that East Asians first make automatic situational (not dispo-

sitional) attributions and then effortfully correct them with dispositional information. They found support for the "automatized situational correction" model in which everyone first makes automatic dispositional attributions, but those from Hong Kong "have automatized the ability to correct attributions to personal dispositions to take into account situational influences" (p. 1344).

Lieberman, Jarcho, and Obayashi (2005) used the "anxious woman" paradigm of Gilbert et al. (1988), and varied both cognitive load and whether East Asian and American participants were asked to make dispositional or situational attributions. The results across five studies suggested two conclusions. First, "automatic attributional habits were substantively the same across cultures" (p. 898). Under cognitive load, when controlled correction was blocked, those from both cultures made whichever attributions (dispositional or situational) they were instructed to make. Second, under no cognitive load, East Asians did not show the usual pattern of augmentation and discounting that Americans showed. Instead, they "ignore the specific content of situational information in favor of a general situationalist account of behavior" (p. 899).

Mason and Morris (2010) surveyed the social cognitive neuroscience literature for evidence on cultural differences in automatic impression formation processes. Among others, they reported cultural differences in activity "early in the processing stream that support automatic functions" (p. 300), that is, in the posterior superior temporal sulcus (pSTS) and the temporal poles (TPs), that are generally consistent with but that are not tightly tied to behavioral evidence. Rather than supporting clear conclusions, this paper identifies a promising research agenda as well as gaps in our knowledge.

Among the gaps "are attempts to identify brain regions recruited when participants deliberately explain behavior in terms of situational constraints" (Mason & Morris, 2010, p. 302). Brosch, Schiller, Mojdehbakhsh, Uleman, and Phelps (2013) recently did this by showing that the left dorsolateral prefrontal cortex (DLPFC) is uniquely active when people intentionally make situational rather than dispositional attributions. The DLPFC is heavily involved in executive processing and conscious control. Although this study provides strong social neuroscience support for the Gilbert et al. (1988) hypothesis of a final controlled correction stage, it did not examine cultural differences. The participants were NYU undergraduates.

Thus, the evidence on where cultural differences enter a stage model of impression formation is remarkably sketchy and incomplete. It includes differences in automatic attention to, processing of, correcting for, or defaulting to situational information. However, it omits what we, Na and Kitayama (2011), and Zárate et al. (2001) have found: cultural differences in the earliest stages of forming trait impressions from behavior.

THE RESULTING MODEL

Our results suggest an extension of the Gilbert et al. (1988) model at the initial automatic stages of trait-relevant categorization and characterization. First, STTs

occurred among both American and Japanese participants, so neither culture precludes this most elemental kind of trait impression. Second, STTs were more frequent among American than among Japanese participants. This is consistent with Zárate et al. (2001) and Na and Kitayama (2011). Zárate et al. (2001) observed that trait constructs were more readily accessible to Anglos than to Chicanos when encoding trait-implying behaviors. Na and Kitayama (2011) found that STIs did not occur among Asian-Americans but did occur among Euro-Americans. Thus, cultural differences exist in the initial stages of impression formation, and given the appropriate stimuli and measures, trait inferences occur in all or most cultures.

Third, our STT cultural difference resulted from automatic rather than controlled processes. Automatic processes contributed to STT more among Americans than among Japanese, whereas the contribution of controlled processes did not differ between the groups. This is the first study to use the PDP definition of automaticity, as opposed to one based on concurrent cognitive load or the other criteria of automaticity that Bargh (1994) outlined. The advantage of the PDP definition is that it is unitary, intuitive, and affirmative. Moreover, our finding that this cultural difference is due to automatic processes is consistent with the view of culture as "automatic" in some sense. As Kitayama (2002) noted, "many researchers of culture have long assumed that culture is tacit and implicit. What culture is to humans is what water is to fish…culture is tacit largely because it is embodied in… human-made artifacts and associated on-line mental responses that make up the society" (p. 90).

