



Isolating effects of cultural schemas: Cultural priming shifts Asian-Americans' biases in social description and memory

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ABSTRACT

Cross-national research on social description documents that Westerners favor abstract linguistic categories (e.g. adjectives rather than verbs) more than East Asians. Whereas culture-related schemas are assumed to underlie these differences, no research has examined this directly. The present study used the cultural priming paradigm to distinguish the role of cultural schemas from alternative country-related explanations involving linguistic structures or educational experiences. It compared Asian-Americans' descriptions of others and memory for social information following American versus Asian priming. Asian priming fostered more concrete, contextualized verb-based descriptions and reduced memory errors associated with trait inference, compared to American priming (and to separate samples of non-primed Asian-Americans and Euro-Americans). This provides the first incisive evidence that cultural schemas influence the linguistic categories used to describe and remember social targets. Implications for research on biculturals, culture-related schemas, and linguistic practices are discussed.

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Cultural groups differ in their prevalent ways of talking about other people. Speakers from Western countries have a penchant for describing others in terms of abstract traits (Rhee, Uleman, Lee, & Roman, 1995; Shweder & Bourne, 1984), whereas speakers from East Asian countries tend to describe others in terms of concrete behaviors (Kashima, Kashima, Kim, & Gelfand, 2006; Maass, Karasawa, Politi, & Suga, 2006). Memory studies suggest that these differences are not merely matters of surface diction but extend to the ways that social information is mentally encoded or represented. Westerners make more memory errors reflecting spontaneous inference of abstract traits given concrete behavioral information (e.g., Uleman, 1987; Uleman, Hon, Roman, & Moskowitz, 1996), whereas East Asians make more memory errors reflecting inference of concrete behaviors given abstract traits (Maass, Karasawa, et al., 2006).

Researchers have interpreted these country differences as effects of culture-related social schemas, conceptions of what people are like or how to understand them (e.g., Kashima et al., 2006; Maass, Karasawa, et al., 2006). Yet these studies have relied on cross-language comparisons, so they do not address alternative explanations for the country differences based on linguistic features (e.g., grammatical rules, the lexicon's proportions of abstract versus concrete words, norms of conversation), distinct from conceptual aspects of culture. If language could be held constant while still

observing culture-related differences in person description and inference, the role of cultural schemas would be clarified.

A recent approach to isolating effects of cultural schemas is cultural priming with bicultural participants (Hong, Chiu, & Kung, 1997; Hong, Morris, Chiu, & Benet-Martínez, 2000). The present research uses this procedure with Asian-Americans to investigate the role of cultural schemas in social description biases. (For brevity, our use of "Asian" in this article refers to *East Asian*.) Specifically, we test whether American versus Asian cultural primes induce biases in social description and memory congruent with past cross-national findings (Kashima et al., 2006; Maass, Karasawa, et al., 2006). We also probe more detailed proposals about the cultural mechanisms underlying person description and memory biases.

Distinguishing cultural from linguistic effects

Cross-national studies of person description find that Westerners tend to use adjectives that summarize behavior in terms of internal traits (e.g., "Lee is cooperative") (Miller, 1984; Shweder & Bourne, 1984), whereas East Asians tend to use verbs that depict behavior in specific contexts (e.g., "Lee cooperated with Sam") (Maass, Karasawa, et al., 2006). Studies have observed these differences between Italians and Japanese (Maass, Karasawa, et al., 2006) and between Australians and Koreans (Kashima et al., 2006), suggesting that the differences are not specific to particular languages and could reflect schemas prevalent in Western versus East Asian cultures (e.g., individualistic versus collectivistic social conceptions; Morris, Menon, & Ames, 2001).

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However, empirical support for the role of cultural schemas remains largely indirect. Past studies relied on quasi-experimental designs, so factors other than cultural schemas that vary across countries are possible alternative explanations. A chief concern is that past studies compared Western and East Asian groups in their respective native languages (e.g., Italians in Italian; Koreans in Korean). These languages have different structural features. One linguistic explanation could be that the frequency of time-stable, abstract terms (e.g., nouns) in Western languages accounts for the trait bias in Western speakers. In Italian and English, there is no subject drop (Bornstein et al., 2005) whereas in Korean (Kim, 1990) and Japanese (Ogura, Dale, Yamashita, Murase, & Mahieu, 2006), noun phrases are often omitted. For example, “Do you like it?” in English is expressed in Korean as “좋아 합니까?” or “like do?” where the pronouns “you” and “it” are omitted. Noun dominance in a language could elicit tendencies to use abstract terms (e.g., traits) more generally.

A second linguistic explanation concerns the structure-induced salience of abstract versus concrete terms in a language. Words in the final position of a sentence tend to recruit more attention in language learning. Research has shown, for example, that words presented in an utterance-final position are more likely to be remembered and reproduced than those in earlier positions, consistent with a recency effect (Brown & Fraser, 1963; Siegel & Allik, 1973). In Western languages, nouns tend to appear in the sentence-final position more than verbs (Camaioni & Longobardi, 2001; Caselli et al., 1995 for Italian; Tardif, Shatz, & Naigles, 1997 for English), whereas in East Asian languages, verbs appear in the sentence-final position more than nouns (Au, Dapretto, & Song, 1994 for Korean; Ogura et al., 2006 for Japanese). For example, English has a Subject–Verb–Object language structure (“Sue goes to school”), whereas Japanese and Korean languages prefer a Subject–Object–Verb structure (the sentence “Sue goes to school” can be translated in Korean as “수는 학교에 갑니다” or “Sue school goes”). The greater salience of verbs in East Asian versus Western languages as a function of their position in sentences could engender the verb bias in social description (Maass, Karasawa, et al., 2006).

A third linguistic possibility is that the cross-national difference is linked to pragmatic aspects of social interaction. Studies have found that Italian and English-speaking mothers elicit and use nouns more frequently than verbs when playing with their children (e.g., Choi, 1998; Tardif et al., 1997), whereas Korean (Choi & Gopnik, 1995) and Japanese-speaking mothers (Ogura et al., 2006) elicit and use verbs more often than nouns. Child-directed speech also generalizes to adult-directed speech in use of nouns (e.g., Verlinden & Gillis, 1988). Others' utterances as object versus activity-centered could shape and reinforce an individuals' expressive vocabularies, resulting in less behavior-based descriptions in Western than in East Asian languages. Hence, experiential factors such as implicit teaching by others or linguistic practices could drive the past cross-national difference, as opposed to cultural schemas.

