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I like it, because I like myself: Associative self-anchoring and post-decisional change of implicit evaluations ☆

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Abstract

Research in the cognitive dissonance tradition has shown that choosing between two equally attractive alternatives leads to more favorable evaluations of chosen as compared to rejected alternatives (spreading-of-alternatives effect). The present research tested associative self-anchoring as an alternative mechanism for post-decisional changes of implicit evaluations. Specifically, we argue that choosing an object results in the creation of an association between the chosen object and the self. By virtue of this association, implicit evaluations of the self tend to transfer to the chosen object, such that implicit evaluations of the chosen object depend on implicit evaluations of the self. Importantly, this mechanism can lead to ownership-related changes in implicit evaluations even in the absence of cognitive dissonance. Results from four experiments provide converging evidence for these assumptions. Implications for a variety of phenomena are discussed, including cognitive dissonance, the mere ownership effect, the endowment effect, and ingroup favoritism.
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Introduction

When people have to choose between two alternatives that are initially equally attractive, they often evaluate the chosen alternative substantially more positively than the rejected alternative after they have made their decision (Brehm, 1956). A common explanation for this

spreading-of-alternatives effect is that people experience an aversive feeling of post-decisional dissonance when they recognize either (a) that the rejected alternative has positive features that the chosen alternative does not have, or (b) that the chosen alternative has negative features that are not present in the rejected alternative (for a review, see Olson & Stone, 2005). In order to reduce this uncomfortable feeling of cognitive dissonance, people often emphasize (Brehm, 1956) or deliberately search for (Frey, 1986) positive characteristics of the chosen alternative and negative characteristics of the rejected alternative. This kind of selective information processing, in turn, leads to more favorable evaluations of the chosen alternative and to less favorable evaluations of the rejected alternative.

Drawing on the distinction between explicit and implicit evaluations (Greenwald & Banaji, 1995; Wilson, Lindsey, & Schooler, 2000), we sought to test whether choice decisions are sufficient to change implicit evalua-

tions toward the selected object. Even though the spreading-of-alternatives effect is a well replicated finding for explicit evaluations, we are not aware of any evidence for post-decisional changes of implicit evaluations. In addition, we propose and test an alternative mechanism for post-decisional changes of implicit evaluations that does not require a dissonance-driven process of selective information processing. Specifically, we argue that choosing an object may be sufficient to create an association between the chosen object and the self, and that implicit self-evaluations may associatively transfer to the chosen object. Before we test these assumptions, however, we provide a more detailed analysis of our theoretical conceptualization of explicit and implicit evaluations, and how explicit and implicit evaluations might be influenced by choice decisions and dissonance processes.

Associative vs. propositional processes

Drawing on our recently proposed Associative-Propositional Evaluation Model (APE Model; Gawronski & Bodenhausen, in press), we argue that implicit and explicit evaluations should be understood in terms of their underlying mental processes (see also Strack & Deutsch, 2004). Specifically, we argue that there are two different processes that underlie psychological tendencies to evaluate a given entity with some degree of favor or disfavor (cf. Eagly & Chaiken, 1993; Zanna & Rempel, 1988), which can be described as associative processes for implicit evaluations and propositional processes for explicit evaluations.

The first source of evaluative tendencies resides in associative processes, which build the basis for what many researchers call implicit attitudes. Evaluations resulting from associative processes are best characterized as *affective reactions* resulting from the particular associations that are activated automatically upon encountering a relevant stimulus. The defining feature of associative processes is that they are independent of subjective truth or falsity. For example, the activation level of negative associations regarding African Americans may be high even when an individual regards these associations as inadequate or false (Devine, 1989).

The second source of evaluative tendencies comes from propositional processes, which build the basis for what many researchers call explicit attitudes. Evaluations resulting from propositional processes can be characterized as *evaluative judgments* that are based on syllogistic inferences from any kind of information that is considered relevant for a given judgment. The critical feature that distinguishes propositional from associative processes is their dependency on truth values. Whereas the activation of associations can occur irrespective of whether a person considers these associations to be true or false, processes of propositional reasoning are generally concerned with the (subjective) truth or falsity of a proposition.

Even though evaluative judgments and affective reactions have their roots in different types of processes, it is important to note that the two are not mutually independent. Drawing on a central idea in Strack and Deutsch's (2004) Reflective–Impulsive Model, we argue that people typically transform their affective reactions into propositional format (e.g., a negative affective reaction to object X is transformed into the proposition "I dislike X"). The resulting proposition then is subject to syllogistic inferences that assess its validity for an evaluative judgment (Gawronski & Bodenhausen, in press). Thus, whether or not an affective reaction will be reflected in a corresponding evaluative judgment depends on the subjective validity of the propositional translation of this reaction, as determined by processes of propositional reasoning.

Applied to attitudes, we argue that people typically use their affective reactions toward an object (i.e., implicit evaluation) as a basis for evaluative judgments about this object (i.e., explicit evaluation). Thus, the default mode of propositional reasoning is affirmation of validity (see Gilbert, 1991), in this case of the validity of the propositional implication of an affective reaction (e.g., the proposition "I dislike X" implied by a negative affective reaction toward X). However, evaluative judgments can also be independent of affective reactions when the propositional implications of these reactions are rejected as a valid basis for an evaluative judgment. Drawing on the notion of logical consistency implied by probabilogical models of belief systems (for a review, see Wyer, 2004), we argue that the perceived validity of a proposition— and thus of the propositional implication of an affective reaction—depends on the consistency of this proposition with all other propositional information that is considered relevant for a given judgment (Gawronski & Bodenhausen, in press). If the propositional implication of an affective reaction is consistent with other relevant propositions, it may be considered valid, and thus may serve as the basis for an evaluative judgment. If, however, the propositional implication of an affective reaction is inconsistent with other salient propositions, it may be considered invalid. In this case, evaluative judgments will be independent of affective reactions (see Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005; Nosek, 2005). For example, the propositional implication of a negative affective reaction to a minority member (e.g., "I dislike this African American person.") may be inconsistent with the propositional evaluation of another attitude object (e.g., "It is wrong to evaluate members of disadvantaged minority groups negatively.") and non-evaluative propositions referring to general beliefs (e.g., "African Americans are a disadvantaged minority group."). Hence, the resulting inconsistency among the three propositions may lead to a rejection of the negative affective reaction as a valid basis for an evaluative judgment (Gawronski, Brochu, & Peters, 2006). Note, however, that the resulting dissociation between affective

