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FlashReport

Learning to like or dislike by association: No need for contingency awareness

Kirsten I. Ruys [a,*], Diederik A. Stapel [b]

[a] Utrecht University, Department of Psychology, P.O. Box 80140, 3508 TC Utrecht, The Netherlands
[b] Tilburg University, Tilburg Institute for Behavioral Economics Research (TIBER), The Netherlands

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ABSTRACT

One way to learn to like or dislike a neutral target stimulus is through associations with positive or negative context stimuli. The present research investigates whether people need to be aware of the association between a target and a context stimulus (i.e., contingency aware) in order for associative learning of likes and dislikes to occur. We predicted that awareness of the association between context and target is necessary when target novelty is low, but not when target novelty is high. We conducted two experiments in which we varied target novelty and measured contingency awareness using a picture-bound recognition task. This allowed us to separately investigate evaluative conditioning for "contingency awareness" and "contingency unawareness" context–target pairs. The results show, as predicted, that awareness of the association between context and target is needed for low-novelty targets but not needed for high-novelty targets.

What determines people's likes and dislikes? Why do some people prefer Audi to BMW or Volkswagen? Do some people prefer Audi because this brand elicits positive thoughts that are the result of effective advertising efforts? Do some people prefer Audi because it makes them think of the attractive super model that was hanging over the hood in a recent commercial? Recently, researchers have suggested that this is especially likely to be the case when people are aware of these specific associations. That is, evaluative conditioning effects are thought to depend on "contingency awareness": People need to be aware of the association between a neutral target stimulus and a positive (or negative) context stimulus for the valence of the context stimulus to transfer to the target stimulus. (Corneille, Yzerbyt, Pleyers, & Mussweiler, 2009; Dawson, Rissling, Schell, & Wilcox, 2007; Pleyers, Corneille, Luminet, & Yzerbyt, 2007; Stahl & Unkelbach, 2009; Wardle, Mitchell, & Lovibond, 2007).

The present research questions this need for contingency awareness for the transfer of valence from context to target to occur. Inspired by attitude and affective priming research (e.g., Duckworth, Bargh, Garcia, & Chaiken, 2002; Murphy & Zajonc, 1993; Payne, Cheng, Govorun, & Stewart, 2005; Stapel, Koomen, & Ruys, 2002), we argue and demonstrate that target characteristics moderate whether awareness is needed for evaluative conditioning effects. Specifically, we argue that awareness of the association between context and target is unnecessary when the target novelty is high. Thus, when there are no pre-existing positive and negative associations.

Evaluative conditioning is an associative learning mechanism that influences the acquirement of likes and dislikes (e.g., De Houwer, Thomas, & Baeyens, 2001). Evaluative conditioning is said to occur when the (repeated) pairing of a neutral target (conditioned stimulus (CS) in technical terms) and an affective context (unconditioned stimulus (US)) leads to valence transfer between the affective context and the neutral target. Thus, when neutral postcards of unfamiliar works of art or landscape photographs are repeatedly paired with attractive postcards this increases liking of the neutral postcards, and when these neutral postcards are repeatedly paired with unattractive postcards this decreases liking of the neutral postcards (Levey & Martin, 1975).

What to date remains unclear is the role of contingency awareness in evaluative conditioning: Do people need to know that a particular neutral target was paired with a specific affective context in order for evaluative conditioning to occur? Although some researchers have shown that contingency awareness *is not* a prerequisite (e.g., Baeyens, Eelen, & Van den Bergh, 1990; Custers & Aarts, 2005; De Houwer, 2001; De Houwer, Hendrickx, & Baeyens, 1997; Dijksterhuis, 2004; Field & Moore, 2005; Fulcher & Hammerl, 2001; Krosnick, Betz, Jussim, & Lynn, 1992; Niedenthal, 1990; Walther, 2002), recently a number of researchers have claimed that contingency awareness *is* necessary for the occurrence of evaluative conditioning effects (Corneille et al., 2009; Dawson et al., 2007; Field, 2000; Lipp & Purkis, 2005; Lovibond & Shanks, 2002; Pleyers et al., 2007; Shanks & Dickinson, 1990; Stahl & Unkelbach, 2009; Wardle et al., 2007). For example, Pleyers and colleagues

* Corresponding author. Fax: +31 30 253 4718.
E-mail addresses: k.i.ruys@uu.nl, kirsten.ruys@gmail.com (K.I. Ruys).

