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Positive and negative associations underlying ambivalent attitudes ☆

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Abstract

In two studies, we compared the strength of positive and negative associations of ambivalent attitudes to those of nonambivalent attitudes. In Study 1, results from an implicit association task showed that, in contrast to nonambivalent attitudes, ambivalent attitudes were characterized by strong positive *and* negative associations. In Study 2 responses to ambivalent attitude objects were faster following a positive as well as following a negative prime, compared to a non-word prime, whereas for neutral attitude objects prime type did not influence response times. Results provide direct evidence for the assumption that both positive and negative associations of ambivalent attitudes are relatively strong. Implications for attitude strength and attitude structure are discussed.

Keywords: Ambivalence; Evaluative conflict; Attitude structure; Attitude strength; Affective priming; Implicit association measure

Lighting up one more cigarette, going for a run at 6 a.m., legislating abortion, restricting the number of immigrants: These diverse attitude objects have in common that they can evoke strong conflicting feelings. In contrast to the traditional idea that attitudes are either positive or negative there is now ample evidence that separate positive and negative evaluations can and do exist (e.g., Cacioppo, Gardner, & Berntson, 1997, 1999). Ambivalence can be defined as the simultaneous existence of strong positive *and* negative evaluations about the same attitude object (e.g., Thompson, Zanna, & Griffin, 1995). The concept of ambivalence fits with more general ideas about the structure of affect, suggesting that positive and negative affect can occur relatively independently (e.g., Ito & Cacioppo, 2001).

Definitions of ambivalence imply that ambivalent attitudes have a structure that differs from nonambivalent (univalent) attitudes. Univalent positive or negative attitudes result from strong associations between the attitude object and positive or negative attributes (Fazio, 1995). In the case of ambivalent attitudes, strong associations are also likely to be present. However, ambivalent attitudes are thought to have both strong positive *and* strong negative associations. In the present studies, we aim to show this in a direct way.

Ambivalent attitudes share several characteristics and consequences that differ from nonambivalent attitudes. For instance, ambivalence is associated with slow evaluations, low attitude stability (Bargh, Chaiken, Govender, & Pratto, 1992) and systematic processing (Maio, Bell, & Esses, 1996). In general, such effects are thought to result from a weak link between the attitude object and a corresponding evaluation. However, for ambivalent attitudes this explanation seems less appropriate. For instance, Bargh et al. (1992) suggest that the long evaluation latencies are due to the fact that presentation of an ambivalent attitude object activates both positive and negative associations. Both sides fight for attention (and evaluation) and this makes it harder to decide whether the object is positive or negative. A similar argument is used to explain why ambivalence is associated with an absence of automatic attitude activation effects.

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Generally, mere presentation of an attitude object (e.g., Flower) automatically activates the associated evaluation (Fazio, Sanbonmatsu, Powell, & Kardes, 1986). Although not tested directly, results from Bargh et al. (1992) suggest that ambivalence is one of the factors that moderate this automatic activation effect. Again, this is attributed to the idea that ambivalent attitudes have a specific associative structure with both strong positive and negative associations. To further investigate these ideas, we set out to directly test whether ambivalent attitudes are characterized by strong positive *and* negative associations.

When trying to assess ambivalence, most researchers rely on one of two types of measurement: 'Formula-based' indices of ambivalence and self-reports. The former requires participants to evaluate only the positive aspects of a stimulus, while ignoring the negative aspects and vice versa (Kaplan, 1972). These separate ratings are then combined into an index of ambivalence. For self-report measures, people are asked to indicate the degree to which they feel conflicted about a certain issue (e.g., Priester & Petty, 1996). Both types of measures have strengths and weaknesses (see e.g., Jonas, Brömer, & Diehl, 2000). Importantly, neither of the two types of measures directly assesses the degree to which the attitude is characterized by conflicting associations. Instead, strength of positive and negative associations is inferred from the equality and extremity of the given evaluations.

