

NATURE AND OPERATION OF ATTITUDES

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■ **Abstract** This survey of attitude theory and research published between 1996 and 1999 covers the conceptualization of attitude, attitude formation and activation, attitude structure and function, and the attitude-behavior relation. Research regarding the expectancy-value model of attitude is considered, as are the roles of accessible beliefs and affective versus cognitive processes in the formation of attitudes. The survey reviews research on attitude strength and its antecedents and consequences, and covers progress made on the assessment of attitudinal ambivalence and its effects. Also considered is research on automatic attitude activation, attitude functions, and the relation of attitudes to broader values. A large number of studies dealt with the relation between attitudes and behavior. Research revealing additional moderators of this relation is reviewed, as are theory and research on the link between intentions and actions. Most work in this context was devoted to issues raised by the theories of reasoned action and planned behavior. The present review highlights the nature of perceived behavioral control, the relative importance of attitudes and subjective norms, the utility of adding more predictors, and the roles of prior behavior and habit.

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INTRODUCTION

The attitude construct continues to be a major focus of theory and research in the social and behavioral sciences, as evidenced by the proliferation of articles, chapters, and books on attitude-related topics published between 1996 and 1999, the period covered in this review. To the relief of authors, the *Annual Review of Psychology* now divides this burgeoning field into two separate chapters, one surveying attitude change, persuasion, and social influence (Wood 2000), and this chapter, intended to deal with most of the remaining topics: conceptualization of attitudes, attitude formation and activation, attitude structure and function, and the attitude-behavior relation. Space limitations confine this review to basic, theory-oriented research, and to topics not covered in other *Annual Review* chapters, such as biases in judgment and decision making (Mellers et al 1998, Johnson-Laird 1999), social cognition and social perception (Fiske 1993), mood and emotion (Cacioppo & Gardner 1999), the self and self esteem (Demo 1989, Banaji & Prentice 1994), and stereotypes and prejudice (Hilton & von Hippel 1996), as well as intra- and inter-group attitudes (Levine & Moreland 1990, Pettigrew 1998). A new collection of attitude scales in the political domain (Robinson et al 1999) provides a useful discussion of available instruments.

CONCEPTUALIZATION OF ATTITUDE

There is general agreement that attitude represents a summary evaluation of a psychological object captured in such attribute dimensions as good-bad, harmful-beneficial, pleasant-unpleasant, and likable-dislikable (Ajzen & Fishbein 2000, Eagly & Chaiken 1993, Petty et al 1997; an in-depth discussion of issues related to evaluation can be found in Tesser & Martin 1996; see also Brendl & Higgins 1996). Recent neurological evidence suggests that evaluative judgments differ in important ways from nonevaluative judgments. Crites & Cacioppo (1996; see also Cacioppo et al 1996) asked respondents to categorize food items either as positive versus nonpositive or as vegetable versus nonvegetable. Compared with the late positive brain potential evoked by nonevaluative categorizations, evaluative categorizations were found to evoke a potential that was relatively larger over wide areas of the right than the left scalp regions. So fundamental and ubiquitous are evaluative reactions to psychological objects that investigators have posited a need to evaluate (Jarvis & Petty 1996, Petty & Jarvis 1996). Individuals are said to differ in their chronic tendency to engage in evaluative responding. Jarvis & Petty

(1996) developed a 16-item scale to measure this tendency, a scale shown to have high internal consistency, a single-factor structure, high test-retest reliability, and convergent and discriminant validity. Compared to respondents with low scores, respondents high in the need to evaluate were found to be more likely to hold attitudes toward various social and political issues and to list more evaluative thoughts about unfamiliar paintings and about a typical day in their lives.

Attitude Objects

The idea that attitudes are dispositions to evaluate psychological objects would seem to imply that we hold one, and only one, attitude toward any given object or issue. Recent work, however, suggests that this may be too simplistic a conception. Thus, when attitudes change, the new attitude overrides but may not replace the old attitude (Wilson et al 2000). According to this model of dual attitudes, people can simultaneously hold two different attitudes toward a given object in the same context, one attitude implicit or habitual, the other explicit. Motivation and capacity are assumed to be required to retrieve the explicit attitude in favor of the implicit evaluative response.

Depending on perspective, different evaluations of the same object in different contexts can be considered evidence for multiple attitudes toward the same object, or attitudes toward different psychological objects. One mechanism for the development of different context-dependent attitudes has been found in the presence of illusory correlations between a target's behavior and the context in which the behavior is observed (McConnell et al 1997). These investigators suggest that some apparent discrepancies between attitudes and behavior may reflect the presence of multiple context-dependent attitudes toward social targets. In a similar vein, respondents have been found to hold different attitudes with respect to high and low relevance versions of the same attitudinal issue (Liberman & Chaiken 1996).

Evaluation Versus Affect

Reflected in Thurstone's (1931) well-known definition of attitude as affect for or against a psychological object, early theorists used the term affect in the sense in which we now use the term attitude, i.e. to denote overall degree of favorability. The current preference is to reserve the term affect for general moods (happiness, sadness) and specific emotions (fear, anger, envy), states that contain degrees of valence as well as arousal (Ajzen & Fishbein 2000, Giner-Sorolla 1999, Schwarz & Clore 1996, Tesser & Martin 1996).

Bipolarity of Affect Somewhat beyond the scope of this review, an emerging resolution of the controversy regarding bipolarity of affect is worth noting. Findings reported in the 1960s (e.g. Nowlis 1965) suggested that, contrary to intuition and theory, positive moods and emotions may be orthogonal to their negative counterparts, and many investigators subsequently accepted the relative independence and

separability of positive and negative affect (e.g. Cacioppo & Berntson 1994, Ito et al 1998a). In a persuasive reconceptualization and series of experiments, Feldman Barrett & Russell (1998) and Russell & Carroll (1999) posed a serious challenge to this view (see also Watson & Tellegen 1999). The apparent independence of positive and negative affect is shown to be largely an artifact of the methodology used in empirical investigations. When items are selected to be semantic bipolar opposites of affective experience, to represent the full domain of positive and negative terms, and to separate high and low levels of activation inherent in the experience, strong negative correlations between positive and negative affect are obtained.

