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A Multi-measure Investigation of the Divergence of Implicit and Explicit Consumer Evaluations

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Abstract

This research extends findings that implicit and explicit attitudes may diverge to a consumer evaluation task using multiple measures of implicit evaluation: Evaluative Movement Assessment (EMA; Brendl, Markman, & Messner, 2005), and Evaluative Priming (Fazio,Jackson, Dunton, & Williams,1995). These measures were significantly associated with each other for both positive and negative implicit attitudes. Neither measure predicted explicit liking of the product or explicit intention to purchase the product. We believe this to be the first such demonstrated divergence in a naturalistic, unconditioned consumer evaluation context. Implicit activation of the product's emotional benefit (e.g., "relaxation"), as assessed in a lexical decision task (LDT) was not associated with the EMA or evaluative priming, but was significantly associated with both explicit emotional state (e.g., relaxation) and explicit purchase intention; the latter effect was not mediated by explicit emotion.

Keywords: consumer attitudes, implicit measures, implicit attitudes, reaction time measures

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Consumer research typically relies on explicit attitude measurement strategies such as consumer surveys or focus group methods. Explicit attitudes are most predictive of highly deliberative behaviors (Wilson, Lindsey, & Schooler, 2000), whereas most consumer decisions are made when shoppers are not fully focused on the decision process. Implicit attitudes are automatically triggered by encountering the attitude object (Bargh, Chaiken, Govender, & Pratto, 1992; Fazio, Sanbonmatsu, Powell, & Kardes,1986), meaning they will be influential even when shoppers are cognitively busy. Moreover, consumer behavior may be highly habitual: most of us know which brand of detergent we tend to use but have likely given little thought to the reasons behind that preference. Implicit attitudes are thus highly relevant to consumer decision-making (Chartrand, 2005; Dijksterhuis, Smith, vanBaaren, & Wigboldus, 2005). Indeed, subtle factors, such as a match between the first letters of one's name and of the brand name, can powerfully influence consumer preferences (Brendl, Chattopadhyay, Pelham, & Carvallo, 2005). Likewise, even incidental exposure to a brand increases preference for that brand due to non-conscious effects on brand accessibility and automatic inferences about the observed users (Ferraro, Bettman, & Chartrand, 2009). Given the importance of these non-conscious influences, consumer research needs a better understanding of implicit measurement within the consumer attitudes domain. The present research examines the interrelation of three implicit measures and investigates how they relate to commonly used explicit measures of consumer preference in an attempt to fill a current gap in research.

In addition to the intrisic importance of consumer goods, this class of attitude objects allows for unique insights into basic implicit processes (Bargh, 2002). In particular, we examine the question of implicit and explicit attitude divergence. Implicit and explicit attitudes predict different classes of behavior (Dovidio, Kawakami, & Gaertner, 2002; McConnell & Leibold, 2001; Wilson, Lindsey, & Schooler, 2000) and are formed differently (DeCoster, Banner, Smith, & Semin, 2006; Rydell, McConnell, Mackie, & Strain, 2006; Rydell & McConnell, 2006). Competing theories, however, suggest a unitary attitude structure with explicit attitudes aligning with implicit attitudes except under motivational pressure, social pressure, or processing constraints (Fazio & Olson, 2003; Petty & Wegener, 1998), or because of a lack of clarity in the explicit measure (Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005). We believe that consumer goods offer a valuable domain for an investigation of the debate about divergence. Social and motivational pressures are unlikely to influence attitudes towards mundane consumer good targets: in contrast to social and intrapersonal pressures surrounding racial attitudes, it seems unlikely that anyone experiences meaningful pressure to report positive attitudes toward particular types of dish soap. To the extent that deliberate misreporting of explicit attitudes causes a divergence between these two attitude types, we would expect greater convergence for consumer goods, where this misreporting should be minimized (see Hofmann et al., 2005). If, however, these two systems are truly distinct, then the attitude context should not affect their divergence.

Existing research on the convergence of implicit and explicit attitude measures has focused heavily on the Implicit Association Task (IAT; Greenwald, McGhee, & Schwartz, 1998; for a recent meta-analysis, seeHofmann et al., 2005). In order not to

replicate this body of work,we used two less common measures of implicit evaluation that both utilize computerized reaction time tasks: the evaluative priming paradigm (EVP; Fazio et al., 1995) and the Evaluative Movement Assessment (EMA; Brendl, Markman, & Messner, 2005). These measures both include independent components of positive and negative attitudes or preference. Using these components independently allows a neutral response, where the individual holds *neither* strongly positive nor strongly negative feelings, to be disambiguated from an ambivalent response, in which the individual holds *both* strongly positive and strongly negative attitudes (Cacioppo & Berntson, 1994). We believe that using independent measures of these two dimensions provides greater power in determining the predictive utility of implicit measures on behavioral intentions through more sensitive measurement of attitudes likely to fall toward the midpoint of a bipolar scale.