reactions and evaluative judgments is not the result of two distinct attitudes toward the same object that are stored independently in memory (e.g., Wilson et al., 2000). Rather, these dissociations have their roots in processes of propositional reasoning, such that these processes can lead to a rejection of one's affective reaction as a basis for an evaluative judgment when this reaction is inconsistent with other momentarily considered propositions (Gawronski & Bodenhausen, in press).[1]

The propositional nature of cognitive dissonance

The proposed conceptualization of implicit and explicit evaluations in terms of associative and propositional processes has important implications for cognitive consistency (for a review, see Gawronski, Strack, & Bodenhausen, in press). Because cognitive consistency cannot even be defined without reference to the notion of truth values, cognitive consistency is exclusively a concern of propositional reasoning (Gawronski & Bodenhausen, in press). Drawing on Festinger's (1957) seminal definition of cognitive consistency, we argue that two propositions are inconsistent when both are regarded as true, and one follows from the opposite of the other. In contrast, two propositions are consistent when both are regarded as true, and one does not imply the opposite of the other. This conception implies that inconsistency within a set of propositions has to be resolved propositionally either by changing the truth value of one proposition, or by finding an additional proposition that resolves the inconsistency (Quine & Ullian, 1978). For instance, in the example outlined above, people may resolve the inconsistency (a) by rejecting their negative affective reaction as a valid basis for an evaluative judgment (i.e., "I like this African American person."), (b) by rejecting the propositional evaluation of another relevant attitude object (e.g., "Negative evaluations of disadvantaged minority members are okay."), (c) by rejecting the non-evaluative proposition referring to general beliefs (e.g., "African Americans are not a disadvantaged minority group."), or (d) by finding an additional proposition that resolves the inconsistency (e.g., "This African American person was very unfriendly.").

The implications of these assumptions for cognitive dissonance were recently tested by Gawronski and Strack (2004). Drawing on the considerations outlined above, Gawronski and Strack argued that cognitive dissonance is inherently propositional, and thus should influence only explicit evaluations (i.e., evaluative judgments), but not implicit evaluations (i.e., automatic affective reactions). Moreover, explicit and implicit

evaluations should be highly correlated when dissonance can be resolved by means of an additional proposition, but not when dissonance is resolved by a rejection of affective reactions as a basis for an evaluative judgment. To test these predictions, Gawronski and Strack employed Festinger and Carlsmith's (1959) induced compliance paradigm. Participants were asked to write a counterattitudinal essay under conditions of either high or low situational pressure and to complete measures of explicit and implicit evaluations of the topic in question afterwards. Participants in a control condition completed the two measures without writing an essay. Consistent with previous research on cognitive dissonance, explicit evaluations of the initially counterattitudinal position were more favorable when situational pressure was low than when it was high. However, implicit evaluations were generally unaffected by dissonance manipulations (see also Wilson et al., 2000). Moreover, explicit and implicit evaluations were significantly correlated under high situational pressure and under control conditions, but not when situational pressure was low. These results suggest that participants based their evaluative judgments on their automatic affective reactions when cognitive dissonance could be reduced by an additional proposition that resolved the inconsistency between the propositional implications of their counterattitudinal behavior and their automatic affective reaction (high situational pressure). However, participants seem to have rejected the propositional implication of their automatic affective reaction when cognitive dissonance could not be reduced by an additional proposition (low situational pressure).

Even though Gawronski and Strack (2004) tested these assumptions only for cognitive dissonance arising from counterattitudinal behavior (Festinger & Carlsmith, 1959), the proposed conceptualization should also be applicable to the case of post-decisional dissonance (Brehm, 1956), such that post-decisional dissonance should affect only explicit, but not implicit evaluations. That is, even though choice decisions between two equally attractive alternatives may lead to more favorable explicit evaluations of chosen objects and to less favorable explicit evaluations of rejected objects, implicit evaluations of chosen and rejected objects should be unaffected by choice decisions.

Associative self-anchoring

This prediction, however, is contingent upon the assumption that there is no additional associative process that could lead to post-decisional changes of implicit evaluations, independent of the propositional process of dissonance reduction. A candidate for such an alternative process is associative self-anchoring. Associative self-anchoring can be understood as the formation of an association between an object and the self, leading to a subsequent transfer of already existing self-associa-

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[1] Note that propositional processes may influence associative evaluations when these processes lead to an affirmation of a particular evaluation. However, propositional processes should leave associative evaluations unaffected when these processes imply a negation or rejection of an affective reaction (e.g., Deutsch, Gawronski, & Strack, in press; Gawronski, Deutsch, & Mbirkou, 2006).

tions to the object (see Cadinu & Rothbart, 1996; Otten, 2003). Applied to the present case, choosing an object may be sufficient to create an association between the object and the self, thus leading to an associative transfer of people's implicit self-evaluation to the chosen object (Greenwald & Banaji, 1995; Walther & Trasselli, 2003). Given that most people's implicit self-evaluation is highly positive (Bosson, Swann, & Pennebaker, 2000; Greenwald & Farnham, 2000; Koole, Dijksterhuis, & Van Knippenberg, 2001), this process of associative self-anchoring may lead to post-decisional enhancement of implicit evaluations of chosen objects without requiring the higher-order propositional processes implied by dissonance reduction (see Gawronski & Strack, 2004).