ATTITUDE FORMATION AND ACTIVATION

The Expectancy-Value Model

Evaluation is known to be a fundamental aspect of any concept's connotative meaning (Osgood et al 1957). According to the most popular conceptualization of attitude, the expectancy-value model (see Feather 1982, Fishbein 1963, Fishbein & Ajzen 1975), this evaluative meaning arises spontaneously and inevitably as we form beliefs about the object (see Ajzen & Fishbein 2000). Each belief associates the object with a certain attribute, and a person's overall attitude toward an object is determined by the subjective values of the object's attributes in interaction with the strength of the associations. Although people can form many different beliefs about an object, it is assumed that only beliefs that are readily accessible in memory influence attitude at any given moment. A belief's chronic accessibility tends to increase as a function of the frequency with which the expectancy is activated and the recency of its activation, as well as the belief's importance (Higgins 1996, Olson et al 1996). The expectancy-value model will serve as a conceptual framework for the remaining sections of this review.

Critical Issues Despite, or perhaps because of, its popularity, the expectancy-value model continues to draw critical attention. In a provocative article, Fishbein & Middlestadt (1995) presented evidence that overall evaluations or attitudes are indeed based on beliefs and their associated evaluations, and argued that when noncognitive factors are sometimes found to have a direct effect on attitudes, this is due to methodological artifacts. A torrent of replies has challenged this conclusion, reaffirming the idea that beliefs are only one possible influence on attitudes (Haugtvedt 1997, Miniard & Barone 1997, Priester & Fleming 1997, Schwarz 1997; but see Fishbein & Middlestadt 1997 for a rejoinder).

A recurrent issue regarding the expectancy-value model has to do with the relative importance of different beliefs as determinants of attitude. Assuming that importance affects accessibility (see Higgins 1996), and hence that only important beliefs are likely to be activated spontaneously, the expectancy-value model

assigns equal weights to all belief-value products. Following up on a study by Budd (1986), van der Pligt & de Vries (1998; see also van der Pligt et al 2000) examined the role of belief importance in smoking attitudes and behavior. Student smokers and nonsmokers expressed their attitudes toward smoking, rated the likelihood and value of each of 15 potential consequences of smoking, and selected the 3 consequences they considered most important. In comparison to an expectancy-value index based on the 12 low-importance beliefs, an index based on only the 3 most important beliefs correlated better with the direct semantic differential measure of attitude toward smoking and with reported smoking behavior. However, the 15 consequences of smoking included in the survey were selected by the investigators and did not necessarily represent accessible beliefs. Consistent with this reasoning, the authors noted that their measure of perceived importance may have served primarily to identify the beliefs that were accessible for smokers and nonsmokers. Indeed, follow-up research (van Harreveld et al 2000) showed that beliefs judged to be important are more accessible in memory, as indicated by lower response latencies.

Another concern regarding the expectancy-value model is that the assumed belief \times evaluation interaction may misrepresent the cognitive processes involved in attitude formation. Thus, it has been proposed that beliefs and values may relate independently to overall attitudes in a process termed double denial (Sjoberg & Montgomery 1999). To illustrate, a person with a strong negative attitude toward drinking alcohol may deny (rate as highly unlikely) that drinking makes you happy, yet at the same time assign a negative evaluation to "being happy." When multiplied in accordance with the expectancy-value model, the product term implies a relatively favorable attitude toward drinking alcohol, or at least a less negative attitude than if the likelihood rating had been high. Sjoberg & Montgomery (1999) obtained data in support of this phenomenon, in an apparent contradiction of the expectancy-value model. However, according to the expectancy-value model, when attributes come to be linked to an object in the process of belief formation, the pre-existing attribute evaluations are associated with the object, producing an overall positive or negative attitude. It is thus important to assess attribute evaluations independent of their link to the attitude object. In the above example, a person who rates "being happy" as negative most likely does so in the context of drinking alcohol, i.e. the person asserts that being happy as a result of drinking alcohol is undesirable, not that being happy is bad in general.

Although not dealing directly with attitudes, an interesting perspective on the interaction between expectancies and values has arisen out of theorizing on regulatory focus (Higgins 1987). Shah & Higgins (1997) either measured or manipulated promotion and prevention focus, and predicted task performance or decisions from expectancies and values associated with potential outcomes of goal attainment. Positive expectancies and values generally had the anticipated effects, increasing goal commitment. However, after entering the expectancy and value measures as main effects, the added contribution of the interaction varied as a function of regulatory focus: The interaction term had a significant positive coefficient for

participants with a promotion focus, but a negative coefficient for participants with a prevention focus.

Automatic Attitude Activation

As noted earlier, the expectancy-value model assumes that an object's evaluative meaning arises spontaneously, without conscious effort. Evidence indicating that evaluative reactions tend to be immediate and fast, and can occur outside of awareness, has been accumulating rapidly. Much of this research relies on the sequential evaluative priming paradigm in which stimuli with known positive or negative valence, usually words, serve as priming events. Presented at subliminal exposure times, these primes are found to influence the speed at which subsequent target stimuli, usually adjectives, are judged to be good or bad. Judgments are faster when the valence of the target adjective matches the valence of the prime (see, however, Glaser & Banaji 1999 for a reversal of this effect in the case of evaluatively extreme primes).

Initial research tried to demonstrate that attitudes can be automatically activated, and—more importantly—to establish the conditions necessary for automatic attitude activation. Thus, it was first proposed that attitudes are activated automatically only by stimuli that elicit a quick, conscious evaluative response (Fazio et al 1986). Low-conscious evaluation latencies were assumed to indicate the presence of a strong, chronically accessible attitude amenable to automatic activation. Subsequent research, however, showed that preconscious automatic attitude activation is independent of attitude strength, i.e. of the speed at which conscious evaluations occur (Bargh et al 1992). In fact, it is now clear that automatic attitude activation occurs even in the absence of an explicit goal to make evaluative judgments (Bargh et al 1996, Bargh & Chartrand 1999). In the first of three experiments, explicit evaluation of the target adjectives was removed by asking participants to simply pronounce the target stimuli as quickly as possible. Although nonevaluative, these responses were found to be faster when prime and target valences were congruent rather than incongruent. In the remaining two experiments, the need to obtain an initial evaluation of the priming stimuli was obviated by using normative data from previous research. Shorter pronunciation latencies for target adjectives with prime-congruent valences again confirmed the automatic attitude activation effect. Moreover, the experiments demonstrated automatic attitude activation not only for primes with strongly positive and negative valences, but also for primes with mildly positive and negative valences. Similarly, using drawings of animate and inanimate objects instead of words as primes, Giner-Sorolla et al (1999) again extended the generality of the automatic evaluation effect to moderately valenced priming stimuli, and to situations that do not pose evaluation as an explicit processing goal.

