Attention to Context during Evaluative Learning and Context-Dependent Automatic Evaluation: A Cross-Cultural Analysis

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Abstract

Previous research has shown that changes in automatic evaluations can be limited to the context

in which counterattitudinal information was acquired. This effect has been attributed to enhanced

attention to context cues during the encoding of expectancy-violating counterattitudinal information. Drawing on previous evidence for cultural differences in attention to context and tolerance for inconsistency, the present research examined cultural differences in responses to conflicting evaluative information and the resulting context-effects on automatic evaluation. Study 1 revealed that both Canadian and Singaporean participants showed enhanced attention to context during exposure to counterattitudinal information. In a reanalysis of studies with Singaporean participants, Study 2 replicated the pattern of contextualized changes of automatic evaluations previously obtained in Western participants. The results suggest that contextualized change of automatic evaluations might be a general phenomenon that replicates across cultures. Implications for East-West similarities in basic attentional processes and automatic evaluation are discussed.

Attention to Context during Evaluative Learning and Context-Dependent Automatic

Evaluation: A Cross-Cultural Analysis

Counter to earlier research suggesting that automatic evaluations are relatively difficult to change, an accumulating body of evidence suggests that automatic evaluations can change rapidly in response to counterattitudinal information (for a review, see Gawronski & Bodenhausen, 2006). To reconcile the conflicting findings, it has been argued that changes in automatic evaluations can be limited to the context in which the counterattitudinal information was learned (Brannon & Gawronski, in press; Gawronski, Rydell, Vervliet, & De Houwer, 2010; Gawronski, Ye, Rydell, & De Houwer, 2014; Rydell & Gawronski, 2009). In their representational theory, Gawronski et al. (2010) specified the processes by which context cues become integrated into the representation of conflicting evaluative information about an object, which allows these cues to moderate automatic evaluations upon future encounters with that object (for a review, see Gawronski & Cesario, 2013). Despite the large body of evidence supporting the theory (for a meta-analysis, see Gawronski, Hu, Rydell, Vervliet, & De Houwer, 2015), most studies were conducted with samples from Western cultures. Because research in cross-cultural psychology suggests possible East-West differences in the context-effects predicted by the representational theory (Ye & Gawronski, in press), it seems imperative to investigate the generality of these effects across cultures. By examining potential cultural differences in the hypothesized context-effects, the present research aims to deepen our understanding of cultural influences on (1) fundamental psychological processes involved in evaluative learning and (2) social impression formation in situations that involve conflicting information.

The Representational Theory

According to Gawronski et al.'s (2010) representational theory, attention to context during the learning of evaluative information determines whether context cues are integrated into

the representation of the newly acquired information. If attention to context during the learning of evaluative information is high, the newly acquired information is assumed to be stored in a contextualized representation. Yet, if attention to context during the learning of evaluative information is low, the newly acquired information should be stored in a context-free representation. The theory further assumes that attention to context is typically low during the learning of initial attitudinal information (Gilbert & Malone, 1995) and enhanced by exposure to expectancy-violating counterattitudinal information (Roese & Sherman, 2007). As a result, initial attitudinal information tends to be stored in context-free representations, whereas expectancy-violating counterattitudinal information is stored in contextualized representations. Together with the principle of feature-matching in memory activation (Smith, 1996), these assumptions imply that counterattitudinal information should influence automatic evaluations only in the context in which this information was learned. In contrast, initial attitudinal information should determine automatic evaluations in any other context, including the context in which the initial attitudinal information was learned and any other context in which the target objects had not been encountered before.

To describe the context-effects resulting from these processes, Gawronski et al. (2010) adapted the term *renewal effect* from animal learning research (see Bouton, 2004). *ABA renewal* refers to cases in which initial attitudinal information is learned in Context A, counterattitudinal information is subsequently learned in a different Context B, and the initial attitudinal information determines automatic evaluations in the initial Context A. Correspondingly, *ABC renewal* refers to cases in which initial attitudinal information is learned in Context A, counterattitudinal information is subsequently learned in a different Context B, and the initial attitudinal information determines automatic evaluations in a novel Context C. These patterns differ from automatic evaluations in ABB scenarios in which initial attitudinal information is

learned in Context A, counterattitudinal information is subsequently learned in a different

Context B, and the counterattitudinal information determines automatic evaluations in Context B.

Consistent with the predictions of their representational theory, several studies by Gawronski and

colleagues (Gawronski et al., 2010, 2014; Rydell & Gawronski, 2009) found reliable evidence for

ABA and ABC renewal effects on automatic evaluations of a target person when participants had

learned conflicting evaluative information about this person (i.e., statements about positive and

negative behaviors) in different contexts (i.e., the statements being presented against different

colored backgrounds).

