Attitudes and Recycling: Does the Measurement of Affect Enhance Behavioral Prediction?

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ABSTRACT

Recent attempts to improve the influence of social marketing have often focused on behavioral strategies, largely neglecting the concept of attitude. This is understandable given the weak performance of attitudinal variables as a predictor in past studies of proenvironmental behavior. However, we suggest that part of the reason for the poor association between attitudes and such behavior is the possibility that many altruistic acts such as recycling are subject to affective influences that may not be fully captured by commonly employed attitude measures. We also suggest that attitude strength might moderate the extent to which affective reactions account for additional variance in behavior. Specifically, it is predicted that affect is more important for weak than for strong attitudes. Empirical results are presented to support these suggestions.

The role of attitudes in determining behavior continues to be of great interest to scholars both in psychology (e.g., Eagly, 1992) and marketing (e.g., Cohen, 1990). Since its inception as a field of inquiry, research on attitudes has operated on the assumption that attitudes are directly

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related to a variety of behaviors, and are important mediators of the influence of information on behavior (e.g., Allport, 1935). Attitudes are not always reliable predictors of behavior, however, and a number of factors have been shown to moderate the attitude-behavior relationship. For example, attitude accessibility (e.g., Fazio, Powell, & Williams, 1989), attitude importance (e.g., Krosnick, 1988, 1990), direct contact with the attitude object (e.g., Fazio & Zanna, 1981), perceived efficacy of the behavior (e.g., Berger & Corbin, 1992), and individual differences such as need for cognition (e.g., Cacioppo, Pety, Kao, & Rodriguez, 1986) and self-monitoring (cf. Snyder & DeBono, 1989) have been shown to play a role in determining when attitudes will guide behavior.

The Role of Affect in Attitudes and Behavior

There has been a historical concern that cognitive theories (such as those predominant in the field of attitudes) fail to capture fully the many affective influences on behavior (e.g., Hirschman & Holbrook, 1982; Holbrook & Hirschman, 1982; Zajonc, 1980). A widely cited pair of studies by Abelson and colleagues (Abelson, Kinder, Peters, & Fiske, 1982) demonstrated that affective reactions were strongly related to candidate preferences and voting behavior, and that this association was not mediated by assessments of various traits (i.e., cognitive or semantic judgments). Results such as these led some researchers away from complete reliance on cold cognitive models of human behavior and increased interest in the hot area of emotion. Within the field of attitudes, subsequent scholarship has reinforced the notion that affective reactions can serve as the basis of attitudinal evaluations, as can beliefs and past experiences (e.g., Breckler, 1993; Engel, Blackwell, & Miniard, 1990; Petty & Cacioppo, 1986; Zanna & Rempel, 1988).

Nevertheless, the dominant view of attitudes as global evaluations of objects implies that emotions can only guide behavior via their impact on attitudes. That is, affect contributes to global evaluations, and these global evaluations determine behavior. Thus, the impact of emotion on behavior is assumed to be completely mediated by attitudes. This assumption has been questioned recently by Allen and colleagues (Allen, Machleit, & Kleine, 1992), who found that emotional reports were strongly related to blood donation behavior, and that attitudes toward blood donation did not mediate completely the influence of emotions on donating blood.

Allen et al. (1992) mailed surveys to a large sample of blood donors, assessing their attitudes toward blood donation, the emotions they associated with the act of blood donation, and their number of prior donations. A year later, the donation records of individuals completing the survey were accessed from a computerized data base to determine their donation activity in the 12 months since the survey. The researchers assigned respondents to one of four groups on the basis of

their number of donations *before* the survey: 1–2 prior donations; 3–7 prior donations; 8–15 prior donations; and 16 or more prior donations. Employing a series of regression analyses they found that, for some donors, emotions such as sadness and fear that were associated with blood donation were significant predictors of future donation behavior, even when attitudes toward donation were included in the regression equation. Although a number of prior investigations have noted the importance of affect (e.g., Ajzen & Driver, 1991; Ajzen & Timko, 1986; Godin, 1987), Allen et al. (1992) provided empirical evidence that affect can influence behavior independently of attitudes.