If automatic attitude activation seems to be unaffected by degree of accessibility, a recent series of experiments suggests that it may be moderated by familiarity with the attitude object (Ottati et al, submitted for publication). Using a variation

of the sequential priming paradigm, it was shown that automatic attitude activation is produced by primes representing well-known positive or negative person types (e.g. genius, bully) but not by primes representing newly acquired attitude objects (fictitious persons who performed positive or negative behaviors).

The finding that attitudes are activated automatically has led investigators to propose that response latencies be used to obtain measures of attitude that are free of reactive effects, especially when trying to assess racial attitudes or attitudes toward other socially sensitive issues. Ingenious methods have been developed to take advantage of reaction times to relevant stimuli, and evidence for the validity of these methods is becoming available (see Fazio et al 1995, Greenwald & Banaji 1995, Greenwald et al 1998).

Affect Versus Cognition as Antecedents of Evaluation

Inherent in the expectancy-value model of attitude is the assumption that evaluative judgments are the result of cognitive processes: associations between the attitude object and valued attributes. Some theorists have challenged this assumption, proposing that evaluations may also be controlled by affective processes. In fact, the affective primacy hypothesis (Zajonc 1980) assigns precedence to affect over cognition.

Affective Primacy It is well established that repeated exposure to novel stimuli tends to increase liking for those stimuli even—and especially—when participants are unaware of having been exposed (see Bornstein 1989 for a review). A recent attempt to validate the affective basis of evaluative judgments pitted the affective primacy hypothesis against Schwarz & Clore's (1983) feelings-as-information model (Winkielman et al 1997). Participants evaluated Chinese ideographs following subliminal exposure to positive, negative, or neutral affect primes. Happy and angry faces served as positive and negative primes, respectively, whereas polygons or neutral faces served as neutral primes. The feelings-as-information model assumes that positive or negative feelings elicited by the primes are misattributed to the neutral ideographs, thus producing an affective priming effect. However, participants were also explicitly induced to expect feeling positively or negatively (or were given no such expectation) by either telling them of the subliminal primes (in one experiment) or by playing new-age background music (in a second experiment). This affective expectation manipulation was intended to give participants a situational cue to which they could misattribute their positive or negative feelings. The results were incompatible with the feelings-as-information model. Although subliminal exposure to happy or angry faces produced the usual affective priming effect on evaluations, this effect was not moderated by the affective expectation. Affective priming thus seems to be unaffected by, and independent of, such higher-order cognitive processes as attributional judgments. Of course, this does not rule out the operation of lower-level cognitive processes that may have preceded the evaluative judgments. In fact, the question as to whether evaluation is preceded

by low-level affective processes, low-level cognitive processes, or both may not be amenable to resolution by currently available means.

Joint Effects of Affect and Cognition An alternative and by far more popular position is based on the multi-component view of attitude and assumes that evaluations are influenced by cognition as well as affect (see Eagly & Chaiken 1993, van der Pligt et al 1998). Recent research suggests that the affective and cognitive components of attitude may differ in accessibility (Verplanken et al 1998b). Participants were asked to indicate, on a set of evaluative semantic differential scales, how they thought versus how they felt about attitude objects in two different domains: brand names and countries. Response times were significantly shorter for affective judgments, suggesting that the affective aspects underlying attitudes are more easily accessible in memory.

Consistent with this finding, when beliefs and feelings regarding an object are of opposite valence, feelings tend to predominate (Lavine et al 1998b). Using national survey data, the investigators measured the feelings (e.g. proud, angry) engendered by candidates in four recent U.S. presidential elections as well as their beliefs about the candidates' personal characteristics (e.g. knowledgeable, dishonest). The participants were then divided into those whose affect and cognition scores were evaluatively consistent (univalent) and those who reported oppositely valenced beliefs and feelings (ambivalent). A univalent pattern of affect and cognition permitted better prediction of overall attitudes toward the candidates and of reported voting choice. Of greater interest, when affect and cognition were consistent with each other, both contributed strongly and about equally to the prediction. However, among the ambivalent respondents, feelings toward the candidates were found to be the primary determinants of attitudes and voting behavior. In a related study (Simons & Carey 1998), experience with drug and alcohol use was found to influence the relative importance of the cognitive and affective bases of attitudes: The importance of affect as a predictor of attitudes increased with experience.

In a chapter describing their recent research program, Haddock & Zanna (2000) summarized the results of several studies that provide support for the joint effects of beliefs and feelings on evaluations. Of more interest, they also show that individuals differ in their tendency to base their attitudes on cognition or affect. After developing a measure to capture individual differences in the tendency to rely on thoughts or feelings, the investigators administered the instrument together with a survey of beliefs, feelings, and attitudes with respect to several social issues (Haddock & Zanna 1998). Regression analyses showed the expected results: The attitudes of individuals identified as "thinkers" were predicted by their beliefs about the attitude objects, but not by their feelings, and the reverse was true for individuals identified as "feelers."

In a parallel manner, attitudes toward some objects rely more on affect than cognition, whereas attitudes toward other objects rely more on cognition than affect (Kempf 1999). Participants in this study were asked to try one of two computer software products, a computer game or a grammar checking program, and to

report their feelings and beliefs with respect to the product. Evaluation of the trial experience with the hedonic product (the computer game) was found to be based largely on feelings, whereas for the functional product (grammar checking program) the evaluation was determined primarily by beliefs about brand attributes.

In sum, it has been found that individuals differ in their reliance on cognition versus affect as determinants of attitude, and that the two components also take on different degrees of importance for different attitude objects.

Negativity Bias Whether cognitive or affective in nature, it is well known that negative information tends to have a greater impact on overall evaluations than comparably extreme positive information. The negativity bias was again demonstrated by research regarding the effects of positive and negative information on evaluations of political candidates (Klein 1996) and sponsors of political advertising (Matthews & Dietz-Uhler 1998), and by research showing greater cognitive activity and better memory for negative as compared to positive stimulus words (Ohira et al 1998). Research that assessed event-related brain potentials while participants viewed positive, negative, and neutral pictures (Ito et al 1998b) has shown that this negativity bias occurs very early in the processing of information, as the information is being categorized into positive or negative valence classes.

