At the Boundaries of Misattribution: Does Positivity Influence Judgments of Familiarity in the Affect Misattribution Procedure?

Rebecca Weil
University of Hull

Tomás A. Palma
Universidade de Lisboa

Bertram Gawronski
University of Texas at Austin

Priming effects in the Affect Misattribution Procedure (AMP) have been explained by a misattribution of prime-related affect to neutral targets. However, the measure has been criticized for being susceptible to intentional use of prime features in judgments of the targets. To isolate the contribution of unintentional processes, the present research expanded on the finding that positive affect can be misattributed to familiarity (i.e., positivity-familiarity effect). To the extent that prime-valence is deemed irrelevant for judgments of target-familiarity, positivity-familiarity effects in the AMP could potentially rule out intentional use of the primes. Seven experiments collectively suggest that prime-valence influences judgments of target-familiarity in the AMP, but only when the task context does not suggest a normatively accurate response to the familiarity-judgment task. Relations of positivity-familiarity effects to self-reported use of prime-valence revealed mixed results regarding the role of intentional processes. Implications for the AMP and misattribution effects are discussed.

Keywords: affect, familiarity, implicit measures, intention, misattribution

To overcome the well-known limits of self-reports (e.g., Paulhus, 1984; Nisbett & Wilson, 1977), attitude researchers have devoted considerable efforts to develop alternative measurement instruments. Different from explicit measures that rely on self-reported answers to verbal questions about an attitude object, implicit measures are based on people's unintentional reactions to attitude-related stimuli (for overviews, see Gawronski & De Houwer, 2014; Weil, 2016).

One instrument with rapidly increasing popularity is the Affect Misattribution Procedure (AMP; Payne, Cheng, Govorun, & Stewart, 2005). The AMP has shown high reliability and large effect sizes (Payne & Lundberg, 2014), and has proven its validity in the prediction of judgments and behavior (Cameron, Brown-Iannuzzi, & Payne, 2012). Yet, the AMP has been criticized for being susceptible to intentional processes (Bar-Anan & Nosek, 2012; Teige-Mocigemba, Penzl, Becker, Henn, & Klauer, 2016), which would undermine its suitability as an implicit measure. The aim of the current research was to capitalize on the misattribution mechanism that is commonly assumed to underlie the AMP (e.g., Gawronski & Ye, 2014; Loersch & Payne, 2011) to isolate unintentional processes as a source of AMP effects. Toward this end, the present research tested whether prime-related affect is misattributed to familiarity of the targets in the AMP. To the extent that prime-valence is deemed irrelevant for judgments of target-familiarity, intentional use of prime-valence for judgments of target-familiarity should be unlikely, which would help to isolate the contribution of unintentional processes in the AMP.

The AMP

On a typical AMP trial, participants are briefly presented with a prime stimulus, followed by a neutral Chinese ideograph. Participants' task is to indicate if they find the Chinese ideograph visually more pleasant or visually less pleasant than the average Chinese ideograph. The modal finding is that ideographs preceded by positive primes are evaluated as more pleasant than ideographs preceded by negative primes (cf. Murphy & Zajonc, 1993).

In the original presentation of the measure, Payne et al. (2005) hypothesized that priming effects in the AMP are driven by a misattribution of the affective state elicited by the prime to the neutral target. According to this interpretation, participants fail to identify the actual source of their affective reaction (i.e., the prime), which is mistakenly attributed to the target. This misattribution effect is assumed to emerge despite participants' intention not to use features of the primes in evaluating the targets (Payne et al., 2005), allowing a classification of AMP effects as unintentional, fulfilling one of the criteria of implicitness (see De Houwer, Teige-Mocigemba, Spruyt, & Moors, 2009).

Payne et al.'s (2005) hypothesis that AMP effects are driven by misattribution of affect has been supported in several studies (e.g., Gawronski & Ye, 2014; Oikawa, Aarts, & Oikawa, 2011; Payne, Hall, Cameron, & Bishara, 2010). Additional findings suggest that AMP effects might be driven by misattribution of semantic concepts rather than affective states (e.g., Blaison, Imhoff, Hess, & Banse, 2012). Expanding on this work, Gawronski and Ye (2014) demonstrated that priming effects in the AMP can be driven by misattribution of either affective states or semantic concepts (or both). This insight increases the flexibility of potential applications of the AMP, making it suitable for the measurement of various types of reactions depending on

the required judgments of the targets (Deutsch & Gawronski, 2009). For example, instead of asking participants to judge whether a Chinese ideograph is more or less pleasant, participants may be asked to judge whether the ideograph refers to a male or female name to measure gender stereotyping (Gawronski & Ye, 2014), whether it has a sexual or non-sexual meaning to measure sexual preferences (Imhoff, Schmidt, Bernhardt, Dierksmeier, & Banse, 2011), or whether participants would like to have the ideograph printed on a personal T-shirt to measure the self-concept of personality (Sava, Maricutoiu, Rusu, Macsinga, Virga, Cheng, & Payne, 2012).

Intentional and Unintentional Processes

A major critique that questioned the implicit nature of AMP effects was raised by Bar-Anan and Nosek (2012). The authors argued that AMP effects might be at least partly driven by participants' intentional use of the primes in judging the Chinese ideographs. Consistent with this assumption, Bar-Anan and Nosek found that priming effects in the AMP were positively related to participants' self-reported use of the primes in judging the Chinese ideographs. Yet, in a reply to Bar-Anan and Nosek's study, Payne et al. (2013) showed that AMP effects were positively related to self-reports of both (a) intentionally using the primes and (b) being unintentionally influenced by the primes. Moreover, offering participants an opportunity to skip trials (as an alternative to intentionally rating the primes in these trials) did not reduce the overall size of priming effects in the AMP. These results provide evidence for the role of unintentional processes in the AMP. However, they do not rule out the possibility that intentional use of the primes can contribute to AMP effects over and above the contribution of unintentional processes.

To resolve this ambiguity, Gawronski and Ye (2015) suggested a slight modification of the AMP's standard protocol to isolate the contribution of unintentional processes. The central idea underlying their argument is to direct participants' attention away from the critical features of the primes. Although participants may intentionally use attended prime-features for their judgments of the targets, unattended prime-features may influence target judgments unintentionally and outside of awareness. To test this hypothesis, Gawronski and Ye presented participants with prime stimuli showing black and white faces of either young or old age. In addition to evaluating the Chinese ideographs, half of the participants were asked to count the number of young and old faces that are presented over the course of the task; the remaining half were asked to count the number of black and white faces (see Olson & Fazio, 2003). Supporting the contribution of unintentional processes, Gawronski and Ye found reliable and construct-valid priming effects of race

regardless of whether participants were instructed to pay attention to the race or the age of the face primes. The same result emerged for priming effects of age (see also Gawronski, Cunningham, LeBel, & Deutsch, 2010). Importantly, although priming effects of the attended category dimension were positively related to participants' self-reported use of the primes in judging the targets, priming effects of the unattended category dimension were unrelated to self-reported intentionality.

Misattribution of Affect to Familiarity

Gawronski and Ye's (2015) findings suggest that unintentional processes in the AMP can be isolated by directing participants' attention to prime features that are unrelated to the critical features of interest (e.g., attention to age in an AMP designed to measure racial attitudes). An alternative approach might be to change the required categorization of the target stimuli, such that the prime feature of interest becomes irrelevant for the target judgment from the perspective of the participants. In the evaluative variant of the AMP, this approach would require a change of the evaluative response categories to response options that are unrelated to valence. Yet, a precondition for this approach is that the valence of the primes retains its influence on participants' judgments of the targets.

An interesting possibility in this regard is the finding that positive affect can be misattributed to familiarity (positivity-familiarity effect; e.g., Corneille, Monin, & Pleyers, 2005; Garcia-Marques, Mackie, Claypool, & Garcia-Marques, 2004; Monin, 2003; Phaf & Rotteveel, 2005). The central idea underlying the positivity-familiarity effect is that positive affect serves as a cue to answer the question of whether a stimulus has been encountered before (Winkielman, Schwarz, Fazendeiro, & Reber, 2003; Zajonc, 1968). The positivity-familiarity effect has been found for attractive faces (Corneille et al., 2005; Monin, 2003), positive words (Monin, 2003), and smiling faces (Garcia-Marques et al., 2004), which were judged as more familiar compared to less attractive faces (Corneille et al., 2005; Monin, 2003), neutral and negative words (Monin, 2003), and faces with neutral expressions (Garcia-Marques et al., 2004). For the purpose of the current research, the most significant demonstrations of the positivity-familiarity effect are studies in which neutral stimuli were judged as more familiar when they were presented in a positive context (e.g., Garcia-Marques et al., 2004; Phaf & Rotteveel, 2005). The assumption underlying these demonstrations is that, although the target stimuli themselves do not elicit positive affect, positive affect elicited by a different source is misattributed to the familiarity of the neutral targets. Such misattribution effects have been found when positive affect was elicited by subliminal presentations of smiley faces (Garcia-Marques et al., 2004), supra- and subliminal presentations of positive

words (Phaf & Rotteveel, 2005), and contraction of the zygomaticus muscle (Phaf & Rotteveel, 2005).

Misattribution of contextually induced affect to the familiarity of a neutral stimulus is conceptually equivalent to the proposed misattribution mechanism underlying AMP effects (Gawronski & Ye, 2014; Loersch & Payne, 2011). In both cases, the affective state elicited by a judgment-irrelevant stimulus is misattributed to features of a neutral target. The only difference is that the affective state matches the required target judgment in the AMP (i.e., valence-valence), but not in the positivity-familiarity effect (i.e., valence-familiarity). Thus, if the response options in the AMP are changed from evaluative judgments to judgments of familiarity, positive and negative primes may influence judgments of the targets' familiarity in line with the positivity-familiarity effect. That is, positive stimuli should increase judgments of familiarity, whereas negative primes should reduce judgments of familiarity.

Importantly, the emergence of a positivity-familiarity effect in the AMP may also help to isolate the contribution of unintentional processes. To the extent that people deem prime-valence as irrelevant for their judgments of the targets' familiarity, the valence of the primes would no longer provide meaningful information that could be used intentionally to judge the familiarity of the target. This should be especially likely when people do not have any meta-cognitive knowledge about the relation between valence and judgments of familiarity (Gawronski & Ye, 2015). Thus, although effects of prime-valence on target judgments may be related to self-reported use of the primes when the task involves judgments of valence, effects of prime-valence on target judgments should be unrelated to self-reported use of the primes when the task involves judgments of familiarity.

To test these hypotheses, we conducted seven experiments. In all seven experiments, we replicated the traditional AMP effect, showing large effects of prime-valence on evaluative judgments of the targets. Yet, only two of the seven experiments revealed a replicable positivity-familiarity effect. Across the seven studies, replicable effects of prime-valence on judgments of target-familiarity were limited to conditions in which the task context did not suggest a normatively accurate solution to the familiarity-judgment task. Although a moderating effect of accuracy motivation on traditional AMP effects is consistent with previous evidence (Eder & Deutsch, 2015), we did not expect such a moderation for positivity-familiarity effects (cf. Garcia-Marques et al., 2004; Phaf & Rotteveel, 2005). Relations of positivity-familiarity effects to self-reported use of prime-valence revealed mixed results, suggesting that more research is needed to address the role of intentional processes in positivity-familiarity effects before such effects are used to isolate the role of unintentional processes in applications of the AMP.