Aside from language, countries also differ in educational norms which could shape responses to the types of tasks used in person description and inference studies. Western versus Asian educational systems could differentially reinforce the use of abstract adjectives or concrete verbs. Compared to East Asia, the classroom pedagogy and academic testing in Western countries place more emphasis on creative abstractions rather than acquiring concrete facts (e.g., Stevenson & Stigler, 1992). Educational norms about exploratory thinking could influence the use of more conceptually abstract language in social description studies. When data on Westerners are collected at Western universities and data on Asians are collected at Asian universities, it may be the norms and expectations associated with these educational institutions that shape the different responses, rather than social schemas.

In sum, past cross-national differences in social description and inference (e.g., Kashima et al., 2006; Maass, Karasawa, et al., 2006)

could be attributable to several linguistic differences (frequency, saliency, or pragmatics), to educational experiences, or to some combination of these factors. This leaves ample reason to doubt whether culture-related social schemas account for the observed country differences.

In the present research, we aim to disentangle cultural schemas and language by studying bicultural individuals with language held constant. Our central goal is to investigate whether level of abstraction in description and recall of social information is influenced by cultural mindsets and not simply the product of linguistic-structural or educational factors. We use the cultural priming procedure to isolate the effects of cultural schemas. Empirical evidence suggests that biculturals have two sets of cultural schemas and shift between them in response to culture-related cues (Hong et al., 1997; Hong et al., 2000). These cues seemingly activate the relevant cultural mindset that channel inferences consistent with cultural tendencies, even with language held constant. For example, in a causal perception task requiring interpretation of an actor's behavior (in English), Asian-Americans attributed more to internal dispositions after exposure to iconic American-culture images, whereas they attributed more to the actor's social surroundings after exposure to iconic Asian-culture images (Hong et al., 2000). This bolsters the evidence that cultural schemas may underlie cross-national differences in explanations for others' behavior (Morris & Peng, 1994), as the internal validity of an experiment, in which participants are randomly assigned to cultural priming conditions, exceeds that of quasi-experimental country comparisons.

To test the cultural schema account for cross-national differences in social description and memory, we primed Asian-Americans with images of Asian or American culture before asking them to describe others in English. We examined whether participants show a bias toward more concrete, contextualized linguistic forms (e.g., verb phrases rather than adjectives or nouns) after Asian than after American priming. To the best of our knowledge, the present research is the first incisive test of cultural influences on person description and inference controlling for language of testing and other factors that differ in cross-national comparisons.¹

Linguistic Category Model

According to the Linguistic Category Model (LCM; Semin & Fiedler, 1988; 1991), the kinds of words used in a description reflect the underlying mental representation. Semin and Fiedler (1991) proposed that adjectives and nouns reflect abstract, context-general representations (e.g., “Amy is a workaholic,” “Brad is helpful”). In contrast, verb phrases reflect concrete representations of behavior contextualized with regard to an occasion or relationship (e.g., “Amy worked long hours,” “Brad helps his parents”). The LCM has been applied to many languages including those in Western and East Asian cultures (e.g., Kashima et al., 2006; Maass, Karasawa, et al., 2006).

Several studies using the LCM have found meaningful variation as a function of culture. For example, in autobiographical descriptions of emotional events, a Dutch group favored abstract terms (e.g., “I was envious”) which decontextualize the emotion from the object, whereas a Hindustani–Surinamese group relied on contextualized verbs (e.g., “I envied Martha”) which preserve the relationship to the target (Semin, Gorts, Nandram, & Semin-Goossens, 2002). Similarly, members of another Western individualistic group (Italians) favor abstract, decontextualized terms such as trait adjectives to describe others, whereas members of an Asian collectivistic group (Japanese) favor specific, contextual language such as behavior-descriptive verbs

¹ Participants were randomly assigned to the cultural priming conditions, so differences in linguistic and educational experiences are distributed evenly across conditions. Therefore, effects of cultural priming imply that linguistic-structural or educational factors are not necessary for a cross-national difference.

(Maass, Karasawa, et al., 2006). Studies of verbal explanations for others' behavior observe a similar pattern. Westerners reference an actor's internal traits, encoded by nouns and adjectives, whereas East Asians reference an actor's responses to social contexts, encoded by verb phrases (Morris & Peng, 1994).

The linguistic categories favored in social description appear linked to those used in memory. Maass, Karasawa, et al. (2006) studied two kinds of memory errors reflecting inferences made when processing social information. Consistent with Western research on spontaneous trait inference (Uleman, 1987), Westerners were found to misremember traits (given contextualized behavioral information) more than they misremember contextualized behaviors (given trait information). East Asians did not show this bias toward erroneous trait recall (Maass, Karasawa, et al., 2006, Study 4), and sometimes even showed a reverse bias toward erroneous recall of contextualized behaviors (Maass, Karasawa, et al., 2006, Study 3).

An issue on which recent studies provide mixed evidence is the scope or domain-generality of the cultural differences in description and memory. Past research with judgment tasks finds that whereas attribution to traits of individual targets is higher for Westerners than for East Asians, this pattern does not extend to group targets (Menon, Morris, Chiu, & Hong, 1999). However, with a social description task, Maass, Karasawa, et al. (2006) found that Westerners were more inclined than East Asians toward abstract, trait terms for both kinds of social targets, individuals and groups. This effect observed across social targets implies that the cultural schemas involved may be more general than conceptions of persons or of individual agency.

In another study with a memory recall task, Maass, Cadinu, Taroni, and Masserini (2006) found that the Western bias to misremember abstract, trait phrases (Uleman, 1987) did not extend to non-human targets such as the wind. This suggests that while the cultural difference in description and memory extends across types of social targets, it does not extend to *nonsocial* targets. Such evidence is consistent with a role of culture-related social schemas, rather than a domain-general mechanism.

At the same time, other evidence suggests that the cultural difference lies in domain-general cognitive styles. Western culture fosters an analytic cognitive style of separating the world into discrete objects whereas East Asian culture fosters a holistic style of emphasizing interconnections (Nisbett, Peng, Choi, & Norenzayan, 2001). Drawing on this notion, Kashima et al. (2006) proposed that Westerners encode stimuli through objectifying—"extracting the focal point of construal (figure) from its context (background)" (p. 389). Kashima et al. (2006) developed a linguistic measure of objectifying construal and found suggestive evidence that it drives country differences in the linguistic categories used to describe others. Kashima et al. (2006) conclude that the penchant of Westerners (vs. East Asians) for more abstract linguistic categories is merely a byproduct of their tendency toward domain-general objectifying construal.