A study by Newby-Clark and colleagues (Newby Clark, McGregor, & Zanna, 2002) addressed the question about the strength of positive and negative associations more directly. They measured the speed with which participants gave their separate evaluations of positive and negative aspects on Kaplan-scales and submitted these evaluation latencies to an ambivalence-formula, intended to form an index of the strength in activation of the positive and negative associations. Their approach can be interpreted as a measure of the strength of conflicting associations. However, latencies in their study are likely to be a combination of the activation of the associations, and the time it takes to formulate the appropriate response on a Kaplan-scale. Conceptually, especially the first aspect is of interest. Therefore, with the present studies we aimed to provide more direct evidence that ambivalent attitudes are characterized by strong positive and negative associations. To do this, we compared the activation of positive and negative associations for ambivalent attitudes with those for univalent, positive and negative, attitude objects (Study 1) and neutral objects (Study 2). In Study 1, we used an implicit association paradigm to demonstrate that for ambivalent attitudes, positive and negative associations are comparable in strength. In Study 2, we used a priming paradigm that enabled us to distinguish ambivalent from neutral attitudes with respect to the strength of positive and negative associations.

Study 1

We used a variation on the Implicit Association Test (IAT; Greenwald, McGhee, & Schwarz, 1998) to investigate whether attitude objects to which people are ambivalent are characterized by equally strong positive and negative associations. In the IAT, people respond to words related to the attitude object and to unrelated positive and negative words. On different experimental blocks, the required response for the attitude object and valence words are either congruent (same key for, e.g., positive attitude object and positive valence words) or incongruent (same key for positive attitude object and negative valence words). We expected to obtain the standard effect for nonambivalent attitudes: Faster responses on congruent blocks than on incongruent blocks. In contrast, for ambivalent attitude objects we expected responses on the different blocks to be equally fast, reflecting that these attitudes have equally strong positive and negative associations.

Methods

Participants

Fifty psychology students (67% women, $M = 21$ years) from the University of Amsterdam completed the experiment in partial fulfillment of a course requirement.

Procedure

All tasks and instructions were administered on computers (iMac, 450 MHz), using Authorware 1.6 software. We used 15 in. monitors at a resolution of 800×600 pixels; refresh rate was 75 Hz. Stimuli were presented in 28-point Times New Roman font.

Participants learned the experiment consisted of several reaction tasks. They were instructed to be accurate and as fast as possible. To measure the strength of positive and negative associations for ambivalent and univalent attitude objects, participants completed three separate Single Target—Implicit Association Tests (ST-IAT; Wigboldus, Holland, & van Knippenberg, 2004), one for each type of attitude object. The ST-IAT differs from the original IAT in that it assesses associations of only one attitude category at a time instead of comparing two categories (e.g., Muslim vs. Christian). After completion of the ST-IATs, participants were thanked and debriefed.

Ambivalent and univalent attitude objects

Targets in this study were individually selected ambivalent and nonambivalent attitude objects. Preceding each ST-IAT, participants were instructed to think of an object that for them personally was ambivalent, positive, or negative, respectively. The attitude object they entered was then used as target in the subsequent ST-IAT.

Measure of positive and negative associations

In each ST-IAT, participants' task was to correctly categorize words that appeared in the center of the screen by pressing one of two keys (A or L). Words were general positive and negative words (e.g., pleasure, awful) and words representing the attitude object (e.g., meat, abortion). Each trial started with a 500 ms fixation point ("*"), followed by

the target word which remained on screen until the respondent pressed a key. Incorrect responses were followed by a 200 ms presentation of the word "incorrect." Inter-trial interval was 1500 ms.

Each ST-IAT consisted of three blocks, each consisting of 20 trials in random order. During a first (valence-practice) block a set of five positive (*happiness*, *lovely*, *spring*, *joy*, and *friendly*) and five negative (*disgust*, *sad*, *hate*, *awful*, and *horrible*) words was presented twice. Participants' task was to indicate whether each word was positive or negative, by pressing the appropriate key. The two experimental blocks were similar, except that now the attitude object was presented as well. In the *positive block*, participants pressed one key for general positive words and for the attitude object, and the other key for general negative words. In the *negative block*, this was reversed: The same response was required for the attitude object as for general negative words. To ensure that on each block the number of correct responses for each key was the same, on the negative block general positive words were presented twice and vice versa for the positive block.

Results

Participants chose diverse ambivalent (e.g., beer, immigrants), positive (e.g., love, friendship), and negative (e.g., war, violence) attitude objects. Since order of ST-IATs or blocks did not moderate the relevant effects, these factors are excluded from the analyses.

