

THE INFLUENCE OF ATTITUDES ON BEHAVIOR

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ABSTRACT

Research on the influence of attitudes on behaviors has made great strides over the past decades. Early failures to demonstrate strong attitude-behavior relations were shown to be attributable to incompatibility in the level of generality at which these variables were assessed. General attitudes toward policies, people, institutions, or events are found to correlate well with behavioral patterns but not with specific behaviors; to predict specific actions requires a measure of attitude toward the behavior itself. The processes whereby general attitudes may influence performance of specific behaviors are currently the subject matter of one major line of theorizing and research best represented by Fazio's (1990b) MODE model. This work has drawn attention to the roles of attitude accessibility, controlled versus automatic information processing, and biases in information processing produced by automatically activated attitudes. A popular second line of research takes specific behavior as its starting point and tries to identify its important determinants. A reasoned action approach, and especially the theories of reasoned action and planned behavior (Ajzen, 1991, 2012; Fishbein & Ajzen, 1975), have been highly influential in this domain, suggesting that performance of a behavior follows from such proximal antecedents as behavior-specific beliefs, attitudes, subjective norms, perceptions of control, and intentions. Issues raised by the MODE model and by the reasoned action approach are discussed, as are recent developments regarding the differential effects of explicit versus implicit attitudes on behavior. Major meta-analyses of the attitude-behavior relation are reviewed and discussed.

INTRODUCTION

Supporters of Donald Trump in the 2016 United States presidential election viewed illegal immigration as a serious problem and strongly favored Trump's proposal to build a wall separating the southwestern US from Mexico. Voters were confronted with questions like: Should the US deport some or all of the nation's estimated eleven million unauthorized immigrants? The answer to such a question reflects beliefs about the contribution of immigrants. If immigrants are likely to be criminals, US citizens tend to favor deportation. If immigrants are only taking poorly-paid, unfilled jobs, US citizens tend to oppose deportation. The immigration beliefs and attitudes that contributed to voting decisions often stemmed from social media postings, many with egregiously racist contents not acceptable in the more regulated traditional media. From the time Trump formally began this presidential campaigns, two conversations made the list of top 10 topics with most-tweeted days. One was Trump's proposal of a ban on Muslims entering the US, the other was a fiery immigration speech Trump delivered in Arizona, in which he characterized Latino immigrants as "bad hombres". Trump's own attitudes clearly guided his discourse, which in turn shaped key voters' attitudes, ultimately leading to his election. In light of such evidence, few would question the proposition that people act in accordance with their attitudes. Yet there was a time when many social psychologists were ready to abandon the attitude construct because they had become convinced that people's attitudes had little to do with their actual behavior.

In this chapter we discuss the role of attitudes in human social behavior. We will show that, to understand the influence of attitudes on behavior we must distinguish between two types

of attitude. The first type are general attitudes toward physical objects (Yosemite National Park, the Empire State Building); racial, ethnic, or other groups (African Americans, Jewish people, gay people); institutions (Congress, the Catholic Church); policies (gun control, tax cuts); events (September 11, the World Series); or other general targets. The second type are attitudes toward performing specific behaviors with respect to an object or target (visiting Yosemite National Park, hiring an African American, etc.). These attitudes will be referred to as “attitudes toward a behavior.” A parallel distinction will be made between broad behavioral categories or multiple-act aggregates and single behaviors. We first consider the problems and issues involved in relating general and behavior-specific attitudes to multiple-act aggregates and to single behaviors. Our discussion of the determinants of specific behaviors is guided largely by a reasoned action approach which assumes that people’s behavior follows reasonably from their beliefs, attitudes, and intentions. We focus on this causal analysis because a great deal of contemporary research concerning the influence of attitudes on behavior is conducted within this conceptual framework. We recognize the possibility that influence can also flow from attitudes and behaviors to beliefs, but these topics are covered in other chapters of this volume (Earl & Hall, this volume; see also Albarracín & Wyer, 2001). Similarly, the effect of attitude change on changes in behavior is not a major focus of this chapter because it is discussed elsewhere in this volume.