The present research, which measured social description and memory in separate tasks, allowed a stricter test of this proposal. Objectifying construal can be assessed in responses to the social description task and then examined in relation to performance on the (subsequent) memory recall task. If Asian cultural primes predominantly have their effects through reducing objectifying construal, objectifying construal (tapped by the description task) should mediate priming effects on the memory task.

In sum, while the primary purpose of the present study is to establish a causal role of cultural schemas in social description and memory biases (Kashima et al., 2006; Maass, Karasawa, et al., 2006), a secondary aim is to explore the scope of the phenomenon and the nature of schemas underlying it. To do this, we examine whether the effects of cultural primes are limited to the domain of individual behavior or they extend to other kinds of social targets. We also explore whether priming effects on the memory task is mediated by objectifying construal.

The present research

We believe that cultural schemas give rise to East-West differences in social description and memory (Kashima et al., 2006; Maass, Karasawa, et al., 2006). To isolate cultural schemas from other country-related factors that affect linguistic category preferences, we conducted an experiment in English in the U.S., varying whether Asian-American students were primed with American or Asian culture before being asked to describe social targets. We measured the degree to which participants relied on abstract versus concrete linguistic categories. We predicted that cultural primes would shift participants' linguistic category biases in ways that parallel past cross-national findings. Specifically, in a social description task, we expected that participants primed with American versus Asian culture would use more abstract terms (adjectives, nouns, rather than verbs) and fewer contextual qualifications (e.g., references to place). In a memory task, we asked participants to recall sentences about a target person presented earlier in the session who was described in terms of abstract traits and contextualized behaviors. We expected that American-primed participants would show more memory errors reflecting spontaneous trait-from-behavior inferences (adjective-from-verb errors) than behavior-from-trait inferences (verb-from-adjective errors). This is based on prior work showing that perceivers from individualistic Western cultures spontaneously make dispositional inferences (Duff & Newman, 1997; Uleman, 1987). Conversely, in collectivistic or Asian cultures, the bias toward trait inferences is reduced (Maass, Karasawa, et al., 2006; Zarate, Uleman, & Voils, 2001). Hence, our prediction is that the trait inference bias would be reduced after Asian compared to American priming.

We expect that this predicted effect arises from Asian priming pushing Asian-American participants away from their default social schemas (presumably American), we compared our two experimental groups to separate groups of Asian-Americans and Euro-Americans who were not culturally primed in order to confirm this.

In addition, we examined the effects of cultural primes on domain-general objectifying construal (Holtgraves & Kashima, 2008; Kashima et al., 2006). We tested whether objectifying construal varies as a function of cultural priming and whether it drives priming effects on tendencies to infer traits. In Kashima et al.'s (2006) study, responses to a single task (e.g., traits in the Ten Statements Test) were coded to analyze both objectifying construal and linguistic category preferences. Given that the two codings both tap the use of trait adjectives, the high correlation between the two could reflect an identity relationship rather than a causal relationship. Our design allows a stronger test of the causal role of objectifying construal through assessing it in the description task and exploring its relationship to trait bias in the separate memory task.

Method

Participants

Priming experiment

Forty-six Asian-Americans (25 first-generation, 21 second-generation, 14 men; mean age = 22.89, $SD = 4.24$) at Columbia University participated in exchange for \$7. Participants were recruited through campus flyers soliciting "East Asian-American Biculturals". Participants' ethnicities comprised Chinese ($n = 35$), Korean ($n = 7$), and Japanese ($n = 4$). On average, participants had lived 15.76 ($SD = 8.11$) years in the U.S. Identification with American and East Asian culture, rated on a scale of 1 (*very weak*) to 7 (*very strong*) was 5.04 ($SD = 1.38$) and 5.50 ($SD = 1.21$), respectively. Proficiency in English and an East Asian language, assessed on a scale of 1 (*very poor*) to 7 (*very fluent*) was 6.70 ($SD = .76$) and 5.09 ($SD = 1.64$), respectively. No immigrant-generation differences emerged on the dependent variables, so we collapsed across immigrant-generation in the

analysis. Ethnicity had no effects in the analysis below so it was not considered further.

Comparison groups

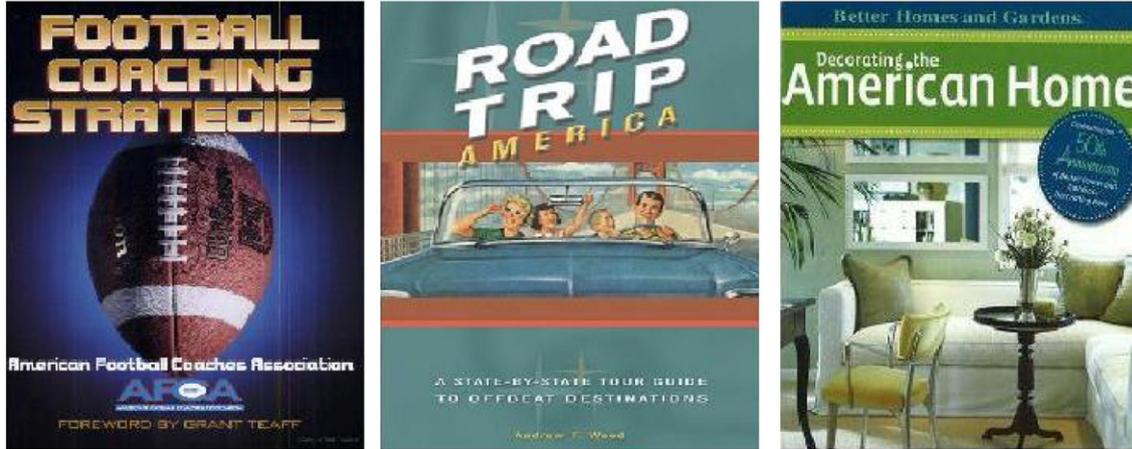
Participants were recruited subsequently and exposed to culturally neutral primes to provide points of comparison. Participants were 23 Asian-Americans (who did not participate in the priming experiment) and 21 Euro-Americans at Columbia University. The Asian-American group did not differ from the priming experiment groups on any of the demographic measures. We recruited Euro-Americans who were born in the U.S. or had parents or grandparents

who were born in the U.S.; no participants had lived in an Asian country. No significant differences emerged between the Asian-American and Euro-American participants on age, years in the U.S., American identification, or English proficiency.