The main dependent variable was the time participants needed to categorize words in the different blocks for each of the three ST-IATs. For each ST-IAT, we calculated the average reaction time (RT) over all words for the positive and the negative block. Reaction times below 300 ms (0.5% of all responses) and above 3000 ms (0.05%) were set to their respective limits. Incorrect responses (0.5% of all trials) were removed. All RT's were then log-transformed and averaged per block for each ST-IAT (Wigboldus et al., 2004).

Response times for ambivalent vs. nonambivalent attitudes

To examine the effect of attitude object on reaction times, we performed a 3 (attitude object: positive, negative, and ambivalent) × 2 (block: attitude object paired with positive vs. negative key) ANOVA with repeated measures on both factors (see Table 1).

Results confirmed the predicted interaction between target type and block, $F(2,98) = 40.06$, $p < .01$. For the ST-IAT with the positive attitude object, responses on the positive block were faster than those on the negative block, $F(1,49) = 68.33$, $p < .01$. For the ST-IAT with the negative attitude object we found the reverse, $F(1,49) = 14.39$, $p < .01$. As predicted, for ambivalent attitude objects, responses on the positive and negative block did not differ, $F(1,49) = 1.02$, $p = .64$.[2]

Table 1
Mean reaction times (and *SD*s) per block as a function of attitude type

Attitude Type	Block	
	Positive	Negative
Ambivalent	559 (75)	555 (68)
Positive	520_a (65)	608_b (56)
Negative	583_a (70)	538_b (52)

Note. $N = 50$. Means in a row with different subscripts differ, $p < .01$.

Discussion

As expected, ambivalent attitudes showed equally strong positive and negative associations, judging from both the reaction times and error rates. This indicates that the associative structure underlying ambivalent attitudes is different from the structure of univalent positive and negative attitudes. An important next question is how strong these associations are. To answer this question, we carried out a second study in which we compared ambivalent and neutral attitude objects. Neutral attitude objects or nonattitudes are characterized by the absence of strong positive or negative evaluations in memory (Fazio, 1995). We compared ambivalent and neutral attitudes, because both should have comparable positive and negative associations. The crucial difference is that for neutral attitudes these associations are thought to be weak, whereas in the case of ambivalence they should be strong (Cacioppo et al., 1997; Jonas et al., 2000).

However, most association paradigms such as the IAT, cannot show this difference in strength. In these paradigms, the task will activate both positive and negative associations to an equal degree. For instance in the ST-IAT of Study 1 on the positive block, responses for ambivalent attitude objects should be relatively easy, because of its positive features. At the same time negative features of the attitude object hinder responses, probably resulting in the moderate reaction times we found in Study 1. The problem is that for neutral attitude objects one would expect a similar pattern. In the example above, when the attitude object is neutral, responses on the positive block would be neither hindered nor facilitated, because neither positive nor negative associations are activated. In this case, moderate reaction times would result from weak associations. To disentangle the two, we needed a paradigm where positive and negative associations could be activated separately. In Study 2, we employed a sequential priming paradigm, whereby participants evaluate attitude objects that are preceded by a positive, negative or neutral prime. If ambivalent attitudes are characterized by strong associations, a clearly positive prime presented just before the attitude object, should speed up evaluation times, relative to a neutral (non-word) prime: the prime provides a valenced context that should disproportionally activate the matching positive associations. Similarly, a negative prime should also facilitate reaction times, because it activates the negative

[2] The same pattern of results was found for error rates.

associations. In contrast, for neutral attitude objects, positive and negative primes should provide less benefit in terms of reaction times, due to the absence of any strong associations. In other words, differences in the strength of positive and negative associations between ambivalent and neutral targets, will lead to differences in strength of activation as a result of both positive and negative primes.

Study 2

Methods

Participants

A total of 68 undergraduate students (72% female, $M = 21$ years) participated in this study in exchange for course credit or payment (€3).

Procedure

All instructions and tasks were administered on computers (Pentium 4, 2.86 GHz), using a stimulus presentation program (WESP, 2002). The 15 in. monitors were set at 800×600 pixels; refresh rate was 75 Hz.

Participants were told that the aim of the study was to investigate reactions to words under different circumstances. Participants' task was to indicate, as accurately and as fast as possible, whether the word on the screen was positive or negative by pressing one of two keys (A-key or L-key). They were told that to increase complexity of the task each word would be preceded by a brief presentation of another word or letter string and that they were to ignore this first word. After the priming task, participants completed explicit measures of ambivalence, neutrality and overall attitude. Finally, they were thanked, paid and debriefed.