A Cross-Cultural Analysis

Although Gawronski et al. (2010) treated the reviewed pattern of context-effects as the

default outcome, their theory also implies specific predictions for two alternative scenarios

involving different levels of attention to context during learning. First, if attention to context is

high during the learning of initial attitudinal information, attitudinal and counterattitudinal

information should be stored in two contextualized representations. In this case, ABC renewal

should be reduced, because encountering the target in a novel context should activate the two

contextualized representations to the same extent, producing automatic evaluations that reflect

the average of the two types of information. Yet, ABA renewal should be unaffected, because

encountering the target in the context of the initial attitudinal information should activate the

contextualized representation of that information. This prediction has been confirmed in a study

by Gawronski et al. (2010) in which attention to context during the learning of initial attitudinal

information was experimentally enhanced.

Second, if attention to context is low during the learning of counterattitudinal information,

attitudinal and counterattitudinal information should be integrated in a single context-free

representation. In this case, both ABA and ABC renewal should be reduced, because

encountering the target should activate this integrated, context-free representation regardless of the context. This prediction has been confirmed in a study by Gawronski et al. (2010) in which attention to context during the learning of counterattitudinal information was experimentally reduced.

Expanding on the two scenarios, Ye and Gawronski (in press) proposed that they represent two possible ways in which individuals from Eastern and Western cultures may differ in the learning of conflicting evaluative information, and thus in the tendency to show ABA and ABC renewal.[1] First, drawing on research showing that Easterners generally pay more attention to context than Westerners (e.g., Chua, Boland, & Nisbett, 2005; Masuda & Nisbett, 2001; Masuda, Russell, Chen, Hioki, & Caplan, 2014; Zhou, He, Yang, Lao, & Baumeister, 2012), it is possible that Easterners pay more attention to context during the learning of initial attitudinal information (Figure 1, Hypothesis 1). Consequently, Easterners should show weaker effects of ABC renewal and similar effects of ABA renewal compared to Westerners. Second, drawing on research showing that dialectical thinking is more prevalent among Easterners whereas analytical thinking is more prevalent among Westerners (Jenkins, Yang, Goh, Hong, & Park, 2010; Peng & Nisbett, 1999; Spencer-Rodgers, Williams, & Peng, 2010), it is possible that Easterners pay less attention to context during the learning of counterattitudinal information than Westerners (Figure 1, Hypothesis 2). This hypothesis is based on the notion that a given object can have opposite attributes from dialectical view, which would represent a logical contradiction from an analytical

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[1] For the sake of brevity, we refer to individuals from the two cultures as *Easterners* and *Westerners*. This demarcation is not intended to imply perfect homogeneity within cultures. For example, although explanations of social events in terms of contextual factors are more prevalent in Eastern than Western cultures, there is considerable variability in causal explanations within cultures (Chiu & Hong, 2006).

view. Therefore, dialectical thinking can weaken Easterners' perception of inconsistency (see

Choi & Nisbett, 2000), the driving force behind enhanced attention to context during the learning

of counterattitudinal information (Gawronski, 2012). Consequently, Easterners should show

weaker effects of ABA and ABC renewal compared to Westerners.

Gawronski et al. (2015) recently conducted a meta-analysis of all studies from their

research groups that tested predictions of Gawronski et al.'s (2010) representational theory.

Because the meta-analysis included a small number of unpublished studies conducted in

Singapore, the findings provide preliminary evidence for the current question of whether

Easterners and Westerners differ with regard to their susceptibility to ABA and ABC renewal.

The most relevant finding is that effect sizes of ABA and ABC renewal significantly differed

from zero in samples from the United States and Canada, but not in samples from Singapore.

Although this result seems to support Hypothesis 2, the possibility of strong conclusions

is undermined by the lack of a significant difference between Singaporean and Canadian

participants, the latter of which showed significant effects for both ABA and ABC renewal.

Another limitation is that the absence of ABA and ABC renewal in Singaporean participants

might reflect a simple replication failure due to sampling or measurement error (Maxwell, Lau, &

Howard, 2015; Stanley & Spence, 2014). After all, the meta-analysis also included several

studies that failed to replicate the predicted patterns of ABA and ABC renewal in Western

samples. Thus, to allow for stronger conclusions, it is critical to provide independent evidence for

cultural differences in the hypothesized processes and the resulting context-effects on automatic

evaluations.

Study 1

Study 1 tested the proposed East-West difference in attention to context during the

learning of counterattitudinal information. Adapting a paradigm from Gawronski et al. (2014,

Experiments 1a & 1b), participants from Canada and Singapore received either positive or

negative information about an unknown target individual and were then exposed to information

that was either congruent or incongruent with the valence of the initial information. To measure

attention to incidental context cues, the statements about the target individual were presented

against randomly varying background colors. After the impression formation task, participants

completed a surprise recognition test in which they were asked to indicate the background color

against which the critical target statement had been presented. The idea underlying this paradigm

is that expectancy-violations resulting from inconsistent information enhance attention to the

context, which should improve participants' memory for the incidental background color (cf.