Moderation of the Affect-Behavior Link

The most obvious prerequisite for an unmediated affect-behavior link is that affect has some influence in the behavioral domain of interest. It seems clear that emotional responses are relevant to the behavior studied by Allen et al.—donating blood. It can be further hypothesized that any altruistic act will involve some affective influences, with donating blood being but one example (e.g., Piliavin, Callero, & Evans, 1982). Given that the above condition is met, Allen et al. (1992) proposed that emotions are more likely to incrementally predict behavior over attitudes at low levels of behavioral experience.[1] Furthermore, their results support the notion that emotions are more important predictors of blood donation at very low levels of prior behavioral experience (1–2 prior donations) than at more moderate levels (8–15 donations), and that attitudes become relatively more influential in predicting blood donation as experience increases from low to moderate levels.[2]

Attitude Strength as a Moderator of the Affect-Behavior Link

A broader hypothesis is that the more general construct of *attitude strength* is an underlying moderator of the affect-behavior link. That is, the stronger one's attitude, the more likely (a) the attitude will predict behavior, and (b) the less likely emotional influences are to yield additional predictive power. Hence, the extent to which affective measures enhance behavioral prediction is contingent upon the strength of the attitude.

It is important to note that the concept of attitude strength was not introduced in the Allen et al. (1992) article. Although levels of prior behavioral experience should certainly be associated with increased

[1]Indeed, Breckler and Wiggins (1989) made the same prediction in an earlier study involving blood donation. However, Breckler and Wiggins reported no evidence bearing on the hypothesis that affective influences are not fully mediated by attitudes.

[2]At the highest experience levels (over 16 donations), attitudes declined in prediction of behavior and emotions increased. Allen et al. suggest that by this point, donation had become habitual and was no longer under the control of attitudes.

attitude strength (e.g., Fazio & Zanna, 1981), many other factors have also been associated with attitude strength, and the present analysis suggests that any construct that taps attitude strength is a potential moderator of the affect-behavior link. Some examples include increased accessibility of the attitude (Fazio, in press), increased consistency between affective and cognitive elements of the attitude (Chaiken, Pomerantz, & Giner-Sorolla, in press), and reduced ambivalence concerning the attitude object (Thompson, Zanna, & Griffin, in press). In addition, the amount of issue-relevant elaboration has been suggested to be a critical determinant of attitude strength (Haugtvedt & Petty, 1992; Haugtvedt & Wegener, in press; Petty, Haugtvedt, & Smith, in press). Variables thought to produce strong attitudes, such as high self-relevance or importance of the attitude object (Boninger, Krosnick, Berent, & Fabrigar, in press), would also be potential moderating variables.

Although a variety of perspectives on attitude strength have emerged, a number of points of agreement can be identified. Foremost for the present analysis is the fact that most theorists agree that stronger attitudes will often result from increased importance of the attitude, and/or increased behavioral experience with the attitude object. They also agree that stronger attitudes are likely be more accessible than those that are weakly held (see Petty & Krosnick [in press], for a review).

Why Is Attitude Strength Important?

Consistent with Allen et al. (1992), we hypothesize that poorly integrated attitudes will be less predictive of behavior, making it more likely that other variables (such as emotional reactions) can account for additional variance. However, our analysis departs from that of Allen et al. in that we suggest that any variable affecting attitude strength, not just prior behavioral experience, can potentially drive this integration process. To the extent that the affective component of an attitude is inconsistent with other components and not well integrated into the overall attitude, then affect might be significantly associated with behavior even when the influence of global attitude measures are partialled out. As the affect becomes more integrated, or more consistent with other attitude components, it will be less likely to account for any additional variance in behavior.

We are assuming, along with other theorists (e.g., Chaiken & Baldwin, 1981; Fazio, in press), that as attitude strength increases, more integrated attitudes result. That is, highly accessible attitudes, those on important issues, et cetera, are more integrated than those which are not. Thus, affect should contribute to behavior independently of attitudes mostly for weak attitudes. In the present study, we used attitude accessibility and attitude importance as indicators of attitude strength. These dimensions of strength were then applied as moderators in an analysis of the role of affect in predicting behavior.