Accessibility of Beliefs

According to the expectancy-value model, chronically accessible beliefs provide the foundation for our current, relatively stable attitudes, but various contextual factors can temporarily make certain beliefs more readily accessible. Depending on the valence of these beliefs, the prevailing attitude could shift in either a positive or negative direction (Ajzen & Sexton 1999). A systematic approach to the relation between accessibility of beliefs and its effects on attitudes is provided by attitude representation theory (Lord & Lepper 1999; see also Sia et al 1999), which makes a strong case for the dependence of evaluation on the subjective representation of the attitude object. An experimental test of the theory showed that measured attitudes toward such social categories as politicians, homosexuals, and rock musicians remain relatively stable over time to the extent that the same representations (exemplars) of the category are accessed on different occasions (Sia et al 1997). In a somewhat related approach, the goal compatibility framework (Markman & Brendl 2000) suggests that people evaluate objects in relation to currently active goals.

Perhaps the simplest way to influence people's accessible beliefs in a positive or negative direction is to ask them to think about positive or negative aspects of the attitude object, a directed thinking task that can at least temporarily impact even such a fundamental aspect of personality as self-esteem (McGuire & McGuire 1996). College students asked to list desirable characteristics they possess or undesirable characteristics they do not possess expressed more favorable attitudes toward themselves than did students who were asked to list undesirable

characteristics they possess or desirable characteristics they do not possess. A related experiment (Ratcliff et al 1999) showed that directed thinking about the actions people could take to make studying enjoyable increased intentions to spend time studying, but directed thinking about reasons why people should find studying enjoyable did not. Other research (Levine et al 1996) also supported the proposition that thinking about the reasons for holding an attitude can distort attitudinal judgments and disrupt the attitude-behavior relation.

A study by Waenke et al (1996) similarly illustrated that activation of beliefs can have paradoxical effects on attitudes. Participants generated either three or seven arguments in favor of or opposed to the use of public transportation, and then expressed their attitudes toward this issue. The elicitation of pro versus con beliefs produced a corresponding difference in attitudes when three beliefs were generated (easy task) but no significant difference when seven beliefs were generated (difficult task). Readers of the same arguments, however, displayed the intuitively expected pattern: Their attitudes were affected more by seven than by three arguments. It appears that the attitudes expressed by participants who generated the arguments took account of the subjective difficulty of the task.

According to temporal construal theory (Liberman & Trope 1998), a goal's desirability is represented at an abstract level, whereas the likelihood that the goal will be attained is construed at a more concrete level. Furthermore, the value of the abstract aspects of the goal, i.e. the goal's desirability, increases with temporal distance from the goal, whereas the value of the concrete aspects, i.e. its probability, decreases with temporal distance. In a series of experiments, Liberman and Trope found that people give weight to a goal's positive aspects (its desirability) when making decisions for the long term, and to the goal's negative aspects (i.e. its difficulty) when making decisions for the short term. These findings imply that positive beliefs about the goal are more readily accessible in long-term decisions, whereas negative beliefs predominate in short-term decisions.

Studying impression formation, Wojciszke et al (1998) distinguished between morality- and competence-related beliefs. Personality traits related to morality (e.g. sincere, generous) were found to be more chronically accessible than traits related to competence (e.g. intelligent, foresighted): Many more morality than competence traits were emitted spontaneously as being important in others. Consistent with this finding, global impressions of real persons were better predicted from beliefs about morality-related traits than from beliefs about competence-related traits, and attitudes toward fictitious persons were based more on the morality than on the competence of their behaviors.

An interesting finding regarding the accessibility of beliefs comes from research on the effects of alcohol on behavioral decisions. According to the alcohol myopia hypothesis (Steele & Josephs 1990), alcohol consumption decreases cognitive capacity so that intoxicated individuals are likely to attend to the most salient cues in a situation. In laboratory and field experiments (MacDonald et al 1996), intoxicated participants indicated a greater likelihood of engaging in unprotected sex than did sober participants and, in support of the alcohol myopia

hypothesis, they were more likely to endorse beliefs that provide justifications for unprotected sex.

In short, personal and contextual factors combine to increase or decrease the accessibility of different kinds of beliefs, with potentially important ramifications for evaluative judgments and behavioral decisions.

ATTITUDE STRENGTH

Strong attitudes are thought to have a number of interesting qualities. They are said to be relatively stable over time, to be resistant to persuasion, and to predict manifest behavior. Visser & Krosnick (1998) documented changes in attitude strength over the life cycle. Contrary to the common belief that cognitive flexibility and readiness to change one's attitudes decline with age, the results of several studies demonstrated that susceptibility to attitude change declines from early to middle adulthood and then increases again in late adulthood. Similarly, rated importance of attitudinal issues, certainty, and perceived quantity of attitude-relevant knowledge were greater in middle adulthood than during early or late adulthood. However, these various indexes of attitude strength were found to correlate differentially with education, gender, and race, challenging the notion that attitude strength is a unitary construct.

High personal relevance of information on which an attitude is based has been found to increase its strength (Kokkinaki & Lunt 1999), as measured by response times, i.e. accessibility. College students were exposed to an advertisement for an unfamiliar product under high and low personal relevance conditions, and subsequently their brand attitudes, as well as the response latencies of these attitudes, were assessed. In line with dual-mode processing models, high personal relevance, or involvement, was expected to increase information processing and, consistent with predictions, attitudes formed under conditions of high involvement were found to be significantly more accessible compared to those formed under low levels of involvement.

Consequences of Attitude Strength

Using a sequential priming paradigm, Bassili & Roy (1998) examined the effects of attitude strength on the representation of attitudes in memory. Participants either first evaluated a policy and then thought of one of its consequences, or they first thought of a possible consequence and then evaluated the policy. In general, it took participants longer to think of a consequence of a policy than to evaluate it, suggesting that evaluations are relatively automatic, whereas belief emission requires some cognitive effort. Results further showed that thinking of a consequence of a policy speeded up its subsequent evaluation, regardless of whether the participant held a strong or weak attitude about the policy. Evaluating the policy speeded up thinking of one of its consequences for strong attitudes but not for weak ones.

Strong attitudes are, among other things, expected to be relatively resistant to change. Drawing a distinction between meta-attitudinal and operative indexes of attitude strength, Bassili (1996) reported the results of two studies concerning resistance to attitude change with respect to three social issues: employment quotas for women, laws regulating pornography, and laws prohibiting hateful expressions. Meta-attitudinal measures of strength were of a subjective nature, asking participants in the first study to judge the certainty, importance, and strength of their attitudes, as well as their knowledge, attention, and frequency of thought concerning the issues. The operative, and relatively more objective, indexes were measures of attitude extremity, ambivalence, and response latency. In the second study, participants were also asked to provide subjective judgments of these operative aspects of their attitudes. Resistance to change was, in both studies, assessed by observing reactions to a counter argument, and in the second study also by stability over a two-week period. The results of multiple regression analyses showed that resistance to change was affected only by the operative measures of attitude strength; the meta-attitudinal measures did not account for unique variance.