Cacioppo, Crites, Berntson, & Coles, 1993). Thus, to the extent that Singaporean participants pay

less attention to the context of counterattitudinal information, they should show a reduced

memory advantage for the context of expectancy-incongruent over expectancy-congruent

information compared to Canadian participants.[2]

Method

      Participants and design. One-hundred Canadian undergraduate students from the

University of Western Ontario (78 women and 22 men, mean age 18.7 years) participated for a

course requirement and 80 Singaporean undergraduate students from the Singapore Management

University (50 women and 30 men, mean age 21.4 years) participated for SG$5 (about US$3.6).[3]

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[2] We aimed to recruit at least 80 participants from each country. Based on the average effect size for mean level
differences in earlier research using the same paradigm (Gawronski et al., 2014), a sample of 80 participants
provides a power of .859 to detect an expectancy-violation effect within each group. The data were collected in one
shot without prior statistical analyses. We report all data exclusions, all experimental manipulations, and all
dependent measures. All materials and data are available from the authors upon request.

[3] Of the 100 participants in the Canadian sample, 27 were reported being born in Asia. Excluding these participants
did not change the pattern and statistical significance of the reported results. Of the 80 participants in the

The study included a 2 (Country: Canada vs. Singapore) × 2 (Valene of Initial Information: positive vs. negative) × 2 (Target Statement: congruent with initial information vs. incongruent with initial information) between-subjects design.

Impression formation task. Participants were asked to form an impression of a target person based on behavioral information (Gawronski et al., 2014, Experiments 1a & 1b). Toward this end, participants were presented with 30 behavioral statements along with a picture of the person's face. To obtain an ethnically ambiguous face, we created a 50% morph of a face-pair that included an Asian man and a Caucasian man. The statements were adapted from Rydell and Gawronski (2009) with minor adjustments to ensure that they are perceived as equally positive and negative in Eastern and Western cultures.[4] The valence and cultural independence of the statements was confirmed in a pretest. The first 20 and the last 9 statements were of the same valence and randomly selected from two lists of 29 positive or 29 negative statements; the 21st statement served as the critical target statement that was either congruent or incongruent with the valence of the other statements. Each statement was presented for 5000ms against one of ten colored backgrounds. The screen turned black during the 1000ms inter-trial interval. Each colored background appeared once during one of three 10-trial blocks. The critical target statement was always presented against a blue background. There was no reference to the background in the task instructions.

Recognition test. After the impression formation task, participants completed a 7-item surprise recognition test. Each trial showed 10 squares, displaying the 10 background colors

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Singaporean sample, none was born in North America.

[4] Because English is one of the main languages in Singapore and the primary language at the university from which we recruited our participants, all materials were presented in English.

(numbered from 0 to 9), and one of the statements from the impression formation task.

Participants were asked to identify the background color against which each statement had been

presented in the impression formation task. The first item included the critical target statement;

the following six items included statements that were randomly selected from the other 29

statements. Participants' memory performance on the critical target item served as the primary

dependent measure.

Results

Data were analyzed with binary logistic regression. The three independent variables

Country (Canada vs. Singapore), Valence of Initial Information (positive vs. negative), and

Target Statement (incongruent vs. congruent) were dummy-coded and entered simultaneously

into the regression model together with all possible interactions. The analysis revealed a

significant main effect of Target Statement, $B = 1.94$, $SE = 0.87$, Wald $= 4.94$, $p = .026$, $OR =$

6.96, indicating that memory for the background color was better when the target statement was

incongruent ($M = .39$, CI [.30, .47]) than when it was congruent ($M = .08$, CI [-.009, .16]) with

the initial attitudinal information (see Figure 2). No other main or interaction effect reached

statistical significance (all ps $> .61$), including the two-way interaction between Country and

Target Statement ($p = .62$). Analyses within each group of Country revealed that the effect of

Target Statement was significant for both Canadian participants, $B = 1.46$, $SE = 0.57$, Wald $=$

6.57, $p = .010$, $OR = 4.31$, and Singaporean participants, $B = 2.72$, $SE = 0.80$, Wald $= 11.63$, p

$= .001$, $OR = 15.10$. If anything, Singaporean participants showed a stronger memory advantage

for the background of incongruent information than Canadian participants.

Discussion

The findings of Study 1 contradict the hypothesis that individuals from Eastern countries

pay less attention to context during the learning of counterattitudinal information (Ye &

Gawronski, in press). Thus, they are at odds with the proposed interpretation of Gawronski et al.'s (2015) meta-analytic findings, which showed ABA and ABC renewal in samples from the United States and Canada, but not in samples from Singapore. This conclusion raises the question of what accounts for the lack of ABA and ABC renewal in Singaporean samples in Gawronski et al.'s (2015) meta-analysis.