Materials and procedures

Participants were run in small groups in a classroom and completed the “Social Perception Study” individually on paper. The cultural manipulation (for the priming experiment groups) was embedded in a book evaluation task. Participants were randomly

(A)



(B)



(C)

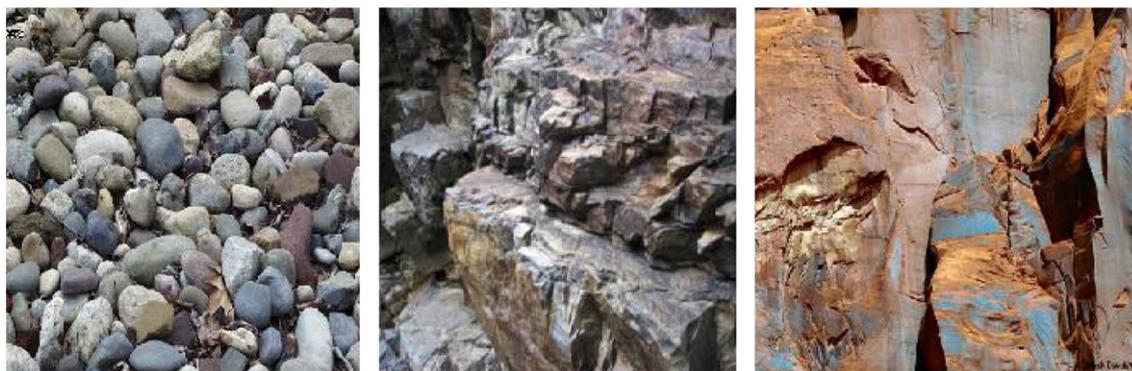


Fig. 1. (A) Examples of American cultural primes. (B) Examples of East Asian cultural primes. (C) Examples of pictures in the noncultural priming condition.

assigned to view six book covers from either American ($n = 23$) or East Asian culture ($n = 23$) (see Fig. 1A and B for examples). Participants listed two thoughts evoked by each image and two topics they thought the book would describe. Comparison group participants viewed four pictures of rocks with no cultural connotations (see Fig. 1C for examples), and wrote down two thoughts for each.

Next, participants were asked to describe an individual and a group. The order was counterbalanced. We prompted participants to describe an individual and a group of moderate (vs. high) familiarity, as we assume participants would rely more on social schemas rather than distinct episodic memories to describe less familiar targets. This would provide clearer evidence of how cultural schemas shape linguistic category biases.

For the individual target, participants were asked to think of a person who they knew but not very well. Examples provided were a neighbor, roommate, fellow student, or family friend. Then participants were asked to write 8 statements that were descriptive of this person in their own opinion. For the group target, participants were asked to think of a group who they knew but not very well. Examples provided were a family (other than their own), sports team, work organization, or student association. Participants were asked to write the name of the group, followed by 8 statements that were descriptive of this group in their own opinion.

Next, participants received the memory task. We adapted the experimental approach used by Maass, Karasawa, et al. (2006, Study 4). Participants were asked to form an impression of an individual called P. W. from a list of 22 pieces of information. Participants were told that the list was compiled from descriptions made by P. W.'s relatives, friends, and classmates, who were asked to provide both positive and negative information about P.W. Participants were instructed that they should not write their impressions down. They were given 5 min to read the list.

The word list describing P. W. contained 16 descriptions (half in adjective form and half in verb form; half were positive and half were negative in valence), which were presented in minimal sentences. In addition, 6 fillers were included, where 2 were specifically inserted at the beginning and 2 at the end of the list to reduce primacy and recency effects (e.g., they referred to height, hair length, and number of siblings). There were two different orders of the list, and each order had a complementary version that counterbalanced the adjectives and verbs (e.g., if "P.W. is persuasive" appeared in one version, "P.W. persuades others" appeared in the other version). The adjectives and verbs were similar semantically and phonetically, and were presented in minimal sentence form (see Maass, Cadinu, et al., 2006; Maass, Karasawa, et al., 2006); more examples are provided in the coding section. In total, four list versions were randomly assigned to participants.

After 5 min, participants engaged in a distraction task for around 10 min, or about twice the length of time they had spent reading the list. The filler task involved a decision-making task that was unrelated to the use of adjectives or verbs. Afterwards, participants received a surprise recall task. They were asked to write down all the pieces of information about P.W. that they could remember. Participants were given as much time as they needed. Last, they filled out a demographic survey.

Coding

Description task

To analyze the relative abstractness or concreteness of the target descriptions, we used the LCM. The LCM distinguishes four levels of abstraction, (a) descriptive action verbs (e.g., "A hits B"), (b) interpretive action verbs (e.g., "A hurts B"), (c) state verbs (e.g., "A hates B"), and (d) adjectives (e.g., "A is aggressive"). These categories range from descriptions of a specific observable event with high

contextual dependence to descriptions featuring only the subject and which generalize across contexts. Descriptions were coded by the second author and a research assistant familiar with the LCM. Noun phrases were also coded (e.g., "partier"). Both coders were blind to the experimental conditions. Disagreements were resolved through discussion. The inter-coder reliability across the individual and group target was 94%.

Two scores were computed to measure objectifying construal: objectification and contextualization. The first score drew on LCM codings. We computed the proportions of noun phrases (NP), adjectives (ADJ), state verbs (SV), and interpretive and descriptive action verbs (IAV, DAV) for each participant's individual and group descriptions. Using these proportions, we derived an objectification score for each target by the formula, $(NP + ADJ) - (SV + IAV + DAV)$ following Kashima et al. (2006), with higher scores reflecting an object-centered construal (implied by adjectives and nouns) as opposed to a process-centered construal (implied by verbs).

The contextualization score drew on coding for the presence ("1") or absence ("0") of contextual qualifiers per statement (8 per target); any reference to place, other people, time, event, or domain was coded as "1" (e.g., "lives near my house," "plays baseball with his sons," "shy at first," "holds some parties," "not ambitious in career"). The inter-coder reliability across targets was 86%. We computed the proportion of contextual qualifiers for each participant's individual and group descriptions, forming separate contextualization scores. The contextualization score was negatively related to the objectification score for both targets (individual target: $r(46) = -.57, p < .001$; group target: $r(46) = -.50, p < .001$), consistent with past research (Kashima et al., 2006).