An extended model would include cultural differences in initial automatic processing of impression information. These differences may result from chronic attentional habits to persons or contexts (Masuda & Nisbett, 2001), habits of thought (Choi et al., 1999), and implicit goals (e.g., Rim, Min, Uleman, Chartrand, & Carlston, 2013). Explicit controllable questions (What is this person like? What is this situation like?), if any exist, also affect processing (see Knowles et al., 2001; Lieberman et al., 2005). Then, the STT or STI process (depending on the stimuli present) unfolds relatively automatically, reflecting cultural differences as in the present study. Finally, effortful corrections may occur. These corrections require motivation and available cognitive capacity, but they are also shaped by individual beliefs (Church et al., 2012), cultural differences in perceived "common sense" (Zou, Tam, Morris, Lee, Lau, & Chiu, 2009), and conversational maxims.

This view suggests that cultural differences can be found at many stages, that self-reports alone are limited in isolating the affected processes, and that studies of spontaneous processes are particularly revealing because they minimize the effects of explicit goals and permit separate estimates of automatic and controlled processes. The present study illustrates this approach.

PDP AND STT

Automatic (A) and controlled (C) processes are both involved in any complex judgment or behavior, even in relatively simple STIs and STTs (McCarthy & Skow-

ronski, 2011; Uleman, Blader, & Todorov, 2005). In this study, the PDP (Payne, 2005) was therefore used to estimate the contribution of automatic and controlled processes to the occurrence of STTs. Although some (e.g., Hintzman & Curran, 1997) have cautioned that the assumption of independent automatic and control processes underlying the PDP approach (Jacoby, 1991) may not be warranted, others (e.g., Jacoby & Shrout, 1997) have noted that this independence is conceptual, not empirical. (In our study, C and A were negatively correlated to the same degree within both cultures.) McCarthy and Skowronski (2011) have confirmed that certain manipulations selectively affect one process but not the other in STI. In our study, culture affected only A and not C. Thus, the PDP provides a method for investigating the role of "culture" in implicit or automatic processes (Kitayama, 2002; Mason & Morris, 2010).

The phenomenon of STT also provides a method for studying cultural differences in elemental processes of impression formation, that is, in the minimal combination of concepts that constitute an impression, a person representation and a trait. This is the first study to have done so. Its use here illustrates our more general approach to studying cultural differences, that is, to isolate, as much as possible, elemental processes (and their automatic and controlled components) that contribute to cultural differences. We believe this is an important complement to approaches that examine the outcomes of multi-stage processes (e.g., Knowles et al., 2001; Lieberman et al., 2005).

CONCLUSION

Cultural differences arise from multiple simultaneous, interacting, and cascading processes. Impression formation is a domain where cultural differences are well documented but poorly understood. Thus, it is important to develop theories and methods that allow us to analyze the processes that contribute to these differences. In this article, we suggested the general outline of an elaborated stage theory and showed that STT and PDP are useful tools for investigating elemental processes of impression formation.

Much remains to be explored, both theoretically and empirically. In addition to sampling other cultures, future work should examine subcultural effects. Socioeconomic status (SES) affects STI (Lillard & Skibbe, 2005; Varnum, Na, Murata, & Kitayama, 2012). Varnum et al. (2012) found that STIs were less frequent among working-class participants than among middle-class participants. Interestingly, working-class individuals showed high context sensitivity and weak STI effects, just as those in collectivistic cultures do. Thus, cultural and SES differences can help us "carve nature at its joints" to better understand impression formation processes.