One possibility is that the absence of ABA and ABC renewal in Singaporean samples reflects a simple replication failure as a result of measurement error (Maxwell et al., 2015; Stanley & Spence, 2014). Consistent with the latter interpretation, a closer inspection of Gawronski et al.'s (2015) meta-analysis suggests that effect sizes for the Singaporean samples might have been attenuated by the low reliability of one of the employed measures. Although the meta-analysis revealed significant renewal effects for various measures of automatic evaluation, there were no significant effects for studies that used the evaluative priming task as a measure of automatic evaluation (EPT; Fazio, Jackson, Dunton, & Williams, 1995). Because the EPT tends to show rather low estimates of reliability (Cronbach's Alpha values between .00 and .55; see Gawronski & De Houwer, 2014), it is possible that the failure to obtain significant renewal effects with the EPT is due to substantial proportions of measurement error (LeBel & Paunonen, 2011). Consistent with this possibility, studies that utilized the affective misattribution procedure (AMP; Payne, Cheng, Govorun, & Stewart, 2005), a measure of automatic evaluation known for its high reliability (Cronbach's Alpha values between .70 and .90; see Gawronski & De Houwer, 2014), showed meta-analytic effect sizes that were (1) significantly larger and (2) significantly different from zero.

Of the three studies with Singaporean samples in Gawronski et al.'s (2015) meta-analysis, one used the EPT and two used the AMP as a measure of automatic evaluation. This ratio is higher than compared to the ratio in the entire sample, where only 4 out of 30 studies used the

EPT as a dependent measure. Hence, it is possible that the absence of ABA and ABC renewal in Singaporean samples was due to the relatively large impact of a single study with an unreliable measure rather than genuine cultural differences in attention to context during the learning of counterattitudinal information.

Study 2

The main goal of Study 2 was to re-examine the emergence of ABA and ABC renewal in Singaporean samples while controlling for potential confounds with measurement error. Toward this end, we obtained an updated Singaporean sample that included all studies that we have conducted in Singapore except for one study that used the EPT. Our data base for this approach included three identical replications that used the AMP as a dependent measure. Two of these studies had already been included in the meta-analysis; one additional study was conducted shortly after Gawronski et al.'s (2015) meta-analysis was accepted for publication. This updated sample allowed us to draw stronger conclusions about the emergence of ABA and ABC renewal in Eastern cultures.

Method

Participants and design. Study 2 combined the samples from three independent studies: 103 students from the Singapore Management University (67 women, 36 men, mean age = 21.1), 102 students from the Nanyang Technological University (51 women, 51 men, mean age = 20.9), and 101 students from the Singapore Management University (57 women, 42 men, 2 unspecified, mean age = 21.6). All three studies used the same 2 (Background Order: yellow-blue vs. blue-yellow, between-subjects) $\times$ 2 (Valence Order: positive-negative vs. negative-positive, within-subjects) $\times$ 3 (Evaluation Background: yellow vs. blue vs. green, within-subjects) mixed-model design (see Gawronski et al., 2014, Experiment 2). Participants received research credit for an introductory psychology course or SG$5 (US$3.6). With the average effect sizes obtained in

Gawronski et al.'s (2015) meta-analysis, the updated sample ($N = 306$) provided a power of .991

to detect an ABA renewal effect and a power of .859 to detect an ABC renewal effect.

Impression formation task. Participants were asked to form first impressions of two

individuals on the basis on behavioral information (see Gawronski et al., 2014, Experiment 2).

Each target was depicted with a picture of an ethnically ambiguous man (see Study 1). In the first

block, participants were presented with 20 positive behaviors performed by one of the two

individuals and 20 negative behaviors performed by the other individual. In the second block,

participants were presented with 40 new behavioral statements, such that the target paired with

positive statements in the first block was now paired with negative statements, and vice versa.

The statements were adapted from the same set of pretested statements used in Study 1. Each

picture-statement pair was presented for 5000ms against a colored background, which remained

on the screen throughout each block, with an inter-trial interval of 1000ms. A different

background color (blue vs. yellow) was used for each block. The background color for each block

and the valence of information about each target individual were counterbalanced. The order of

trials was randomized.

Automatic evaluation. Following the impression formation task, automatic evaluations

were assessed with the AMP. On each trial, participants were presented with a prime stimulus

(i.e., face of one of the two individuals) for 100ms, a blank screen for 100ms, and an ambiguous

polygon for 100ms, which was followed by a black-and-white pattern mask. Participants were

asked to indicate if they considered the polygon visually more pleasant or visually less pleasant

than average by pressing one of two response keys. The AMP consisted of 120 trials, including

60 trials for each of the two faces. To investigate effects of the background colors on automatic

evaluations, we manipulated the background color during the 100ms presentation of the face

primes, with one-third of the trials showing the background of the first learning block, one-third

showing the background of the second learning block, and the remaining third showing a novel

background that had not been presented in the impression formation task (i.e., green). Following

Payne et al. (2005), participants were told that the pictures can influence their evaluations of the

polygons and that they should try their absolute best to avoid any biasing influence.