Memory task

We coded for the number of errors, which was classified into two types: the incorrect recall of trait adjectives that were implied by behavior-descriptive verbs (*adjective-from-verb errors*; e.g., recalling "P. W. is helpful" or "P. W. is demanding," having read "P. W. helps others" or "P. W. demands a lot," respectively), and the incorrect recall of behaviors that were implied by traits (*verb-from-adjective errors*; e.g., recalling "P. W. works hard" or "P. W. annoys others," having read "P. W. is hardworking" or "P. W. is annoying," respectively). In addition, we coded for the number of hits, defined as the correct recall for behavior-descriptive verbs and for trait adjectives; synonyms were included using a thesaurus (see Maass, Cadinu, et al., 2006). The maximum number of errors or hits was 16.

Results

Overview

To investigate the role of cultural schemas, we first compared the Asian and American priming groups on the description task and the memory task. We then explored the association between responses to these tasks and objectifying construal. Finally, we compared responses of the experimental groups with separate samples of Asian-Americans and Euro-Americans who were not exposed to cultural primes. The comparison groups shed light on the question of whether Asian-Americans' default schemas are closer to American or Asian culture.

Description task

If cultural schemas are a causal mechanism for the past cross-national differences (Kashima et al., 2006; Maass, Karasawa, et al., 2006), Asian-American participants with American priming should describe others using more abstract and decontextualized language than those with Asian priming. We tested this hypothesis by conducting separate ANOVAs on the linguistic categories and the

objectification and contextualization scores. Participant sex and language proficiency (English or East Asian) did not affect the results so they will not be discussed further.

We performed a cultural priming (Asian vs. American) \times description order (individual first vs. group first) \times target (individual vs. group; within-subjects) mixed-factors ANOVA on the proportions of verbs (DAV, IAV, SV), adjectives (ADJ), and noun phrases (NP) separately; all proportions were significantly greater than zero. A main effect of description order only emerged for ADJ, $F(1, 43) = 4.47$, $p < .05$, $\eta^2 = .09$. A main effect of cultural priming was found for all categories (except for SV), suggesting that accessible cultural schemas determine the categories used to describe targets. (The statistical values comparing the priming groups were as follows: for DAV: $F(1, 43) = 5.23$, $p < .05$, $\eta^2 = .11$; for IAV: $F(1, 43) = 8.43$, $p < .01$, $\eta^2 = .16$; for SV: $F(1, 43) = 1.77$, $p = .19$, $\eta^2 = .04$; for ADJ: $F(1, 43) = 4.55$, $p < .05$, $\eta^2 = .10$; for NP: $F(1, 43) = 3.47$, $p = .07$, $\eta^2 = .08$.) As predicted, whereas participants with Asian (vs. American) priming used more concrete terms or verbs, participants with American priming used more abstract terms, such as adjectives and noun phrases. Table 1 displays the means. Moreover, these findings generalized across individual versus group targets, consistent with past cross-national differences in social description (Kashima et al., 2006; Maass, Karasawa, et al., 2006).²

Next, we submitted the objectification score to the above ANOVA. As predicted, the main effect of cultural priming was significant, $F(1, 43) = 10.16$, $p < .01$, $\eta^2 = .19$, showing that targets were described in a less object-centered way after Asian versus American priming; see Table 1 for the means. No other effects were significant.

Last, we submitted the contextualization score to the above ANOVA. The main effect of cultural priming was significant, $F(1, 43) = 8.89$, $p < .01$, $\eta^2 = .17$. As expected, participants primed with Asian culture contextualized their statements more than those primed with American culture; see Table 1 for the means. There was also a main effect of target, $F(1, 43) = 5.45$, $p < .05$, $\eta^2 = .11$, suggesting that group descriptions ($M = .33$, $SE = .04$) were more contextualized than person descriptions ($M = .23$, $SE = .03$). Overall, results imply that Asian priming reduces objectifying construal. They also suggest that individual targets invite objectifying construal more than group targets.

Methodological check

Before we conclude that cultural schemas drive the linguistic category biases, it is wise to check an alternative explanation for the results. Priming participants with Asian or American culture may shift the object of construal (e.g., focusing on Asian or Caucasian targets, respectively), rather than shape their construal of the target per se. To ensure that our findings did not depend on the culture of the target, we focused on the group target condition where participants provided the name of the group. If priming affected the culture of the target, participants should have a greater tendency to describe Asian groups after Asian versus American priming. To this end, we coded group names with Asian references as "1" (e.g., Chinese Students Club, Asia Student Association) and "0" otherwise (e.g., church, the Simpsons).

Our data do not support this alternative interpretation. Asian priming did not lead to a greater tendency to list Asian-related targets, $\chi^2(1, N = 46) = .97$, $p = .33$ (Asian priming: Asian target, $n = 8$, other-culture target, $n = 15$; American priming: Asian target, $n = 5$, other-culture target, $n = 18$). Thus, there is no evidence that our results reflect a difference in targets described rather than a difference in target description. Culture of target as a covariate did not modify any of the results above.

² The only variable on which a cultural priming \times target interaction emerged was for DAV, $F(1, 43) = 4.67$, $p < .05$, $\eta^2 = .10$, suggesting that the individual was described more concretely than the group in the Asian condition and the reverse in the American condition.

Table 1

Linguistic category proportions and objectification and contextualization scores as a function of group and priming.

| Group | Asian-American | | Asian-American | Euro-American |
|-----------|------------------------|-------------------------|-------------------------|-------------------------|
| | Asian | American | Noncultural | Noncultural |
| DAV | .05 ^a (.01) | .02 ^b (.01) | .03 ^{ab} (.01) | .03 ^{ab} (.01) |
| IAV | .11 ^a (.02) | .05 ^b (.02) | .07 ^b (.01) | .05 ^b (.02) |
| SV | .07 ^a (.01) | .05 ^{ab} (.01) | .04 ^b (.01) | .02 ^b (.01) |
| ADJ | .73 ^a (.03) | .81 ^{ab} (.03) | .77 ^{ab} (.03) | .82 ^b (.03) |
| NP | .04 ^a (.02) | .07 ^{ab} (.02) | .10 ^b (.02) | .08 ^{ab} (.02) |
| OBJ score | .54 ^a (.05) | .76 ^b (.05) | .73 ^b (.05) | .80 ^b (.05) |
| CTX score | .37 ^a (.04) | .19 ^b (.04) | .19 ^b (.04) | .12 ^b (.04) |

Note. Cells display the means, standard errors are in parentheses. In each row, different letters indicate significant differences between the groups at least at .05. Asian prime ($n = 23$), American prime ($n = 23$), Noncultural prime ($n = 23$ for the Asian-American sample, $n = 21$ for the Euro-American sample). Results were very similar when comparing the cultural priming groups only. Linguistic category variables (V = verb, ADJ = adjective, NP = noun phrase) are proportions. Objectifying construal variables (OBJ = objectification, CTX = contextual qualification) are computed scores.