Brief Historical Overview of Attitude-Behavior Research

In the early days of attitude research, most investigators accepted as a given that human behavior is guided by social attitudes. In fact, the field of social psychology was originally defined as the scientific study of attitudes (Thomas & Znaniecki, 1918; Watson, 1925) because it

was assumed that attitude was the key to understanding human behavior. Early work with the attitude construct gave no reason to doubt this assumption. Applying newly developed methods to assess attitudes, divinity students were found to hold more favorable attitudes toward the church than other college students (Thurstone & Chave, 1929); military training groups, veterans, and conservative political groups had more favorable attitudes toward war than labor groups and professional men (Stagner, 1942); some racial and ethnic groups received much more welcoming responses than others (Bogardus, 1925); business people were found to be more opposed to prohibition of alcohol than were Methodists (H. N. Smith, 1932), and so forth (see Bird, 1940).

Yet some investigators challenged the view that verbal reactions to symbolic stimuli (i.e., attitudes) provide insight into how people behave in the real world. To demonstrate that people might say one thing and do another, LaPiere (1934) accompanied a young Chinese couple in their travels across the United States and recorded whether they received service in restaurants and overnight accommodation in motels, hotels, and inns. Following their travel, LaPiere mailed a letter to each establishment they had visited, asking whether it would “accept members of the Chinese race as guests.” As LaPiere had expected, there was no consistency between the symbolic attitudes (responses to the letter) and actual behavior. The Chinese couple received courteous service in virtually every establishment, but responses to the letter were almost universally negative. A more recent replication found a highly similar pattern by contrasting emails, which are more impersonal, with phone calls, which require direct interaction with the other person (Howerton, Meltzer, & Olson, 2012). Email requests about booking a bed and breakfast for a honeymoon trip were declined or went unanswered more often when they

purportedly came from a man in a same-gender relationship as opposed to a heterosexual relationship (no such difference was found for women). In contrast, when a different sample of bed and breakfast establishments was contacted directly by phone, 100% of all accommodation requests were accepted regardless of the caller's ostensible sexual orientation.

Whereas LaPiere's first systematic investigation of the attitude-behavior relation started with the assumption that behavior has little to do with attitudes, the second study to examine this issue accepted the proposition that attitudes guide behavior and tried to use a measure of attitude toward cheating to predict actual cheating in the classroom (Corey, 1937). Corey assessed college students' attitudes at the beginning of the semester and provided multiple opportunities to cheat by allowing them to score their own tests. To his dismay, there was virtually no correlation between the students' attitudes and their cheating behavior.

In subsequent years, studies on the attitude-behavior relation started to appear with increasing frequency. By the late 1960s, at least 45 separate studies had been reported in which investigators assessed verbal attitudes and observed actual behavior that they expected to be related to the attitudes. Investigators attempted to predict job performance, absenteeism, and turnover from job satisfaction attitudes (e.g., Bernberg, 1952; Vroom, 1964; see also Newman & Yearick, Volume 2 of this handbook); they looked at attitudes toward African Americans in relation to conformity with the judgments made by African Americans (Himmelstein & Moore, 1963), or in relation to willingness to have a picture taken with an African American (DeFleur & Westie, 1958; Linn, 1965); they used attitudes toward cheating in attempts to predict cheating behavior (Corey, 1937; Freeman & Ataöv, 1960), attitudes toward labor unions to predict attendance at labor union meetings (Dean, 1958), attitudes toward participating as a subject in

psychological research to predict actual participation (Wicker & Pomazal, 1975), and so forth.

For anyone inclined to rely on attitudes to predict and explain human behavior, the results of these studies were extremely discouraging: Attitudes were usually found to be very poor predictors of actual behavior and many social psychologists began to worry about the utility of the attitude construct (e.g., Blumer, 1955; Campbell, 1963; Deutscher, 1966; Festinger, 1964). In a provocative and highly influential review of this literature, Wicker (1969) called attention to the inconsistency between attitudes and behavior and essentially called for abandoning the attitude construct. After conducting his review of relevant studies, he reached the following conclusion regarding the strength of the attitude-behavior relation:

"Taken as a whole, these studies suggest that it is considerably more likely that attitudes will be unrelated or only slightly related to overt behaviors than that attitudes will be closely related to actions. Product-moment correlation coefficients relating the two kinds of responses are rarely above .30, and often are near zero" (p. 65).