A possible clue to the inferiority of the subjective or meta-attitudinal measures of attitude strength can be found in a study by Haddock et al (1996), who showed that the subjective experience of attitude strength is quite malleable. After expressing their attitudes toward doctor-assisted suicide, college students were asked to list either three or seven arguments pro or counter their own positions. This was followed by several questions designed to assess subjective attitude strength. As might be expected, participants found it easier to generate three as compared to seven arguments. They then apparently used the ease of argument generation to infer the strength of their attitudes. Attitude importance, intensity, and certainty were judged greater when generation of arguments in favor of one's position was relatively easy (three pro arguments) and when generation of arguments opposed to one's position was relatively difficult (seven con arguments). Interestingly, these findings were obtained only when subjective attitude strength was assessed in terms of importance, intensity, and certainty, not when attitude strength was measured in terms of frequency of thinking or knowledge concerning the issue. Furthermore, in a subsequent experiment, ease of argument retrieval was found to have no effect on subjective certainty for individuals with relatively extreme attitudes (Haddock et al 1999). These findings again support the relative independence of different aspects of attitude strength.

A similar conclusion emerged in another series of studies concerning the effects of attitude strength on temporal stability (Prislin 1996). Undergraduates expressed their attitudes toward affirmative action, euthanasia, and legalized abortion on two occasions. Different dimensions of attitude strength were found to predict the stability of these different attitudes. Generalized attitude strength (judged certainty, importance, vested interest, frequency of thought, experience, knowledge) moderated the stability of attitudes toward affirmative action, with strong attitudes being more stable than weak attitudes; internal consistency of the attitude (evaluative-cognitive and evaluative-affective consistencies) moderated stability of attitudes

toward euthanasia; and attitude extremity affected the stability of attitudes toward legalized abortion.

Lavine et al (1998a) showed that attitude strength moderates the susceptibility of attitudes to item context effects in surveys, with relatively weak attitudes being more susceptible to context effects than relatively strong attitudes. However, this finding was obtained only with a multi-item aggregate measure of attitude strength (containing measures of importance, certainty, extremity, frequency of thought, intensity, and ambivalence), not when a single item was used to assess attitude strength.

The strength of evaluative reactions has proven to be an important characteristic of attitudes, but its multidimensional nature is proving to be a serious obstacle to progress. Attitude strength has been operationalized in different ways, including importance of the issue, extremity of the attitude, its stability over time, certainty in one's position, vested interest, involvement, affective-cognitive consistency, knowledge about the issue, frequency of thinking about it, and—consistent with Fazio's (Fazio et al 1986, Fazio & Towles-Schwen 1999) theorizing—latency of conscious, deliberate responses to attitudinal inquiries (see Krosnick et al 1993, Petty & Krosnick 1995). Yet, research continues to reveal only weak relations among these dimensions of attitude strength, and different measures tend to produce conflicting research findings.

ATTITUDINAL AMBIVALENCE

Generally speaking, ambivalence reflects the co-existence of positive and negative dispositions toward an attitude object. This ambivalence can result from simultaneously accessible conflicting beliefs within the cognitive component (McGregor et al 1999), or from a conflict between cognition and affect (for discussions, see Eagly & Chaiken 1993, Maio et al 2000, McGregor et al 1999). Recent attempts to quantify this property of attitudes have focused on ambivalence within the cognitive component. By differentially weighting the strength of conflicting beliefs, it is possible to derive varying formulas for the computation of ambivalence. Building on earlier work (Thompson et al 1995), Priester & Petty (1996) reviewed and then evaluated the relative merits of different operational definitions by comparing their ability to predict the subjective experience of ambivalence. Following a sophisticated analysis, they presented data to support the superiority of a gradual threshold model. According to this model, ambivalence increases as a negatively accelerating function of the number of conflicting beliefs, and decreases with the number of dominant reactions (i.e. the more frequent reactions, whether positive or negative) up to a threshold defined by a certain level of conflicting reactions. Despite its unique features, however, the proposed formulation was found to correlate quite highly with other quantifications of ambivalence, and although it was superior to other indices in some respects, the proposed measure accounted for only a moderate amount of variance in the subjective ambivalence criterion.

Consequences of Ambivalence

Holding ambivalent attitudes has been shown to affect judgments and behavior in profound ways. Thus, although equal in stability over time, relatively nonambivalent attitudes toward eating a low-fat diet were found to be more predictive of subsequent intentions and behavior than ambivalent attitudes, and they were also more resistant to a persuasive communication (Armitage & Conner 2000b; see also Conner et al 1998b). However, this may hold only for attitudes toward familiar objects or issues. Arguing that ambivalence decreases people's confidence in their attitudes toward behaviors involving the attitude object, Jonas et al (1997) postulated that ambivalent attitudes are associated with more systematic information processing and hence, predict intentions better than nonambivalent attitudes. Two experiments confirmed these expectations: Attitudes of participants provided with evaluatively inconsistent information about fictional shampoos predicted buying intentions better than did attitudes based on evaluatively consistent information. Similarly, people with ambivalent attitudes toward a minority group were found to be more likely to systematically process information about the group (Maio et al 1996) and, in comparison to individuals with less ambivalent attitudes, their reactions toward the group reflected more readily a mood-induced priming of positive and negative feelings (Bell & Esses 1997).

Ambivalence is a dominant theme in theorizing about racial, ethnic, and gender-related prejudice (Fiske & Glick 1995, Gaertner & Dovidio 1986). Drawing on this work, MacDonald & Zanna (1998) reported that men who exhibit ambivalent attitudes toward feminists tend to rate them positively on the dimension of admiration but negatively on the dimension of affection. Priming respondents with related positive (agentic) or negative interpersonal qualities had little impact on nonambivalent respondents but it had a significant effect on the attitudes and hiring preferences of ambivalent respondents. After reading a résumé of a feminist applicant, ambivalent participants who were positively primed expressed more liking for the applicant and greater intentions to hire her than did negatively primed ambivalent participants.