The evaluative priming procedure (EVP; Fazio et al., 1995) examines the ability of an attitude object to prime positivity or negativity. In this procedure, the target or control object appears briefly prior to presentation of a positive or negative word. Participants are instructed to indicate if the word means “good” or “bad” using a response keypress. The degree to which the attitude object facilitates the identification of positive words as “good” represents the implicit positive evaluation, and the facilitation of identifying negative words represents the implicit negative evaluation.

The EMA (Brendl, Markman, & Messner, 2005) is a relatively new computerized reaction time task that uses response compatibility to assess implicit attitudes. Participants use response keys to move words toward or away from their name, which appears at the center of the screen. Positive distractor words (e.g., baby, birthday) are

always moved toward the name, and negative distractor words (e.g., rats, death) are always moved away from the name. A separate set of target words, representing the attitude objects, is identified before the task. These attitude objects are mixed in with the distractor words and have specific instructions per block of trials. Participants perform two blocks in which the attitude objects are moved toward the name and two blocks in which the attitude objects are moved away from the name; during these blocks, they continue to move positive words toward the name and negative words away from the name (see Figure 1 for a schematic). The mean latency to move the attitude object toward the name represents the implicit positive attitude, and the mean latency to move the attitude object away from the name represents the implicit negative attitude.

The theoretical basis of the EMA parallels work by Chen and Bargh (1999) that, like Brendl, Markman, and Messner (2005), has found reaction time scores from "moving" targets in relation to the self correlate with explicit evaluations of attitude objects. These movement compatibility effects generalize across a variety of movement response types (Rotteveel & Phaf, 2004; Seibt, Neumann, Nussinson, & Strack, 2008; van Dantzig, Pecher, & Zwaan, 2008; van Dantzig, Zeelenberg, & Pecher, 2009; Wentura, Rothermund, & Bak, 2000). The Implicit Associative Procedure (IAP; Schnabel, Banse, & Asendorpf, 2006) is a joystick measure equivalent to the EMA (Markman & Brendl, 2005). An IAP assessing implicit perceptions of control over anxiety-causing events was associated with explicit measurements of anxiety (Hogendoorn et al., 2008). Likewise, Reinecke, Becker, and Rinck (in press) report in this issue that responses to phobic stimuli on the Approach-Avoidance Task (Rinck & Becker, 2007), another movement-compatibility task, relate to self-report measures of

anxiety about these stimuli. Overall, these findings suggest the EMA and its kin have predictive utility for a variety of contexts.

Whereas the EMA and the evaluative priming procedure are both designed to measure implicit evaluations, we are also interested in assessing implicit activation of specific attributes of the target products, namely the emotional experiences the products are meant to evoke (e.g., a detergent making the user feel joyful). We therefore also included a lexical decision task (LDT; Meyer & Schvaneveldt, 1971). This task, unlike the previously discussed measures, does not involve a direct pairing of the attitude object and the target attribute within the task. Instead, it assesses general activation of the target attribute (e.g., joy) by measuring response latencies in the decision of whether a letter string represents a word (e.g., JOY, JOE) or a non-word (e.g., YJO). Facilitation of target words related to the concept (JOY) relative to control words (JOE) indicates activation of the target concept.

In short, the present research examines the convergent validity of two evaluative implicit measures, and compares them to a non-evaluative implicit measure in their relation to explicit attitudes and behavioral intentions. The research thus had three key goals. The first was to determine whether implicit and explicit attitudes would in fact converge for neutral targets. If this were the case, the evaluative measures would be associated with liking, and lexical decision performance would be associated with explicit belief in the product benefit and with explicit emotional experience. The second aim was to examine the interrelations of the three implicit measures; the two evaluative measures should be associated with each other, but not necessarily related to the lexical decision task. Finally, we compared the predictive validity of the three implicit attitude

measures and the explicit measures in predicting behavioral intentions related to the consumer judgment.

Methods

Ninety-seven female employees of a consumer goods company participated in a computer-based study. Participants saw images of packages for three different consumer goods brands (a detergent, a fabric softener, and a cold medicine) presented on a computer monitor. Although these brands were products of the company employing the participants, none of the participants worked in the divisions of the company that produced these products. Participants saw a slide before each new product identifying the product type (e.g., "The next product you will see is a fabric softener"). The order of the packages was counterbalanced. Following the presentation of the three packages, participants completed an LDT, an EVP, and an EMA, all presented using DirectRT software (Empirisoft, 2008).

In the LDT, participants were presented with letter strings that were either words related to the target emotional benefit for each of the three brands (detergent: joy; softener: confidence; cold medicine: restoration), unrelated words, or non-word letter strings. Non-emotion-related control words were matched for length, frequency in usage, and response time using data from the English Lexicon Project (Balota et al., 2007); non-words were matched for length and first letter. Participants were instructed to use the "Q" key to indicate if the letter string on the screen was a real word, and "P" to indicate if it was not a real word in English. To keep participants oriented, "WORD" and "NOT A WORD" appeared in yellow at the bottom of the screen at the left and right, respectively. Approximately 10 target words appeared for each brand, with an equal number of

matched control and non-words. Mean response latencies were computed for the three string types (target, control, and non-word); the facilitation of the target emotional concept was calculated by subtracting the response latency for the target words from the response latency for the matched control words[1].