Results

AMP responses were aggregated by calculating the proportion of *more pleasant* responses

for each target individual against each of the three backgrounds. Scores were collapsed across

conditions to reflect (1) the order of evaluative statements about each target (positive-negative vs.

negative-positive), and (2) the nature of the backgrounds with reference to the two blocks of the

impression formation task (first context vs. second context vs. novel context). The resultant

scores were submitted to a 2 (Valence Order: positive-negative vs. negative-positive) $\times$ 3

(Evaluation Context: first vs. second vs. novel) repeated-measures ANOVA, which revealed a

significant two-way interaction of Valence Order and Evaluation Context, $F(2, 608) = 6.25$, p

$= .002$, $\eta_p^2 = .020$ (see Figure 3). No other effects reached statistical significance (all Fs < 0.98,

all ps $> .32$). To decompose this interaction, we conducted a priori pairwise comparisons

reflecting the emergence of ABA and ABC renewal (see Gawronski et al., 2015).

For ABA renewal, automatic evaluations assessed in the first context (Context A) were

compared to those in the second context (Context B) at each level of Valence Order. In the

positive-negative condition, we found a significant ABA renewal effect, in that automatic

evaluations were more positive in Context A than Context B, $t(304) = 2.72$, $p = .007$, $d = 0.16$. In

the negative-positive condition, automatic evaluations seemed more negative in Context A than

in Context B, but the difference was not statistically significant, $t(304) = 1.07$, $p = .29$, $d = 0.061$.

To investigate potential order effects, we calculated indices of the size of ABA renewal effects

for each Valence Order condition by subtracting AMP scores in Context B from AMP scores in

Context A in the positive-negative condition, and vice versa in the negative-positive condition. The resulting scores were submitted to an ANOVA with Valence Order as a within-subjects factor. The analysis revealed no significant effect of Valence Order, $F(1, 304) = 1.03$, $p = .31$, $\eta_p^2 = .003$. Yet, the analysis did reveal a significant intercept, $F(1, 304) = 7.24$, $p = .008$, $\eta_p^2 = .023$, indicating an overall ABA renewal effect.

For ABC renewal, automatic evaluations assessed in the novel context (Context C) were compared to those in the second context (Context B) in the manner described for ABA renewal. In the positive-negative condition, the results indicated a significant ABC renewal effect, in that automatic evaluations were more positive in Context C than Context B, $t(304) = 2.22$, $p = .027$, $d = 0.13$. Conversely, in the negative-positive condition, automatic evaluations were marginally more negative in Context C than Context B, $t(304) = 1.96$, $p = .051$, $d = 0.11$. To investigate potential order effects, we calculated indices of the size of ABC renewal effects for each condition of Valence Order by subtracting AMP scores in Context B from AMP scores in Context C in the positive-negative condition, and vice versa in the negative-positive condition. An ANOVA with Valence Order as a within-subjects factor revealed no significant effect of Valence Order, $F(1, 304) = 0.00$, $p = 1.00$, $\eta_p^2 = .00$. Yet, the ANOVA did reveal a significant intercept, $F(1, 304) = 10.40$, $p = .001$, $\eta_p^2 = .033$, indicating an overall ABC renewal effect.

To investigate potential differences in the size of ABA and ABC renewal effects, aggregate scores of ABA and ABC renewal were submitted to a 2 (Effect Type: ABA renewal vs. ABC renewal) × 2 (Valence Order: positive-negative vs. negative-positive) repeated-measures ANOVA. This analysis revealed no significant main or interaction effects (all Fs < 1.53, all ps > .21). Post-hoc comparisons indicated no significant difference between the size of ABA renewal and that of ABC renewal in the positive-negative condition, $t(304) = 0.72$, $p = .47$, $d = 0.041$, and in the negative-positive condition, $t(304) = -1.08$, $p = .28$, $d = -0.062$.

Discussion

Study 2 obtained evidence for both ABA and ABC renewal in Singaporean participants. Replicating earlier findings with North American samples (e.g., Gawronski et al., 2010, 2014; Rydell & Gawronski, 2009), automatic evaluations reflected the valence of counterattitudinal information only in the context in which this information was learned. In contrast, automatic evaluations reflected the valence of the initial attitudinal information in other contexts, including the context of the attitudinal information and a novel context in which the target had not been encountered before. Together, these results suggest that contextualized change of automatic evaluations is a general phenomenon that replicates across cultures.[5]

General Discussion

Drawing on Gawronski et al.'s (2010) representational theory and research in cross-cultural psychology, we tested two hypotheses on East-West differences in the encoding of conflicting evaluative information and their downstream effect on automatic evaluations (see Figure 1). According to the first hypothesis, Easterners pay more attention to context during the learning of initial attitudinal information than Westerners, and therefore show weaker effects of ABC renewal. According to the second hypothesis, Easterners pay less attention to context during the learning of counterattitudinal information than Westerners, and therefore show weaker