Attitudinal ambivalence is emerging as a promising area of research with the potential to throw light on attitude structure—within as well as between attitude components—on the processing of attitude-relevant information, on attitude change, and on the effect of attitudes on behavior.

FUNCTIONS OF ATTITUDES

In the broadest sense of functionality, attitudes facilitate adaptation to the environment (Eagly & Chaiken 1998). Researchers continue their attempts to identify the functions served by attitudes and to investigate their role in the formation and consequences of attitudes (see Maio & Olson 1999 for a collection of chapters on this topic). Among the functions recognized by most theorists

are the value-expressive function of attitudes, the knowledge function, the ego-defensive function, the social-adjustive function, and the utilitarian function (see e.g. Murray et al 1996). The operation of some of these functions has been investigated in recent studies.

In a laboratory experiment, Chen & Bargh (1999) demonstrated that positive and negative evaluations serve to orient people toward approach and avoidance, respectively. Participants exposed to positive words responded faster when instructed to pull a lever toward them than to push it away, whereas the reverse pattern was observed for participants exposed to negative words.

Attitudinal function can be associated with positions on social issues (cf. Reeder & Pryor 1999). Studying the functions of attitudes toward lifting the ban on homosexuals in the military, Wyman & Snyder (1997) examined ego-defensive beliefs (e.g. "Admitting gays to the military would create many more problems of unwelcome sexual advances") and value-expressive beliefs (e.g. "Homosexuality is wrong and this policy would be condoning it"). Respondents who approved of lifting the ban rejected ego-defensive reasons for keeping it and they endorsed value-expressive reasons to lift it. Conversely, respondents opposed to lifting the ban endorsed ego-defensive and value-expressive reasons for keeping the ban and rejected value-expressive reasons to lift it. Approaching this issue in the context of the expectancy-value model, Demski & McGlynn (1999) showed that attitudes toward parolees were based primarily on beliefs related to the instrumental or utilitarian function (i.e. practical concerns) rather than to beliefs related to the value-expressive function (i.e. moral or symbolic concerns).

An attitude's functional basis has been shown to influence the extent to which people process function-consistent and function-inconsistent information (Petty & Wegener 1998). College students preselected to be high or low in self-monitoring tendency were exposed to a message that matched or mismatched the functional basis of their attitudes toward common products: an image appeal for high self-monitors and a quality appeal for low self-monitors, or vice versa. To examine depth of information processing, the message contained either strong or weak arguments. The strength of the arguments had a greater impact on attitudes toward the products when they matched rather than mismatched the functional basis of the attitude and, in a second study, this difference was especially pronounced for individuals low in need for cognition.

Biasing Effects of Attitudes If attitudes serve a variety of functions for the individual, they are likely to bias judgments and memory. It is generally hypothesized that attitudes bias information processing and memory in favor of attitude-consistent material. Thus, participants judged research consistent with their attitudes toward homosexuality as more convincing than they judged research inconsistent with their attitudes (Munro & Ditto 1997), and they classified multiply categorizable objects in line with their most accessible attitudes (Smith et al 1996). A meta-analysis of research on the attitude congeniality hypothesis (Eagly et al 1999; see also Eagly 1998), however, failed to provide clear support.

Results across studies were inconsistent, and the overall effect was weak. Attitude structure and motivation to process attitude-relevant information were found to be of possible significance in understanding the inconsistent findings. In line with this suggestion, amount of prior knowledge combined with high fear of AIDS was found to bias processing of information relevant to risk estimates, enabling respondents to defend their existing views regarding the risk of contracting AIDS (Biek et al 1996).

Attitudes and Values Favorable valences associated with such abstract concepts as freedom and equality are known as values. Interest in the measurement and function of values continues (see Seligman et al 1996). It has been suggested that global values reflect cultural truisms, i.e. widely shared and rarely questioned beliefs supported by a very limited cognitive foundation (Maio & Olson 1998). Consistent with this assumption, asking participants to analyze their reasons for holding such values as altruism and equality caused them to change their ratings of these values. Moreover, this change was observed only when participants were not provided with cognitive support for their values.

General values, once activated, are assumed to influence evaluations of specific objects and events (Feather 1996). Indeed, broad values, as assessed by Schwartz's (1992) survey instrument, have been found to be related to food preferences in different contexts (Feather et al 1998). Similarly, the values of security through order, humanistic and expressive concerns, and religiosity and personal restraint are related to liberal versus conservative attitudes (Braithwaite 1998; see also Braithwaite 1997), and values of communalism and the work ethic predict attitudes toward welfare (P Kulesa & AH Eagly, unpublished). On a somewhat narrower scale, attitudes toward fat people were found to be linked to strong value placed on responsibility for one's actions in the United States, but not in Mexico (Crandall & Martinez 1996).

The functional approach to attitudes has so far held out more promise than it has been able to deliver. Attempts to link the functional basis of attitudes to processing of function-relevant information may help to integrate work on attitudinal functions with other theory and research on attitude formation and change.

PREDICTION OF BEHAVIOR

The ability of attitudes to predict behavioral intentions and overt behavior continues to be a major focus of theory and research. By far the greatest number of publications on a single topic were concerned with this issue.

Moderators of Attitude-Behavior Consistency

Several studies continued to explore the role of moderating variables. Operationalizing attitude embeddedness as the number of free associations respondents

produced in relation to an issue, Prislín & Ouellette (1996) found that highly embedded attitudes toward preservation of the environment were more strongly related to an aggregate measure of behavioral intentions than were low-embedded attitudes. Also dealing with environmental issues, Schultz & Oskamp (1996) determined that the relation between concern about the environment and recycling behavior increased, as expected, to the extent that the behavior required effort on the part of the participant. Others have investigated the effects on the attitude-behavior relation of prior experience and thought (Millar & Millar 1998), cognitive load and positive mood (Blessum et al 1998), direct and indirect experience (Millar & Millar 1996), and the accessibility of alternative actions (Posavac et al 1997).

Returning to a theme of the 1970s, several studies dealt with the moderating effect of involvement. In one experiment (Kokkinaki & Lunt 1997), involvement as well as response latency (accessibility) were found to increase the impact of attitudes on product choices. Involvement also took central stage in an exchange about the role of vested interest in political behavior (Crano 1997a,b; Sears 1997). Contrary to earlier research that reported limited impact of vested interest on political attitudes and actions, Crano (1997b) presented data to show that vested interest—although uncorrelated with attitude valence—does affect the strength of the relation between attitudes and behavior. In response, Sears (1997) contended that the moderating effects of vested interest tend to be relatively small and restricted largely to the daily lives of college students. According to Sears, symbolic aspects of an attitude (ideology and values evoked by the attitude object) take on greater significance in the public arena where they overshadow the impact of narrow self-interest.