The EVP followed a modified version of the procedures of Fazio et al. (1995). Positive and negative words were preceded by an image related to the brand (i.e., a logo or package) or a conceptually related control image (e.g., for the cough medicine, a box of tissues or a thermometer). Each image appeared onscreen for 315 ms and was followed by a blank screen for 135 ms. Participants were told that the image was a warning signal to orient their attention and that they did not need to respond to it, but instead should determine as quickly as possible whether the word that then appeared was positive or negative[2]. A positive or negative word then appeared onscreen; participants were instructed to determine whether the word meant "good" or "bad" and to press the "Q" key to indicate that the word meant "good," and the "P" key to indicate that it meant "bad." The words "GOOD" and "BAD" appeared in yellow at the bottom of the screen at the right and left, respectively, to keep participants oriented. Each brand appeared eight times preceding a positive word and eight times preceding a negative word; the order of words and images was randomized. Response times for target images followed by positive words and for target images followed by negative words were calculated as indicators of measures of implicit positivity and implicit negativity, respectively.

In the EMA, following the procedures of Brendl, Markman, and Messner (2005), participants entered their first name, which appeared in a box in the middle of the screen (see Figure 1 for a schematic). Words appeared either to the left or the right of their

name, about half the distance between the center and edge of the screen. Participants were told to move negative words (e.g., divorce, death) away from their name and positive words (e.g., birthday, baby) toward their name (see Figure 1b). Participants were told that the "Q" key would move objects toward the left, and the "P" key would move them toward the right. Thus, the "Q" key would move a word that appeared to the right of the name *toward* the name at the center, and move a word that appeared to the left of the name *away* from the name and off the screen, and the "P" key would do the converse. After a practice block of just positive and negative distractors (e.g., death, baby), they were told that the brand names of the three products they had seen at the start of the session would appear in capitalized font. For the first and fourth experimental blocks, they were told to move these words away from their name, while continuing to move positive words towards their name and negative words away from their name. In the second and third experimental blocks, they were told to move these words toward their name, while continuing to move positive words towards their name and negative words away from their name (see Figure 1a). Each brand name appeared seven times per block; the order of words within each block was randomized. Mean latencies for moving each brand name toward their name (i.e., positivity) and away from their name (i.e., negativity) were calculated.

Following the implicit tasks, participants completed explicit measures of their emotional state, attitude toward the brands, beliefs about the brands' emotional benefits, and purchase intentions. Participants were instructed to use the 1-5 number keys to respond to Likert scale items (where 1 corresponded to the most favorable rating and 5 the least). Participants first rated their explicit emotional state for each of the three target

emotions ("Right now, I feel [JOYFUL/CONFIDENT/RESTORED]"). The order of these items was randomized. One of the three brands' logos then appeared onscreen, and participants completed several ratings for this brand. Scale items appeared below the logo, which remained onscreen for all ratings. Participants rated each brand on their purchase intention ("How likely are you to buy this product?"), their explicit evaluation of the product ("How much do you like this project?"), and their belief in the targets emotional benefit ("Do you believe this product will make you more [JOYFUL/CONFIDENT/RESTORED]?"). After participants had made these ratings for one brand, the next logo would appear and the participants would make the same ratings for that brand, and then for the third brand. The order of the three explicit rating items was randomized within each brand, and the three brands were randomly ordered.

Results

Incorrect responses for each task (e.g., calling a word a non-word, identifying a positive word as negative, moving the brand away from the name in a block in which they were instructed to move the word toward the name) were discarded from further analysis. To restore normality, response times were log transformed, and responses more than three standard deviations greater than the within-participant mean for the response type within each task were deleted. As measures were collected for each of three unrelated brands, data were analyzed in hierarchical linear regressions, nesting brands within participants, which helps reduce error variance and improve reliability over the use of a single target.

Both the evaluative movement assessment (EMA) and evaluative priming (EVP) procedure allow the calculation of independent scores for positivity (response time to

moving the attitude object toward one's name in EMA and to positive words preceded by the attitude object prime in EVP) and negativity (response time to moving the attitude object away from one's name in EMA and to negative words preceded by the attitude object prime in EVP). As predicted, these dimensions were significantly associated across these two measures: for positivity, $\rho = 0.20$, $t(96) = 3.31$, $p = .002$, and for negativity, $\rho = 0.20$, $t(96) = 4.31$, $p < .001$[3].

In all analyses reported below, the implicit measure was entered as a univariate predictor of the measure of interest in a hierarchical linear regression. In order to reduce possible effects of multicolinearity between the two subfactors, which might mask real significant effects of the subfactors, we treated them as univariate predictors in a hierarchical regression, rather than including both in a multivariate analysis.