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[5] As an additional test of cross-cultural differences in ABA and ABC renewal, we compared the effect sizes in Study 2 to the meta-analytic effect sizes in studies with Western participants using the same procedural details (i.e., within-subject manipulation of valence-order and use of a measure other than the EPT; see Gawronski et al., 2015). In the current study, the average effect size for ABA renewal ($d = 0.11$) was outside the 95% confidence interval of the meta-analytic effect size ($d = 0.200$, CI [0.157, 0.243]), and that for ABC renewal ($d = 0.12$) was inside the 95% confidence interval of the meta-analytic effect size ($d = 0.121$, CI [0.076, 0.166]). Although these findings suggest potential cultural differences in ABA renewal, they are incompatible with both of our hypotheses (also see Ye & Gawronski, in press). Because these comparisons may involve unrecognized confounds, future research is needed to establish the reliability of the obtained difference in ABA renewal.

effects of both ABA and ABC renewal. Although a recent meta-analysis (Gawronski et al., 2015) seemed to support the second hypothesis, the current findings contradict both hypotheses. Both Easterners and Westerners showed (1) enhanced attention to context during the encoding of expectancy-violating counterattitudinal information and (2) contextualized changes in automatic evaluations after learning conflicting evaluative information.

The current findings seem to contradict previous evidence showing that Easterners generally pay more attention to context (e.g., Chua et al., 2005; Zhou et al., 2012) and have a higher for tolerance of inconsistency (e.g., Peng & Nisbett, 1999; Spencer-Rodgers et al., 2010) than Westerners. To reconcile these discrepancies, it is important to note two fundamental differences between the present and previous research. First, whereas previous research on attention to context focused on contexts that have a clear conceptual relation to the learned information, the present research was concerned with incidental context cues that are irrelevant for the learned information. Second, whereas previous research on tolerance of inconsistency focused mainly on how inconsistency influences thinking and reasoning, the present research was concerned with the effect of conflicting information on automatic evaluations. Together, these differences highlight the contribution of the present research by showing that, in contrast to the well-documented differences in controlled processing, Easterners and Westerners may be relatively similar in terms of automatic processing.

The present research also makes a valuable contribution to the current debate about the replicability of social psychological findings (Open Science Collaboration, 2015). First, our findings echo LeBel and Paunonen's (2011) concern that unreliable measurement can reduce the likelihood of replicating an actually existing effect. To maximize the informational value of replication studies, it is essential to ensure reliable measurement of the critical outcome. Second, our findings illustrate the significance of culture in understanding successful and failed

replications. As Van Bavel, Mende-Siedlecki, Brady, and Reinero (2016) pointed out, the success

of direct replications across cultures may depend on the culturally specific *meanings* of materials,

even if the hypothesis about the *mechanism* underlying the to-be replicated effect is correct (cf.

Kashima, 2015). From this perspective, the present research makes a valuable contribution by

demonstrating the cross-cultural replicability of two key findings despite the existence of

theoretical arguments for cultural differences.

Given the strong influence of Western culture on the Singaporean society, one could

argue that Singapore may not be the best candidate for a study on cross-cultural differences in

attention and thinking styles. Another potential objection is that our findings might have been

distorted by the use of English materials, given that language can moderate the use of culture-

specific thinking styles in participants with bi-cultural identity (for a review, see Oyserman &

Lee, 2008). Both concerns can be alleviated with a study by Ji, Zhang, and Nisbett (2004), who

found that ethnically Chinese participants from Singapore showed the same relational reasoning

style as participants from other regions in East Asia (e.g., Taiwan, mainland China, Hong Kong).

Importantly, unlike participants from mainland China or Taiwan, the relational thinking style of

Singaporean Chinese was unaffected by the use of English or Chinese, making them ideal

candidates for testing East-West differences. Nevertheless, future research should explore

whether the current findings generalize to individuals from other Eastern countries.

In sum, the present research suggests individuals from Eastern and Western cultures may

be relatively similar in terms of their susceptibility to contextualized changes of automatic

evaluations and the attentional processes underlying such changes. Thus, in addition to the well-

documented differences in reasoning and thinking, there might be an interesting layer of cultural

similarities in automatic processes awaiting further research.