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(2007) showed, using a within-participants item-based analysis of contingency awareness, that evaluative conditioning did occur for contingency awareness context–target pairs and did not occur for contingency unawareness context–target pairs.

Why is it that some researchers obtained reliable evaluative conditioning effects without contingency awareness, whereas other researchers did not? We think that one crucial factor is the novelty of the neutral target (see also Rozin, Wrzesniewski, & Byrnes, 1998).

A *low-novelty*, familiar neutral target, such as a piece of chewing gum, often has both positive and negative associations (e.g., fresh taste, but sticks to the sole of your shoes) that add up to a neutral overall evaluation (Cacioppo, Gardner, & Berntson, 1999). Because of such existing evaluations, it is difficult for one new, positive or negative association to (re)shape the overall evaluation of a low-novelty target. When, for example, a neutral target has five positive and five negative existing associations, learning one new, positive association (resulting in six positive and five negative associations) is unlikely to have much impact on the evaluation of this neutral target. Only when new positive or negative associations are relatively salient and thus receive more weight than existing associations may the evaluation of a low-novelty target be influenced. This may be the case, when, for example, people are consciously aware of a new association between a low-novelty target and an affective context (Dijksterhuis & Nordgren, 2006). Thus, only when people consciously think of the new association between an attractive sports guy and chewing gum will the new positive association affect their liking of the gum.

A *high-novelty* target, however, such as a Chinese ideogram, by definition does not have prior positive or negative associations. Therefore, a new positive or negative association will directly shape the evaluation of a high-novelty target, because then it is the *only* evaluative information that it is associated with.

Our reasoning implies that evaluative conditioning of low-novelty targets does depend on contingency awareness, whereas evaluative conditioning of high-novelty stimuli does not. We investigated this hypothesis in two experiments where we varied target novelty, measured contingency awareness using a picture-bound recognition task, and adopted a within-participant, item-based analysis of contingency awareness (see Pleyers et al., 2007). This allowed us to separately investigate evaluative conditioning effects for contingency awareness and contingency unawareness context–target pairs.

Experiment 1

Method

Participants and design

Undergraduates at Tilburg University ($n = 128$) participated for course credit. They were randomly assigned to the conditions of a mixed design with context valence (positive and negative) as a counterbalanced within-participants factor and target novelty (high and low) as between-participants factor.

Materials

Targets. Low-novelty and high-novelty targets were used. Half of the participants were exposed to eight low-novelty consumption products (see Pleyers et al., 2007). Pretests revealed that all targets were affectively neutral and sufficiently different from existing brands (Pleyers et al., 2007). The other half of the participants were exposed to eight high-novelty figures that were sufficiently different such that they could easily be distinguished: We selected two polygons (one with five, one with six convex angles), three Chinese ideograms in a noisy background (one with round shapes, one horizontally organized, and one vertically organized), and three Chinese ideograms in a clear background (one consisting of two strikes, one consisting of two grids, and one with round shapes). A pilot showed that the high-novelty figures were indeed judged as more novel ($M = 7.50$, $SD = 1.20$) than the low-novelty consumption products ($M = 5.89$, $SD = 2.23$, $t(36) = 4.43$, $p < .001$) on a 9-point scale ranging from highly familiar (1) to highly novel (9).

Contexts. We selected four positive and four negative pictures as context stimuli from the International Affective Picture System (Lang, Bradley, & Cuthbert, 1999) that would elicit an immediate and unambiguous positive or negative affective reaction. The negative pictures were dirty dishes (IAPS 9390), skulls (9440), cigarette buds (9830), and a car wreck (9911). The positive pictures were balloons (8162), flowers (5010), mountains (8190), and a summer lake (5760).

Procedure

The procedure was similar to Experiment 2 of Pleyers et al. (2007). Participants were instructed to focus on the screen, as various stimuli would be presented, followed by several questions regarding the stimuli. Participants went through a conditioning phase, an evaluation phase, and a memory phase.