Experiment 1

In the first experiment, participants went through a bogus subliminal familiarity task (see Westerman, Lloyd, & Miller, 2002) before they completed one of two versions of the AMP. Participants were told that the first part would include very brief, allegedly subliminal presentations of Chinese ideographs. They were further informed that they would again be presented with Chinese ideographs in a second task after they completed the subliminal presentation task. Participants were told that the second task would include some of the ideographs from the subliminal presentation task and novel ideographs that had not been presented before. Because we did not present any Chinese ideographs in the first part, all ideographs in the second part were in fact novel. In the second part, which included the two versions of the AMP, half of the participants were asked to judge the familiarity of the Chinese ideographs (i.e., familiarity-judgment condition); the remaining half was asked to judge the visual pleasantness of the ideographs (i.e., valence-judgment condition). Following the standard protocol of the AMP, each ideograph in the second part was preceded by a positive, a negative, or a neutral prime. After completion of the AMP, all participants were asked to indicate whether they relied on features of the primes in judging the Chinese ideographs. In the valence-judgment condition, we expected to obtain the well-replicated AMP effect, such that the Chinese ideographs are judged more favorably when they were preceded by a positive prime than when they were preceded by a negative prime. More importantly, in the familiarity-judgment condition, we expected that positive primes should increase judgments of target-familiarity, whereas negative stimuli should decrease judgments of target-familiarity. We further hypothesized that, although priming effects of valence on valence judgments may be related to self-reported use of the primes, priming effects of valence on familiarity judgments should be unrelated to self-reported use of the primes.

Methods

Participants and design. One-hundred-and-forty-five undergraduates at the University of Lisbon (107 female, 38 male; mean age = 22.01 years) participated in a lab study in return for course credit. The study consisted of a 3 (Prime-valence: positive vs. neutral vs. negative) × 2 (Task: valence judgment vs. familiarity judgment) mixed-model design, with the first factor being manipulated within-participants and the second one between-participants.[1]

---

[1] The sample size for each study was determined beforehand with the requirement of at least 50 participants per cell. For Experiment 1, the

Bogus subliminal presentation task. The study was introduced as being concerned with unconscious perception. Participants were informed that they will be presented with a set of Chinese symbols on a computer screen. They were further told that the symbols will be presented subliminally, that is, "they will appear so quickly that you probably will not be able to see them or even be aware of their presence." Participants were informed that the symbols will be masked and that their task is to keep their eyes on the screen throughout the entire task. In the familiarity-judgment condition, participants were additionally told that they will be asked to identify the allegedly subliminally presented symbols in a later task, and distinguish them from other novel symbols. The task itself included 30 presentations of three visual masks that were presented in sequential order (the first one for 250ms, the second one for 35ms, and the last one for 250ms). Each of the three visual masks consisted of a rectangle (12cm x 20cm each) filled with different combinations of numbers, ampersands, and asterisks. Each sequence was interspaced by a blank screen for 1000ms (see Westerman et al., 2002). To keep the cover story plausible, participants were initially presented with six foil ideographs at decreasing durations (119ms, 102ms, 85ms, 68ms, 51ms, and 34ms) that were not presented in the subsequent AMP. The foil ideographs appeared instead of the second mask in the sequence of masks. The 24 remaining trials showed only the three masking stimuli without any ideographs.

AMP. The procedure of the AMP followed the general recommendations by Payne et al. (2005). On each trial of the task, participants were first presented with a warning signal (+++) for 500ms, which was replaced by a prime stimulus of either positive, negative, or neutral valence for 75ms. The presentation of the prime was followed by a blank screen for 125ms, after which a Chinese ideograph appeared for 100ms. The Chinese ideograph was then replaced by a pattern mask, and participants were asked to make their response. In the valence-judgment condition, participants' task was to indicate whether they considered the Chinese ideograph as more pleasant or less pleasant than the average Chinese ideograph by pressing one of two designated keys on the keyboard. In the familiarity-judgment condition, participants' task was to indicate whether they considered the Chinese ideograph as familiar or unfamiliar, that is, whether they thought that the ideograph was presented to them before in the bogus

subliminal task. The pattern mask remained on the screen until participants gave their response. The next trial started immediately afterwards. As prime stimuli we used 8 positive, 8 negative, and 8 neutral images from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2008). Each prime was presented three times, summing up to a total of 72 trials. As target stimuli, we used 72 Chinese ideographs from Payne et al. (2005). Order of trials and prime-target combinations were randomized by the computer for each participant and organized in three blocks of 24 trials. In line with the original instructions by Payne et al. (2005), participants were told that the photographs can sometimes bias people's responses to the Chinese ideographs, and that they should try their best not to let the photographs bias their judgments of the Chinese ideographs.

Intention ratings. Self-reported intentionality was measured with a modified variant of Bar-Anan and Nosek's (2012) 5-point scale, asking participants to respond to the question: "Did you intentionally use aspects of the real-life images to make your judgments about the Chinese ideographs?" [2] The response options were (1) *not at all, I judged the ideographs*; (2) *usually no*; (3) *sometimes, but not always*; (4) *usually yes*; (5) *yes, I used aspects of the real-life images*. If participants selected the response option 3, 4, or 5, they were additionally provided with an open-ended question, asking them which aspects of the real-life images they used to make their judgments about the Chinese ideographs.

Results

Target judgments. Data from nine participants who used the same response key on more than 90% of the AMP trials were excluded from the following analysis (see Deutsch, Kordts-Freudinger, Gawronski, & Strack, 2009). The following analysis is based on the remaining 136 participants. The proportion of pleasant/familiar responses towards the ideographs served as the dependent variable. A 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Task: valence judgment vs. familiarity judgment) mixed-model ANOVA revealed a significant main effect of Task, $F(1, 134) = 24.52$, $p < .001$, $\eta_p^2 = .16$, and a significant main effect of Prime Valence, $F(2, 268) = 8.97$, $p < .001$, $\eta_p^2 = .06$, which were qualified by a significant two-way interaction of Prime Valence and Task, $F(2, 268) = 8.99$, $p < .001$, $\eta_p^2 = .06$ (see Figure 1). To specify this

sample size was based on the availability of participants in the department's subject pool and we aimed to recruit as many participants as were available during the term of the study. For Experiments 2, 6 and 7 we set the number of participants to $N = 200$ and for Experiment 3, 4 and 5 to $N = 400$, respectively. Slightly larger samples resulted from participants who took part in the experiment but did not request their compensation immediately after completing the study. If these participants asked for their compensation later, it was granted retroactively. Post-hoc statistical power analyses (GPower 3.1.9.2)

revealed a power > .95 in all experiments for the main statistical comparison of interest. The data for each experiment were collected in one shot without prior statistical analyses. We report all data exclusions, all manipulations, and all measures. All materials and data are available at https://osf.io/gxqrt/.

[2] Different from the wording in the current studies, Bar-Anan and Nosek (2012) asked whether participants intentionally rated the primes instead of the targets.

interaction, we conducted separate within-subjects ANOVAs comparing each level of Prime Valence within the valence-judgment condition and the familiarity-judgment condition, respectively. The analyses revealed that, within the valence-judgment condition, targets were evaluated more favorably when they followed a positive prime than when they followed a negative prime, $F(1, 68) = 17.46$, $p < .001$, $\eta_p^2 = .20$. Moreover, targets that followed positive primes were evaluated more favorably than targets that followed neutral primes, $F(1, 68) = 12.62$, $p = .001$, $\eta_p^2 = .16$. Evaluations of targets that followed negative primes tended to be less favorable than evaluations of targets that followed neutral primes, although this effect was only marginally significant, $F(1, 68) = 3.83$, $p = .055$, $\eta_p^2 = .05$. Counter to our predictions, this pattern was not replicated in the familiarity-judgment condition. Judgments of target-familiarity did not differ as a function of prime-valence (all $ps > .70$).

Intention ratings. To investigate whether participants' judgments of the targets were related to self-reported use of the primes, we calculated three priming scores and correlated them with participants' intention ratings. Toward this end, we subtracted (1) the mean judgments of targets after neutral primes from the mean judgments of targets after positive primes (*pos-neut$_{diff}$*), (2) the mean judgments of targets after negative primes from the mean judgments of targets after neutral primes (*neut-neg$_{diff}$*), and (3) the mean judgments of targets after negative primes from the mean judgments of targets after positive primes (*pos-neg$_{diff}$*). Replicating the findings by Bar-Anan and Nosek (2012), the three priming scores were positively correlated to intention ratings in the valence-judgment condition ($r = .24$, $p = .05$ for *pos-neut$_{diff}$*; $r = .38$, $p = .001$ for *neut-neg$_{diff}$*; $r = .50$, $p < .001$ for *pos-neg$_{diff}$*). These correlations indicate that larger priming effects in the AMP were associated with greater self-reported use of the primes in judging the targets. There were no significant correlations between the three priming scores and intention ratings in the familiarity-judgment condition (all $ps > .15$).[3]

Discussion

Experiment 1 did not confirm our hypothesis that prime-valence influences judgments of target-familiarity in the AMP. Yet, the study did replicate the typical effect of prime-valence on valence judgments, and the relative size of this effect was positively related to self-reported use of the primes in judgments of the targets (see Bar-Anan & Nosek, 2012). Although these findings may be taken as evidence against our hypothesis, a possible limitation of Experiment 1 is that our paradigm deviated

from earlier studies showing a positivity-familiarity effect (e.g., Garcia-Marques et al., 2004). Specifically, the AMP in the current study did not include any ideographs that were actually shown to participants before, and therefore could have been correctly identified as familiar (but see Brown & Marsh, 2009; Westerman et al., 2002). All of the ideographs in the AMP were novel stimuli that participants had not encountered before. To test whether the absence of familiar stimuli in the AMP might have been responsible for the lack of a positivity-familiarity effect, we conducted a second experiment.

Experiment 2

In Experiment 2, we replaced the bogus subliminal presentation task with a supraliminal presentation task that included 30 Chinese ideographs. Participants were instructed to memorize the ideographs for a subsequent task. The 30 ideographs of the supraliminal presentation task were used together with 30 novel ideographs as target stimuli in the AMP. We expected that positive primes should increase judgments of target-familiarity for novel ideographs, but not for ideographs that had been presented before.

Methods

Participants and design. Two-hundred-and-forty-nine participants (111 female, 129 male, 1 other; 8 not reported; mean age = 33.43 years) were recruited via Amazon's Mechanical Turk (see Buhrmester, Kwang & Gosling, 2011) to participate in a study on "visual distraction and memory". Participants were eligible to sign up for the experiment only if (a) their country of residence was registered as the United States, (b) they had completed at least 100 HITs[4] on MTurk, and (c) held an approval record of at least 95%. Participants were paid $0.50 for their participation. The study consisted of a 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Target Familiarity: old vs. new) × 2 (Task: valence judgment vs. familiarity judgment) mixed-model design, with the first two factors being manipulated within-participants and the third one between-participants.