Preliminary evidence for this assumption can be derived from recent research on associative transfer effects between the mental representations of ingroups and the self (for a discussion, see Gawronski et al., in press). Employing the framework of their unified theory of implicit attitudes, stereotypes, self-esteem, and self-concept, Greenwald et al. (2002) found that people's implicit evaluation of their ingroup, their implicit self-concept as a member of this group, and their implicit self-esteem are generally related in a manner such that one concept is predicted by the interaction of the other two. In one study, for example, Greenwald et al. found that women's implicit self-esteem was significantly related to the interaction of their implicit self-concept as female and their implicit evaluation of women. The more women associated the category "women" with a negative evaluation, and the stronger they associated themselves with the category "women," the lower was their implicit self-esteem (for similar findings, see Nosek, Banaji, & Greenwald, 2002; Rudman, Greenwald, & McGhee, 2001). However, even though Greenwald et al.'s (2002) findings are consistent with the assumption that people's implicit self-evaluations may associatively transfer to objects that are associated with the self, they only speak to the interplay of already existing rather than newly formed associations. Hence, it is still an open question whether choice decisions are sufficient to form an association between a chosen object and the self, and whether implicit self-evaluations can associatively transfer to the chosen object.

In order to test these assumptions, we conducted a total of four experiments. Experiment 1 tested whether choice decisions actually lead to post-decisional changes of implicit evaluations of chosen and rejected objects. Experiment 2 investigated whether choice decisions are sufficient to result in the formation of an association between the self and a chosen object. Experiment 3 tested whether implicit evaluations of the self transfer to chosen objects via their new association with the self, such that implicit self-evaluations predict post-decisional implicit evaluations of chosen objects. Finally, Experiment 4 aimed to rule out post-decisional dissonance as an alternative cause of changes in implicit evaluations by

testing whether associative self-anchoring influences implicit evaluations even in the absence of choice decisions.

Experiment 1

The main goal of Experiment 1 was to test whether choice decisions influence implicit evaluations of chosen and rejected alternatives. For this purpose, we first assessed participants' implicit evaluations of two equally attractive objects. Participants were then asked to choose one of the two objects. Finally, we again assessed participants' implicit evaluations of the two objects.

Method

Participants and design

A total of 40 undergraduates (20 female; 20 male) participated in a study on "attention and categorization" in return for course credit. The experiment consisted of a 2 (time: before decision vs. after decision) × 2 (object: chosen vs. rejected) within-subjects design. Data from two participants who did not contact the experimenter to get the chosen object (see below) were excluded from analyses.

Procedure

When participants arrived, they were welcomed by a male experimenter and seated in a cubicle in front of a computer. Written instructions explained that they would be taking part in a study on attention and categorization. Participants then completed an affective priming task (Fazio, Jackson, Dunton, & Williams, 1995) designed to assess their implicit evaluations of two pictures (see below). Afterwards, participants were told that they will be given a gift in gratitude for their participation. Specifically, participants were told that they would be free to choose one of the two pictures from the previous task and that they would be given a color print of the preferred picture as a gift (see below). The two pictures were then simultaneously presented on the screen, with one picture being presented on the left and the other picture on the right side of the screen. The position of the two pictures was counterbalanced. Participants were asked to press a left-hand key ("A") if they would like to have the picture on the left side of the screen, and to press a right-hand key ("5" of the number pad) if they would like to have the picture on the right side of the screen. Immediately after the decision, participants were asked to contact the experimenter and tell him which picture they had chosen. The experimenter then showed the two color prints to the participant, asking which one he or she had chosen. The experimenter explained that he would keep the chosen picture until the participant has completed the study. Participants were then instructed to go back to the cubicle and to go on with the experiment. They again completed an affective priming task designed to assess their implicit evaluations of the two pictures. Finally, participants were

thanked for their participation and given their preferred picture.

Materials

As objects for the decision making task, we chose two large color postcards (14 × 20 cm) from the series "Earth from Above" by Yann Arthus Bertrand (published by AMI-Images). Based on pretests, we selected two relatively similar, yet sufficiently distinct pictures depicting aerial shots of a dromedary caravan in the desert. The two pictures were "Dromedary caravans near Nouakchott, Mauritania" (from now on referred to as Picture A) and "Dromedary caravan in the dunes near Nouakchott, Mauritania" (from now on referred to as Picture B).

Measures

To assess participants' implicit evaluations of the two pictures, we used a variant of Fazio et al.'s (1995) affective priming paradigm. Participants were first presented with a blank screen for 1000 ms, which was followed by a picture prime showing one of the two pictures for 200 ms. Picture primes were immediately followed by either a positive or a negative target word (SOA = 200 ms). Participants' task was to indicate as quickly as possible whether the word presented on the screen was positive or negative. Positive target words were: *paradise, summer, harmony, freedom, honesty, honor, health, cheer, pleasure, heaven, friend, sunrise, love, relaxation, peace, vacation, happy, lucky, miracle, gift.* Negative target words were: *evil, sickness, vomit, bomb, murder, abuse, prison, death, assault, cancer, rotten, accident, grief, poison, stink, cockroach, virus, disaster, ugly, terror.* Each of the two picture primes was presented once with each of the 20 positive and 20 negative target words, thus resulting in a total of 80 priming trials. Incorrect responses were indicated by the word "ERROR!" which was presented for 1000 ms in the center of the screen.