Theories of Reasoned Action and Planned Behavior

Most studies concerned with the prediction of behavior from attitudinal variables were conducted in the framework of the theory of planned behavior (Ajzen 1991) and, to a lesser extent, its predecessor, the theory of reasoned action (Ajzen & Fishbein 1980). According to the theory of planned behavior, people act in accordance with their intentions and perceptions of control over the behavior, while intentions in turn are influenced by attitudes toward the behavior, subjective norms, and perceptions of behavioral control. The cognitive foundations of these factors are consistent with an expectancy-value formulation. Support for the theory in general is summarized in a meta-analysis (Armitage & Conner 2000a) and a review of the literature (Sutton 1998), and another review summarizes its applications to health-related behavior (Conner & Sparks 1996).

Several studies have compared the predictive power of the theory of planned behavior with that of other models, including the information-motivation-behavioral-skills model (de Witt et al 2000), the health belief model (Quine et al 1998), and the integrated waste management model (Taylor & Todd 1997). Although designed for application in specific domains, the alternative models were found to perform not much better, and sometimes worse, than the general, content-free theory of planned behavior.

Applications Many investigators continue to demonstrate the applicability of the theory in various content domains, including condom use (e.g. Albarracin et al 1998, de Witt et al 2000, Jamner et al 1998, Reinecke et al 1996; see Sheeran & Taylor 1999 for a meta-analysis) and other safe-sex behaviors (Boldero et al 1999, de Vroome et al 2000), smoking (e.g. Norman et al 1999, Morrison et al 1996), getting hormone replacement therapy (Quine & Rubin 1997), adhering to a medication regimen (Conner et al 1998a), drinking alcohol (Morrison et al 1996, Trafimow 1996), using illegal substances (Conner et al 1998b, Conner & McMillan 1999), eating low-fat food (e.g. Armitage & Conner 1999a, Paisley & Sparks 1998), engaging in physical activity (e.g. Courneya et al 1999b, Trafimow & Trafimow 1998), choosing a career (Vincent et al 1998), playing basketball (Arnscheid & Schomers 1996), wearing a safety helmet (Quine et al 1998), using dental floss (Rise et al 1998), exposing oneself to sunlight (Hillhouse et al 1997), and composting (Kaiser et al 1999). By and large, these studies have found support for the theory, and little can be gained at this point by further demonstrations of the theory's applicability to particular domains.

Perceived Behavioral Control Going beyond the demonstration of applicability, several studies have pursued a distinction between perceived controllability (whether people believe that they have volitional control over performance of a behavior) and self-efficacy, conceptualized as the degree of anticipated difficulty in performing a behavior (see Bandura 1997 for a comprehensive discussion of self-efficacy). Factor analyses of items designed to tap these two constructs revealed the expected factors in the domains of eating behavior (Armitage & Conner 1999a,b; Sparks et al 1997) and academic achievement (Manstead & van Eekelen 1998), but only perceived difficulty—not perceived controllability—added significantly to the prediction of intentions and behavior (Armitage & Conner 1999b, Manstead & van Eekelen 1998, Sparks et al 1997). In a somewhat related study, Trafimow & Duran (1998) validated the distinction between attitude and perceived behavioral control.

Attitudes Versus Norms Another issue has to do with the relative contributions of attitudes and subjective norms to the prediction of intentions. Relying on within-subjects analyses across 30 different behaviors, Trafimow & Finlay (1996; see also Finlay et al 1997, 1999) confirmed that individuals differ in the relative weights they place on attitudes and subjective norms, and that the weights of these predictors also vary across behaviors. At the group level, workers' turnover intentions were, as might be expected, more under the influence of subjective norms in a collectivist culture (Japan) than in an individualistic culture (Britain) (Abrams et al 1998). Similarly, the intentions of general medical practitioners to refer Asian patients to mental health services were more under control of subjective norms, whereas their intentions to refer non-Asian patients were more under the control of attitudinal considerations (Conner & Heywood-Everett 1998). In an experimental analogue, Ybarra & Trafimow (1998) primed the accessibility of

either the private or the collective self. Intentions to use condoms during sexual intercourse were more under the control of attitudes in the former condition and more under control of subjective norms in the latter. Similarly, intentions to avoid exposure to the sun were influenced by the perceived norms of a reference group among respondents who strongly identified with the group, whereas among low identifiers, personal attitudes were a better predictor (Terry & Hogg 1996).

In a study on the effects of mood (Armitage et al 1999) it was found that attitudes influenced intentions to use condoms and to eat low-fat foods after induction of a negative mood, whereas subjective norms influenced these behaviors in a positive mood condition. Intentions to eat sweets showed a consistent pattern of gender differences: women's intentions were under the influence of both attitudes and subjective norms, whereas only attitudes significantly predicted the intentions of men (Grogan et al 1997). Finally, the readiness of managers to undertake benchmarking in their organization was influenced by their attitudes toward this behavior, but only if they had past experience with it. Inexperienced managers were influenced by their normative beliefs concerning the expectations of others in the organization (Hill et al 1996).

Past research has often reported strong correlations between attitudes and subjective norms. The differential patterns of impact on intentions and behavior documented in recent investigations tend to validate the conceptual distinction between attitudinal and normative considerations.

Sufficiency Many studies challenge the assumption that the predictors in the theory of planned behavior are sufficient to account for intentions and behavior. This is done by including measures of additional variables in the prediction equation and showing significant improvement in the prediction of intentions or behavior (see Conner & Armitage 1998 for a review). Thus, several investigations showed that the inclusion of a measure of self-identity can account for additional variance in adherence to a low-fat diet (Armitage & Conner 1999a,b; Sparks & Guthrie 1998) and in marijuana use (Conner & McMillan 1999). Other studies demonstrated improved prediction of environmentally relevant behavior with the addition of personal or moral norms (Harland et al 1999; see also Kristiansen & Hotte 1996 and Manstead 2000 for a general discussion) and improved prediction of playing the lottery and of precautionary sexual behavior with the addition of anticipated regret (Richard et al 1998, Sheeran & Orbell 1999a; see also van der Pligt et al 1998). Measures of personality traits also improved prediction (Courneya et al 1999a), but the addition of various demographic variables did not (Albarracín et al 1997). In general, however, even when improvements were found, for the most part the improvements in prediction of intentions or behavior were relatively minor, and their generalizability to other behavioral domains has yet to be demonstrated.