Conditioning phase. Participants were exposed to eight context–target pairs. Similar to Pleyers et al. (2007) a target was superimposed on a context picture that occupied the entire screen. The target appeared at the bottom in a 6×6 cm white square. A context–target pair was presented for 1 s, followed by a black screen for 1.5 s. Each pair was presented seven times. The resulting 56 trials appeared in a random order.

Each target was paired with the same context throughout the task. The context–target pairings were counterbalanced between participants such that each target was presented in a positive context for half of the participants and in a negative context for the other half of the participants (see also Pleyers et al., 2007).

Evaluation phase. Next, participants evaluated the eight target products or figures on a 7-point scale from negative (1) to positive (7) in a random order.

Memory phase. After the evaluation phase, context–target contingency awareness was measured with a picture-bound recognition task (as in Experiment 2, Pleyers et al., 2007). In each trial, participants were presented with the eight contexts. Participants indicated for each target (presented in a random order) in which context this target was presented during the conditioning phase, or indicated "I don't know."

Results

General evaluative conditioning effects

Neutral products presented in positive contexts were rated significantly more positive ($M = 5.09$, $SD = .77$) than neutral products presented in negative contexts ($M = 4.05$, $SD = 1.16$, $t_p(61) = 6.08$, $p < .001$). Also, neutral figures presented in positive contexts were rated significantly more positive ($M = 4.90$, $SD = .96$) than neutral figures presented in negative contexts ($M = 3.28$, $SD = 1.06$, $t_f(61) = 7.22$, $p < .001$). Thus, evaluative conditioning effects were obtained for both products and figures.

General contingency awareness

Participants showed better recognition memory for context–product pairings ($M = 6.41$, $SD = 1.59$) than for context–figure pairings ($M = 4.50$, $SD = 2.43$, $t(126) = 28.13$, $p < .001$). Thus,

participants were more often contingency aware of the context–product associations than of the context–figure associations.

Evaluative conditioning and contingency awareness

We investigated the relation between evaluative conditioning and contingency awareness using an item-based assessment of contingency awareness (see Pleyers et al., 2007). For correctly remembered context–target pairings, the ratings of both products and figures showed a significant evaluative conditioning effect ($t_p(60) = 6.80$, $p < .001$; $t_f(49) = 7.72$, $p < .001$). Specifically, when participants were aware of the particular context–target combination, they rated products presented in positive contexts more positively ($M = 5.27$, $SD = .80$) than products presented in negative contexts ($M = 4.02$, $SD = 1.29$) and figures presented in positive contexts more positively ($M = 5.17$, $SD = 1.05$) than figures presented in negative contexts ($M = 3.02$, $SD = 1.33$).

Interestingly, for incorrectly remembered context–target pairings only the ratings of the figures showed a significant evaluative conditioning effect (t_f (44) = 3.27, $p < .002$). Thus, when participants were contingency unaware, they rated figures presented in positive contexts more positively ($M = 4.56$, $SD = 1.29$) than figures presented in negative contexts ($M = 3.43$, $SD = 1.22$), but did *not* rate products presented in positive contexts more positively ($M = 4.46$, $SD = 1.20$) than products presented in negative contexts ($M = 4.68$, $SD = 1.18$), $t_p(16) = .58$, ns.

The results of Experiment 1 support our hypothesis that evaluative conditioning of high-novelty targets is independent and evaluative conditioning of low-novelty targets is dependent of contingency awareness. To test the robustness of our conclusion, we conducted a replication using a different participant pool.

Experiment 2

Method

Participants, design, materials, and procedure

Undergraduates at Utrecht University ($n = 121$) participated for a monetary reward. The design, materials, and procedure were identical to Experiment 1.

Results

General evaluative conditioning effects

Similar to Experiment 1, products presented in positive contexts were rated significantly more positive ($M = 4.87$, $SD = .97$) than products presented in negative contexts ($M = 3.87$, $SD = 1.14$, $t_p(62) = 6.00$, $p < .001$). Also, figures presented in positive contexts were rated significantly more positive ($M = 5.09$, $SD = 1.02$) than figures presented in negative contexts ($M = 3.22$, $SD = 1.13$, $t_f(57) = 7.67$, $p < .001$). Thus, evaluative conditioning effects were obtained for both products and figures.