Results and discussion

Overall, participants' choice decisions were approximately equal for the two pictures, with 15 decisions for Picture A and 23 decisions for Picture B. Prior to analyses of the affective priming data we eliminated latencies from incorrect responses (4.8%) and truncated outlier latencies higher than 1500 ms (1.9%). Response latencies were then log-transformed in order to achieve normal distribution (Fazio, 1990). Although the following analyses were conducted with log-transformed latencies, means are generally reported in milliseconds for ease of interpretation. A 2 (prime: chosen vs. rejected picture) × 2 (target: positive vs. negative) × 2 (time: before decision vs. after decision) within-subjects ANOVA on response latencies to target words revealed a significant main effect of target, $F(1,37) = 5.77$, $p = .02$, $\eta^2 = .135$, a significant main effect of time, $F(1,37) = 24.71$, $p < .001$, $\eta^2 = .400$, a significant two-way interaction of prime and target, $F(1,33) = 4.46$, $p = .04$, $\eta^2 = .108$, and, more importantly, a significant three-way interaction of prime, target, and time, $F(1,37) = 11.59$,

Table 1
Means and standard deviations of response latencies to target words (positive vs. negative) as a function of prime type (chosen vs. rejected object) and time (before decision vs. after decision), Experiment 1

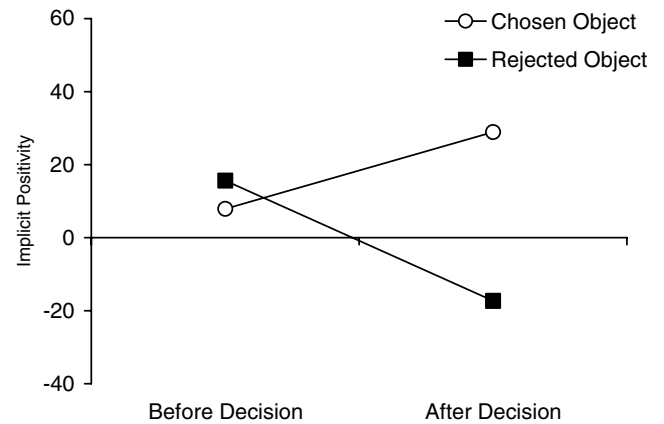|	Before decision		After decision	
	Positive target	Negative target	Positive target	Negative target
Prime				
Chosen object				
M	633	641	582	611
SD	87	91	82	79
Rejected object				
M	617	632	609	592
SD	87	89	88	77

Fig. 1. Mean indices of implicit positivity as a function of object (chosen vs. rejected) and time (before decision vs. after decision), Experiment 1.

$p = .002$, $\eta^2 = .239$ (see Table 1). In order to specify this interaction, we calculated positivity indices for the two pictures before and after the decision. Positivity indices were calculated by subtracting the mean response latency for positive target words from the mean response latency for negative target words for each of the two picture primes.[2] Mean values of implicit positivity are depicted in Fig. 1. Whereas implicit evaluations of chosen and rejected objects did not differ before the decision, $F(1,37) = 0.45$, $p = .50$, $\eta^2 = .012$, implicit evaluations of chosen objects were more positive than implicit evaluations of rejected objects after the decision, $F(1,37) = 16.09$, $p < .001$, $\eta^2 = .314$. Moreover, implicit evaluations of chosen objects were more positive after than before the decision, $F(1,37) = 4.87$, $p = .03$, $\eta^2 = .116$. In contrast, implicit evaluations of rejected objects were less positive after than before the decision,

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[2] Typically, indices of implicit positivity (negativity) are calculated by subtracting the mean response latency to a positive (negative) target word given a particular prime from the mean response latency to the same target word given a neutral baseline prime (see Wittenbrink, in press). Our indices of implicit positivity, in contrast, reflect the difference between positive and negative target words given a particular prime. Hence, these scores should not be interpreted in an absolute manner (e.g., a value of zero reflecting a neutral attitude), because response latencies for positive target words typically differ from response latencies for negative target words. The same reasoning applies to the indices calculated in Experiments 2–4.

$F(1, 37) = 9.57$, $p = .004$, $\eta^2 = .205$. Taken together, these results indicate that decisions do indeed influence implicit evaluations of chosen and rejected objects.

Experiment 2

The main goal of Experiment 2 was to test whether choosing an object is sufficient to create an association between the chosen object and the self. For this purpose, we first assessed participants' implicit associations between the self and two equally attractive objects. Participants were then asked to choose one of the two objects. Finally, we again assessed participants' implicit associations between the self and the two objects.

Method

Participants and design

A total of 39 undergraduates (24 female; 15 male) participated in a study on "attention and categorization" in return for course credit. The experiment consisted of a 2 (time: before decision vs. after decision) × 2 (object: chosen vs. rejected) within-subjects design. Data from five participants who did not contact the experimenter to get the chosen picture were excluded from analyses.

Procedure

The materials and procedure were identical to Experiment 1, the only exception being that we assessed implicit associations between the two pictures and the self, rather than implicit evaluations of the pictures. For this purpose, participants completed a sequential priming task similar to the affective priming task in Experiment 1. In contrast to categorizing positive and negative target words, however, participants had to indicate as quickly as possible whether each of the target words was related to "self" or "other." Target words related to "self" were: *self, me, I, mine, my*. Target words related to "other" were: *other, them, their, they, it*. Each of the two pictures was presented four times with each of the five self-related and five other-related target words, thus resulting in a total of 80 priming trials.