Both EMA positivity and both factors of the EVP were unassociated with activation of the target emotion as measured by the lexical decision task (LDT), suggesting that their association with each other was not simply an artifact of common method variance. (EMA negativity, $\rho = -0.02$, $t(96) = 0.49$, $p = .63$; EVP negativity, $\rho = -0.07$, $t(96) = -1.03$, $p = .31$; EVP positivity $\rho = 0.01$, $t(96) = 0.12$, $p = .90$.) The EMA positivity measure was significantly associated with the LDT, ($\rho = -0.12$, $t(96) = 2.39$, $p = .02$).

If explicit and implicit attitudes converge, we would expect that EMA and EVP would be associated with explicit liking, whereas the LDT would be associated with explicit belief in the product's emotional benefit and/or explicit emotional experience. In fact, none of the implicit measures were associated with explicit liking (see Table 1 for results of all analyses). Likewise, none of the implicit measures were significantly

associated with explicit belief in the product benefit, though EVP negativity was marginally associated with belief in the rated benefit, indicating that as negativity was inhibited following a target brand prime, participants showed an increased endorsement of the product's target brand's emotional benefit. However, as predicted, LDT, though not EMA or EVP, was significantly associated with the measure of explicit emotional experience associated with the brand ("Right now, I feel…").

In the context of consumer evaluations, the most critical explicit assessment is the behavioral intention to purchase the product. As might be expected from the lack of relationship with explicit liking, neither EMA nor EVP were significantly associated with purchase intention. However, LDT was significantly associated with purchase intention, such that facilitation of the brand's emotional attribute was associated with increased intention to purchase the product. This effect remained significant when explicit emotional experience was included as a predictor of purchase intention, r = -1.33, $t(96)$ = 3.19, p = .002, suggesting that the effect of implicit activation on purchase intention was not mediated by explicit emotion.

Discussion

The results of this examination of three implicit measures are highly informative. The two evaluative measures, evaluative movement assessment (EMA) and evaluative priming (EVP), were correlated for both negative and positive associations. It is perhaps surprising that implicit activation of product benefits, as measured by the lexical decision task (LDT), was associated with positive implicit evaluations of the product on only EMA but not EVP. However, the evaluative tasks differed in how the attitude object was presented. In EMA, the brand name appeared onscreen, and remained until the participant

made a response. In contrast, in evaluative priming, the brand was represented by an image that appeared onscreen for less than half a second. Moreover, in order to avoid repetition of the same package image, which might create a confound in evaluations due to valence effects of enhanced fluency (Bornstein, 1989; Janiszewski, 1993), we used both images of the full package and close-up images of package details as primes. It is therefore plausible that EVP, as presently instantiated, was less robust than the EMA, which might explain why EVP, but not EMA, failed to correlate with the LDT.

The second goal of this research was to examine the convergence or divergence of these measures from explicit measures in a naturalistic attitude context. Even in a consumer context, in which individuals have a low motivation to misrepresent attitudes, we found divergence of explicit and implicit evaluations. Though it is possible that explicit evaluations were subject to social desirability pressures (participants were employees of the corporation that manufactured the target products, but worked in unrelated divisions and were tested outside their workspace by unknown experimenters), there should still be substantially less pressure to alter responses about detergent preference relative to pressures to conceal prejudiced attitudes. Thus, the present research strongly suggests that divergence may be a common rather than rare feature of implicit and explicit attitudes (Hoffmann et al., 2005; Nosek, 2005). It is possible, however, that despite the use of multilevel modeling techniques, there was still excessive error variance in our implicit measures. We did not include a neutral-prime baseline measure as in Fazio et al.'s (1995) original EVP, and in the EMA, participants might have used the surface cue of the brand names appearing in capitalized font rather than deeply evaluating the targets. Further replications of a pattern of divergence in these naturally formed attitudes

would more strongly support this conclusion. Overall, this result, taken with previous lab studies, undermines the idea that implicit and explicit attitudes are drawn from the same basic attitude representation (Fazio & Olson, 2003; Petty & Wegener, 1998).

The final goal of the research, to compare the predictive validity of the three implicit attitude measures for behavioral intentions, found that the divergence of implicit evaluations from explicit measures extended to these behavioral intentions as well, as neither EMA nor EVP predicted purchase intention. However, implicit activation of the product benefit, as measured by LDT, did significantly predict behavioral intention. There are at least three possible ways of conceptualizing the LDT, with each conceptualization suggesting a different interpretation of this correlation. One interpretation is that activation of product benefits, as measured by the LDT, represents a cognitive (as opposed to affective or evaluative) component of the implicit attitude. The lack of a correlation with explicit beliefs about the product would thus parallel the lack of correlation between implicit and explicit evaluations. However, this interpretation would imply that the cognitive, but not evaluative, component of an implicit attitude predicts purchase intention, which seems dubious in light of past research on implicit evaluations and behavior (Dovidio, Kawakami, & Gaertner, 2002; McConnell & Leibold, 2001; Wilson, Lindsey, & Schooler, 2000). For this reason, we find this interpretation the least palatable. Another interpretation, supported by the correlation between the LDT and explicit emotional experience, is that the LDT measured an implicit emotional state. Although LDT and explicit emotion were correlated, the LDT predicted unshared variance in purchase intention, suggesting that these levels of emotional experience, like the two levels of evaluation, can diverge. This interpretation would suggest that "gut