Attitudes and Recycling

Recycling is an action that typically offers little direct benefit to the individual, and involves (often considerable) personal costs with respect to time and effort. However, it almost certainly carries important benefits for society as a whole, particularly for future generations. Thus, like donating blood, recycling has frequently been characterized as an act of altruism (e.g., Hopper & Nielsen, 1991). This implies that recycling, like other altruistic behaviors, might be heavily influenced by affect (e.g., Rosenhan, Salovey, Karylowski, & Hargis, 1981).[3]

Another interesting feature of recycling (or, more generally, proenvironmental behavior) is that it has shown a weak attitude-behavior link in a number of past investigations (e.g., Hines, Hungerford, & Tomera, 1987; Oskamp et al., 1991). The poor performance of the attitude construct in this domain has led many researchers to explore behaviorally oriented strategies in lieu of persuasion-oriented ones (e.g., Hutton & Markley, 1991; Wang & Katzev, 1990). It would therefore be useful to document conditions under which attitudes are more or less likely to relate strongly to behavior, as well as to highlight factors that can supplement traditional attitude measures in predicting behavior (cf. Smith & Haugtvedt, in press). In the meta-analysis reported by Hines et al. (1987), traditional attitudinal measures were found to be more strongly correlated with proenvironmental behavior among individuals with ties to environmental organizations ($r = 0.59$) than among those without such ties ($r = 0.33$). A multitude of explanations can account for this finding, but it is quite consistent with the notion that more important, more accessible attitudes are more predictive of behavior, as well as the notion that increased behavioral experience enhances attitude-behavior consistency. We attempted to test these notions in the present study, while also assessing affective responses to see if the Allen et al. (1992) results could be replicated in a different topic domain. In addition, we examined whether the impact of emotion on behavior was moderated by attitude importance and accessibility.

Hypotheses

Consistent with a number of prior investigations, we anticipated that attitudes would be more highly correlated with behavioral reports for individuals with strong attitudes than for those with weak attitudes. We have operationally defined strong attitudes in the present study as attitudes that are (a) more important to the individual, and (b) more accessible, in terms of latency of response to a direct attitudinal query.

[3]Also consistent with the notion that affective variables are important predictors when behaviors involve personal costs but largely societal benefits is a recent study by Ajzen and Driver (1992), in which affective reports were better predictors than attitudes of people's willingness to pay for public goods, such as the use of beaches.

The first focal hypothesis of the present study is that *measures of affect will be significantly associated with behavioral reports, even when attitudes are taken into account.* This is anticipated on the basis of the Allen et al. (1992) findings, and would extend their results to another behavioral domain. Second, we hypothesize that *the added predictive value of affective measures will be greater for individuals whose attitudes are low in importance or accessibility than for those whose attitudes are high on these dimensions.* This also would extend the Allen et al. findings, as they suggested only increased behavioral experience as a moderator of this relationship.

METHOD

Subjects

Data were collected from 217 undergraduate students enrolled in a marketing class. They received course extra credit for their participation. Participants with incomplete response profiles (n = 19) were dropped, leaving a total of 198 respondents.

Procedure

The bulk of the experimental materials were presented via personal computers. Participants reported in groups of two to five and were seated in partitioned cubicles to minimize interaction. After a few practice questions were administered to orient them with the procedures, the dependent measures were assessed (see the following). The experiment took about 20 min to complete, after which subjects were asked what they thought the experiment was about. Inspection of written responses to this question indicated that no one correctly guessed our hypotheses.

Measures

Attitudes and Attitude Accessibility. The first items presented asked subjects to indicate their attitudes toward recycling on 9-point scales anchored by the adjectives "good-bad," "wise-foolish," "undesirable-desirable," and "useless-valuable." The four attitude items were highly intercorrelated (alpha = 0.84) and were summed to form a single index. Response latency to the first attitude item represented our measure of accessibility.[4] (See Table 1 for a listing of all questionnaire items.)

[4]Accessibility is typically measured using dichotomous response scales. Due to a branching error in our program, dichotomous items were not administered to our subjects, leaving us with only the continuous-scale data. However, we note that the use of these data confers no advantage in supporting our hypotheses. Indeed, our less precise latency measures would seem to bias our findings toward null results.