Procedure. The experimental procedure was largely identical to Experiment 1 with the exception of the bogus subliminal presentation task. Because the study was administered online, we also asked participants if (a) they were interrupted during the experiment, (b) they were in the presence of others while solving the task, (c) they had help in solving the task, and (d) they wrote down the key assignment instead of memorizing it. Stimulus presentation and response measurement were controlled by Inquisit 4 Web by

---

[3] Responses to the open-ended questions revealed that, among the participants who indicated having used aspects of the real-life images, 53% mentioned the valence of the primes, 10% mentioned the familiarity of the primes, 17% mentioned other features of the primes, and 27% did not mention any specific features of the primes. 7%

mentioned both the valence and the familiarity of the primes.
[4] Human Intelligence Tasks (HITs) include a variety of different tasks, such as product-choice tasks, different types of questionnaires, or other experimental research available on MTurk.

Millisecond Software, allowing for precise timing in online studies.

Memory task. In the first part of the study, participants were informed that they would be presented with pictures of Chinese ideographs. Participants' task was to look at the ideographs and memorize them as good as possible. The memory task included a total of 30 ideographs, each of which was presented for 2000ms with an inter-trial interval of 1000ms.

AMP. The design of the AMP was largely identical to the one in Experiment 1. Different from Experiment 1, the AMP included 30 ideographs that were previously shown in the memory task (old targets) and 30 ideographs that have not been shown before (new targets). As prime stimuli we used 10 positive, 10 negative, and 10 neutral images from the International Affective Picture System (Lang et al., 2008). Ten of the 30 targets within each category were paired with positive primes; 10 were paired with negative primes; and 10 were paired with neutral primes, summing up to a total of 60 trials. Thus, each prime was presented twice throughout the task: once with an old target and once with a new target. Order of trials was randomized by the computer for each participant. The assignment of nominal targets as old versus new was counterbalanced.

Results

Target judgments. Data from 14 participants were incomplete and therefore excluded from the analysis. In addition, we excluded the data from five participants who used the same response key on more than 90% of the AMP trials (see Deutsch et al., 2009). The following analysis is based on the remaining 230 participants.[5] The proportion of pleasant/familiar responses towards the ideographs served as the dependent variable. A 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Target Familiarity: old vs. new) × 2 (Task: valence judgment vs. familiarity judgment) mixed-model ANOVA revealed a significant main effect of Prime Valence, $F(2, 456) = 35.71$, $p < .001$, $\eta_p^2 = .14$, which was qualified by a significant two-way interaction of Prime Valence and Task, $F(2, 456) = 25.00$, $p < .001$, $\eta_p^2 = .10$ (see Figure 2). To specify this interaction, we conducted separate within-subjects ANOVAs comparing each level of Prime Valence within the valence-judgment condition and the familiarity-judgment condition, respectively. These analyses revealed that, within the valence-judgment condition, targets were evaluated more favorably when they followed a positive prime than when they followed a negative prime, $F(1, 111) = 52.88$, $p < .001$, $\eta_p^2 = .32$. Moreover, targets that followed positive primes were evaluated more favorably than

targets that followed neutral primes, $F(1, 111) = 29.10$, $p < .001$, $\eta_p^2 = .21$, and targets that followed negative primes were evaluated less favorably than targets that followed neutral primes $F(1, 111) = 19.45$, $p < .001$, $\eta_p^2 = .15$. Prime Valence did not influence judgments of the targets in the familiarity-judgment condition (all ps > .14).

In addition to these effects, the omnibus ANOVA revealed a significant main effect of Familiarity, $F(1, 228) = 14.01$, $p < .001$, $\eta_p^2 = .06$, which was qualified by a significant two-way interaction of Familiarity and Task, $F(1, 228) = 8.59$, $p = .004$, $\eta_p^2 = .04$. To further specify this interaction, we conducted separate within-subjects ANOVAs with the factor Target Familiarity for the valence-judgment condition and the familiarity-judgment condition, respectively. The analyses indicated that, in the familiarity-judgment condition, old targets were more frequently identified as familiar than novel targets ($M_{old} = .59$ vs. $M_{new} = .52$), $F(1, 117) = 16.11$, $p < .001$, $\eta_p^2 = .12$. Target judgments remained unaffected by the status of the targets in the valence-judgment condition ($M_{old} = .55$ vs. $M_{new} = .54$), $F(1, 111) = .58$, $p = .50$, $\eta_p^2 = .01$. No other main or interaction effect reached statistical significance (all ps > .15).

Intention ratings. To investigate the relation between AMP effects and self-reported use of the primes, we again correlated intention ratings with the size of priming effects. Toward this end, three priming scores were calculated following the procedures in Experiment 1. Collapsing data over old and new targets, intention ratings were positively correlated with all three types of priming scores in the valence-judgment condition ($r = .21$, $p = .03$ for $pos\text{-}neut_{diff}$; $r = .29$, $p = .002$ for $neut\text{-}neg_{diff}$; $r = .38$, $p < .001$ for $pos\text{-}neg_{diff}$). There were no significant correlations between intention ratings and priming scores in the familiarity-judgment condition (all ps > .41).[6]

Discussion

Experiment 2 revealed that the absence of familiar target stimuli in Experiment 1 was not responsible for the lack of a positivity-familiarity effect in the AMP. Although participants in the current study were able to differentiate between old and new targets in the familiarity-judgment condition, their familiarity judgments were again unaffected by the valence of the primes. Together with the results of Experiment 1, these findings pose a challenge to our hypothesis that positivity-familiarity effects could be used to isolate the contribution of unintentional processes in the AMP.

---

[5] Note that in this and all other experiments additional exclusion of participants who had prior knowledge in Chinese, were interrupted or in the presence of others during the experiment, wrote down the key assignment instead of memorizing it, or were helped by others during the task did not change the overall pattern of results.

[6] Responses to the open-ended questions revealed that, among the participants who indicated having used aspects of the real-life images, 29% mentioned the valence of the primes, 3% mentioned the familiarity of the primes, 54% mentioned other features of the primes, and 14% did not mention any specific features of the primes.

Experiment 3

A possible explanation for the absence of a positivity-familiarity effect in the AMP is that misattribution of valence to familiarity depends on boundary conditions that are not met in the AMP. In Experiment 3, we tested one potential boundary condition: the duration of target presentations. Previous studies that successfully demonstrated a positivity-familiarity link (e.g., Garcia-Marques et al., 2004) did not limit the duration of the target presentations. Instead, the targets usually remained on the screen until a response was given. Although priming effects in the AMP are typically smaller for longer presentations of the targets, Payne et al. (2010) obtained reliable AMP effects with presentation times of 1000ms. Based on these findings, Experiment 3 manipulated the presentation times of the targets (i.e., 100ms vs. 1000ms) to gain deeper insights into the boundary conditions of positivity-familiarity effects in the AMP. We expected that longer target presentations would reduce the effect of prime-valence on valence judgments. At the same time, we wanted to explore whether longer target presentations would increase the likelihood for a positivity-familiarity effect in the AMP.

Methods

Participants and design. Four-hundred-and-twenty-nine participants (237 female, 173 male, 3 other; 16 not reported; mean age = 36.84 years) were recruited via MTurk. We limited participation to MTurk workers that had not participated in Experiment 2. The compensation and all eligibility criteria were identical to Experiment 2. The study consisted of a 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Target Familiarity: old vs. new) × 2 (Target Presentation: 100ms vs. 1000ms) × 2 (Task: valence judgment vs. familiarity judgment) mixed-model design, with the first two factors being manipulated within-participants and the last two factors between-participants. The experimental procedure was identical to Experiment 2, the only exception being the additional manipulation of Target Presentation.

Results

Target judgments. Data from 19 participants were incomplete and therefore excluded from the analysis. In addition, we excluded data from nine participants who used the same response key on more than 90% of the AMP trials (see Deutsch et al., 2009). The following analysis is based on the remaining 401 participants. The proportion of pleasant/familiar responses served as the dependent variable. A 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Target Familiarity: old vs. new) × 2 (Target Presentation: 100ms vs. 1000ms) × 2 (Task: valence judgment vs. familiarity judgment) mixed-model ANOVA revealed a significant main effect of Task, $F(1, 397) = 17.53$, $p < .001$, $\eta_p^2 = .04$, and a significant main effect of Prime Valence, $F(2, 794) = 31.96$, $p < .001$, $\eta_p^2 = .08$, which were qualified by a significant two-way interaction of Prime Valence and Task, $F(2, 794) = 32.46$, $p < .001$, $\eta_p^2 = .08$ (see Figure 3). To specify this interaction, we conducted separate within-subjects ANOVAs comparing each level of Prime Valence within the valence-judgment condition and the familiarity-judgment condition respectively. The analyses indicated that, within the valence-judgment condition, targets were evaluated more favorably when they followed a positive prime than when they followed a negative prime, $F(1, 199) = 53.44$, $p < .001$, $\eta_p^2 = .21$. Moreover, targets that followed positive primes were evaluated more favorably than targets that followed neutral primes, $F(1, 199) = 34.55$, $p < .001$, $\eta_p^2 = .15$, and targets that followed negative primes were evaluated less favorably than targets that followed neutral primes, $F(1, 199) = 18.01$, $p < .001$, $\eta_p^2 = .08$. Prime Valence did not influence judgments of the targets in the familiarity-judgment condition (all $ps > .25$).

In addition, the 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Target Familiarity: old vs. new) × 2 (Target Presentation: 100ms vs. 1000ms) × 2 (Task: valence judgment vs. familiarity judgment) ANOVA revealed a marginally significant two-way interaction of Prime Valence and Target Presentation, $F(2, 794) = 3.04$, $p = .05$, $\eta_p^2 = .01$, indicating that the effects of Prime Valence were less pronounced when the targets were presented for 1000ms (all $ps < .02$; all $\eta_p^2 > .03$) than when the targets were presented for 100ms (all $ps < .002$; all $\eta_p^2 > .06$). Replicating the results of Experiment 2, the ANOVA also revealed a significant main effect of Familiarity, $F(1, 397) = 40.89$, $p < .001$, $\eta_p^2 = .09$, which was qualified by a significant two-way interaction of Familiarity and Task, $F(1, 397) = 34.92$, $p < .001$, $\eta_p^2 = .08$. To specify this interaction, we conducted separate within-subjects ANOVAs with the factor Target Familiarity for the valence-judgment condition and the familiarity-judgment condition, respectively. In the familiarity-judgment condition, old targets were more frequently identified as familiar than novel targets ($M_{old} = .56$ vs. $M_{new} = .46$), $F(1, 200) = 59.91$, $p < .001$, $\eta_p^2 = .23$. Target judgments remained unaffected by the status of the targets in the valence-judgment condition ($M_{old} = .56$ vs. $M_{new} = .56$), $F(1, 199) = 0.08$, $p = .78$, $\eta_p^2 = .00$.

Intention ratings. To investigate the relation between AMP effects and self-reported use of the primes, we again correlated intention ratings with the size of priming effects. Collapsing data over old and new targets, intention ratings were positively correlated with all three types of difference scores in the valence-judgment condition ($r = .22$, $p = .002$ for *pos-neut$_{diff}$*; $r = .29$, $p < .001$ for *neut-neg$_{diff}$*; $r = .37$, $p < .001$ for *pos-neg$_{diff}$*). None of the correlations were statistically

significant in the familiarity-judgment condition (all *p*s > .25).[7]

Discussion

The results of Experiment 3 replicated the main findings of Experiment 2. Although participants were able to differentiate between old and new targets, their judgments of target-familiarity were unaffected by the valence of the primes. Importantly, presenting the target for a longer duration did not qualify the obtained pattern of results. There was no evidence for a positivity-familiarity effect regardless of whether the targets were presented for 100ms or 1000ms.