feelings" are useful predictors of consumer preferences (see also Maison, Greenwald, & Bruin, 2004). A third interpretation is that the accessibility of the target emotions in the LDT reflects the activation of non-conscious goals (cf. Aarts, Dijksterhuis, & de Vries, 2001), which have received a tremendous amount of attention in the consumer literature (Bargh, 2002; Dijksterhuis et al., 2005). Priming a goal leads to increases in the effort expended on achieving that goal (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Troetschel, 2001), increases positive appraisals of objects that can help with goal progress (Ferguson & Bargh, 2004), and leads to devaluation of objects unrelated to active goals (Brendl, Markman, & Messner, 2003). If the LDT reflects the degree of non-conscious activation of emotional-state goals, the association between the LDT and purchase intention would thus result from active emotional goals (e.g., to be joyful) leading to increased preference for products that could help satisfy that goal (e.g., a detergent associated with joyfulness). The non-conscious goal literature has demonstrated that goal activation (e.g., thirst) is a necessary condition for other variables to have a behavioral effect (e.g., to be able to alter beverage consumption; Berridge & Winkielman, 2003). This interpretation of the LDT as an indicator of active non-conscious goals might explain why it, and not global measures of implicit attitude, was associated with purchase intention, as the LDT (and not the evaluative measures) would measure this necessary state of goal activation. Clearly, all three of these interpretations are speculative and would require experimental evidence to be disentangled. Likewise, it remains to be seen whether implicit evaluations or emotional benefit activation predict actual purchase behavior, rather than ratings of purchase intentions.

In short, the present research offers valuable insights into how implicit measures of consumer attitudes relate to each other, explicit attitudes, and behavioral intentions to purchase the product. These results are not merely informative about methodological concerns in consumer research, but also speak to the structure of attitudes within the consumer-goods context, and thus are important within both the attitudes and the consumer decision-making literatures.

References

Aarts, H., Dijksterhuis, A., & de Vries, P. J. (2001). On the psychology of drinking: Being thirsty and perceptually ready. *British Journal of Psychology, 92,* 631-642.

Balota, D. A., Yap, M. J., Cortese, M. J., Hutchison, K. A., Kessler, B., Loftis, B., Neely, J. H., Nelson, D. L., Simpson, G. B., & Treiman, R. (2007). The English Lexicon Project. *Behavior Research Methods, 39,* 445-459. Available from http://elexicon.wustl.edu/.

Bargh, J. A. (2002). Losing consciousness: Automatic influences on consumer judgment, behavior, and motivation. *Journal of Consumer Research, 29,* 280-285.

Bargh, J. A., Chaiken, S., Govender, R., & Pratto, F. (1992). The generality of the automatic attitude activation effect. *Journal of Personality and Social Psychology, 62,* 893-912.

Bargh, J. A., Gollwitzer, P. M., Lee-Chai, A., Barndollar, K., & Troetschel, R. (2001). The automated will: Nonconscious activation and pursuit of behavioral goals. *Journal of Personality and Social Psychology, 81,* 1014-1027.

Berridge, K., & Winkielman, P. (2003). What is an unconscious emotion? (The case for unconscious "liking"). *Cognition and Emotion, 17,* 181-211.

Bornstein, R. F. (1989). Exposure and affect: Overview and meta-analysis of researchm 1968-1987. *Psychological Bulletin, 106,* 265-289.

Brendl, C. M., Chattopadhyay, A., Pelham, B. W., & Carvallo, M. (2005). Name letter branding: Valence transfers when product specific needs are active.*Journal of Consumer Research, 32,* 405-415.

Brendl, C. M., Markman, A. B., & Messner, C. (2003). The devaluation effect: Activating a need devalues unrelated objects. *Journal of Consumer Research, 29,* 463-473.

Brendl, C. M., Markman, A. B., & Messner, C. (2005). Indirectly measuring evaluations of several attitude objects in relation to a neutral reference point. *Journal of Experimental Social Psychology, 41,* 346-368.

Cacioppo, J. T., & Berntson, G. G. (1994). Relationship between attitudes and evaluative space: A critical review, with emphasis on the separability of positive and negative substrates. *Psychological Bulletin, 115,* 401-423.

Chartrand, T. L. (2005). The role of conscious awareness in consumer behavior. *Journal of Consumer Psychology, 15,* 203-210.

Chen, M., & Bargh, J. (1999). Consequences of Automatic Evaluation: Immediate Behavioral Predispositions to Approach or Avoid the Stimulus. *Personality and Social Psychology Bulletin, 25*, 215-224.

DeCoster, J., Banner, M. J., Smith, E. R., & Semin, G. R. (2006). On the inexplicity of the implicit: Differences in the information provided by implicit and explicit tests. *Social Cognition, 24,* 5-21.

Dijksterhuis, A., Smith, P. K., vanBaaren, R. B., & Wigboldus, D. H. J. (2005). The unconscious consumer: Effects of environment on consumer behavior. *Journal of Consumer Psychology, 15,* 193-202.