Results and discussion

As with Experiment 1, participants' choice decisions were approximately equal for the two pictures, with 18 decisions for Picture A and 21 decisions for Picture B. Outliers and errors were treated according to the procedures described for Experiment 1. A 2 (prime: chosen vs. rejected picture) × 2 (target: self vs. other) × 2 (time: before decision vs. after decision) within-subjects ANOVA on response latencies to target words revealed a significant main effect of target, $F(1, 33) = 16.36$, $p < .001$, $\eta^2 = .331$, a significant two-way interaction of prime and target, $F(1, 33) = 6.64$, $p = .02$, $\eta^2 = .167$, and, more importantly, a significant three-way interaction of prime, target, and time, $F(1, 33) = 6.22$, $p = .02$, $\eta^2 = .159$ (see Table 2). In order to specify this interaction, we

Table 2
Means and standard deviations of response latencies to target words (self vs. other) as a function of prime type (chosen vs. rejected object) and time (before decision vs. after decision), Experiment 2

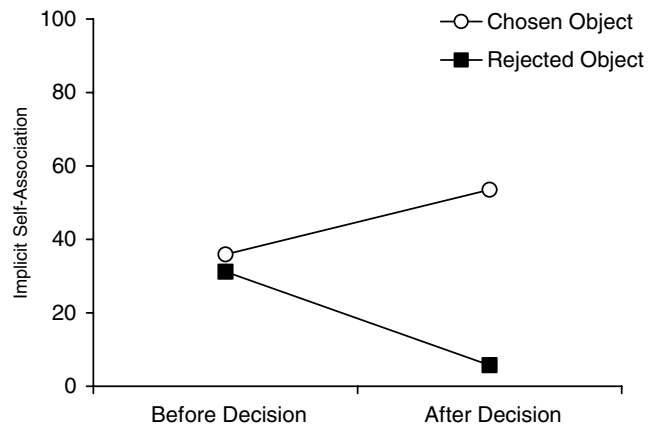|	Before decision		After decision	
	Self-related target	Other-related target	Self-related target	Other-related target
Prime				
Chosen object				
M	561	597	563	617
SD	87	91	140	127
Rejected object				
M	552	584	587	593
SD	84	78	112	120

Fig. 2. Mean indices of implicit self-associations as a function of object (chosen vs. rejected) and time (before decision vs. after decision), Experiment 2.

calculated self-association indices for the two pictures before and after the decision. Self-association indices were calculated by subtracting the mean response latency for self-related target words from the mean response latency for other-related target words for each of the two picture primes. Mean values of self-associations are depicted in Fig. 2. Whereas self-associations for chosen and rejected objects did not differ before the decision, $F(1, 33) = 0.35$, $p = .56$, $\eta^2 = .010$, self-associations were stronger for chosen objects as compared to rejected objects after the decision, $F(1, 33) = 7.75$, $p = .009$, $\eta^2 = .190$. These results suggest that decisions actually create new associations, such that chosen alternatives exhibit stronger associations to the self than rejected alternatives.

Experiment 3

The goal of Experiment 3 was to test whether post-decisional changes of implicit evaluations are indeed related to implicit self-evaluations. The associative self-anchoring hypothesis holds that post-decisional changes in implicit evaluations are due to an associative transfer of implicit self-evaluations to the chosen object. In order to test this assumption, participants first completed a measure of implicit self-evaluation. Immediately afterwards, participants were asked to choose between two equally attractive

objects. Finally, we assessed participants' implicit evaluations of the chosen and the rejected object. If post-decisional changes of implicit evaluations are due to an associative transfer of implicit self-evaluations to the chosen object, implicit self-evaluations should show a significant positive correlation with post-decisional evaluations of the chosen object. Post-decisional evaluations of the rejected object, in contrast, should show no (or a negative) correlation to implicit self-evaluations.

Method

Participants

A total of 40 undergraduates (21 female; 19 male) participated in a study on "attention and categorization," receiving course credit. The experiment consisted of a 2-group (object: chosen vs. rejected) within-subjects design, with implicit self-evaluations serving as a continuous subject variable. Due to a computer error, data from four participants were only partially recorded and were thus excluded from analyses.

Procedure

The stimuli and procedure were identical to Experiment 1, the only exception being that we assessed only post-decision evaluations, rather than pre-decision and post-decision evaluations. Additionally, before participants were asked to choose one of the two pictures, they completed a measure of implicit self-evaluations.

Measures

The affective priming task designed to assess implicit evaluations of the two pictures was identical to Experiment 1. In order to assess participants' implicit self-evaluations, we employed an initials preference task (Greenwald & Banaji, 1995) that was based on previous research on the name letter effect (Kitayama & Karsawa, 1997; Koole et al., 2001; Nuttin, 1985). Specifically, participants were presented with all letters of the alphabet in a random order and asked to rate the likeability of each letter on a scale ranging from 1 (not at all) to 5 (very much). The degree to which participants show a preference for their own initials is usually interpreted as an index of implicit self-evaluation (or implicit self-esteem).

Results and discussion

Post-decisional evaluations

Participants' choice decisions were divided for the two pictures, with 25 decisions for Picture A and 14 decisions for Picture B. Outlier treatment and data aggregation were conducted according to the procedures described for Experiment 1. A 2 (prime: chosen vs. rejected picture) × 2 (target: positive vs. negative) within-subjects ANOVA on response latencies to target words revealed a significant two-way interaction, $F(1,35) = 4.19$, $p < .05$, $\eta^2 = .107$ (see Table 3). In order allow a direct comparison with the results of Experiment 1, we calculated positivity indices for chosen and rejected pictures

Table 3
Means and standard deviations of response latencies to target words (positive vs. negative) as a function of prime type (chosen vs. rejected object), Experiment 3

	Target	
	Positive	Negative
Prime		
Chosen object		
M	609	633
SD	91	78
Rejected object		
M	618	616
SD	76	73

according to the procedures described for Experiment 1. Replicating the pattern obtained in Experiment 1, post-decisional implicit evaluations were more favorable for chosen as compared to rejected objects (Ms = 24.46 vs. −2.01, respectively).