Table 1.

1. *Attitude Measures*

Recycling is:

1	2	3	4	5	6	7	8	9	
bad									good
1	2	3	4	5	6	7	8	9	
foolish									wise
1	2	3	4	5	6	7	8	9	
undesirable									desirable
1	2	3	4	5	6	7	8	9	
worthless									valuable

2. *Attitude Importance Items*

Recycling is an extremely important issue

1	2	3	4	5	6	7	8	9
strongly disagree								strongly agree

Recycling is very important to me personally

1	2	3	4	5	6	7	8	9
strongly disagree								strongly agree

3. *Affective Items*

When I recycle, I feel good

1	2	3	4	5	6	7	8	9
strongly disagree								strongly agree

When I fail to recycle, I feel guilty

1	2	3	4	5	6	7	8	9
strongly disagree								strongly agree

When I imagine myself recycling, I feel good

1	2	3	4	5	6	7	8	9
strongly disagree								strongly agree

When I imagine myself failing to recycle, I feel guilty

1	2	3	4	5	6	7	8	9
strongly disagree								strongly agree

4. *Recycling Behavior*

I recycle aluminum:

1	2	3	4	5	6	7	8	9
never		seldom				usually		always

I recycle plastic:

1	2	3	4	5	6	7	8	9
never		seldom				usually		always

I recycle newspaper:

1	2	3	4	5	6	7	8	9
never		seldom				usually		always

I recycle glass:

1	2	3	4	5	6	7	8	9
never		seldom				usually		always

I recycle white paper:

1	2	3	4	5	6	7	8	9
never		seldom				usually		always

Attitude Importance. Two items were included to measure attitude importance, and these items were interspersed among several others that focused on reasons why the individual would or would not want to recycle. These items were also highly intercorrelated (alpha = 0.72), and were summed to form a single index.

Affective Reactions. Four items were designed to assess the affect subjects associated with recycling. Two items were designed to assess the affect subjects typically associated with recycling, and two additional items were designed to assess the emotions that subjects *expected* to experience if and when they engaged in recycling behavior. The latter items were included for two reasons. A practical consideration was that some subjects might have little or no actual experience with recycling, and hence would not have any direct affective associations. Responses to such items would probably be more valid for these subjects. A theoretical consideration is that recent research in decision making suggests that measurement of *anticipated* emotions can add to behavioral prediction (e.g., Baron, 1992; Ritov & Baron, 1992). These items were also strongly intercorrelated (alpha = 0.81), and were summed to form a single measure.

Recycling Behavior. We included five items to assess subjects' self-reported recycling behavior.[5] These items asked subjects to indicate on 9-point scales the frequency with which they recycled aluminum, newspaper, white paper, glass, and plastics. These items were included primarily because facilities were known to exist in the campus area to handle these materials. Four scale anchors were provided: (1) never, (3) seldom, (7) usually, and (9) always. Responses to these items were submitted to a principal-components factor analysis with varimax rotation. Because this analysis indicated a one-factor solution, we summed the behavioral items to form a single index (alpha = 0.84).

RESULTS

Affect-Behavior Relationship

The first hypothesis was that affect would supplement attitudes in the prediction of recycling behavior.[6] This was tested in two ways. First, a

[5]Although the use of self-report measures might well inflate attitude-behavior correlations (with subjects perhaps striving to appear consistent), these measures would not seem to bias our results in favor of our focal hypotheses. The same argument applies to the fact that shared method variance likely created overestimates in our sample.

[6]As an aside, we also assessed subjects' scores on a general environmentalism scale (the NEP scale; Dunlap & Van Liere, 1978). Consistent with the notion that more specific attitude measures are better predictors of specific behaviors (e.g. Weigel & Newman, 1976), attitudes toward recycling were significantly related to reported recycling behaviors ($r = 0.31$, $p < .001$), but the more general environmental attitudes did not predict recycling ($r = 0.05$, n.s.). The weak performance of general environmental attitudes as behavioral predictors, and the mediocre performance of behavior-specific attitudes, is consistent with past findings in this area (cf. Hines et al., 1987).