Based on this empirical evidence, he questioned the existence of attitudes, or at least the relevance of attitudes to behavior:

"The present review provides little evidence to support the postulated existence of stable, underlying attitudes within the individual which influence both his verbal expressions and his actions" (p. 75).

Wicker's pessimistic conclusions fell on fertile ground in a discipline that in the late 1960s and early 1970s was mired in a crisis of confidence and was searching for new directions.

Reactions to Attitude-Behavior Inconsistency

The development of reliable measurement techniques in the 1920s and 1930s allowed investigators to commence with the scientific study of attitudes. Concern with validation of attitude measures quickly gave way to interest in attitude formation and change. Spurred in part by research on the effectiveness of the Army's wide use of films and other mass communication media during World War II (Hovland, Lumsdaine, & Sheffield, 1949), the major focus in the postwar years turned to questions of communication and persuasion (Hovland, Janis, & Kelley, 1953; see also B. T. Johnson & Nichols, 1998, for a review of social psychology's role in the war). The relation between attitudes and behavior was taken for granted, with the implication that changes in attitudes would influence behavior, an assumption that was rarely questioned (but see Festinger, 1964). Wicker's (1969) review challenged this assumption by drawing attention to the mounting evidence for inconsistency between attitudes and behavior.

Wicker's conclusions did not come as a surprise to sociologists who had questioned the importance of personal dispositions and had emphasized instead social context and norms as determinants of human action (DeFleur & Westie, 1958; Deutscher, 1969; LaPiere, 1934). It did, however, shatter the complacency of many psychologists who, like Gordon Allport (1968), considered attitude to be "the most distinctive and indispensable concept in contemporary American social psychology" (p. 59). Maintaining their faith in the predictive validity of attitudes, they reacted to Wicker's conclusions by offering possible explanations for the observed inconsistencies. A few investigators came to the defense of the attitude construct by questioning the relevance of some of the most frequently cited experiments or the representativeness of the sample of studies included in Wicker's review. For example, Dillehay (1973) pointed out that LaPiere's (1934) study on acceptance of a Chinese couple and other similar studies (e.g., Kutner,

Wilkins, & Yarrow, 1952) failed to properly address the attitude-behavior relation because the person performing the behavior may not have been the same person who provided the verbal attitude measure. In a different vein, Kelman (1974) argued that Wicker's review focused on experimental studies and neglected survey data that provided much stronger evidence for attitude-behavior consistency.

For the most part, however, social psychologists acknowledged that the field was faced with a serious problem. Negative evidence regarding the attitude-behavior relation had been published sporadically over many years, but it was relatively easy to dismiss each study by pointing to methodological flaws. When the disparate studies were brought together in an integrated review, it became clear that this issue could no longer be ignored and it forced the field to reexamine the assumption that attitudes can help understand and predict behavior. Several possible explanations for observed attitude-behavior inconsistencies were proposed.

Response biases. Long before it became evident that attitudes are poor predictors of behavior, investigators were concerned with the validity of verbal attitude measures. It was argued that such measures may be systematically distorted or biased and thus may not reflect a person's "true" attitude (e.g., Campbell, 1950; Cook & Selltitz, 1964; Guilford, 1954). The earliest and most frequently cited response bias is the tendency to give socially desirable responses on attitude and personality inventories (Bernreuter, 1933; Lenski & Leggett, 1960; Vernon, 1934). This possibility provided a ready explanation for the reported failure of attitudes to predict behavior and it suggested the need to use attitude measures that are less subject to systematic biases. The methods available to avoid social desirability bias were of two types. Disguised procedures of a verbal nature, such as Hammond's (1948) error-choice technique or

Waly and Cook's (1965) plausibility technique, were based on the assumption that when the purpose of the instrument is not apparent, respondents are less likely to distort or falsify their answers to attitudinal inquiries (for a more recent version of the plausibility technique, see Saucier and Miller, 2003). Alternatively, physiological reactions (e.g., galvanic skin response, heart rate, palmar sweat, or pupillary dilation and constriction) were assumed to prevent bias by assessing involuntary responses over which the individual has little or no control (for a review, see Kidder and Campbell, 1970).