Implicit self-evaluations

In order to get an index of implicit self-evaluations, we first calculated the mean initials ratings for each participant. Mean ratings of the same letters provided by the rest of the sample were then subtracted from the mean initials ratings by a given participant (letter baseline). In addition, we controlled for individual response tendencies by dividing the resulting values by the mean ratings of all letters provided by the participant (individual baseline). Consistent with previous research (e.g., Bosson et al., 2000; Koole et al., 2001), this index was significantly higher than zero ($M = .16$, $SD = .30$), indicating that implicit self-evaluations were generally positive, $t(35) = 3.30$, $p = .002$, $d = .55$.

Associative transfer

In order to test whether post-decisional changes of implicit evaluations are actually related to implicit self-evaluations, we correlated the index of implicit self-evaluation with post-decisional implicit evaluations of chosen and rejected objects, respectively. Consistent with the present predictions, implicit self-evaluations showed a significant positive correlation to post-decisional implicit evaluations of the chosen object ($r = .35$, $p = .04$). In other words, participants showed implicit positivity toward the chosen object when their implicit self-evaluation was positive, but they showed implicit negativity toward the chosen object when their implicit self-evaluation was negative. In contrast, implicit evaluations of rejected objects were uncorrelated with implicit self-evaluations ($r = −.02$, $p = .91$). The difference between the two correlations was statistically significant, $z = 2.30$, $p = .02$. These results support our assumption that post-decisional changes of implicit evaluations are mediated by an associative transfer of implicit self-evaluations to the chosen object.

Experiment 4

Even though the present results are consistent with our claim that choice decisions create an association between chosen objects and the self and that implicit self-evaluations

associatively transfer to objects that are associated with the self, one could still object that cognitive dissonance is not yet ruled out as an alternative explanation for post-decisional changes of implicit evaluations. That is, in all studies presented so far participants may have experienced an uncomfortable feeling of post-decisional dissonance, and the obtained changes in implicit evaluations may haven been driven by attempts to reduce dissonance (for a more detailed discussion, see Gawronski et al., in press). Thus, the main goal of Experiment 4 was to demonstrate that associative self-anchoring influences implicit evaluations even in the absence post-decisional dissonance. For this purpose, Experiment 4 employed a manipulation in which self-object associations were created by a random procedure rather than by participants' choice decisions. If the obtained results are due to processes of associative self-anchoring, randomly determined ownership should be sufficient to change implicit evaluations of owned objects and such evaluations should again depend on implicit self-evaluations. If, however, the obtained results are due to post-decisional dissonance, randomly determined ownership should leave implicit evaluations of owned objects unaffected (see Brehm, 1956).

Method

Participants

A total of 84 undergraduates (61 female; 23 male) participated in a study on "attention and categorization," receiving course credit. The experiment consisted of a 2-group (object: owned vs. not owned) within-subjects design, with implicit self-evaluations as a continuous subject variable. Due to a computer error, data from three participants were only partially recorded and were thus excluded from analyses. In addition, we excluded the data from three participants who did not contact the experimenter to get their picture (see below).

Procedure and measures

The procedure and measures were identical to Experiment 3, the only exception being that the picture participants would receive as a gift was determined randomly by the experimenter rather than by participants' choice decision. Specifically, participants were told that they would be given one of two color prints as a gift in gratitude for their participation. Instructions indicated that the experimenter would randomly determine which of the two pictures presented on the screen they would receive. Participants were then requested to contact the experimenter to get their picture. In order to determine which of the two pictures a participant would receive, the experimenter rolled a dice. The procedure was defined such that odd numbers represented Picture A and even numbers represented Picture B. After the picture was determined, participants were given their postcard. Participants were then instructed to return to the cubicle and to go on with the experiment, which involved the affective priming task designed to assess implicit evaluations of the two pictures.

Table 4
Means and standard deviations of response latencies to target words (positive vs. negative) as a function of prime type (owned vs. non-owned object), Experiment 4

	Target	
	Positive	Negative
Prime		
Owned object		
M	632	648
SD	95	84
Non-owned object		
M	633	632
SD	91	87

Results and discussion

Implicit evaluations

Overall, the employed random procedure resulted in comparable numbers for the two pictures, with 43 participants who received Picture A and 37 participants who received Picture B. Outlier treatment and data aggregation were conducted according to the procedures described for Experiment 1. A 2 (prime: owned vs. non-owned picture) $\times 2$ (target: positive vs. negative) within-subjects ANOVA on response latencies to target words revealed a significant main effect of target, $F(1,77) = 5.27$, $p = .02$, $\eta^2 = .064$, and, more importantly, a significant two-way interaction between prime and target, $F(1,77) = 6.26$, $p = .01$, $\eta^2 = .075$ (see Table 4). In order allow a direct comparison with Experiments 1 and 3, we calculated positivity indices for owned and non-owned pictures according to the procedures described for Experiment 1. Consistent with our claim that choice decisions are not necessary to influence implicit evaluations of objects that are associated with the self, implicit evaluations were more favorable for owned objects as compared to non-owned objects ($Ms = 15.96$ vs. -0.98, respectively).

Associative transfer of implicit self-evaluations

The index of implicit self-evaluations was calculated according to the procedures described for Experiment 3. This index was again significantly higher than zero ($M = .19$, $SD = .30$), indicating that implicit self-evaluations were generally positive, $t(77) = 5.63$, $p < .001$, $d = .64$. In order to test whether the obtained changes in implicit evaluations depend on implicit self-evaluations, we correlated the index of implicit self-evaluations with implicit evaluations of owned and non-owned objects, respectively. Replicating the pattern obtained in Experiment 3, implicit self-evaluations showed a significant positive correlation to implicit evaluations of owned objects ($r = .28$, $p = .01$). That is, participants showed implicit positivity toward the owned object when their implicit self-evaluation was positive, but they showed implicit negativity toward the owned object when their implicit self-evaluation was negative. In contrast, implicit evaluations of non-owned objects were uncorrelated with

implicit self-evaluations ($r = -.03$, $p = .76$). The difference between the two correlations was statistically significant, $z = 2.77$, $p = .006$. These results corroborate our assumption that post-decisional changes of implicit evaluations are mediated by an associative transfer of implicit self-evaluations to owned objects rather than by post-decisional dissonance. If post-decisional changes of implicit evaluations were indeed due to post-decisional dissonance, randomly determined ownership should leave implicit evaluations unaffected.