Table 2. Stepwise Regression Results with Affective Measures Entered After Attitude Measures, for Subjects Low or High in Attitude Importance or Accessibility.

	Low Importance	Moderate Importance	High Importance	Low Accessibility	Moderate Accessibility	High Accessibility
R^2 increment when affect is entered	0.065	0.192	0.037	0.080	0.112	0.041
F value	4.81*	11.38**	3.40	5.83**	8.69**	3.14
Multiple R	0.342	0.491	0.361	0.376	0.427	0.419
Sample size	$N = 68$	$N = 48$	$N = 82$	$N = 66$	$N = 66$	$N = 66$

*$p < .05$.
**$p < .01$.

simple correlation was calculated between affective reactions and behavioral responses. This correlation was significant, $r\,(198) = 0.37\ p < .001$. Second, we assessed the extent to which affect predicted behavior incrementally. This was tested via a stepwise linear regression equation, first entering individuals' attitudes, and then entering their affective responses. The increment in R^2 (0.073) was significant, $F(1,195) = 17.10$, $p < .001$, indicating clearly that the affective measures were accounting for variance in reported behaviors above and beyond that explained by the overall attitude measures.

Moderation of the Affect-Behavior Link

Hypotheses were also forwarded regarding the conditions under which affect is likely to supplement attitudes in predicting behavior. We anticipated that affect would add more explanatory power for individuals whose attitudes were relatively low in importance or accessibility. The strength moderation hypotheses were tested by first classifying subjects as either high, moderate, or low in attitude importance on the basis of a tertiary split of their importance scores, and conducting a similar procedure for attitude accessibility.[7] Using stepwise regression procedures, we tested the hypothesis that affect would significantly increase explanatory power for low importance and low accessibility subjects, but less so for subjects whose attitudes were highly important or accessible. Consistent with our hypothesis, the increment in R^2 was significant for low importance and low accessibility subjects, but nonsignificant for high importance and high accessibility parrticipants (see Table 2). Unexpectedly, however, participants whose attitudes were

[7]Fazio suggests creating low and high accessibility groups by performing splits within each level of attitude. This technique controls for potential confounding of accessibility with extremity or variability of attitudes. Conducting the tertiary splits in this fashion did not significantly alter any of our results.

only moderately important or accessible showed the strongest incremental effect of affect.

The moderate strength conditions suggest a complex relationship between attitude strength and affective influences on behavior. Although not anticipated, these results dovetail with recent theory and research about the nature of attitudinal ambivalence. Ambivalence refers to the extent to which individuals hold mixed thoughts and feelings regarding an attitude object. It has been suggested that ambivalence is generally higher for attitude objects that have received a moderate amount of thought or elaboration rather than very much or very little thought (Priester & Petty, 1993), and research has supported the notion that ambivalence is highest for attitudes that are moderately important (Petty & Priester, 1993). Future research should address whether ambivalence undermined the strength of the moderately important and moderately accessible recycling attitudes in our research.

DISCUSSION

Although proenvironmental behavior has been conceptualized as both altruistic (Hopper & Nielsen, 1991) and affectively driven (e.g., Iozzi, 1989), little empirical evidence exists to support either claim. It is perhaps no coincidence, then, that efforts to identify barriers to proenvironmental action have frequently ignored potential affective influences (e.g., Simmons & Widmer, 1990; Wiener & Doescher, 1991). The present results suggest that there is some merit to the notion that affect is an important factor in proenvironmental behavior.

Theoretical Implications

The present research was designed to test the notion, suggested in earlier studies (e.g., Abelson et al., 1982) and recently elaborated by Allen et al. (1992), that affect plays an important role in determining behavior that sometimes is not mediated by attitudinal judgments. Although a stricter test of this hypothesis may eventually be possible, one objective of our study was to see if the Allen et al. (1992) results would replicate in another behavioral domain, using similar attitude measurement techniques.

More importantly, we sought to extend the Allen et al. analysis by embedding the moderator concept (which was focused in their study solely on past behavioral experience) in the broader terms of attitude strength. Using two measures that are associated with strength, we found that the affect-behavior link was indeed moderated by attitude strength, with affect having a significantly greater impact on attitudes for individuals whose attitudes were low in accessibility and importance than for individuals whose attitudes were high on these dimensions.