Dovidio, J. F., Kawakami, K., & Gaertner, S. L. (2002). Implicit and explicit prejudice and interracial interaction. *Journal of Personality and Social Psychology, 82*, 62–68.

Empirisoft (2008). DirectRT (v2008) [computer software]. New York: Empirisoft Corporation.

Fazio, R. H., Jackson, J. R., Dunton, B. C., & Williams, C. J. (1995). Variability in automatic activation as an unobtrusive measure of racial attitudes: A bona fide pipeline? *Journal of Personality and Social Psychology, 69,* 1013-1027.

Fazio, R. H., & Olson, M. A. (2003). Implicit measures in social cognition research: Their meaning and uses. *Annual Review of Psychology, 54*, 297–327.

Fazio, R. H., Sanbonmatsu, D. M., Powell, M. C., & Kardes, F. R. (1986).On the automatic activation of attitudes. *Journal of Personality and Social Psychology, 50,* 229-238.

Ferguson, M. J., & Bargh, J. A. (2004). Liking is for doing: The effects of goal pursuit on automatic evaluation. *Journal of Personality and Social Psychology, 87, 557-572.*

Ferraro, R., Bettman, J. R., & Chartrand, T. L. (2009). The power of strangers: The effect of incidental consumer brand encounters on brand choice. *Journal of Consumer Research, 35,* 729-741.

Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The implicit association test. *Journal of Personality and Social Psychology, 74,* 1464-1480.

Hofmann, W., Gawronski, B., Gschwendner, T., Le, H., & Schmitt, M. (2005). A meta-analysis on the correlation between the Implicit Association Test and explicit self-report measures. *Personality and Social Psychology Bulletin, 31*, 1369-1385.

Hogendoorn, S., Wolters, L.H., Vervoort, L., Prins, P., Boer, F., & de Haan, E. (2008). An indirect and direct measure of anxiety-related perceived control in children:

The Implicit Association Procedure (IAP) and Anxiety Control Questionnaire for Children (ACQ-C). *Journal of Behavior Therapy and Experimental Psychiatry, 39,* 436-450.

Janiszewski, C. (1993). Preattentive mere exposure effects. *Journal of Consumer Research, 20,* 376-392.

Maison, D., Greenwald, A. G., & Bruin, R. H. (2004). Predictive validity of the Implicit Association Test in studies of brands, consumer attitudes, and behavior. *Journal of Consumer Psychology*, *14*, 405–415.

Markman, A., & Brendl, C.M. (2005). Constraining theories of embodied cognition. *Psychological Science, 16*, 6-10.

McConnell, A. R., & Leibold, J. M. (2001). Relations among the Implicit Association Test, discriminatory behavior, and explicit measures of racial attitudes. *Journal of Experimental Social Psychology, 37*, 435–442.

Meyer, D. E., & Schvaneveldt, R. W. (1971). Facilitation in recognizing pairs of words: Evidence of a dependence between retrieval operations. *Journal of Experimental Psychology, 90,* 227–234.

Nosek, B. A. (2005). Moderators of the relationship between implicit and explicit evaluation. *Journal of Experimental Psychology: General, 134,* 565-584.

Petty, R. E., & Wegener, D. T. (1998). Attitude change: Multiple roles for persuasion variables. In D. T. Gilbert, S. T., Fiske, & G. Lindzey (Eds.), *Handbook of social psychology: Vol. 1* (4th ed., pp. 323–390). New York: McGraw-Hill.

Reinecke, A., Becker, E. S., & Rinck, M. (in press). Test-retest reliability and validity of three indirect tasks assessing implicit threat associations and behaviousal response tendencies. *Journal of Personality*.

Rinck, M., & Becker, E.S. (2007). Approach and avoidance in fear of spiders. *Journal of Behaviour Therapy and Experimental Psychiatry, 38,* 105-120.

Rotteveel, M. & Phaf, R. H. (2004). Automatic affective evaluation does not automatically predispose for arm flexion and extension. *Emotion, 4*, 156–172.

Rydell, R. J., & McConnell, A. R. (2006). Understanding implicit and explicit attitude change: A systems of reasoning analysis. *Journal of Personality and Social Psychology, 91,* 995-1008.

Rydell, R. J., McConnell, A. R., Mackie, D. M., & Strain, L. M. (2006). Of two minds: Forming and changing valence-inconsistent implicit attitudes. *Psychological Science, 17,* 954-958.

Schnabel, K., Banse, R., & Asendorpf, J. (2006). Employing automatic approach and avoidance tendencies for the assessment of implicit personality self-concept: the implicit association procedure (IAP). *Experimental Psychology, 53,* 69–76.

Seibt, B., Neumann, R., Nussinson, R., & Strack, F. (2008). Movement direction or change in distance? Self and object related approach-avoidance motions. *Journal of Experimental Social Psychology, 44*, 713–720.

van Dantzig, S., Pecher, D., & Zwaan, R. A. (2008). Approach and avoidance as action effects, *Quarterly Journal of Experimental Psychology*, *61*, 1298–1306.

van Dantzig, S., Zeelenberg, R., & Pecher, D. (2009). Unconstraining theories of embodied cognition. *Journal of Experimental Social Psychology, 45*, 345-351.