It was expected that disguised and physiological measures would prove superior to the undisguised measures of attitude in terms of behavioral prediction, but few attempts were made to submit this expectation to empirical test, probably because of the required cost and expertise. Nor did this situation change with the development of additional indirect assessment methods designed to overcome response bias, such as the bogus pipeline (Jones & Sigall, 1971) or the facial electromyogram (Petty & Cacioppo, 1983). Some of the disguised techniques (e.g., the thematic apperception test, the Rorschach test, doll play) proved to be too unreliable; many physiological indices appeared to assess arousal rather than attitude; and the few studies that tested predictive validity found that undisguised measures performed better than disguised measures (Kidder & Campbell, 1970). There was thus no evidence that the indirect assessment approach produced more valid measures of a person's true attitude than did the direct approach, nor could it be used to account for the failure of directly assessed attitudes to predict behavior.

Multi-dimensionality of attitudes. Another longstanding concern had to do with the fact that most attitude measurement techniques resulted in a single score representing the respondent's overall positive or negative reaction to the attitude object. Many theorists believed

that this focus on a single, evaluative dimension did not do justice to the complexity of the attitude construct (Allport, 1935), a view that offered another basis for explaining the failure of attitudes to predict behavior. At the time of Wicker's (1969) review, the most popular conceptions of attitude incorporated the ancient trilogy of thinking, feeling, and doing. In contemporary language, attitude was defined as a complex, multidimensional construct comprised of cognitive, affective, and conative components (Krech, Crutchfield, & Ballachey, 1962; McGuire, 1969; Rosenberg & Hovland, 1960). From this perspective, it was evident that a single evaluative score - although it may assess the affective component - cannot adequately represent the attitude construct in all its complexity. A ready explanation for observed attitude-behavior inconsistencies, then, was to argue that the obtained attitude measures assessed only one of the three components (i.e., affect), and the wrong one at that. It was argued that, if the goal is to predict behavior, we must assess the conative or behavioral component rather than the affective component (Katz & Stotland, 1959; Kothandapani, 1971; Ostrom, 1969; Triandis, 1964).

An early indication that the tripartite approach might not solve the problem of attitude-behavior inconsistency can be found in Thurstone's (1931) writings in which he observed that various overt behaviors could be scaled "in a manner analogous to the procedure for (scaling) the statements of opinion. It is quite probable that these two types of scale, the opinion scale and the situation (overt action) scale, will be highly correlated" (p. 264). Thurstone's insight that measures of attitude based on different types of responses should be highly correlated was later confirmed in several empirical studies. For example, developing a scale to assess attitudes toward African Americans, Woodmansee and Cook (1967) started with a large set of items

representative of the three components. Contrary to expectations, the results of a factor analysis “did not produce components identifiable as cognitive, affective, and conative. Instead, a larger number of format-free, content-defined dimensions were found,” (p. 240) such as ease in interracial contacts, acceptance in close personal relationships, and integration-segregation policy.

Other investigators approached the problem by applying Thurstone, Likert, and Guttman scaling techniques (see Krosnick, Judd, & Wittenbrink, this volume) separately to sets of cognitive, affective, and conative items regarding the church (Ostrom, 1969) and birth control (Kothandapani, 1971). For example, Kothandapani used items such as “Birth control will help me postpone childbirth as long as I want” to assess the cognitive components of attitude, items such as “The very thought of birth control disgusts me” to measure the affective component, and items such as “I would volunteer to speak about the merits of birth control” to assess the conative component. In this fashion, separate Thurstone, Likert, and Guttman scales were developed for the cognitive, the affective, and the behavioral components. Convergent and discriminant validities were evaluated by looking at the correlations among these measures in a multitrait-multimethod matrix (Campbell & Fiske, 1959). A careful secondary analysis of the correlations among components of attitude toward the church reported by Ostrom (1969) revealed virtually no evidence for discriminant validity (Widaman, 1985); all measures were strongly intercorrelated. Also, when the measures of the different components were used to predict such religion-relevant behaviors as church attendance, monetary contributions to the church, or time spent in meditation, the correlations were generally low (median $r = .19$) and there was little support for the postulated superiority of the behavioral component measures. As in the case of

Woodmansee and Cook (1967), this study thus again indicated that the three-component approach could not account for attitude-behavior inconsistencies.