APPENDIX A. TRAIT IMPLICIT SENTENCES, TRAIT EXPLICIT SENTENCES, TRAIT MISMATCHED SENTENCES, AND CONTROL SENTENCES

Type	Behavioral Description	Exposure Task	Recognition Task
Explicit	"He was *thoughtful* and picked up his roommate's package for him on his way home from work."	Thoughtful	Thoughtful
	"She was *caring* and nursed the bird with a broken wing back to health."	Caring	Caring
	"He was *organized* and arranged his books neatly on the shelf in alphabetical order."	Organized	Organized
	"She was *careful* and checked everyone's seat belts before starting off."	Careful	Careful
	"He was *clever* and waited until his boss was in a good mood to ask for permission."	Clever	Clever
	"He was *inconsiderate* and played his music loud while his neighbors were sleeping."	Inconsiderate	Inconsiderate
	"He was *violent* and threatened to hit her unless she took back what she had said."	Violent	Violent
	"She was *dishonest* and sold stock in a nonexistent company for $500 a share."	Dishonest	Dishonest
	"She was *irresponsible* and lost track of the two-year-old she was taking care of."	Irresponsible	Irresponsible
	"She was *rude* and left the dinner party without thanking the hostess."	Rude	Rude
Implicit	"He phoned for help while the others just screamed."	Calm	Calm
	"She clipped food coupons out of the newspaper every week."	Thrifty	Thrifty
	"He went for a 3-mile jog at least four times a week."	Healthy	Healthy
	"She arrived to work ten minutes early every morning."	Punctual	Punctual
	"She spoke five languages and could read three more."	Intelligent	Intelligent
	"He was afraid he wouldn't be able to think of anything to say."	Nervous	Nervous
	"She wouldn't loan her extra blanket to the other campers."	Selfish	Selfish
	"He made half a dozen errors in filling out his income tax return."	Careless	Careless
	"He refused to look for a job even though he needed one."	Unmotivated	Unmotivated
	"She told the dentist all about her neighbor's habits."	Gossipy	Gossipy

Type	Behavioral Description	Exposure Task	Recognition Task
Explicit Mismatched	"He was *confident* and hardly hesitated when attempting to pronounce words he'd never heard before."	Confident	Curious
	"She was *curious* and asked how the swallows find their way."	Curious	Liar
	"He was *smart* and won first prize in the city-wide high school science fair."	Smart	Friendly
	"She was *funny*, and her stories made people laugh so hard that they held their sides."	Funny	Lazy
	"She was *friendly* and invited the new members of the community to her house."	Friendly	Confident
	"He was a *liar* and told his wife that he had to work late, but he hung out with his friends instead."	Liar	Obsessive
	"She was *lazy* and drove to the newsstand, even though it was only a half of a block away."	Lazy	Honest
	"He was a *sexist* and said that women are less fit to work in the business field."	Sexist	Nosy
	"She was *forgetful* and left her purse on the subway seat on her way to work."	Forgetful	Generous
	"He was *greedy* and picked out the best desserts for himself before the guests arrived."	Greedy	Clumsy
Implicit Mismatched	"He told the cashier that she gave him too much change."	Honest	Greedy
	"She donated a lot of money to a foundation."	Generous	Funny
	"She won the amateur contest with her hip hop dancing act."	Talented	Sexist
	"He fished from his row boat for hours and enjoyed taking in his surroundings."	Laid back	Smart
	"He returned the lost wallet with all the money still in it."	Trustworthy	Forgetful
	"She watched her neighbor's house to see who came and went."	Nosy	Laid back
	"He tripped on the bear skin rug and twisted his ankle."	Clumsy	Boring
	"He spoke about his experience and then people yawned."	Boring	Trustworthy
	"She excused herself every ten minutes to go wash her hands in the restroom."	Obsessive	Shy
	"She couldn't find the courage to greet her new neighbor."	Shy	Talented

APPENDIX A. (CONTINUED)

Type	Behavioral Description	Exposure Task	Recognition Task
Control	"He asked where the stars go shopping."		
	"She never drove slower than the speed limit."		
	"He drove to the only newsstand, 20 blocks away."		
	"She turned off the local talk show about a distant toxic waste dump."		
	"He hoped that they knew that their new glasses looked funny."		
	"He and his girlfriend were light on their feet during the foxtrot."		
	"She thought he didn't deserve their award and praise."		
	"He enjoyed watching varsity basketball tryouts for four years in a row."		
	"She didn't have an extra blanket to loan the other campers."		
	"She screamed for the others to help find the phone."		

Note. In the experiment, traits were never presented in italics.

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