Experiment 4

Because Experiments 1 to 3 consistently revealed effects of prime-valence on judgments on target-valence, but no effects on judgments of target-familiarity, Experiment 4 investigated whether there are any priming effects at all on judgments of target-familiarity in the AMP. Toward this end, we manipulated not only the valence of the primes, but also their familiarity. This design allowed us to test two kinds of priming effects on judgments of familiarity: (a) effects of prime-valence on judgments of target-familiarity (i.e., cross-dimensional priming effect) and (b) effects of prime-familiarity on judgments of target-familiarity (i.e., within-dimensional priming effect). As with Experiments 1 to 3, our main question was whether prime-valence influences judgments of target-familiarity and, if so, whether such priming effects are independent of participants' self-reported use of prime-valence. A secondary question was whether judgments of familiarity in the AMP show any evidence for priming effects, including within-dimensional effects of prime-familiarity on judgments of target-familiarity.

Methods

Participants and design. Four-hundred-and-twenty-two participants (165 female, 238 male, 1 other, 18 not reported; mean age = 35.25 years) were recruited via MTurk. We limited participation to MTurk workers that had not participated in Experiment 2 or 3. The compensation and all eligibility criteria were identical to Experiment 2 and 3. The study consisted of a 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Prime Familiarity: old vs. new) × 2 (Target Familiarity: old vs. new) × 2 (Task: valence judgment vs. familiarity judgment) mixed-model design, with the first three factors being manipulated within-participants and the last factor between-participants. The experimental procedure was largely identical to Experiment 2 with the

exception of a short memory task that was completed before the AMP.

Memory task. In the first part of the study, participants were informed that they would be presented with pictures of Chinese ideographs and real-life images (i.e., IAPS pictures). Participants' task was to look at the ideographs and the real-life images and memorize them as good as possible. The memory task included a total of 36 ideographs and 18 IAPS pictures (six positive, six neutral, six negative). Each ideograph was presented once and each IAPS picture was repeated five times, summing up to a total of 126 trials.[8] The stimuli were presented intermixed in a blocked random order with the restriction that no IAPS picture was repeated before all other IAPS pictures were presented at the same rate. Each stimulus was presented for 1000ms with an inter-trial interval of 500ms.

AMP. The AMP was largely identical to the one in Experiment 2. Different from Experiment 2, the AMP included 18 prime stimuli that were previously shown in the memory task (old primes) and 18 prime stimuli that have not been shown before (new primes). Moreover, the AMP included 36 ideographs that were previously shown in the memory task (old targets) and 36 ideographs that have not been shown before (new targets). Each prime was presented twice throughout the task, once with an old target and once with a new target, summing up to a total of 72 unique prime-target pairs. Order of trials was randomized by the computer for each participant. The assignment of nominal primes and targets as old versus new was counterbalanced.

Intention ratings. To obtain a more fine-grained assessment of intentional use of prime features, self-reported intentionality was measured with two 5-point scales, which asked participants to respond to the following two questions: (a) "Did you intentionally use positive or negative aspects of the real-life images to make your judgments about the Chinese ideographs?" (b) "Did you intentionally use the familiarity of the real-life images to make your judgments about the Chinese ideographs?" The response options were (1) *not at all*; (2) *usually no*; (3) *sometimes, but not always*; (4) *usually yes*; (5) *yes*.

Results

Target judgments. Data from 16 participants were incomplete and therefore excluded from the analysis. In addition, we excluded the data from five participants who used the same response key on more than 90% of the AMP trials (see Deutsch et al., 2009). The following analysis is based on the remaining 401 participants. The

---

[7] Responses to the open-ended questions revealed that, among the participants who indicated having used aspects of the real-life images, 47.5% mentioned the valence of the primes, 4% mentioned the familiarity of the primes, and 48.5% mentioned other features of the primes.

[8] We aimed to increase the effect of prime-familiarity, while keeping the familiarity of the targets comparable to Experiments 2 and 3. Thus, to allow for clear memory effects of the primes without changing the conditions for the targets, repetition of the primes was higher compared to the targets.

proportion of pleasant/familiar responses served as the dependent variable. A 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Prime Familiarity: old vs. new) × 2 (Target Familiarity: old vs. new) × 2 (Task: valence judgment vs. familiarity judgment) mixed-model ANOVA revealed a significant main effect of Target Familiarity, $F(1, 399) = 18.43$, $p < .001$, $\eta_p^2 = .04$, and a significant main effect of Task, $F(1, 399) = 10.69$, $p = .001$, $\eta_p^2 = .03$, which were qualified by a significant two-way interaction of Target Familiarity and Task, $F(1, 399) = 13.28$, $p < .001$, $\eta_p^2 = .03$. To specify this interaction, we conducted separate within-subjects ANOVAs with the factor Target Familiarity for the valence-judgment condition and the familiarity-judgment condition, respectively. These analyses indicated that, within the familiarity-judgment condition, the targets were evaluated as more familiar when they were presented before than when they were not presented before ($M_{old} = .55$ vs. $M_{new} = .50$), $F(1, 194) = 22.89$, $p < .001$, $\eta_p^2 = .11$. There was no significant effect of Target Familiarity on target judgments in the valence-judgment condition ($M_{old} = .57$ vs. $M_{new} = .56$), $F(1, 205) = .32$, $p = .57$, $\eta_p^2 = .00$.

More important for the current investigation, the 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Prime Familiarity: old vs. new) × 2 (Target Familiarity: old vs. new) × 2 (Task: valence judgment vs. familiarity judgment) ANOVA revealed a significant main effect of Prime Valence, $F(2, 798) = 28.64$, $p < .001$, $\eta_p^2 = .08$, a significant main effect of Prime Familiarity, $F(1, 399) = 23.79$, $p < .001$, $\eta_p^2 = .06$, a significant two-way interaction of Prime Valence and Task, $F(2, 798) = 24.18$, $p < .001$, $\eta_p^2 = .06$, and a significant two-way interaction of Prime Familiarity and Task, $F(2, 399) = 13.53$, $p < .001$, $\eta_p^2 = .03$, which were qualified by a significant three-way interaction of Prime Familiarity, Prime Valence, and Task, $F(2, 798) = 4.09$, $p = .02$, $\eta_p^2 = .01$ (see Figure 4). To decompose this three-way interaction, we conducted separate 2 (Prime Valence) × 2 (Prime Familiarity) ANOVAs for the valence-judgment and familiarity-judgment condition, respectively.

In the valence-judgment condition, there was a significant main effect of Prime Valence, $F(2, 410) = 34.15$, $p < .001$, $\eta_p^2 = .15$. To specify this interaction, we conducted separate within-subjects ANOVAs for each level of Prime Valence with the valence-judgment condition and the familiarity-judgment condition, respectively. Analyses revealed that the targets were evaluated more favorably when they followed a positive prime than when they followed a negative prime, $F(1, 205) = 41.97$, $p < .001$, $\eta_p^2 = .17$. Moreover, targets that followed positive primes were evaluated more favorably than targets that followed neutral primes, $F(1, 205) = 8.51$, $p = .004$, $\eta_p^2 = .04$, and targets that followed negative primes were evaluated less favorably than

targets that followed neutral primes, $F(1, 205) = 38.77$, $p < .001$, $\eta_p^2 = .16$. No other effect reached statistical significance in the valence-judgment condition (all ps > .14).

In the familiarity-judgment condition, there was a significant main effect of Prime Familiarity, $F(1, 194) = 20.88$, $p < .001$, $\eta_p^2 = .10$, which was qualified by a significant two-way interaction of Prime Familiarity and Prime Valence, $F(2, 388) = 4.22$, $p = .02$, $\eta_p^2 = .02$. To specify this interaction, we conducted separate within-subjects ANOVAs testing the effect of Prime Valence for old and new primes, respectively. The analyses revealed that judgments of target-familiarity were influenced by the valence of the primes when the primes had been presented before (i.e., old primes), $F(2, 388) = 6.01$, $p = .003$, $\eta_p^2 = .03$, but not when the primes had not been presented before (i.e., new primes), $F(2, 388) = .52$, $p = .59$, $\eta_p^2 = .00$. Specifically, targets were judged as more familiar when they followed old positive primes than when they followed old neutral primes, $F(1, 194) = 11.85$, $p = .001$, $\eta_p^2 = .06$, or old negative primes $F(1, 194) = 6.83$, $p = .01$, $\eta_p^2 = .03$. Judgments of target-familiarity did not differ for old neutral primes and old negative primes, $F(1, 194) = .30$, $p = .58$, $\eta_p^2 = .00$.

Intention ratings. To investigate the relation between AMP effects and self-reported use of prime features, we calculated four priming scores and analyzed their correlations with each type of intention rating (i.e., valence, familiarity). In addition to the *pos-neut$_{diff}$*, *neut-neg$_{diff}$* and *pos-neg$_{diff}$* priming scores (collapsing data over old and new primes as well as old and new targets), we calculated an *old-new$_{diff}$* priming score by subtracting the mean target judgments after new primes from the mean target judgments after old primes (collapsing data over positive, neutral, and negative primes as well as old and new targets). Self-reported use of prime-valence showed significant or marginally significant positive correlations with all three types of valence difference scores in the valence-judgment condition ($r = .12$, $p = .09$ for *pos-neut$_{diff}$*; $r = .29$, $p < .001$ for *neut-neg$_{diff}$*; $r = .29$, $p < .001$ for *pos-neg$_{diff}$*). None of the three correlations were statistically significant in the familiarity-judgment condition (all ps > .38). Self-reported use of prime familiarity was not significantly correlated with the familiarity difference scores (*old-new$_{diff}$*) in the valence-judgment condition ($r = .11$, $p = .13$) and the familiarity-judgment condition ($r = .10$, $p = .16$). Because positive primes increased judgments of target-familiarity when the primes had been presented before, we also analyzed the correlation between self-reported use of prime-valence and priming scores of old positive primes (*old-pos-old-neut$_{diff}$*, *old-pos-old-neg$_{diff}$*) in the familiarity-judgment condition. Neither of the two correlations was statistically significant (ps > .82).

Discussion

Different from the findings of our previous studies, Experiment 4 revealed a significant effect of prime-valence on judgments of target-familiarity. However, this effect was limited to primes that had been presented to participants in a memory task before they completed the AMP. For primes that had not been presented before, Experiment 4 replicated the findings of our previous studies, showing that prime-valence influenced judgments of target-valence, but not judgments of target-familiarity. Importantly, positivity-familiarity effects of previously presented primes were unrelated to self-reported use of prime-valence, suggesting that prime-valence influenced judgments of target-familiarity unintentionally. These findings support our hypothesis that the positivity-familiarity effect could help to isolate unintentional processes in the AMP.