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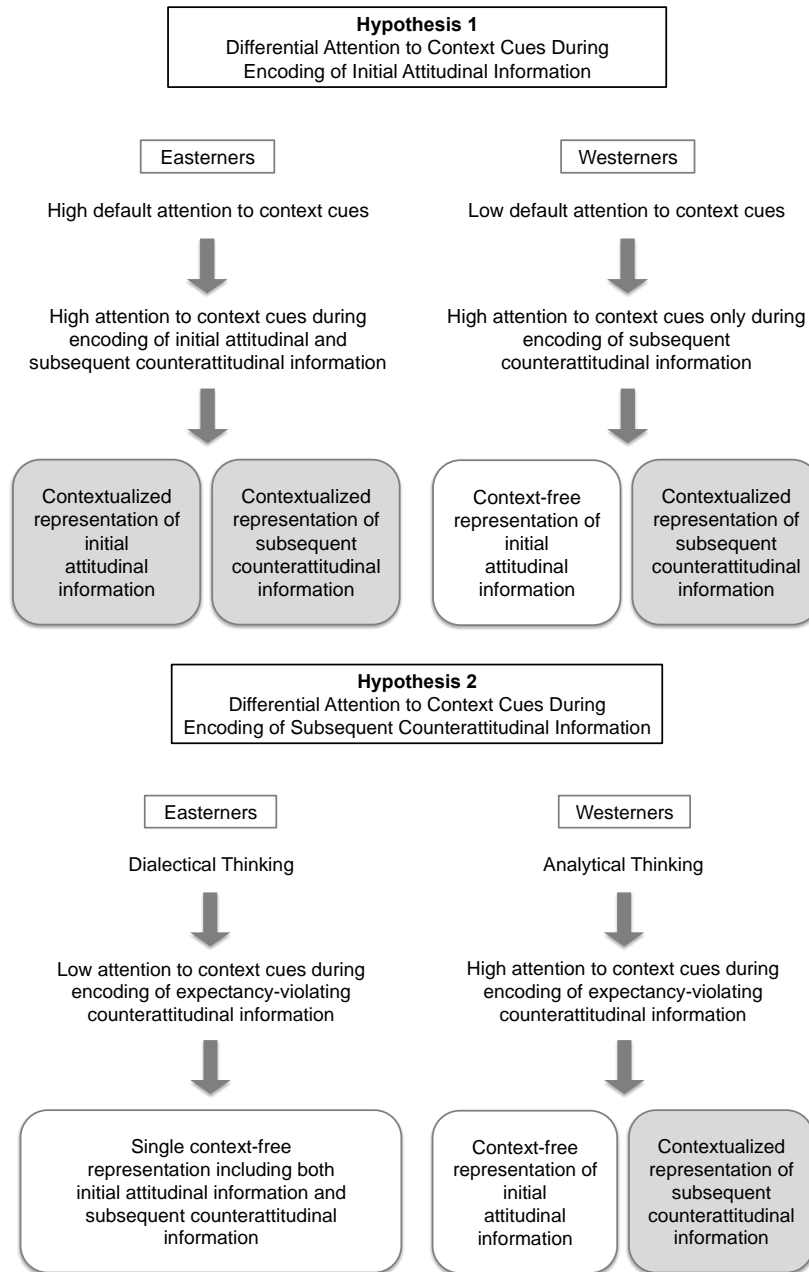
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Author Note

Hypothesis 1
Differential Attention to Context Cues During
Encoding of Initial Attitudinal Information

Easterners

Westerners

High default attention to context cues

Low default attention to context cues

High attention to context cues during encoding of initial attitudinal and subsequent counterattitudinal information

High attention to context cues only during encoding of subsequent counterattitudinal information

Contextualized representation of initial attitudinal information

Contextualized representation of subsequent counterattitudinal information

Context-free representation of initial attitudinal information

Contextualized representation of subsequent counterattitudinal information

Hypothesis 2
Differential Attention to Context Cues During
Encoding of Subsequent Counterattitudinal Information

Easterners

Westerners

Dialectical Thinking

Analytical Thinking

Low attention to context cues during encoding of expectancy-violating counterattitudinal information

High attention to context cues during encoding of expectancy-violating counterattitudinal information

Single context-free representation including both initial attitudinal information and subsequent counterattitudinal information

Context-free representation of initial attitudinal information

Contextualized representation of subsequent counterattitudinal information

Figure 1. Hypotheses about East-West differences in attention to context during encoding of