* $p < .05$.

** $p < .01$.

Memory task

Differences in linguistic category use were also assessed in a memory task. We predicted that American priming would engender a bias toward misremembering traits (adjective-from-verb errors) relative to misremembering behaviors (verb-from-adjective errors), whereas this trait bias would be attenuated after Asian priming. We also examined the effects of cultural priming on correct recall. Researchers (Maass, Cadinu, et al., 2006; Maass, Karasawa, et al., 2006) have proposed that Westerners have a better memory for traits than behaviors and the reverse for East Asians, but have found only partial support for this. Specifically, in Maass, Karasawa, et al. (2006) Study 4, Italians showed a better memory for behaviors than traits whereas Japanese showed no difference in memory between the two. We explored whether American priming would engender a better memory for traits (adjectives) than for behavioral information (verbs), whereas this trait bias would be reduced with Asian priming.

Errors

A preliminary analysis showed no effects of participant sex, list version, or word valence, so these variables were not considered further. We performed a cultural priming (Asian vs. American) \times error type (adjective-from verb vs. verb-from-adjective; within-subjects) mixed-factors ANOVA. Results revealed a main effect of error type, $F(1, 44) = 11.02$, $p < .01$, $\eta^2 = .20$, which was qualified by an interaction with cultural priming, $F(1, 44) = 9.19$, $p < .01$, $\eta^2 = .17$. Consistent with expectations, American-primed participants showed more adjective-from-verb errors ($M = 1.13$, $SE = .17$) than verb-from-adjective errors ($M = .17$, $SE = .14$), $F(1, 44) = 20.17$, $p < .001$, $\eta^2 = .31$, whereas Asian-primed participants showed no difference (adjective-from-verb: $M = .52$, $SE = .17$, verb-from-adjective: $M = .48$, $SE = .14$), $F(1, 44) = .04$, $p = .84$, $\eta^2 < .01$. These findings mirror the pattern of errors observed in cross-national studies (Maass, Karasawa, et al., 2006), and support the notion that the bias in social cognition toward personal traits, pervasive in individualist Western cultures, is markedly reduced in collectivist Asian cultures (e.g., Smith & Bond, 1994).

Could memory errors reflect variations in participants' language abilities and effort levels? We conducted a follow-up ANCOVA on error type that controlled for English and Asian language proficiency and for the total items listed as a measure of effort level. This analysis yielded nearly identical results. The interaction of cultural priming and error type was significant, $F(1, 41) = 9.97$, $p < .01$, $\eta^2 = .20$; no other effects were significant. Hence, memory errors were not attributable to language proficiencies or effort as opposed to cultural schemas.

Hits

We conducted a cultural priming (Asian vs. American) × hit type (verb vs. adjective; within-subjects) mixed-factors ANOVA. Results revealed no main or interaction effects of cultural priming, whereas there was an effect of hit type, $F(1, 44) = 12.93, p < .01, \eta^2 = .23$. Participants showed a better memory for traits ($M = 3.52, SE = .26$) than for behaviors ($M = 2.37, SE = .21$). Controlling for language proficiencies and for the total items listed, reflecting effort reduced the effect of hit type to non-significance, $F(1, 41) = .45, p = .51, \eta^2 = .01$.

To investigate hits in relation to errors, we conducted a signal detection analysis. Specifically, for each participant we computed their performance, d , by the formula $z(\text{hit rate}) - z(\text{false alarm rate})$, where hit rate was the sum of verbs, adjectives, and fillers correctly recalled divided by 22 pieces of information, and the false alarm rate was the sum of relevant errors (recalling words that shared the same word stem as the information they had read, e.g., recalling “P. W. is persuasive” when having read “P.W. persuades others”) and irrelevant errors (reporting information not in the task, e.g., “P.W. is overweight”), divided by 22 pieces of information. We submitted memory performance (d) to a cultural prime ANOVA. Results showed no effects of cultural priming, $F(1, 44) = .16, p = .69, \eta^2 < .01$, suggesting that participants regardless of priming condition, were equally attentive to the task. Including d as a covariate in the above hypothesis tests for memory errors and hits did not change the main findings. In sum, results show an effect of cultural priming on biases in erroneous recall yet no overall effect on memory performance.

Associations between description and memory biases

To assess how closely linguistic category preferences in description mirror those in memory, we computed the correlations between codings of the description task (for individual targets) and variables from the memory task. As Table 2 displays, objectification was marginally correlated with adjective-from-verb errors (i.e., traces of abstracting trait inferences), whereas contextualization was correlated with verb-from-adjective errors (i.e., traces of contextualizing behavior inferences). These weak correlations suggest that an objectifying construal tendency is unlikely to mediate priming effects on the memory measures. To test this, we conducted a 2 (cultural priming: Asian vs. American) × error type (adjective-from-verb vs. verb-from-adjective; within-subjects) mixed-factors ANCOVA, including participants' objectification and contextualization indices as covariates. (Entering the proportion of adjectives and noun phrases as covariates yielded similar results.) A main effect of level

of objectification, $F(1, 42) = 9.31, p < .01, \eta^2 = .18$, and of contextualization, $F(1, 42) = 5.76, p = .05, \eta^2 = .12$, emerged. Importantly, the hypothesized cultural priming × error type interaction remained significant, $F(1, 42) = 7.12, p = .01, \eta^2 = .15$ (and slightly changed from its prior level of $F(1, 44) = 9.19, p < .01, \eta^2 = .17$). This suggests that cultural influences on objectifying construal do not give rise to cultural influences on inferential biases in memory. A parallel analysis with the dependent variable as the sum of adjectives or verbs recalled (within-subjects) showed no effects of the description-task-related covariates. In sum, results do not support the claim that cultural differences in trait inference are merely a byproduct of domain-general objectifying construal (Kashima et al., 2006).

We also considered whether the effects of cultural priming on description biases run through the effects on inferences tapped by memory errors—the opposite mediational possibility. We submitted all the description variables (for individual targets) to a cultural priming MANCOVA, controlling for type of memory error (adjective-from-verb, verb-from-adjective). The main effect of cultural priming remained significant for each person description variable (except for SV) at or below the .05 level. Hence, cultural biases in social inference do not explain cultural biases in social description.