General discussion

The present results indicate that post-decisional changes in implicit evaluations can result from processes of associative self-anchoring. Specifically, the act of choosing an object seems to be sufficient to create a new association between the chosen object and the self, thus leading to an associative transfer of implicit self-evaluations to the chosen object. Hence, even though selective information search (Frey, 1986) or differential weighting of information (Brehm, 1956) resulting from post-decisional dissonance may lead to post-decisional changes in explicit evaluations, associative self-anchoring may simultaneously lead to post-decisional changes in implicit evaluations without requiring the higher-order propositional processes that are typically implied by dissonance-related attitude change (see Gawronski & Strack, 2004).

Causes of post-decisional attitude change

Even though the present research was primarily concerned with post-decisional changes of implicit evaluations, the obtained results also have important implications for post-decisional changes of explicit evaluations (e.g., Brehm, 1956; Harmon-Jones & Harmon-Jones, 2002; Lieberman, Ochsner, Gilbert, & Schacter, 2001). As outlined in the introduction, we argue that evaluative judgments (i.e., explicit evaluations) are typically based on automatic affective reactions (i.e., implicit evaluations), unless processes of propositional reasoning lead to a rejection of the propositional implications of these reactions (Gawronski & Bodenhausen, in press). Thus, associative self-anchoring can contribute to post-decisional changes in explicit evaluations as long as people do not reject the propositional implications of their automatic affective reactions. Note, however, that the proposed influence of associative self-anchoring on explicit evaluations should be indirect rather than direct, such that changes in explicit evaluations are mediated by changes in implicit evaluations (cf. Baron & Kenny, 1986). That is, processes of associative self-anchoring may change automatic affective reactions to owned or chosen objects, and these affective reactions may then serve as a basis for evaluative judgments about these objects. Accordingly, post-decisional changes in explicit evaluations may be driven by two simultaneous, qualitatively distinct processes: (a) a direct effect of post-decisional dissonance on explicit evaluations, and (b) an indirect effect of associative self-anchoring on explicit

evaluations that is mediated by implicit evaluations (Gawronski & Bodenhausen, in press). Even though the present research was primarily concerned with associative self-anchoring effects on implicit evaluations, future research including both explicit and implicit measures may further clarify the unique roles of associative self-anchoring and cognitive dissonance in post-decisional attitude change.

The present findings also have important implications for the interpretation of previous research on post-decisional attitude change. Lieberman et al. (2001), for example, found that even amnesics exhibit post-decisional changes of explicit evaluations. In their study, participants showed post-decisional attitude changes even though they had no memory for their decision. Drawing on this finding, Lieberman et al. concluded that cognitive dissonance reduction does not require explicit memory for decisions (Brehm, 1956) or counterattitudinal behavior (Festinger & Carlsmith, 1959). This conclusion, however, is obviously in contrast with Gawronski and Strack's (2004) claim that both the causes of dissonance experiences and the process of dissonance reduction require a propositional representation of their elements. The present findings help to resolve this inconsistency by suggesting that post-decisional attitude changes may occur even in the absence of cognitive dissonance (see Experiment 4). That is, post-decisional attitude changes exhibited by amnesic participants may be due to associative self-anchoring rather than cognitive dissonance, such that choice decisions influenced implicit evaluations by an associative transfer of implicit self-evaluations which were later used as a basis for evaluative judgments about the object.

Derogation of rejected alternatives

Even though the present findings are generally consistent with our predictions, it has to be noted that the proposed process of associative self-anchoring primarily predicts changes in implicit evaluations for chosen objects. However, a rationale for the implicit derogation of rejected objects, such as obtained in Experiment 1, may not be immediately evident from the perspective of the present framework. We argue that our conception implies at least two possible mechanisms for such derogation effects. First, participants may form not only an excitatory link between the chosen object and the self, but also an inhibitory link between the rejected object and the self. This assumption, however, is inconsistent with the results of Experiment 3 showing that implicit evaluations of rejected objects were generally uncorrelated with implicit self-evaluations. If the obtained derogation of rejected objects is actually caused by an inhibitory link to the self, implicit evaluations of rejected objects should show a significant negative correlation to implicit self-evaluations. Second, participants may not only form an excitatory link between the chosen object and the self, but may also form a "not-me" association to the rejected object. Given that such "not-me" tags tend to have a negative valence, the

formation of "not-me" associations would explain the implicit derogation of rejected objects. Even though the present findings are generally consistent with this explanation, future research may help to clarify the particular processes that are responsible for the implicit derogation of rejected objects.

New perspectives

The obtained effects of associative self-anchoring also offer a new perspective on a variety of other social psychological phenomena (see also Greenwald & Banaji, 1995). One example is previous research on implicit ingroup favoritism. Employing the Minimal Group Paradigm (Tajfel, Billig, Bundy, & Flament, 1971), several researchers found that minimal group settings are sufficient to induce an implicit preference for ingroups over outgroups (e.g., Ashburn-Nardo, Voils, & Monteith, 2001; Otten & Wentura, 1999). From the perspective of the present findings, one could argue that minimal group settings are sufficient to create an association between the new ingroup and the self, which in turn should lead to an associative transfer of implicit self-evaluations to the new ingroup (Greenwald & Banaji, 1995). Given that most people's implicit self-evaluation is highly positive (Bosson et al., 2000; Greenwald & Farnham, 2000; Koole et al., 2001), this process of associative self-anchoring may be sufficient to produce an implicit preference for ingroups over outgroups in minimal group settings (see Otten, 2003). If this assumption is correct, implicit ingroup favoritism should be stronger for people with high rather than low implicit self-esteem (cf. Rubin & Hewstone, 1998).