Experiment 5

The finding that positivity-familiarity effects in the AMP were limited to primes that had been presented in a prior task was clearly unexpected. This effect might be explained by a recognition advantage for positive primes (e.g., Dougal & Rotello, 2007; Phelps & Sharot, 2008) which may translate into an asymmetric effect on judgments of the targets. However, because this effect was driven by a single cell in a three-way interaction with a total of 12 cells, it seems appropriate to replicate the obtained pattern of results before drawing theoretical and practical conclusions. To address these concerns, Experiment 5 aimed to replicate the main finding of Experiment 4 with a new sample of participants using the same materials, procedure, and experimental design.

Methods

Participants and design. Four-hundred-and-nine participants (205 female, 191 male, 13 not reported; mean age = 36.19 years) were recruited via MTurk. We limited participation to MTurk workers that had not participated in our previous experiments. The compensation and all eligibility criteria were identical to Experiment 4. The experimental design, procedure, and all materials were identical to Experiment 4.

Results

Target judgments. Data from 13 participants were incomplete and therefore excluded from the analysis. In addition, we excluded the data from eight participants who used the same response key on more than 90% of the AMP trials (see Deutsch et al., 2009). The following analysis is based on the remaining 388 participants. The proportion of pleasant/familiar responses served as the dependent variable. A 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Prime Familiarity: old vs. new) × 2 (Target Familiarity: old vs. new) × 2 (Task: valence judgment vs. familiarity judgment) mixed-model ANOVA revealed a significant main effect of Target

Familiarity, $F(1, 386) = 37.95$, $p < .001$, $\eta_p^2 = .09$, and a significant main effect of Task, $F(1, 386) = 20.01$, $p < .001$, $\eta_p^2 = .05$, which were qualified by a significant two-way interaction of Target Familiarity and Task, $F(1, 386) = 21.97$, $p < .001$, $\eta_p^2 = .05$. To specify this interaction, we conducted separate within-subjects ANOVAs with the factor Target Familiarity for the valence-judgment condition and the familiarity-judgment condition, respectively. Within the familiarity-judgment condition, the targets were evaluated as more familiar when they were presented before than when they were not presented before ($M_{old} = .54$ vs. $M_{new} = .47$), $F(1, 190) = 49.14$, $p < .001$, $\eta_p^2 = .21$. There was no significant effect of Target Familiarity on target judgments in the valence-judgment condition ($M_{old} = .56$ vs. $M_{new} = .55$), $F(1, 196) = 1.33$, $p = .25$, $\eta_p^2 = .01$.

More important for the current investigation, the 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Prime Familiarity: old vs. new) × 2 (Target Familiarity: old vs. new) × 2 (Task: valence judgment vs. familiarity judgment) ANOVA revealed a significant main effect of Prime Valence, $F(2, 772) = 39.23$, $p < .001$, $\eta_p^2 = .09$, which was qualified by a significant two-way interaction of Prime Valence and Task, $F(2, 772) = 45.36$, $p < .001$, $\eta_p^2 = .11$ (see Figure 5). To specify this interaction, we conducted separate within-subjects ANOVAs comparing each level of Prime Valence within the valence-judgment condition and the familiarity-judgment condition, respectively. The analyses indicated that, within the valence-judgment condition, targets were evaluated more favorably when they followed a positive prime than when they followed a negative prime, $F(1, 196) = 70.15$, $p < .001$, $\eta_p^2 = .26$. Moreover, targets that followed positive primes were evaluated more favorably than targets that followed neutral primes, $F(1, 196) = 17.40$, $p < .001$, $\eta_p^2 = .08$, and targets that followed negative primes were evaluated less favorably than targets that followed neutral primes, $F(1, 196) = 51.32$, $p < .001$, $\eta_p^2 = .21$. Prime Valence did not influence judgments of the targets in the familiarity-judgment condition (all ps > .48).

The 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Prime Familiarity: old vs. new) × 2 (Target Familiarity: old vs. new) × 2 (Task: valence judgment vs. familiarity judgment) ANOVA also revealed a significant main effect of Prime Familiarity, $F(1, 386) = 18.82$, $p < .001$, $\eta_p^2 = .05$, which was qualified by a marginally significant two-way interaction of Prime Familiarity and Task, $F(1, 386) = 3.84$, $p = .05$, $\eta_p^2 = .01$. To specify this interaction, we conducted separate within-subjects ANOVAs with the factor Prime Familiarity for the valence-judgment condition and the familiarity-judgment condition, respectively. Within the familiarity-judgment condition, the targets were judged as more familiar when they followed an old prime than when they followed a new prime ($M_{old} = .54$ vs. $M_{new} = $

.46), $F(1, 190) = 12.54$, $p = .001$, $\eta_p^2 = .06$. Moreover, within the valence-judgment condition, the targets were evaluated more favorably when they followed an old prime than when they followed a new prime ($M_{old} = .57$ vs. $M_{new} = .54$), $F(1, 196) = 6.24$, $p = .01$, $\eta_p^2 = .03$, but this (cross-dimensional) effect of prime-familiarity on judgments of target valence was weaker compared to the (within-dimensional) effect of prime-familiarity on judgments of target-familiarity.

In addition to these effects, there was a theoretically uninteresting two-way interaction of Prime Valence and Target Familiarity, $F(2, 772) = 5.51$, $p = .004$, $\eta_p^2 = .01$, showing that, regardless of the judgmental task, Prime Valence had a stronger effect on judgments of new targets, $F(2, 774) = 25.21$, $p < .001$, $\eta_p^2 = .06$, compared to judgments of old targets, $F(2, 774) = 31.18$, $p = .08$, $\eta_p^2 = .08$. Counter to the findings of Experiment 4, the three-way interaction of Prime Familiarity, Prime Valence, and Task was not statistically significant, $F(2, 772) = 1.05$, $p = .35$, $\eta_p^2 = .00$.

Intention ratings. The relation between AMP effects and self-reported use of prime features were analyzed in line with the procedures of Experiment 4. Self-reported use of prime-valence showed significant positive correlations with all three types of valence difference scores in the valence-judgment condition ($r = .18$, $p = .01$ for *pos-neut_{diff}*; $r = .41$, $p < .001$ for *neut-neg_{diff}*; $r = .44$, $p < .001$ for *pos-neg_{diff}*). None of the three correlations were statistically significant in the familiarity-judgment condition (all $ps > .05$). Different from Experiment 4, self-reported use of prime-familiarity was significantly correlated with the familiarity difference scores (*old-new_{diff}*) in the valence-judgment condition ($r = .28$, $p < .001$). Self-reported use of prime-familiarity was marginally correlated with the familiarity difference scores in the familiarity-judgment condition ($r = .14$, $p = .05$).

Discussion

Experiment 5 failed to replicate the main finding of Experiment 4, which showed that prime-valence influenced judgments of target-familiarity when the primes had been presented before the AMP. Counter to our hypothesis, there was no evidence for a positivity-familiarity effect in Experiment 5. Nevertheless, we did replicate the typical effect of prime-valence on valence judgments, and the relative size of this effect was again positively related to self-reported use of the primes in judgments of the targets (see Bar-Anan & Nosek, 2012). Moreover, replicating a secondary finding of Experiment 4, judgments of target-familiarity were influenced by the familiarity of the primes, indicating that judgments of target-familiarity are indeed influenced by features of the primes. However, priming effects on judgments of familiarity were limited to within-dimensional influences (i.e., effects of prime familiarity on judgments

of target-familiarity) and did not occur across dimensions (i.e., effects of prime-valence on judgments of target-familiarity).

Experiments 6

In Experiments 1-5, participants were led to believe that some of the targets in the AMP had been presented in a preceding task. Thus, participants might have been motivated to provide accurate responses when they were asked to identify old and new targets in the AMP. An anonymous reviewer suggested that this aspect of our studies might have counteracted the emergence of a positivity-familiarity effect. Consistent with this concern, Eder and Deutsch (2015) found that priming effects in the AMP were reduced when participants were motivated to provide accurate responses to the targets. Eder and Deutsch speculated that the obtained reduction might be due to a greater reliance on cognitive strategies in judging the targets and a reduced reliance on "gut feelings," the latter of which might be critical for misattribution to occur (see also De Houwer & Smith, 2013). Hence, a possible explanation for the lack of a positivity-familiarity effect in Experiments 1-5 is that the task context induced an accuracy goal in the familiarity condition, which reduced the likelihood of misattribution of valence to familiarity. Experiment 6 tested this possibility by omitting the memory phase before the AMP.

Methods

Participants and design. Two-hundred-and-ten participants (80 female, 127 male, 3 not reported; mean age = 35.61 years) were recruited via MTurk. We limited participation to MTurk workers that had not participated in our previous experiments. The compensation and all eligibility criteria were identical to Experiment 5. The experiment consisted of a 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Task: valence judgment vs. familiarity judgment) mixed-model design, with the first factor being manipulated within-participants and the second one between-participants. Design and procedure were identical to Experiment 1 with the following exceptions: (1) there was no memory phase before the AMP and (2) participants in the familiarity-judgment condition were asked whether they considered the Chinese ideograph as more familiar or less familiar than the average Chinese ideograph. The measure of self-reported intentionality was identical to Experiment 5.

Results

Target judgments. Data from five participants were incomplete and therefore excluded from the analysis. In addition, we excluded the data from 10 participants who used the same response key on more than 90% of the AMP trials (see Deutsch et al., 2009). The following analysis is based on the remaining 195 participants. The proportion of pleasant/familiar

responses served as the dependent variable. A 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Task: valence judgment vs. familiarity judgment) mixed-model ANOVA revealed a significant main effect of Prime Valence, $F(2, 386) = 28.36$, $p < .001$, $\eta_p^2 = .13$, qualified by a significant two-way interaction of Prime Valence and Task, $F(2, 386) = 10.89$, $p < .001$, $\eta_p^2 = .05$ (see Figure 6). To specify this interaction, we conducted within-subjects ANOVAs comparing each level of Prime Valence within the valence-judgment condition and the familiarity-judgment condition, respectively. Within the valence-judgment condition, targets were evaluated more favorably when they followed a positive prime than when they followed a negative prime, $F(1, 96) = 34.80$, $p < .001$, $\eta_p^2 = .27$. Moreover, targets that followed positive primes were evaluated more favorably than targets that followed neutral primes, $F(1, 96) = 20.33$, $p < .001$, $\eta_p^2 = .18$, and targets that followed negative primes were evaluated less favorably than evaluations of targets that followed neutral primes, $F(1, 96) = 12.96$, $p = .001$, $\eta_p^2 = .12$. A similar, albeit weaker, pattern emerged in the familiarity-judgment condition. Targets were judged as more familiar when they followed a positive prime than when they followed a negative prime, $F(1, 97) = 6.95$, $p = .01$, $\eta_p^2 = .07$. Familiarity judgments of targets that followed neutral primes were in-between, but these judgments did not significantly differ from judgments of targets that followed positive primes, $F(1, 97) = 1.89$, $p = .17$, $\eta_p^2 = .02$, and targets that followed negative primes, $F(1, 97) = 2.59$, $p = .11$, $\eta_p^2 = .03$.