Statistically significant evidence for convergent and discriminant validity of cognition, affect, and conation measures was obtained in a secondary analysis of Kothandapani's (1971) data regarding attitudes toward use of birth control (Widaman, 1985), and there was some indication that the conative measures were somewhat better predictors of behavior than were the cognitive and affective measures.¹ However, these findings had no bearing on attitude-behavior inconsistency because in this study, attitudes did predict behavior: All cognitive, affective, and conative measures of attitude toward birth control correlated highly with contraceptive use (median $r = .68$). As we will see below, it is likely that attitudes predicted behavior better in the Kothandapani study than in the Ostrom study because Kothandapani assessed attitudes toward the behavior of interest, that is, using birth control, whereas Ostrom assessed general attitudes toward the church to predict specific behaviors, such as donating money, attending church, and whether the participant had ever studied for the ministry.

PREDICTIVE VALIDITY OF GENERAL ATTITUDES

Our discussion thus far has shown that the problem of inconsistency between verbal attitudes and overt actions was not resolved by attempts to improve the measures of attitude. To further our understanding of the attitude-behavior relation, it is important to realize that investigators have been concerned with two different types of inconsistency (Schuman & Johnson, 1976). One type is exemplified by LaPiere's (1934) study and involves a contradiction between intentions and action, that is, between what people say they would do and what they actually do. Although LaPiere thought of his study as dealing with *attitudes* versus actions, his

measure of willingness to “accept members of the Chinese race as guests” is best viewed as a measure of behavioral intention (Fishbein & Ajzen, 1975). In this type of inconsistency participants fail to carry out their stated intentions to perform or not to perform a behavior of interest to the investigator. The predictor and criterion are identical, both dealing with the same specific action. Failure to act in accordance with behavioral intentions will therefore be termed *literal inconsistency*.

In a second type of inconsistency participants do not explicitly indicate whether they intend to engage in the behavior of interest to the investigator. Instead, their general (evaluative) attitudes toward the object of the behavior are assessed in a survey or questionnaire. It is assumed that favorable attitudes predispose positive responses to the object and unfavorable attitudes predispose negative responses. Inconsistency is evidenced when the general attitude fails to correlate with the specific behavior under investigation. This type of inconsistency is illustrated in the study by De Fleur and Westie (1958) who found that attitudes toward African Americans failed to predict willingness to have one’s picture taken with a black person of the opposite sex. Because it involves a lack of correspondence in evaluation expressed in verbal attitudes and in actual behavior, it will be termed *evaluative inconsistency*. We will discuss this type of inconsistency first and turn to literal inconsistency later in this chapter.

Evaluative Inconsistency: Broad Attitudes Versus Single Behaviors

Moderating Variables Explanation

Most attitude-behavior inconsistencies reviewed by Wicker (1969) represent instances of evaluative inconsistency, which is a failure of general attitudes to predict a given behavior with respect to the object of the attitude (e.g., Himelstein & Moore, 1963; Rokeach & Mezei, 1966;

Warner & DeFleur, 1969). It is an article of faith in psychology that human behavior is complex and, therefore, very difficult to explain and predict. In line with this reasoning, investigators proposed that general attitudes can have a strong impact on behavior, but that this is to be expected only under certain conditions or for certain types of individuals (see Ajzen, 1988; Sherman & Fazio, 1983). In other words, the degree of attitude-behavior consistency was assumed to be moderated by factors related to the person performing the behavior, the situation in which it is performed, or to characteristics of the attitude itself.