Wentura, D., Rothermund D. & Bak, P. (2000). Automatic vigilance: The attention-grabbing power of approach and avoidance-related social information. *Journal of Personality and Social Psychology, 78*, 1024–1037.

Wilson, T. D., Lindsey, S., & Schooler, T. Y. (2000). A model of dual attitudes. *Psychological Review, 107,* 101-126.

Notes:

[1] The implementation and analysis of the LDT used in the present research differed in aim than traditional uses of the LDT. Typically, performance on an LDT is measured for a group exposed to a stimulus prime compared to a control prime, in order to determine whether the stimulus increases activation of a target concept (Meyer & Schvaneveldt, 1971). In the present research, however, we were concerned with the extent to which the activation of different target concepts would (or would not) covary with other implicit measures and with explicit consumer preference measures. That is, instead of the typical research question addressed by an LDT ("Does stimulus X increase the accessibility of concept Y?"), which would require a comparison of the stimulus condition to a control condition, we posed the research question of whether the general accessibility of a target concept was associated with other measures of interest, which can be addressed correlationally.

[2] These instructions depart from the original instructions of Fazio et al. (1995), in which participants were told that the faces were part of a memory task and that they would later have to identify if they had seen the face previously. Because of the number of tests that participants performed, and the fact that we were testing three attitude objects, we were hesitant to add an additional cognitive burden, and so simply asked participants to orient their attention to the image. Given that neither the original nor our set of instructions included any suggestion of association between the image and the target judgment, and that the priming effect should be automatic and thus independent of any instructions about processing the image, we believe that our non-standard instructions do not pose any

issue in the interpretation of these results. Likewise, we did not include a baseline measure of response latencies to the positive and negative words due to concerns about participant fatigue. We believe that our use of multilevel analytic techniques offers a similar reduction in error variance such a baseline might have likewise provided.

[3] Fazio et al. (1995) used the EVP as both a bivariate and aggregate measure. No results where the EVP subscores were non-significant predictors were significant if the aggregated EVP was used instead.

Table 1

Results of Implicit Measures as Predictors of Explicit Measures

	EMA Negative	*EMA Positive*	*EVP Negative*	*EVP Positive*	*LDT*
Liking	ρ = -0.02 *t*(96) = 0.08 *p* = .94	ρ = 0.07 *t*(96) = 0.26 *p* = .80	ρ = 0.22 *t*(96) = 0.79 *p* = .43	ρ = -0.07 *t*(96) = 0.21 *p* = .84	ρ = -0.02 *t*(96) = 0.05 *p* = .96
Belief in benefit	ρ = -0.03 *t*(96) = 0.08 *p* = .94	ρ = -0.31 *t*(96) = 0.84 *p* = .40	ρ = - 0.55 *t*(96) = 1.65 *p* = .10	ρ = 0.15 *t*(96) = 0.32 *p* = .62	ρ = -0.50 *t*(96) = 1.10 *p* = .27
Explicit emotion	ρ = -0.43 *t*(96) = 1.63 *p* = .11	ρ = -0.39 *t*(96) = 1.38 *p* = .17	ρ = 0.04 *t*(96) = 0.12 *p* = .91	ρ = 0.25 *t*(96) = 0.67 *p* = .51	**ρ = -1.04** ***t*(96) = 2.41** ***p* = .02**
Purchase intention	ρ = -0.07 *t*(96) = 0.21 *p* = .84	ρ = -0.32 *t*(96) = 1.02 *p* = .31	ρ = - 0.12 *t*(96) = 0.35 *p* = .73	ρ = - 0.19 *t*(96) = 0.49 *p* = .63	**ρ = -1.34** ***t*(96) = 3.20** ***p* = .002**