Ambivalent, neutral, positive and negative attitude objects

Attitude objects were six ambivalent attitude objects (*Moroccan*, *alcohol*, *refugee*, *candy*, *abortion*, and *exam*) and six neutral attitude objects (*pincers*, *lamps*, *tile*, *storehouse*, *meeting*, and *transport*) selected on the basis of a pilot study ($N = 30$). Ambivalent and neutral objects were comparable in terms of word length and frequency of occurrence. In addition, we selected three clearly positive (*friend*, *present*, and *flowers*) and three clearly negative attitude objects (*cancer*, *war*, and *cockroach*) to serve as controls for the effectiveness of the paradigm.

Affective priming task

To measure the influence of a positive and negative context on responses to different types of attitude objects, we presented each attitude object three times: Once preceded by a letter string, once preceded by a positive prime and once preceded by a negative prime.

As primes, we used six positive (*magnificent*, *perfect*, *loving*, *fantastic*, *splendid*, and *pleasant*) and six negative adjectives (*disgusting*, *useless*, *dismal*, *terrible*, *annoying*, and *horrible*) and six letter strings (e.g., *bbbbb*, *mmmmm*). Each prime was used only once for one item of each attitude type (ambivalent, neutral, and nonambivalent) and each attitude object was preceded once by each type of prime. This way, we ensured that a specific prime was used an equal amount of times for each type of attitude object. We randomly assigned participants to one of two random sequences of the 54 experimental trials. The experimental trials were preceded by ten practice trials.

Words were presented in white in the middle of a black screen, with labels in the left and right corner of the screen, to remind participants of the meaning of the keys. Each trial consisted of a 500 ms presentation of a fixation point ("*"), directly followed by a 300 ms presentation of the prime. The prime was then replaced by the target attitude object, which remained on the screen until the participant pressed one of the designated keys. Inter-trial interval was 1500 ms.

Explicit measure of ambivalence

Participants indicated for each of the 18 attitude objects the degree to which they felt conflicted, were both positive and negative, and had conflicting thoughts about it. Answers were given on a 100-point visual analogue scale (VAS; *not at all–very much*). For each attitude object, we averaged responses on the three questions into an experienced ambivalence score (Cronbach's $\alpha > .76$). Subsequently, we calculated the mean experienced ambivalence for the four attitude types.

Neutrality

For each attitude object, we asked participants to indicate the degree to which they felt neutral (i.e., neither positive nor negative) about it, on a VAS from (0) *not at all* to (100) *very much*. Responses for each attitude type were averaged.

Overall attitude

Overall attitude was measured with three items. Participants indicated their overall evaluation of the attitude objects on a bipolar scale from very negative (0) to very positive (100). Again, we averaged mean scores per attitude type.

Results

Adequacy of selected attitude objects

First, we checked whether our pre-selection of targets was adequate, using one-factor repeated measure ANOVA's, with the four attitude types as levels of the independent variable and experienced ambivalence, neutrality and overall evaluations as dependent variables, followed by specific one-degree-of-freedom contrasts. For all dependent variables, main effects were reliable, Fs > 98.60, all ps $< .01$. We focus here on comparisons between ambivalent and neutral attitudes, but scores for the univalent attitude objects also confirmed adequacy of our selection. As expected, experienced ambivalence was higher for ambiva-

lent attitude objects ($M = 48$, $SD = 16$) than for neutral ($M = 31$, $SD = 13$) ones. Conversely, neutrality was higher for neutral attitude objects ($M = 57$, $SD = 15$) than for ambivalent ($M = 25$, $SD = 15$) objects. Finally, ambivalent ($M = 43$, $SD = 12$) and neutral ($M = 45$, $SD = 11$) attitude objects did not differ in extremity, all other contrasts, $p < .01$

Responses

Randomization-version did not moderate any of the effects and is therefore not included as a factor in the analyses reported here. For each attitude type, we calculated proportion of prime-congruent responses on valenced-prime trials. Proportion of congruent responses differed as a function of attitude type, $F(2,201) = 3.40$, $p = .02$. As expected, participants gave more congruent responses for both neutral ($M = .54$, $SD = .10$) and ambivalent attitudes ($M = .53$, $SD = .10$) than for univalent attitudes ($M = .50$, $SD = .10$ for positive objects, $M = .49$, $SD = .08$ negative objects, all individual comparisons $p < .05$).