Another phenomenon that has a strong resemblance to the present findings is the mere ownership effect (e.g., Beggan, 1992). This effect describes the phenomenon that people often judge an object more favorably merely because they own it. The original explanation for this effect is that the psychological relation between owner and object leads owners to treat the object as a social entity (Beggan, 1992). However, this account does not explain (a) why exactly social entities are evaluated more positively, and (b) why social entities are sometimes evaluated unfavorably. We argue that associative self-anchoring provides a simple, parsimonious explanation for the mere ownership effect. Specifically, one could argue that newly formed associations between an object and the self lead to an associative transfer of implicit self-evaluations to the object (Greenwald & Banaji, 1995; Walther & Trasselli, 2003). If this assumption is correct, mere ownership effects on explicit evaluations should be mediated by corresponding effects on implicit evaluations. In addition, the proposed interpretation implies that "mere" ownership should be insufficient to result in more favorable (explicit or implicit) evaluations. Instead, ownership should result in more positive evaluations of owned objects only if the owner's implicit self-evaluation is positive. If, however, the owner's implicit self-evaluation is negative, ownership should lead to less rather than more favorable evaluations of owned objects (see Experiment 4).

An important question related to the mere ownership effect is why ownership sometimes does (e.g., Beggan, 1992) and sometimes does not (e.g., Brehm, 1956) result in more favorable explicit evaluations of owned objects. We argue that a crucial factor for ownership effects on explicit evaluations is whether people base their evaluative judgments on their automatic affective reactions. As outlined above, people sometimes reject their automatic affective reactions as a basis for evaluative judgments when the propositional implications of these reactions are inconsistent with other propositional information that is considered relevant for the judgment. This assumption implies that ownership effects may still emerge for implicit evaluations even when explicit evaluations are unaffected by ownership. Moreover, whether or not ownership influences explicit evaluations should depend on whether people base their evaluative judgments on their automatic affective reactions. If people use their automatic affective reactions as a basis for an evaluative judgment, ownership effects may emerge for both implicit and explicit evaluations (cf. Beggan, 1992). In contrast, if people reject their automatic affective reactions as a basis for an evaluative judgment, ownership effects may emerge only for implicit, but not for explicit evaluations (cf. Brehm, 1956).

A crucial question in this context is, however, under which conditions people do or do not use their automatic affective reactions as a basis for evaluative judgments. A preliminary answer to this question is implied by research on introspection. Wilson, Dunn, Kraft, and Lisle (1989) argued that people often have no introspective access to the real causes of their attitudes. Thus, when people ask themselves why they like or dislike an object, they often come up with reasons that do not match the real causes. Most importantly, such mismatches often lead to changes in evaluative judgments about the object. Applied to the present question, one could argue that introspection about reasons elicits processes of propositional reasoning which direct people away from using their automatic affective reactions as a basis for evaluative judgments (Gawronski & Bodenhausen, in press). These assumptions are consistent with findings by LeBel and Gawronski (2006) who found that correlations between implicit and explicit evaluations significantly decreased when participants were asked to think about reasons why they like or dislike a given object. However, correlations significantly increased when participants were asked to focus on their feelings in the course of making an evaluative judgment (see also Millar & Tesser, 1986; Wilson & Dunn, 1986). Thus, if a given object elicits thoughts about the reasons for one's affective reaction, ownership may lead to changes in implicit but not explicit evaluations (cf. Brehm, 1956). If, however, a given object elicits a focus on one's feelings, ownership may lead to changes in both implicit and explicit evaluations, with changes in explicit evaluations being mediated by changes in implicit evaluations (cf. Beggan, 1992). Future research

may help to clarify the specific conditions of ownership effects on explicit and implicit evaluations.

Finally, the present findings offer a new perspective on the endowment effect, which is defined as the increment in value that accrues to an object as a result of ownership (Kahneman, Knetsch, & Thaler, 1990). An example of the endowment effect is that owners often refrain from selling an object (e.g., stocks), even when selling is economically more rational than keeping. The endowment effect is usually explained by an asymmetry in the perceived value of gains and losses, such that gains of a given size are perceived lower in absolute value than losses of the same size. From a critical point of view, however, one could object that this account is just a different description of the phenomenon rather than a psychological explanation, because it does not explain *why* gains and losses are perceived differently. The present findings offer a new perspective on the endowment effect, such that the perceived difference in gains and losses might be due to the enhanced value of owned objects caused by processes of associative self-anchoring (Greenwald & Banaji, 1995). If this assumption is correct, endowment effects on explicit evaluations should be mediated by implicit evaluations. In addition, the proposed explanation implies that endowment effects should be stronger for individuals with a high level of implicit self-esteem as compared to those with a low level. From this perspective, the endowment effect and the mere ownership effect might be driven by the same underlying mechanism. In fact, they may even be regarded as the same phenomenon.

Conclusion

In summary, the present studies suggest that post-decisional attitude changes can result from low-level associative processes that do not require higher-order propositional processes, such as they are involved in cognitive dissonance (Gawronski & Strack, 2004). Specifically, it seems that the act of choosing an object creates an association between the chosen object and the self, and that implicit self-evaluations associatively transfer to the chosen object. Given that most people's implicit self-evaluation is strongly positive, this process leads to more favorable implicit evaluations of chosen objects as compared to rejected objects, even when the two alternatives were evaluated equally before the decision. This mechanism may be a driving force not only in post-decisional attitude change, but also in several other social psychological phenomena, such as ingroup favoritism, the mere ownership effect, or the endowment effect.

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