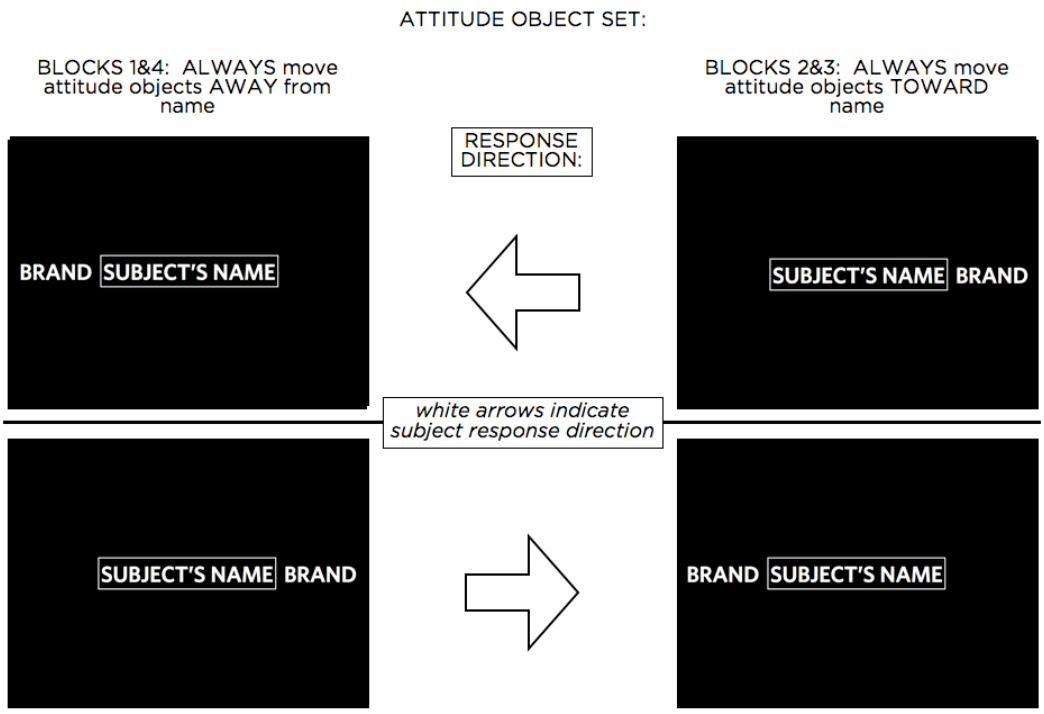
Note: ρ denotes the unstandardized regression coefficient from the hierarchical linear regression, with corresponding *t*-test and *p*-value. Significant cells are shown in **BOLD.**

Figure Caption

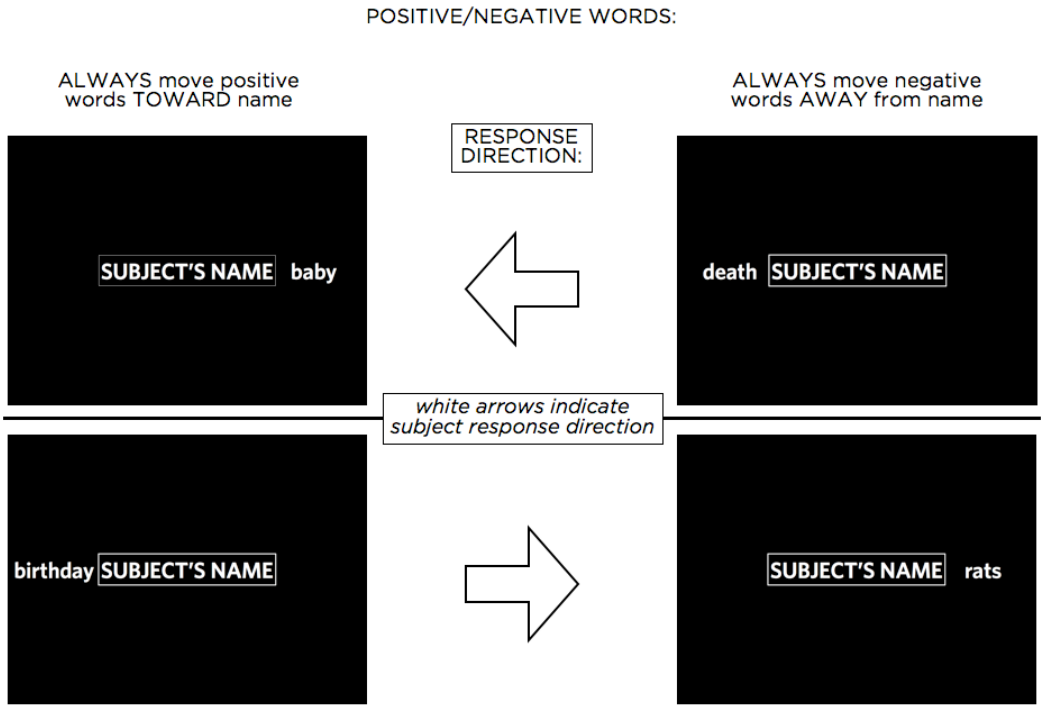
Figure 1. Correct response directions for positive and negative words (1a) and attitude objects (1b). The directions "left" and "right" were indicated by the subject by using the keyboard letters "Q" and "P", respectively. The direction refers to the movement of the word or attitude object, not the subject's name, which remained fixed at the center of the screen.

Figure 1

(A)


ATTITUDE OBJECT SET:
BLOCKS 1&4: ALWAYS move attitude objects AWAY from name
BLOCKS 2&3: ALWAYS move attitude objects TOWARD name
RESPONSE DIRECTION:
BRAND SUBJECT'S NAME
SUBJECT'S NAME BRAND
white arrows indicate subject response direction
SUBJECT'S NAME BRAND
BRAND SUBJECT'S NAME

(B)


POSITIVE/NEGATIVE WORDS:
ALWAYS move positive words TOWARD name
ALWAYS move negative words AWAY from name
RESPONSE DIRECTION:
SUBJECT'S NAME baby
death SUBJECT'S NAME
white arrows indicate subject response direction
birthday SUBJECT'S NAME
SUBJECT'S NAME rats