Reaction times

Responses under 300 ms (3% of all responses) were set to 300 ms and reactions over 3000 ms (0% of all responses) were set to 3000 ms. All responses were then log-transformed. We calculated the mean RT for the different types of attitude objects in response to positive, negative, and neutral (baseline) primes. The resulting average RT's were submitted to a 4 (Attitude: ambivalent, neutral, positive, and negative) × 3 (Prime: baseline, positive, and negative) ANOVA with repeated measures on both factors (for means see Table 2). A main effect for attitude type, $F(3,201) = 43.36$, $p < .01$ and a main effect for prime type, $F(2,134) = 4.23$, $p = .017$ were qualified by the predicted interaction between attitude type and prime type, $F(6,402) = 4.18$, $p < .01$. To test our hypothesis regarding the pattern of associations for ambivalent and neutral targets, we calculated specific one-degree-of-freedom contrasts, comparing RT on valenced prime trials to baseline prime trials for each attitude type. As can be seen in Fig. 1, only for the ambivalent attitudes we found a *valence-facilitation effect*: Reactions to ambivalent targets were facilitated both when the attitude object was preceded by a positive prime, $F(1,67) = 9.22$, $p < .01$, and when it was preceded by a negative prime, $F(1,67) = 4.17$, $p = .04$, in comparison to when the attitude object was preceded by a letter-string (baseline) prime. In contrast, for neutral targets, no facilitation occurred, $F < 1$, *n.s.* For univalent positive targets, we found interference for negative primes, $F(1,67) = 9.95$, $p < .01$ and some facilitation for positive primes, $F(1,67) = 2.85$, $p = .08$, in line with standard affective priming paradigms. For negative univalent targets no clear pattern was found.

Table 2
Mean reaction times (and *SD*s) for the different attitude types as a function of prime

Attitude type	Prime		
	Positive	Negative	Baseline
Ambivalent	757_a	772_a	813_b
Neutral	796	820	804
Positive	642_a	728_b	672_c
Negative	750	735	720

Note. $N = 68$. Different subscripts within a row differ, $p < .05$.

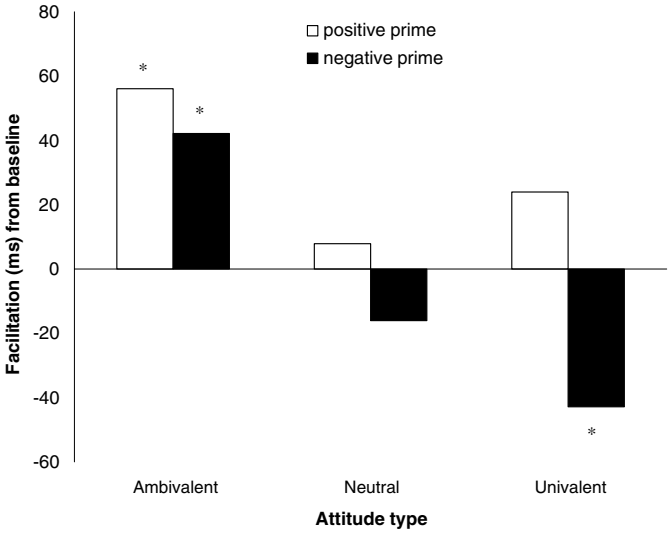

Fig. 1. Mean facilitation (ms) in response to valenced primes compared to baseline primes as a function of attitude type. Bars marked with an "*" differ from baseline, $p < .05$. For univalent targets, the white bar represents mean facilitation on prime–target congruent trials (positive primes for positive attitude objects, negative primes for negative objects); the black bar represents mean RT on incongruent trials for positive and negative attitude objects.