Intention ratings. To investigate whether participants' judgments of the targets were related to self-reported use of the primes, we again calculated three priming scores (*pos-neut_diff*, *neut-neg_diff*, *pos-neg_diff*) and analyzed their correlations with self-reported use of prime-valence. Self-reported use of prime-valence showed significant positive correlations with all three types of valence difference scores in the valence-judgment condition ($r = .22$, $p = .03$ for *pos-neut_diff*; $r = .31$, $p = .002$ for *neut-neg_diff*; $r = .40$, $p < .001$ for *pos-neg_diff*). None of the three priming scores revealed a significant positive correlation to self-reported use of prime-valence in the familiarity-judgment condition ($r = .15$, $p = .13$ for *pos-neut_diff*; $r = -.19$, $p = .06$ for *neut-neg_diff*; $r = -.06$, $p = .57$ for *pos-neg_diff*).[9]

Discussion

Experiment 6 suggests that the failure to obtain a positivity-familiarity effect in our previous studies might have been due to the inclusion of a memory task before the AMP. This task might have induced a motivation to provide accurate judgments of the targets in the familiarity-judgment condition, which has been shown to reduce priming effects in the AMP (see Eder & Deutsch, 2015). When we omitted the memory task in Experiment 6, we found a significant effect of prime-valence on judgments of target-familiarity, and this effect was unrelated to self-reported use of the prime-valence.

Experiment 7

To ensure that the findings of Experiment 6 do not reflect a false positive, Experiment 7 aimed to replicate these findings with a new sample of participants using the same materials, procedure, and experimental design.

Methods

Participants and design. Two-hundred-and-five participants (80 female, 124 male, 1 not reported; mean age = 35.84 years) were recruited via MTurk. We limited participation to MTurk workers that had not participated in our previous experiments. The compensation and all eligibility criteria were identical to Experiment 6. The experimental design, procedure, and all materials were identical to Experiment 6.

Results

Target judgments. Data from two participants were incomplete and therefore excluded from the analysis. In addition, we excluded the data from six participants who used the same response key on more than 90% of the AMP trials (see Deutsch et al., 2009). The following analysis is based on the remaining 197 participants. The proportion of pleasant/familiar responses served as the dependent variable. A 3 (Prime Valence: positive vs. neutral vs. negative) × 2 (Task: valence judgment vs. familiarity judgment) mixed-model ANOVA revealed a significant main effect of Task, $F(1, 195) = 6.53$, $p = .01$, $\eta_p^2 = .03$, and a significant main effect of Prime Valence, $F(2, 390) = 34.36$, $p < .001$, $\eta_p^2 = .15$, qualified by a significant two-way interaction of Prime Valence and Task, $F(2, 390) = 7.08$, $p = .001$, $\eta_p^2 = .04$ (see Figure 7). To specify this interaction, we conducted separate within-subjects ANOVAs comparing each level of Prime Valence within the valence-judgment condition and the familiarity-judgment condition, respectively. Within the valence-judgment condition, targets were evaluated more favorably when they followed a positive prime than when they followed a negative prime, $F(1, 87) = 30.31$, $p < .001$, $\eta_p^2 = .26$. Moreover, targets that followed positive primes were evaluated more favorably than targets that followed neutral primes, $F(1, 87) = 5.08$, $p = .03$, $\eta_p^2 = .06$, and evaluations of targets that followed

---

[9] Self-reported use of prime-familiarity showed significant positive correlations with all three types of valence difference scores in the valence-judgment condition ($r = .23$, $p = .03$ for *pos-neut_diff*; $r = .21$, $p = .04$ for *neut-neg_diff*, $r = .33$, $p = .001$ for *pos-neg_diff*). In the familiarity-judgment condition, one of the three priming scores showed a significant negative correlation with self-reported use of prime familiarity ($r = -.25$, $p = .01$ for *neut-neg_diff*, all other *ps* > .17).

negative primes were significantly less favorable than evaluations of targets that followed neutral primes, $F(1, 87) = 26.95$, $p = .001$, $\eta_p^2 = .24$. A similar pattern emerged in the familiarity-judgment condition. Targets were judged as more familiar when they followed a positive prime than when they followed a negative prime, $F(1, 108) = 12.82$, $p = .001$, $\eta_p^2 = .11$. Moreover, targets that followed positive primes were judged as more familiar than targets that followed neutral primes, $F(1, 108) = 5.03$, $p = .03$, $\eta_p^2 = .05$, and targets that followed negative primes were judged as less familiar than targets that followed neutral primes, $F(1, 108) = 5.57$, $p = .02$, $\eta_p^2 = .05$.

Intention ratings. To investigate whether participants' judgments of the targets were related to self-reported use of the primes, we again calculated three priming scores (*pos-neut*$_{diff}$, *neut-neg*$_{diff}$, *pos-neg*$_{diff}$) and analyzed their correlations with self-reported use of prime-valence. Self-reported use of prime-valence showed significant positive correlations with two of the three priming scores in the valence-judgment condition ($r = .10$, $p = .34$ for *pos-neut*$_{diff}$; $r = .42$, $p < .001$ for *neut-neg*$_{diff}$; $r = .39$, $p < .001$ for *pos-neg*$_{diff}$). In the familiarity-judgment condition, two of the three priming scores showed a significant or marginally significant positive correlation with self-reported use of prime-valence ($r = .20$, $p = .04$ for *pos-neut*$_{diff}$; $r = .05$, $p = .60$ for *neut-neg*$_{diff}$; $r = .19$, $p = .05$ for *pos-neg*$_{diff}$).[10]

Discussion

Experiment 7 replicated the positivity-familiarity effect obtained in Experiment 6, suggesting that effects of prime-valence on judgments of target-familiarity might be counteracted by a goal to provide accurate judgments of the targets (see Eder & Deutsch, 2015). Yet, different from the results of Experiment 6, some of the priming scores in the familiarity-judgment condition were positively related to self-reported use of prime-valence. Although correlations were relatively small, the latter finding indicates that more research on the role of intentional processes in positivity-familiarity effects is needed before these effects can be used to isolate intentional use of the primes in the AMP.

General Discussion

The aim of the current research was to investigate whether misattribution of valence to familiarity could be used to isolate the contribution of unintentional processes in the AMP (cf. Bar-Anan & Nosek, 2012). Drawing on previous evidence for positivity-familiarity effects (e.g., Corneille et al., 2005; Garcia-Marques et al., 2004; Monin, 2003; Phaf & Rotteveel, 2005), we tested whether positive and negative primes retain their influence on target judgments in the AMP when the response options are changed from evaluative judgments to judgments of familiarity. Our hypothesis was that positive stimuli should increase judgments of familiarity, whereas negative primes should reduce judgments of familiarity. We further reasoned that, if people deem prime-valence as irrelevant for their judgments of the targets' familiarity, prime-valence would not provide any meaningful information that could be used intentionally to judge the familiarity of the target. Thus, in addition to the hypothesized effects of prime-valence on judgments of target-familiarity, we expected that AMP effects should be related to self-reported use of prime-valence only when the task involved judgments of valence, but not when the task involved judgments of familiarity.

Our studies replicated the typical effect of prime-valence on evaluative judgments of the targets (Payne et al., 2005), and the relative size of this effect was positively related to self-reported use of the primes in judgments of the targets (Bar-Anan & Nosek, 2012). However, only two of the seven studies found a replicable effect of prime-valence on judgments of target-familiarity. A central feature of these two studies was that they did not include a prior memory phase that suggested a normatively accurate response to the targets in the familiarity-judgment task of the AMP. In the five studies that failed to obtain a replicable positivity-familiarity effect, participants were led to believe that some of the targets in the AMP had been presented in a prior task. Together with earlier findings by Eder and Deutsch (2015), this difference suggests that the emergence of a positivity-familiarity effect in the AMP might be counteracted by the presence of an accuracy goal. According to Eder and Deutsch, enhanced motivation to provide accurate judgments may increase reliance on cognitive strategies in judging the targets and reduce reliance on "gut feelings," the latter of which might be critical for misattribution to occur (see also De Houwer & Smith, 2013).

Although the findings of Experiments 6 and 7 support our primary hypothesis that prime-valence may influence judgments of target-familiarity in the AMP, the two studies are less supportive of our hypothesis that positivity-familiarity effects could be used to isolate the contribution of unintentional processes in the AMP. Although effects of prime-valence on judgments of target-familiarity were unrelated to self-reported use of prime-valence in Experiment 6, two of the three relevant correlations in Experiment 7 were statistically significant or marginally significant. When we combined the data from the two experiments, we found a

---

[10] Self-reported use of prime familiarity showed significant positive correlations with two types of valence difference scores in the valence-judgment condition ($r = .06$, $p = .56$ for *pos-neut*$_{diff}$; $r = .37$, $p = .001$ for *neut-neg*$_{diff}$, $r = .30$, $p = .005$ for *pos-neg*$_{diff}$). In the familiarity-judgment condition none of the three priming scores showed a significant correlation with self-reported use of prime familiarity (all $ps > .08$).

significant positive correlation for one of the three priming scores ($r = .18$, $p = .008$ for *pos-neut*$_{diff}$; $r = -.05$, $p = .49$ for *neut-neg*$_{diff}$; $r = .10$, $p = .16$ for *pos-neg*$_{diff}$). Together, these findings indicate that more research is needed to understand the nature of these correlations before effects of prime-valence on judgments of target-familiarity could serve as a means to isolate the contribution of unintentional processes in the AMP.

Note that our findings should not be interpreted as positive evidence for the involvement of intentional processes in the AMP. After all, positive correlations between priming scores and self-reported use of the primes may also reflect knowledge about having been influenced by the primes in a certain way, rather than intentional processes per se (see Payne et al., 2013). Future research should thus employ alternative methods to investigate the contribution of unintentional processes. One possibility within the existing paradigm would be to provide bogus information about the relation between prime valence and target judgments that conflicts with the notion of a positivity-familiarity effect (e.g., by telling participants that negative primes increase judgments of target familiarity). If such a setup still reveals a positivity-familiarity effect, one could argue that these effects are more likely to reflect the outcome of unintentional processes.

Although our findings are mixed with respect to the idea that positivity-familiarity effects could be used to isolate the contribution of unintentional processes, changing the response format from valence judgments to familiarity judgments in an AMP with positive and negative primes might still help to disguise the true nature of the task. This might be especially helpful in research on prejudice and other socially sensitive domains (see Teige-Mocigemba, Becker, Sherman, Reichardt, & Klauer, in press). If participants do not suspect that the task assesses their attitudes towards primes, they might be less likely to control their responses in the AMP (see Teige-Mocigemba, et al., 2016). It is an interesting question for future research whether disguising the true nature of the task by asking for familiarity judgments rather than valence judgments may also enhance the validity of the AMP in predicting behavior.

In addition to offering valuable insights for the use of the AMP, our findings have important implications for research on the positivity-familiarity effect. To identify potential boundary conditions of positivity-familiarity effects in the AMP, we tested effects of actual target-familiarity and target presentation time. Our test of target-familiarity effects was based on earlier research that started with a learning phase in which some of the target stimuli were presented to participants (Garcia-Marques et al., 2004; Phaf & Rotteveel, 2005); our test of presentation time effects was based on earlier research in which the targets were presented for at least 1000ms

or until a response was given (Garcia-Marques et al., 2004; Phaf & Rotteveel, 2005). In the current studies, neither of these factors moderated the lack of a positivity-familiarity effect in the AMP. However, the five studies that investigated these boundary conditions all included a memory phase prior to the AMP. To the extent that (1) this feature induced a motivation to provide accurate judgments of the targets in the familiarity-judgment condition, and (2) accuracy motivation may reduce misattribution effects in general, our findings suggest a potential boundary condition of positivity-familiarity effects that might be even more fundamental than potential effects of target-familiarity and target presentation times.