conflicting evaluative information and the formation of contextualized representations.
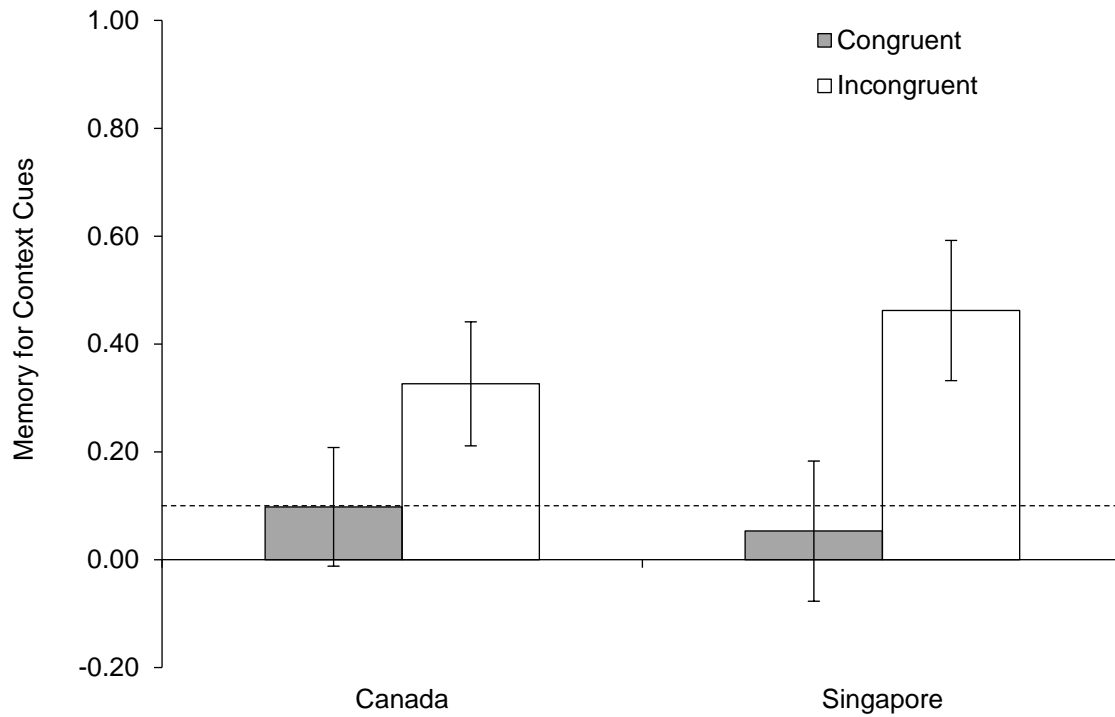
Figure 2. Proportion of correct memory for context cues as a function of target statement (congruent with initial information vs. incongruent with initial information) and country (Canada vs. Singapore), Study 1. The dotted line depicts chance-level performance of 10% correct memory judgments. Error bars depict 95% confidence intervals.
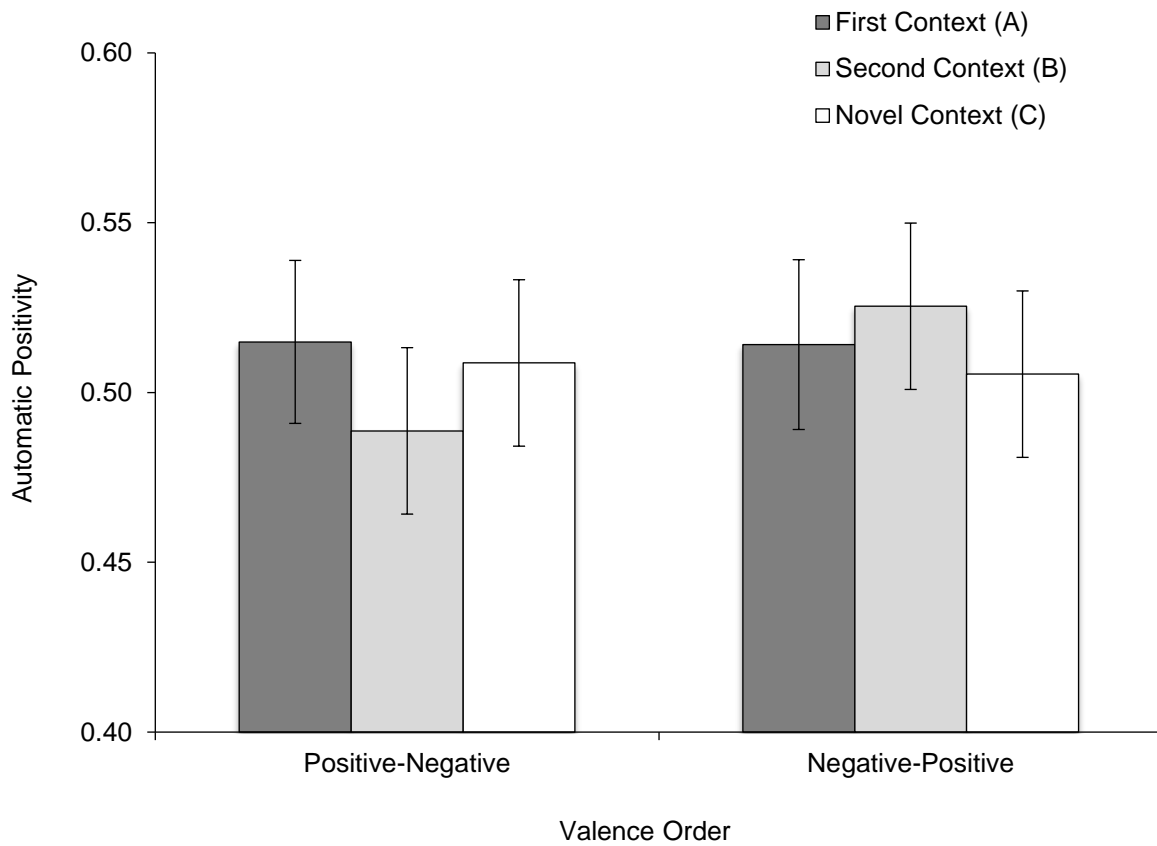
Figure 3. AMP scores of automatic evaluation as a function of Valence Order (positive-negative vs. negative-positive) and evaluation context (first context vs. second context vs. novel context), Study 2. Error bars depict 95% confidence intervals.