As a next step, we investigated whether the valence-facilitation effect for ambivalent attitudes was dependent on whether the response was congruent or incongruent with the prime. If, as we argue, the valence-facilitation effect is found regardless of the actual response given, this would provide further evidence that ambivalent attitudes are indeed characterized by a structure of strong positive and negative associations in memory. In addition this analysis would rule out the possibility that some people constructed the ambivalent targets as positive and others as negative, hence producing the overall facilitation effect. For both ambivalent and neutral targets, we calculated mean RT for congruent trials by collapsing positive prime trials on which a positive response was given with negative prime trials on which a negative response was given. Similarly, we calculated mean RT for incongruent trials by averaging over all trials on which the response was dissimilar to the prime. Congruent and Incongruent trials were then compared with the average RT on the baseline-prime trials.[3] This 3 (response: congruent, incongruent, baseline) × 2 (attitude type: ambivalent, neutral) repeated measures ANOVA showed the interaction between attitude type and response,

[3] For ease of presentation, we collapsed RT's over primes and responses resulting in congruent, incongruent, and baseline trials. However, analyzing the data for each prime and response separately gave comparable results.

$F(2,134) = 3.13$, $p < .05$. As expected, for ambivalent targets responses were facilitated by a valenced prime when the actual response was congruent with the prime, difference from baseline $M = 75$ ms, $F(1,67) = 18.19$, $p < .01$. In addition, even when actual responses were incongruent with the prime (marginal) facilitation from baseline was found, $M = 32$ ms, $F(1,67) = 3.75$, $p = .06$. In contrast, for neutral targets comparison between baseline and congruent and incongruent trials showed no clear pattern, $F < 1$, *n.s.*

Relation between valence-facilitation effect and experienced ambivalence

Finally, we examined the relation between facilitation scores and explicit ambivalence ratings. Therefore, we calculated for each participant mean RT's for the three most ($M = 65$, $SD = 16$) and least ($M = 33$, $SD = 17$) ambivalent targets in response to the different prime types. In line with the idea that the valence-facilitation effect would be largest for those attitude objects that were most ambivalent, separate analyses for the most and least ambivalent objects showed no reliable effect of prime type for the least ambivalent targets, $F(2,66) = 1.61$, $p = .21$, but solely for the most ambivalent targets, $F(2,66) = 3.95$, $p = .024$. Only for the targets for which participants' ambivalence was high, RT's on the positive prime trials ($M = 742$, $SD = 13$) and negative prime trials ($M = 749$, $SD = 12$) were consistently faster than on the baseline trials ($M = 812$, $SD = 13$), $p = .013$ and $p = .033$ for positive and negative primes, respectively.

Discussion

In this study, both positive and negative primes led to response facilitation for ambivalent attitude objects, but not for neutral attitude objects. This indicates there is a clear difference in the associations that underlie these two kinds of attitudes. The valenced primes helped to activate the corresponding associations for the ambivalent targets. In contrast, for neutral attitude objects, valenced primes did not trigger any strong associations and thus did not facilitate responding. It is important to note that for the ambivalent targets the facilitation of RT's in response to a valenced prime was not dependent on the actual response given. Logically, the valence-facilitation effect was most pronounced when the response was congruent with the prime. Nevertheless, when prime and response differed, there was still (marginal) facilitation for ambivalent attitudes. Since there was no such effect for neutral objects, this provides further evidence that the associative structure of ambivalent attitudes is different from that of neutral attitudes.

General discussion

Results of the present studies show that ambivalent attitudes have specific characteristics that distinguish them from other types of attitudes. Study 1 indicated that ambivalent attitudes differ from those that are univalent: Positive and negative associations are comparable in strength only for ambivalent attitudes. Study 2 showed that these associations are relatively strong. This was true for objects people chose as ambivalent (Study 1) and objects for which people reported strong mixed feelings (Study 2). Together the studies show that differences between ambivalent and nonambivalent attitudes are not only present at a meta-attitudinal level or in the extremity of evaluations (Bassili, 1996), but also manifest themselves directly in the strength of associations. In our view, these strong positive and negative associations are a prerequisite for experiencing ambivalence. To experience attitudinal conflict, positive and negative associations have to be strong and equally strongly activated (see Newby Clark et al., 2002 for a similar argument).