General contingency awareness

Participants showed better recognition memory for context–product pairings ($M = 6.95$, $SD = 1.72$) than for context–figure pairings ($M = 4.76$, $SD = 2.61$, $F(120) = 30.26$, $p < .001$). As in Experiment 1, participants were more often contingency aware of the product–context associations than of the figure–context associations.

Evaluative conditioning and contingency awareness

Similar to Experiment 1, we used an item-based assessment of contingency awareness. Again, the ratings of both products and figures showed a significant evaluative conditioning effect for correctly remembered context–target pairings ($t_p(60) = 5.64$, $p < .001$; $t_f(45) = 7.90$, $p < .001$). Specifically, when participants were aware of the particular context–target combination, they rated products presented in positive contexts more positively ($M = 4.88$, $SD = .90$) than products presented in negative contexts ($M = 3.88$, $SD = 1.17$) and figures presented in positive contexts more positively ($M = 5.41$, $SD = 1.06$) than figures presented in negative contexts ($M = 3.06$, $SD = 1.44$).

For incorrectly remembered context–target pairings, only the ratings of the figures showed a significant evaluative conditioning effect, $t_f(33) = 4.13$, $p < .001$. Thus, when participants were contingency unaware, they rated figures presented in positive contexts more positively ($M = 4.73$, $SD = 1.15$) than figures presented in negative contexts ($M = 3.63$, $SD = 1.24$), whereas the difference between products presented in positive contexts ($M = 4.42$, $SD = 1.28$) and products presented in negative contexts ($M = 4.05$, $SD = 1.25$) was not significant, $t_p(13) = 1.11$, ns.

Discussion

The results of two experiments show that target novelty moderates the extent to which contingency awareness is needed to obtain evaluative conditioning effects: Evaluative conditioning of high-novelty stimuli (i.e., geometrical figures) occurred independent of contingency awareness, whereas evaluative conditioning of low-novelty stimuli (i.e., consumption products) only occurred when participants were contingency aware.

To our knowledge, this is the first systematic investigation of the moderating role of target characteristics in the contingency awareness debate. We directly compared high-novelty and low-novelty targets while keeping the evaluative conditioning procedures constant and using a so-called "identity awareness" measure. Interestingly, recent research suggests that measuring "valence awareness" is a more sensitive measure of contingency awareness than "identity awareness" (Stahl & Unkelbach, 2009; Stahl, Unkelbach, & Corneille, 2009). Considering that measurements of valence and identity awareness are highly dependent and because there seem to be no strong theoretical reasons why they should yield different effects for the processes we investigated in this paper, we would expect a similar pattern of findings with valence awareness as the measure of contingency awareness as with the identity valence measure we used. Whether this is indeed the case is an empirical question that merits further attention.

A potential limitation is that participants remembered less context–target pairings for high-novelty than for low-novelty targets. This reduces statistical power of potential evaluative conditioning effects in the "contingency unaware" context–target pairings for low-novelty targets. Importantly however, Pleyers et al. (2007) also did not obtain evaluative conditioning effects for "contingency unaware" context–target pairings using the same product stimuli, but with more statistical power. Additionally, our findings are consistent with a number of previous evaluative conditioning studies using high-novelty stimuli as targets (e.g., Fulcher & Hammerl, 2001; Krosnick et al., 1992; Niedenthal, 1990; Walther, 2002; but see Dawson et al., 2007; Lipp & Purkis, 2005).

Besides addressing the contingency awareness debate, our findings also seem to touch upon the debate regarding the mechanisms underlying evaluative conditioning. Some researchers have proposed that evaluative conditioning occurs because the affective context makes salient the target features that are conceptually congruent with the affective context (e.g., Field & Davey, 1997). This conceptual conditioning account predicts evaluative conditioning effects to be stronger for low-novelty than for high-novelty targets. Interestingly, our findings show the opposite pattern and thus are more supportive of an associative learning account of evaluative conditioning.

In conclusion, the present research indicates that awareness of the association between a target and its prior affective context is not necessary when *learning* likes and dislikes, but is necessary when *changing* your likes and dislikes.

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