Curiously, although the inclusion of a memory phase seemed to counteract a misattribution of positivity to familiarity in the current studies, it seemed to have no such detrimental effect in previous research on the positivity-familiarity effect. For example, Garcia-Marques et al. (2004) as well as Phaf and Rotteveel (2005) found reliable effects of valence on judgments of familiarity although both studies included a memory phase prior to the familiarity-judgment task. In fact, the experimental setup in these studies was the primary reason why we included a similar memory phase in Experiments 1-5. To the extent that inclusion of a memory phase induces a motivation to provide accurate responses in the familiarity-judgment task, the conflicting results suggest that accuracy motivation may influence misattribution of valence to familiarity in interaction with other, yet unknown factors. Although the current findings do not suggest a prime candidate in this regard, they rule out actual target-familiarity and target presentation time, given that neither one of these factors moderated positivity-familiarity effects when the task context suggested a normatively accurate response to the familiarity-judgment task. To the extent that accuracy motivation makes misattribution less likely by increasing the reliance on cognitive strategies, other factors that increase the likelihood of misattribution might carry more weight when an accuracy goal is present. For example, the fact that previous studies have used much shorter prime presentations (typically below 30 ms; e.g., Garcia-Marques et al., 2004) might be an explanation for the occurrence of a positivity-familiarity effect in these studies despite the activation of an accuracy goal. To shed more light on the conditions under which accuracy motivation undermines a misattribution of valence to familiarity, future research could compare two familiarity-judgment conditions (with and without accuracy motivation) within the same experiment.

In sum, our findings provide mixed support for the idea that the positivity-familiarity effect might be a useful way to isolate the contribution of unintentional processes in the AMP. Although prime-valence

influenced judgments of target-familiarity when the task context did not suggest a normatively accurate response to the familiarity-judgment task, positivity-familiarity effects in the AMP showed mixed results in terms of their relation to self-reported use of prime-valence in judging the familiarity of the targets. Yet, despite the mixed support for our hypotheses, our findings provide valuable insights for the use of the AMP and the boundary conditions of the positivity-familiarity effect.

References

Bar-Anan, Y., & Nosek, B. A. (2012). Reporting intentional rating of the primes predicts priming effects in the Affective Misattribution Procedure. *Personality and Social Psychology Bulletin, 38,* 1194-1208.

Blaison, C., Imhoff, R., Hess, U., & Banse, R. (2012). The affect misattribution procedure: Hot or not? *Emotion, 12,* 403-412.

Brown, A. S., & Marsh, E. J. (2009). Creating illusions of past encounter through brief exposure. *Psychological Science*, 20, 534-538.

Buhrmester, M., Kwang, T., & Gosling, S. D. (2011). Amazon's Mechanical Turk a new source of inexpensive, yet high-quality, data? *Perspectives on Psychological Science*, 6, 3-5.

Cameron, C. D., Brown-Iannuzzi, J., & Payne, B. K. (2012). Sequential priming measures of implicit social cognition: A meta-analysis of associations with behaviors and explicit attitudes. *Personality and Social Psychology Review, 16,* 330-350.

Corneille, O., Monin, B., & Pleyers, G. (2005). Is positivity a cue or a response option? Warm glow vs. evaluative matching in the familiarity for attractive and not-so-attractive faces. *Journal of Experimental Social Psychology*, *41*, 431-437.

De Houwer, J., & Smith, C. T. (2013). Go with your gut! Effects in the Affect Misattribution Procedure become stronger when participants are encouraged to rely on their gut feelings. *Social Psychology, 44,* 299-302.

De Houwer, J., Teige-Mocigemba, S., Spruyt, A., & Moors, A. (2009). Implicit measures: A normative analysis and review. *Psychological Bulletin, 135*, 347-368.

Deutsch, R., & Gawronski, B. (2009). When the method makes a difference: Antagonistic effects on "automatic evaluations" as a function of task characteristics of the measure. *Journal of Experimental Social Psychology*, *45*, 101-114.

Deutsch, R., Kordts-Freudinger, R., Gawronski, B., & Strack, F. (2009). Fast and fragile: A new look at the automaticity of negation processing. *Experimental Psychology*, *56*, 434-446.

Dougal, S., & Rotello, C. M. (2007). "Remembering" emotional words is based on response bias, not recollection. *Psychonomic Bulletin & Review*, *14*, 423-429.

Eder, A. B., & Deutsch, R. (2015). Watch the target! Effects in the affective misattribution procedure become weaker (but not eliminated) when participants are motivated to provide accurate responses to the target. *Frontiers in Psychology, 6:1442.*

Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*, 175-191.

Garcia-Marques, T., Mackie, D. M., Claypool, H. M., & Garcia-Marques, L. (2004). Positivity can cue familiarity. *Personality and Social Psychology Bulletin*, *30*, 585-593.

Gawronski, B., Cunningham, W. A., LeBel, E. P., & Deutsch, R. (2010). Attentional influences on affective priming: Does categorization influence spontaneous evaluations of multiply categorizable objects? *Cognition and Emotion, 24,* 1008-1025.

Gawronski, B., & De Houwer, J. (2014). Implicit measures in social and personality psychology. In H. T. Reis, & C. M. Judd (Eds.), *Handbook of research methods in social and personality psychology* (2nd edition, pp. 283-310). New York: Cambridge University Press.

Gawronski, B., & Ye, Y. (2014). What drives priming effects in the affect misattribution procedure? *Personality and Social Psychology Bulletin, 40,* 3-15.

Gawronski, B., & Ye, Y. (2015). Prevention of intention invention in the affect misattribution procedure. *Social Psychological and Personality Science, 6,* 101-108.

Imhoff, R., Schmidt, A. F., Bernhardt, J., Dierksmeier, A., & Banse, R. (2011). An inkblot for sexual preference: A semantic variant of the Affect Misattribution Procedure. *Cognition and Emotion, 25,* 676-690.

Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (2008). *The international affective picture system (IAPS): Technical manual and affective ratings.* Gainesville, FL: The Center for Research in Psychophysiology, University of Florida.

Loersch, C., & Payne, B. K. (2011). The situated inference model an integrative account of the effects of primes on perception, behavior, and motivation. *Perspectives on Psychological Science*, 6, 234-252.

Monin, B. (2003). The warm glow heuristic: When liking leads to familiarity. *Journal of Personality and Social Psychology*, *85*, 1035-1048.

Murphy, S. T., & Zajonc, R. B. (1993). Affect, cognition, and awareness: Affective priming with optimal and suboptimal stimulus exposure. *Journal of*

Personality and Social Psychology, 64, 723-739.

Nisbett, R. E., & Wilson, T. D. (1977). Telling more than we can know: Verbal reports on mental processes. *Psychological Review*, *84*, 231-259.

Oikawa, M., Aarts, H., & Oikawa, H. (2011). There is a fire burning in my heart: The role of causal attribution in affect transfer. *Cognition and Emotion, 25,* 156-163.

Olson, M. A., & Fazio, R. H. (2003). Relations between implicit measures of prejudice: What are we measuring? *Psychological Science, 14,* 636-639.

Paulhus, D. L. (1984). Two component models of social desirable responding. *Journal of Personality and Social Psychology, 46,* 598–609.

Payne, B. K., Brown-Iannuzzi, J. L., Burkley, M., Arbuckle, N. L., Cooley, E., Cameron, C. D., & Lundberg, K. B. (2013). Intention invention and the Affect Misattribution Procedure: Reply to Bar-Anan and Nosek (2012). *Personality and Social Psychology Bulletin*, *39*, 375-386.

Payne, B. K., Cheng, S. M., Govorun, O., & Stewart, B. D. (2005). An inkblot for attitudes: Affect misattribution as implicit measurement. *Journal of Personality and Social Psychology, 89,* 277–293.

Payne, B. K., Hall, D., Cameron, C. D., & Bishara, A. J. (2010). A process model of affect misattribution. *Personality and Social Psychological Bulletin, 36,* 1397-1408.

Payne, B. K. & Lundberg, K. B. (2014). The Affect Misattribution Procedure: Ten years of evidence on reliability, validity, and mechanisms. *Social and Personality Psychology Compass, 8,* 672-686.

Phaf, R. H., & Rotteveel, M. (2005). Affective modulation of recognition bias. *Emotion*, *5*, 309-318.

Phelps, E. A., & Sharot, T. (2008). How (and why) emotion enhances the subjective sense of recollection. *Current Directions in Psychological Science*, *17*, 147-152.

Sava, F. A., Maricutoiu, L. P., Rusu, S., Macsinga, I., Virga, D., Cheng, C. M., & Payne, B. K. (2012). An inkblot for the implicit assessment of personality: The semantic misattribution procedure. *European Journal of Personality, 26,* 613-628.

Teige-Mocigemba, S., Becker, M., Sherman, J.W., Reichardt, R., & Klauer, K. C. (in press). The Affect Misattribution Procedure: In search of prejudice effects. *Experimental Psychology.*

Teige-Mocigemba, S., Penzl, B., Becker, M., Henn, L., & Klauer, K. C. (2016). Controlling the "uncontrollable": Faking effects on the affect misattribution procedure. *Cognition and Emotion*, *30*, 1470-1484.

Weil, R. (2016). A look inside the toolbox: Measurement procedures in Implicit Social

Cognition. In Leong, F. T. L., Bartram, D., Cheung, F. M., Geisinger, K. F., & Iliescu, D. (Eds.). *The ITC International Handbook of Testing and Assessment* (pp. 89-105). New York: Oxford University Press.

Westerman, D. L., Lloyd, M. E., & Miller, J. K. (2002). The attribution of perceptual fluency in recognition memory: The role of expectation. *Journal of Memory and Language, 47*, 607-617.

Winkielman, P., Schwarz, N., Fazendeiro, T., & Reber, R. (2003). The hedonic marking of processing fluency: Implications for evaluative judgment. In J. Musch, & K. C. Klauer (Eds.), *The psychology of evaluation: Affective processes in cognition and emotion* (pp. 189-217). Mahwah, NJ: Erlbaum.

Zajonc, R. B. (1968). Attitudinal effects of mere exposure. *Journal of Personality and Social Psychology*, *9*, 1-27.