Since our main aim was to show that the *experience* of conflict is reflected in a pattern of strong positive and negative implicit associations, we used explicit ratings of ambivalence as benchmarks in this study. However in general, we do not expect a one-to-one relation between explicit and implicit measures of ambivalence. This is illustrated by recent studies in which participants formed positive associations with a stimulus through evaluative conditioning and later learned negative information about this same stimulus (Petty, Tormala, Brinol, & Jarvis, 2006). This manipulation made participants behave as though they were ambivalent (e.g., systematic processing) although no explicit ambivalence was reported; a situation which they called implicit ambivalence. We would expect that the paradigm from Study 2 would be able to reveal these ambivalent associations in the absence of reported ambivalence. In other words, although strong positive and negative associations at an implicit level are a prerequisite for explicit ambivalence, the reverse is not necessarily true.

The present studies clearly indicate that ambivalent attitudes are characterized by *strong* object-evaluation links; links that are both positive *and* negative (see also Fazio, 1995; Thompson et al., 1995). Therefore it seems useful to base conclusions on the strength of object-evaluation links not solely on the speed (or rather slowness) of responses on dichotomous evaluation tasks (Bargh et al., 1992). As we indicated in the introduction, such slow responses are often thought to result from the effort it takes to activate conflicting associations. Others have suggested that it is not so much the activation of ambivalence that is effortful, but rather the resolution of the conflict when people have to act on these attitudes (e.g., Cacioppo, Gardner, & Berntson, 1999). Although not conclusive, based on the present results we argue that both may be the case. Facilitation was largest for congruent responses, suggesting that valenced primes helped to integrate conflicting associations into one response. At the same time, the fact that facilitation for ambivalent attitudes was not restricted to prime-congruent responses, suggests that once the context provides a positive or negative cue this may help to activate the conflicting associations.

In this respect our results add to recent work from Ferguson and colleagues (Ferguson & Bargh, 2003; Ferguson, Bargh, & Nayak, 2005) in which they showed context-

dependent automatic attitude activation. For instance, when the word *dentist* was preceded by *doctor* on the previous trial in a sequential priming paradigm, it facilitated responses to positive words but not to negative words. In contrast, when the same object was preceded by the word *drill*, dentist facilitated responses to negative words but not to positive words. Although their research did not focus on ambivalence, the present studies suggest that this may work especially well for ambivalent attitude objects. In addition our findings suggest that in the case of ambivalent attitudes a positive or negative context cue can help to trigger both conflicting associations. It seems useful therefore for future studies to look into the automaticity of the effects presented here.

Eventually, results may help to shed some light on mixed findings regarding effects of ambivalence (see Conner & Sparks, 2002 for an overview). Ambivalence differs from other commitment-related attributes of attitude strength. While in general attributes such as certainty and perceived likelihood to change are correlated, this may be less the case for ambivalence. Someone with a strongly ambivalent attitude may at the same time be very certain about this attitude, due to the fact that the associations between attitude object and positive and negative attributes are strong. This may help explain why ambivalent attitudes seem weak in some respects (e.g., low attitude stability), but 'act as' strong attitudes in other respects, such as resistance to persuasion when arguments provided in a message are weak (Maio, Esses, & Bell, 2000). Future studies must clarify the precise relation between the strength of positive and negative associations and different strength-related effects.

The current findings again point to the importance of truly integrating a multidimensional view on attitudes into theory and research. Positive and negative evaluations can and do co-occur and this should be reflected in how we conceptualize and measure attitudes (Cacioppo et al., 1999). On a methodological level, as others have noted before, standard explicit evaluation scales do not always allow for the assessment of ambivalence (Kaplan, 1972; Thompson et al., 1995): On bipolar evaluation scales respondents cannot express that they are both positive *and* negative. Unipolar evaluation scales, although they fit with a multidimensional view on attitudes, have as a disadvantage that they do not simultaneously assess positive and negative evaluations. Thus, it is important to include paradigms, such as the current one, which do allow assessment of co-activation of positive and negative associations.

On a conceptual level, we should further incorporate the idea that positive and negative evaluations may simultaneously exert their influence on behavior (see also Petty et al., 2006). Clearly, ambivalence can be an enduring characteristic of the attitudinal structure, both at an implicit and explicit level. Implicit and explicit evaluations can conflict and can separately influence behavior (e.g., Wilson, Lindsey, & Schooler, 2000). Moreover, as the present results indicate, (implicit) associations and explicitly stated evaluations may *both* be simultaneously positive and negative. By investigating the structure of ambivalent attitudes in this way, we hope to contribute to a further understanding of the processes behind conflicted attitudes and their influence on behavior.

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