In sum, results suggest that cultural schemas influence the linguistic categories used to describe and cognize others, yet neither of these effects mediates the other.

Comparisons groups without cultural priming

To shed further light on the cultural priming effects, we included the comparison samples—Asian-Americans and Euro-Americans who were exposed to culturally neutral primes—in the analyses. We expected that Western, rather than Asian cultural schemas, would be the default for Asian-Americans in a Western setting (e.g., American university) and of course, for Euro-Americans. Hence, the comparison groups should resemble the American prime condition.

The inter-coder reliability in coding the individual and group target descriptions exceeded .90 for both comparison groups. We conducted a cultural group (Asian priming vs. American priming vs. Asian-American comparison vs. Euro-American comparison) × target (individual vs. group) MANOVA on the linguistic categories (proportions of verbs, adjectives, nouns), level of objectification and contextualization. No consistent target effects emerged. Controlling for participant sex, description order, or English proficiency did not affect the results. As Table 1 displays, both comparison groups as expected, showed social description biases similar to Asian-American participants with American priming, not those with Asian priming.

For memory errors, we conducted a cultural group (Asian priming vs. American priming vs. Asian-American comparison vs. Euro-American comparison) × error type (adjective-from-verb vs. verb-from-adjective; within-subjects) mixed-factors ANOVA. Controlling for participant sex, list version, word valence, total items listed or English proficiency did not affect the results. The interaction of cultural group and error type was significant, $F(3, 86) = 5.71, p = .001, \eta^2 = .17$. As shown in Fig. 2, all participants except for those in the Asian prime condition committed significantly more adjective-from-verb errors than verb-from-adjective errors (simple effects for Asian prime condition: $F(1, 86) = .04, p = .84, \eta^2 < .01$; simple effects for other conditions: $F(1, 86) > 10.28, p < .01, \eta^2 > .10$). This is consistent with evidence that Western participants exhibit a bias toward inferring traits from behavior information more than the inverse (e.g., Maass, Cadinu, et al., 2006; Maass, Colombo, Colombo, & Sherman, 2001), whereas Asian participants do not (Maass, Karasawa, et al., 2006). A similar ANOVA as above predicting hits did not show an interaction with cultural group, $F(3, 86) = .36, p = .79, \eta^2 = .01$, suggesting that culturally specific memory biases emerge in erroneous rather than correct recall.

Table 2
Means and correlations between dependent measures in the person description task and the separate person memory task.

| Description task | M | Memory task | | | |
|------------------|-----------|-------------------|------------|-------------|-------------|
| | | Errors | | Hits | |
| | | ADJ-from-V | V-from-ADJ | V | ADJ |
| V | .17 (.17) | .83 (.85) | .32 (.67) | 2.37 (1.44) | 3.52 (1.76) |
| ADJ | .77 (.18) | -.29 [†] | -.16 | -.15 | -.05 |
| NP | .06 (.08) | .26 [†] | .03 | .14 | .01 |
| OBJ score | .66 (.35) | .04 | .30* | -.01 | .08 |
| CTX score | .23 (.25) | .29 [†] | .16 | .15 | .05 |
| | | -.13 | .29* | -.08 | -.07 |

Note. $N = 46$ Asian-Americans with cultural priming. Linguistic category variables (V = verb, ADJ = adjective, NP = noun phrase) are proportions. Objectifying construal variables (OBJ = objectification, CTX = contextual qualification) are computed scores. Memory task variables are frequencies. Standard errors are in parentheses.

[†] $p < .10$.

* $p < .05$.

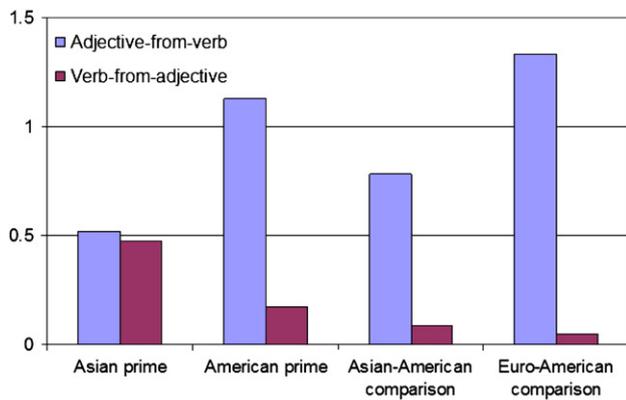


Fig. 2. Mean number of errors as a function of group and priming. Note. Asian prime ($n = 23$), American prime ($n = 23$), Comparison = noncultural prime ($n = 23$ for the Asian-American sample, $n = 21$ for the Euro-American sample).

General discussion

Results provide the first incisive evidence linking cultural schemas to the linguistic categories used to describe and remember others. In a social description task, Asian-Americans primed with American culture described individual and group targets using more abstract linguistic categories (e.g., adjectives), whereas participants primed with Asian culture described the targets using more concrete linguistic categories (e.g., verbs). Comparison groups of Asian-American and Euro-American participants who were exposed to culturally neutral primes exhibited description biases like participants in the American prime condition, which suggests that Asian-Americans in the U.S. default to American cultural schemas.

Priming also affected social memory errors assumed to reflect spontaneous inferences. We observed more errors reflecting trait inferences (i.e., more adjective-from-verb errors than verb-from-adjective errors) in the American-primed group compared to the Asian-primed group. Differences in task effort, memory performance, language proficiencies, and participant sex did not account for the results. Memory errors of the comparison groups who were not culturally primed resembled the American prime condition, again suggesting that the cultural schemas that Asian-Americans default to are American schemas (at least when in psychology experiments at Western universities). Hence, the effects of our manipulation seem to arise from activating Asian cultural schemas in the Asian prime condition, which shifted participants away from their defaults.

Results support the cultural schema account of previous cross-national differences in social description (Kashima et al., 2006; Maass, Karasawa, et al., 2006). Whereas past studies used country as a proxy for culture, it is possible that other factors such as language or experience in a country were the source of the observed adjective (verb) bias in Western (East Asian) countries. To review, for example, East Asian languages compared to Western languages tend to be verb biased in frequency and salience (e.g., Ogura et al., 2006) and this could explain country differences in linguistic category preferences. The greater emphasis on abstract exploratory thinking in Western versus East Asian educational contexts (Stevenson & Stigler, 1992) could also account for the country difference in adjective/verb bias. In the present study, the language was always English and participants were all students at a U.S. university, so these extra-cultural factors were held constant. Randomly assigning individuals to different cultural priming conditions allowed us to test that accessible cultural schemas give rise to different biases in person description and memory. This research is the first experimental evidence for cultural schema effects on linguistic category biases, going beyond past evidence from quasi-experimental cross-national studies, in which the variable of cultural schemas is confounded with other factors.