We contend that the affect-behavior link can appear in any domain when (a) affective influences are important and (b) the components of attitudes are not well integrated. Altruistic behaviors such as recycling or blood donation might be especially likely to meet the first criterion.

We found a nonlinear relationship between two dimensions of attitude strength and the impact of affect on behavior, such that moderate levels of these variables were associated with the greatest affective influence. Although this pattern might reflect important conceptual differences between the behavioral experience measure used by Allen et al. (1992) and the accessibility and importance constructs we assessed, these differences have yet to be identified in the literature. Interestingly, the quadratic relationship that we observed matches the pattern revealed in recent work on the relationship between attitude importance and attitudinal ambivalence (Petty & Priester, 1993). Thus, our results suggest an interesting hypothesis regarding the evolution of recycling attitudes. It might be that the early stages of attitude formation are characterized by predominantly positive information about recycling, but that as individuals gain more knowledge and devote more thought to the recycling issue, negative cognitions are encountered (e.g., "a lot of the things I recycle are going to get landfilled anyway"), and attitudes become ambivalent (and less predictive of behavior). Until an individual is able to resolve the attitudinal conflict, deciding whether or not to recycle might be based more on affective factors that are not well incorporated into the individual's recycling attitude.

Practical Implications

As noted in our introduction and discussions by others, the issue of recycling offers some unique challenges because the benefits are generally long term and societal rather than immediate and personal (see Manrai & Gardner, 1992). Such differences may require the use of strategies that are different than those employed in traditional marketing efforts. Although much more work needs to be done, our findings and conceptualization do point to some important considerations for efforts designed to change environmental attitudes, maintain attitude changes over time, and even enhance attitude strength. For example, our research and that of others suggests that persuasion strategies based on affective rather than cognitive factors might be more effective and appropriate for some issues or persons (e.g., Edwards, 1990; Millar & Millar, 1990; Smith & Haugtvedt, in press), depending on the basis of existing attitudes. Specifically, our data indicate that people with very strong attitudes toward recycling (as reflected by high ratings of attitude importance and high accessibility) were less likely to show a direct link between affect and behavior. One process that could lead to this outcome is high levels of attitudinal elaboration (Petty et al., in

press) leading to more highly integrated attitude structures. Affect, for such individuals, may also be a highly integrated component of the attitude structure and thus concomitantly associated with increased accessibility. As a result, affective influences on behavior would be mediated by the individual's overall attitude. Importantly, the discovery of an apparent quadratic relationship between attitude importance/accessibility and affective impact on attitudes is consistent with the notion that the various dimensions of attitude strength (e.g., importance, ambivalence) can be related to each other in nonlinear ways (Petty & Priester, 1993).

Although more research is certainly needed to understand the role of ambivalence in the attitude-proenvironmental behavior domain, the idea that individuals may experience ambivalence and doubt after early stages of attitude formation might be addressed by specifically acknowledging these possibilities as part of a social marketing campaign. The goal of such communications would be to make salient the important and positive reasons that served as the basis of an individual's initial attitude and to help him/her resist the influence of self-doubts and apparent inconsistencies. This might be accomplished, for example, through the use of advertising campaigns that employ variations in message content across communication exposures (i.e., a substantive variation strategy, see Schumann, Petty, & Clemons, 1990). Because such campaigns may induce people to develop more complex and highly integrated attitude structures, they may help in the development of stronger attitudes (see Haugtvedt, Schumann, Schneier, & Warren, in press). In addition, it may be important to provide multiple explicit and rich examples of positive environmental changes that have occurred as a cumulative result of proenvironmental behaviors to counter thoughts or perceptions of ineffectiveness.

In any case, it is clear that just like changes in many other behavioral domains, researchers and practitioners need to understand the implications of various underlying processes in order to develop campaigns and programs that translate into long-term behavioral changes. In this regard, it is particularly important to carefully analyze and understand the reasons for both successful and unsuccessful efforts in both basic and applied research settings as we all work toward the goal of minimizing the negative effects of our life styles on the environment and all of its current and future inhabitants.

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