Past Behavior Related to the question of sufficiency is the role of past behavior. Based on the assumption that frequent performance of a behavior leads to the formation of a habit, and that habits can influence behavior independent of attitudes

and intentions, theorists have proposed that frequency of past behavior be added to our predictive models (e.g. Bentler & Speckart 1979, Triandis 1977; see also Ouellette & Wood 1998). Several investigators have tested this idea by including a measure of past conduct in the theory of planned behavior and have shown that doing so can help account for a substantial portion of additional variance in intentions or actual behavior (e.g. Conner et al 1999, O'Callaghan et al 1999). For example, in a study of travel mode choice, prediction of car use from intentions and perceptions of behavioral control was significantly improved by the addition of past car use (Verplanken et al 1998a). More importantly, this study revealed a significant interaction between intention and past behavior. When the relation between intention and behavior was examined separately for respondents with high, moderate, and low levels of past car use, it was significant only at the lowest use level (see also Verplanken et al 1997). This finding suggests that intentions may become largely irrelevant when a behavior has been performed many times, i.e. when it has become habitual.

The prediction of studying intentions and behavior among college students was also shown to benefit from the inclusion of a measure of past behavior (Leone et al 1999). This study found, however, that the contribution of past behavior declined when perceived behavioral control was included in the prediction equation. Consistent with this finding, perceived behavioral control was shown to mediate the impact of similar past behaviors on acceptance of hormone replacement therapy (Quine & Rubin 1997).

In short, the frequency with which a behavior has been performed in the past tends to correlate well with later actions. Although there is some indication that this relation may be mediated in part by perceived behavioral control, neither this variable nor intentions completely explain the link between prior and later behavior. Some investigators have interpreted these findings to mean that behavior has come at least in part under the control of automatic processes or habits (e.g. Aarts & Dijksterhuis 2000, Aarts et al 1998, Ouellette & Wood 1998). However, this is not the only possible interpretation. Frequency of past behavioral performance may capture and reflect a number of psychological processes or variables other than habituation (see Ajzen & Fishbein 2000 for a discussion).

From Intentions to Actions

As in research on the attitude-behavior relation, investigators continued their search for moderators of the intention-behavior relation. Studies showed that, as might be expected, the temporal stability of intentions (Conner et al 2000, Sheeran et al 1999b) and of perceived behavioral control (Conner et al 2000) influence predictive validity: Relatively stable intentions and perceptions of behavioral control were better predictors of subsequent behavior. In a meta-analysis of research on intended and actual condom use, shorter time intervals, older samples, and condom use with steady versus casual partners were each found to be associated with stronger correlations (Sheeran & Orbell 1998). Similarly, participants who had developed

a schema relevant for dieting were found to exhibit stronger relations between dieting intentions and behavior than did aschematic participants (Kendzierski & Whitaker 1997); easily accessible voting intentions were better predictors of voting choice than intentions with longer response latencies (Bassili 1995); and intentions based on attitudes tended to predict performance of everyday behaviors better than did intentions based on subjective norms (Sheeran et al 1999a).

Implementation Intentions In an impressive program of research, Gollwitzer (1996, 1999) and his associates (Gollwitzer & Brandstaetter 1997, Gollwitzer & Schaal 1998) have explored the cognitive processes that mediate the relation between intentions and behavior. A fundamental assumption in this work is that the initiation of goal-directed responses becomes automatized following formation of implementation intentions, i.e. intentions to perform a goal-directed behavior when a specific context is encountered (see Gollwitzer & Schaal 1998). Specific plans of this kind are assumed to serve as powerful self-regulatory tools and to facilitate implementation of intended behavior. In an empirical investigation (Gollwitzer & Brandstaetter 1997) implementation intentions were found to facilitate the immediate initiation of goal-directed action when the intended opportunity was encountered, and intentions to attain difficult goals were more likely to be carried out when participants had formed implementation intentions. Similarly, participants asked to formulate plans in the form of implementation intentions were found to be better able to carry out their intentions to go on a healthier diet (Verplanken & Faes 1999) and to take a vitamin C pill each day (Sheeran & Orbell 1999b). Clearly, intentions play an important role in guiding human action, but recent research also reveals the complexities involved in translating intentions into actual behavior.

CONCLUSIONS

Examination of the last four years of basic research on the nature and operation of attitudes reveals continued interest in the major themes of the past. We can see definite progress in some areas, but—as might be expected—no groundbreaking developments in such a short period of time. The ubiquity and importance of evaluative reactions were reaffirmed, with increased emphasis being placed on automatic processes in attitude formation and activation. Evaluative reactions have been shown to occur without awareness, even in the absence of conscious intent to evaluate a stimulus object. The expectancy-value model of attitudes has continued to provide a useful framework for research on attitude formation and organization, but the debate over the cognitive versus affective basis of attitudes has yet to be completely resolved. The research reviewed found that the contributions of affect and cognition to overall evaluation vary with the attitude object and as a function of individual differences. Research has continued to explore the role of attitude strength, revealing again the problematic, multidimensional nature of

this aspect of attitudes. Nevertheless, some interesting conclusions emerged: It was reported that the strength of attitudes varies over the life cycle, with greatest strength being displayed in mid-life. Strong attitudes were found to be associated with more accessible beliefs and, when attitude strength was assessed by relatively objective means, to be more resistant to change. New attempts to operationalize attitudinal ambiguity and explore its implications were also reported.

The largest number of studies on any single topic had to do with the attitude-behavior relation. Although it is now generally recognized that attitudes are relevant for understanding and predicting social behavior, many questions remain. Investigators continued to identify factors that moderate the effects of attitudes and intentions on overt actions. Many other investigations applied or tested the theories of reasoned action and planned behavior. There is now little doubt that these theories can be usefully employed in various domains, but specific aspects continue to draw critical attention. Research has shown that a distinction can be drawn between perceived controllability and perceived difficulty of performing a behavior (self-efficacy) and that the latter may be a more important antecedent of intentions and actions; that the relative contributions of attitudes and subjective norms vary across behaviors and subject populations; that other predictors may have to be added to the theory; and that behavior may contain automatic, habitual aspects not accounted for in models of reasoned action.

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