Acknowledgments

Correspondence concerning this article should be addressed to Rebecca Weile, Department of Psychology, University of Hull, Fenner Building, Cottingham Road, Hull, HU6 7RX, United Kingdom; Phone: +44-1482-466158; r.weil@hull.ac.uk
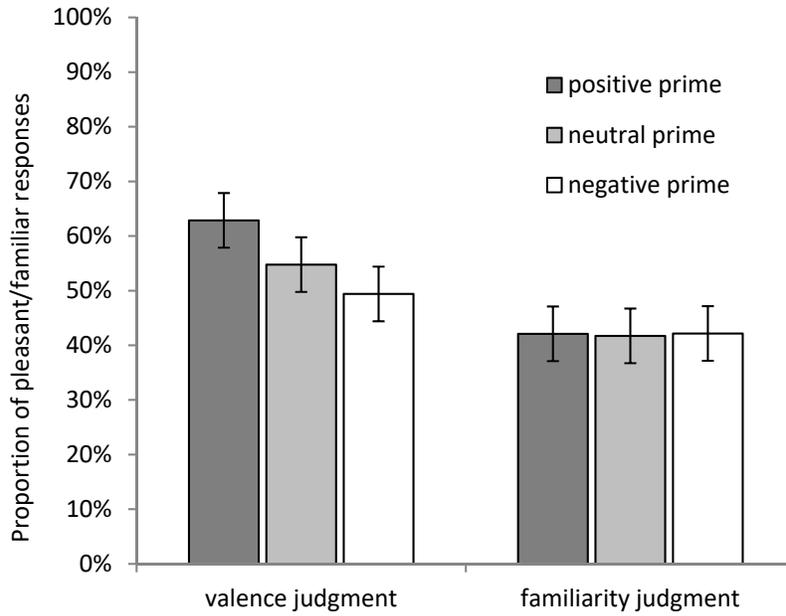
Figure 1. Mean percentages of "pleasant" and "familiar" judgments as a function of prime-valence and task (valence judgment vs. familiarity judgment), Experiment 1. Error bars depict 95% confidence intervals.
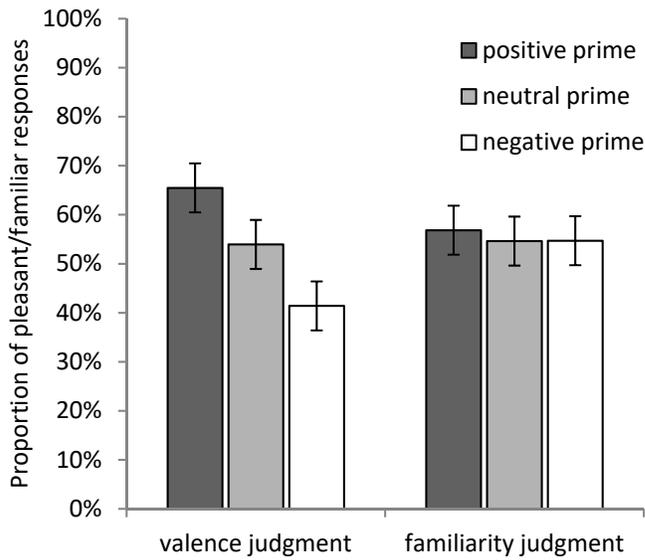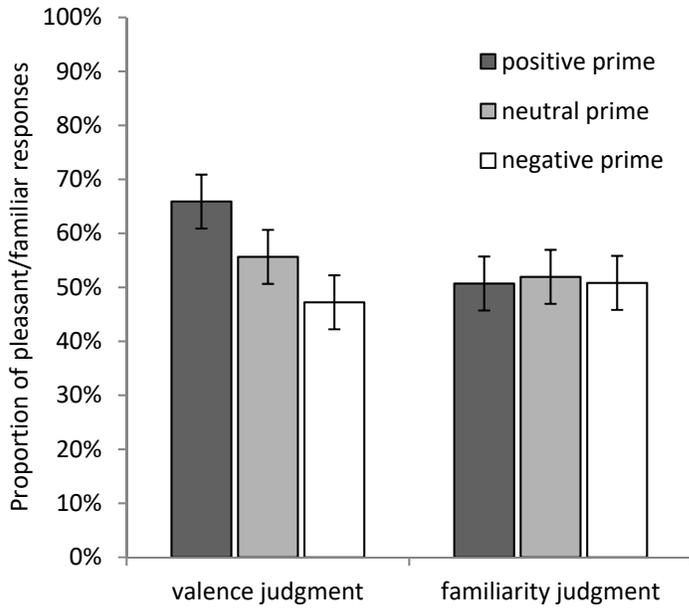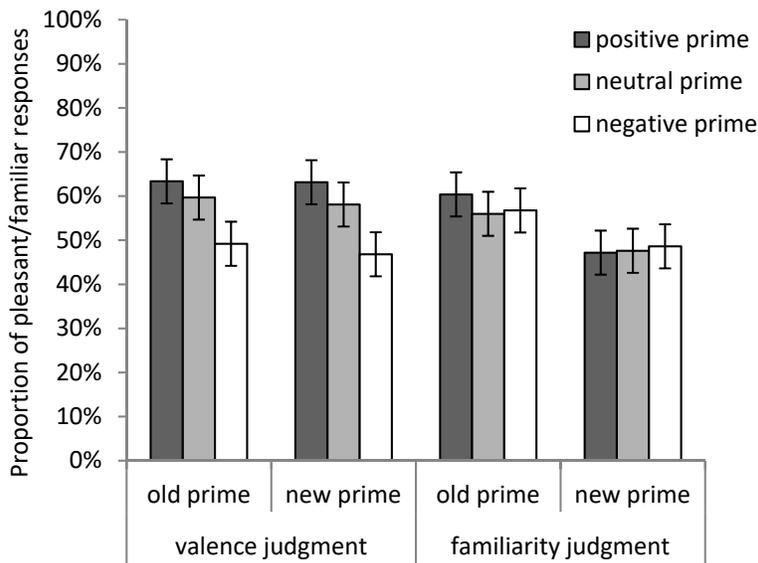

Figure 2. Mean percentages of "pleasant" and "familiar" judgments as a function of prime-valence and task (valence judgment vs. familiarity judgment), Experiment 2. Error bars depict 95% confidence intervals.

Figure 3. Mean percentages of "pleasant" and "familiar" judgments as a function of prime-valence and task (valence judgment vs. familiarity judgment), Experiment 3. Error bars depict 95% confidence intervals.

Figure 4. Mean percentages of "pleasant" and "familiar" judgments as a function of prime-valence, prime familiarity, and task (valence judgment vs. familiarity judgment), Experiment 4. Error bars depict 95% confidence intervals.
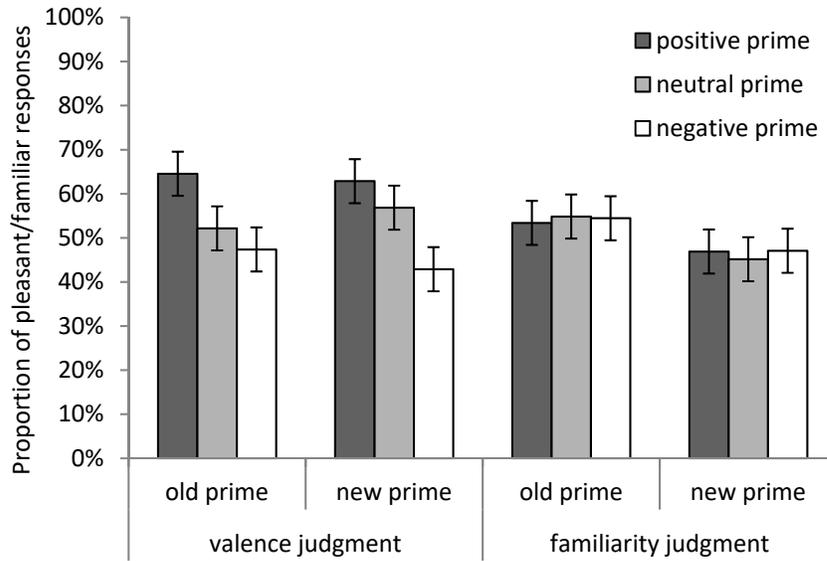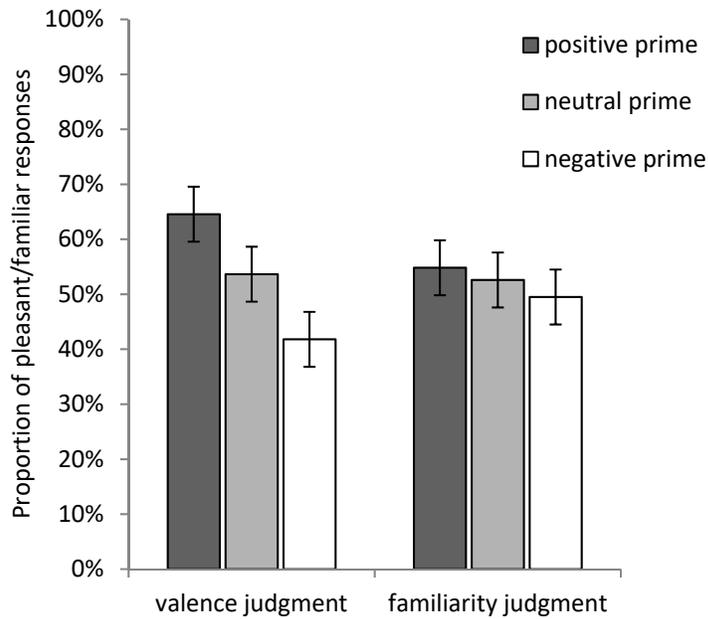
Figure 5. Mean percentages of "pleasant" and "familiar" judgments as a function of prime-valence, prime familiarity, and task (valence judgment vs. familiarity judgment), Experiment 5. Error bars depict 95% confidence intervals.

Figure 6. Mean percentages of "pleasant" and "familiar" judgments as a function of prime-valence and task (valence judgment vs. familiarity judgment), Experiment 6. Error bars depict 95% confidence intervals.
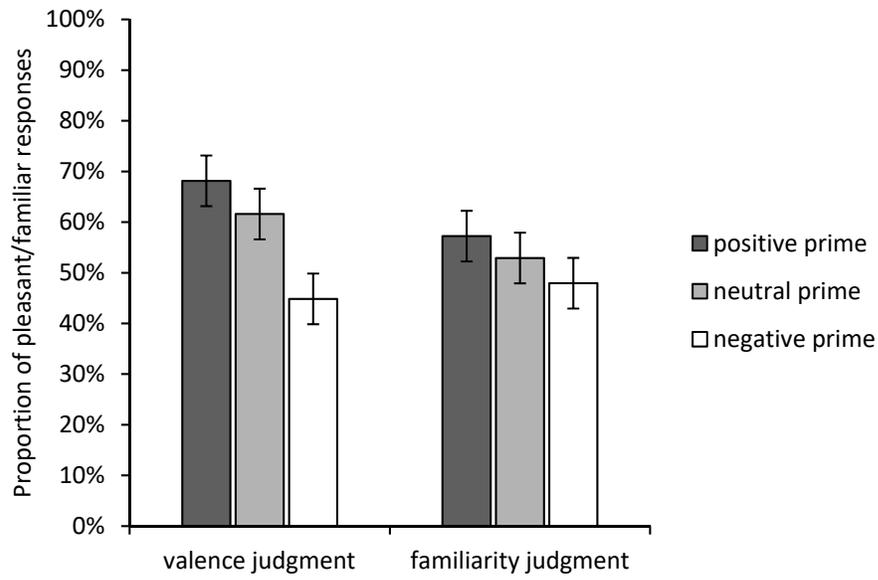
Figure 7. Mean percentages of "pleasant" and "familiar" judgments as a function of prime-valence and task (valence judgment vs. familiarity judgment), Experiment 7. Error bars depict 95% confidence intervals.