Our findings question the view that social inferences are a byproduct of domain-general construal (Kashima et al., 2006). Past research (Kashima et al., 2006) inferred this relationship through coding objectifying construal and trait inference from the same content-constrained textual samples (responses on the Ten Statements Test). We conducted a more conservative test of this relationship by examining whether cultural priming effects on objectifying construal, coded from the description task, account for the effects on the memory task. A lack of mediation by variables of the description task suggests that while cultural schemas influence both objectifying construal and trait inferences, they do not necessarily influence the latter through the former. Different kinds of culture-related schemas may play a role in each effect.

Besides demonstrating the effects of cultural schemas on linguistic category biases, our research suggests that cultural interpretive habits need not be yoked to language per se. Asian-Americans whose Asian (American) schemas were activated produced verb (adjective) dominant social descriptions, even when communicating in English. This is consistent with other evidence that immigrants favor distinctive linguistic forms for heritage-culture reasons even when using the mainstream language (see also Ji, Zhang, & Nisbett, 2004; Tsai, Simeonova, & Watanabe, 2004). Our results also converge with evidence that acculturation can lead individuals to exhibit the culture's normative characteristics (Hong et al., 2000). For Asian-Americans in the U.S., their default linguistic category biases were like those of Euro-Americans. We provide the first evidence of shifts in biculturals' linguistic category biases as a function of the cultural context.

Practical implications

Given the increased diversity of individuals in educational and work settings, this research has important practical implications for teachers, journalists, and managers who are bicultural. For example, Asian-American journalists may keep information more contextualized when reporting in Asian versus Western contexts, leading perceivers to form a more holistic picture of the event. Likewise, Asian-American managers in Western settings may appraise performance using adjective phrases ("Peter is forgetful") whereas in Asian settings they may rely more on verb phrases ("Peter forgot to do something"). Describing another's behavior in adjectival forms (e.g., traits) posits an enduring property and thereby conveys different expectations about future behavior (Semin & Fiedler, 1988, 1991). Hence, linguistic category biases in workplace communications and verbal reports could affect consequential decisions, such as who gets rewarded or promoted.

Issues for future research

Linguistic determinism

Although the present work shows that cultural differences in social description are not bound to a specific language, our results do not disconfirm that language may shape cultural schemas. Our view falls between strong claims of linguistic determinism (Hoffman, Lau, & Johnson, 1986; Whorf, 1956) and cognitive determinism (Brown & Fish, 1983a,b); linguistic practices and cultural schemas may go hand in hand. Over time, the tendencies to describe others abstractly with trait adjectives or contextually with verbs may invite dispositional or situational construals of targets, and these conceptions may develop into cognitive habits, shaping descriptions of others regardless of the language medium linguistic and cognitive habits may mutually perpetuate each other.

Individual versus group targets

The literature contains mixed findings on the issue of whether the Western bias toward trait inferences is specific to the processing of

individual targets (Menon et al., 1999) or whether it extends to group targets, as the current results suggest. Even in past studies that have made cross-national comparisons, the results are mixed. The finding that Westerners use fewer (mental) state verbs than East Asians in descriptions of both individual and group targets (Maass, Karasawa, et al., 2006) appears inconsistent with other findings that cultural differences in social description tasks are moderated by individual versus group actor. Kashima et al. (2005) found that Westerners attribute more mental states (e.g., want, think, fear) to individual versus group targets, and they also rate mental state verbs as differentially appropriate for individual versus group targets. In contrast, East Asians show no difference by target on these measures. A possible account for why cultural differences depend on the target for some tasks and not others is that different processing modes are elicited; judging whether mental state predicates fit a given target via rating tasks (Kashima et al., 2005) may engage deliberate processing, whereas open-ended description tasks may engage spontaneous processing. In spontaneous processing, habitual ways of describing persons may spill over into descriptions of groups. Given that describing individuals is the modal form of social description, the linguistic habits developed for talking about individuals may be extended to groups, whereas deliberate thinking about groups may engage different conceptions than deliberate thinking about individuals. That is, we may “personify” groups more in our spontaneous speech than our careful thinking. Future research could include a number of different linguistic tasks to explore the effects of cultural priming on spontaneous versus deliberate processing.

Asian-Americans' default schemas

Our results suggest that mainstream American settings evoke American schemas for Asian-American biculturals. This notion fits with past results (Bond & Cheung, 1983; Rhee et al., 1995) that Westernized Asians, whose cultural identities were not directly made salient, resembled Euro-Americans in the use of abstract self-descriptions. Yet, this characterization stands in tension with other studies documenting reliable East–West differences using Asian-Americans as a proxy for Asians in Asia (e.g., Chen, Chiu, & Chang, 2009). However, our data contain some signs that Asian-Americans sampled in Western universities are not identical to Euro-Americans. While their biases in description did not differ, further analysis revealed that in person memory, Asian-American comparison participants made fewer trait-from-behavior inferences (adjective-from-verb errors) than Euro-Americans ($p = .05$). Also, their trait inferences were in-between that of Asian-Americans in the cultural priming conditions (although non-significant) (see Fig. 2). That is, the memory biases of Asian-American comparison participants were more ‘Asian’ compared to those with American priming or to Euro-Americans. Assimilation often begins with overt behaviors; host culture speech patterns may be picked up before their memory patterns. This suggests a need for caution in using immigrant biculturals as a proxy for individuals residing in their heritage culture. When examining East–West differences using Asian-Americans, for some tasks it may be necessary to use cultural priming to draw out Asian biases.

Conclusion

The current study shows that cultural priming influences linguistic category biases in person description and memory. Asian-American students exhibited more contextualized and less trait-oriented language after Asian priming compared to American priming, and compared to groups with no cultural priming. Results suggest that cultural effects on person description and memory are only weakly associated and perhaps reflect slightly different mechanisms. Our findings provide support for the interpretation of East–West differ-

ences in linguistic category preferences in terms of culture-related schemas rather than aspects of Eastern versus Western languages.

Author notes

The authors contributed equally to this paper. The author order is reverse alphabetic.

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