Among the individual difference variables considered as moderators were such factors as self-monitoring tendency, self-consciousness or self-awareness, and need for cognition. For example, individuals high in self-monitoring are assumed to be “highly sensitive to social and interpersonal cues of situationally appropriate performances” whereas individuals low in this tendency are thought to “display expressive behavior that truly reflects their own attitudes, traits, feelings, and other current inner states” (Gangestad & Snyder, 1985, p. 322). Several studies examined the hypothesis that attitudes are better predictors of behavior for people low as opposed to people high in the tendency to monitor their behavior (Kline, 1987; Snyder & Kendzierski, 1982a; Zanna, Olson, & Fazio, 1980; Zuckerman & Reis, 1978). Similarly, it was suggested that people who have a vested interest in a topic (I. M. Johnson, Siegel, & Crano, 2014; Regan & Fazio, 1977; Sivacek & Crano, 1982), who hold their attitudes with great confidence (Fazio & Zanna, 1978b; Sample & Warland, 1973), and for whom the attitude object is important, relevant, or involving (Fazio & Zanna, 1978b; Franc, 1999; Krosnick, 1988), are likely to act in accordance with their general attitudes.

Among the situational moderators of the attitude-behavior relation that were examined

are time pressure (Jamieson & Zanna, 1989; Kruglanski & Freund, 1983) and presence or absence of a mirror in the behavioral situation (Carver, 1975). Time pressure is assumed to heighten the need for cognitive structure (Kruglanski, 1989), and introduction of a mirror is used to produce a high level of self-awareness (Wicklund, 1975). As a result of these hypothesized effects, general attitudes were expected to predict behavior better under time pressure and in the presence of a mirror. Time pressure may also alter the aspects of the attitude object that are most salient: Trope and Liberman (2000) have proposed that people give more weight to an object's central features when considering a decision in the distant rather than near future. Further, psychologically distant behaviors are described in more abstract terms than near behaviors (Fujita, Henderson, Eng, Trope, & Liberman, 2006; Henderson, Fujita, Trope, & Liberman, 2006; Liberman & Trope, 1998; Wakslak, Trope, Liberman, & Alony, 2006). The effects of psychological distance can then influence the attitude-behavior association to the extent that an attitude considers central or abstract features. For example, Todorov, Goren, and Trope (2007) reported a greater weight for desirability concerns (i.e., attitudes, as opposed to concrete feasibility) when participants decided to enter lotteries with low probabilities (i.e., distance chance) as opposed to lotteries of high probabilities (i.e., near certainty).

Regarding qualities of the attitude itself (see Fabrigar, MacDonald, & Wegener, this volume) that may moderate the strength of the attitude-behavior relation, investigators examined degree of consistency between the cognitive and affective components of the attitude (Fazio & Zanna, 1978a; Norman, 1975; Zhou, Dovidio, & Wang, 2013; see meta-analysis by Cooke & Sheeran, 2004), whether attitudes are formed through direct experience as opposed to second-hand information (Fazio & Zanna, 1981), and whether they are formed as a result of central or

peripheral processing (Petty & Cacioppo, 1986 and Johnson, Wolf, Maio, & Smith-McLallen in this volume).

Empirical evidence. It has been difficult to demonstrate consistent moderating effects with respect to many of the variables considered, and the amount of research on some of the proposed mediators has been rather limited. Nevertheless, there is good evidence that vested interest or involvement and direct experience with the attitude object tend to improve prediction of specific behavior from general attitudes (see Ajzen, 1988, and Glasman & Albarracín, 2006, for reviews). For example, in a study on the effect of involvement (Sivacek & Crano, 1982), college students completed a scale designed to assess their attitudes toward instituting a comprehensive exam at their university as a prerequisite for graduation. Vested interest in the topic was operationalized in terms of the extent to which such an exam would affect the participant personally. The behavior recorded was whether or not participants signed a petition opposing the proposed exam, whether or not they volunteered to help distribute petitions, write letters to newspapers, etc., and the number of hours of help they pledged. In addition, an aggregate measure of behavior was obtained by constructing a scale on the basis of these three actions. For the total sample of participants, attitude-behavior correlations ranged from .34 to .43 for the three individual actions, while a correlation of .60 was obtained in the prediction of the behavioral aggregate. This demonstrates the importance of aggregation to achieve strong attitude-behavior correlations, an issue we will examine below. As to the effect of vested interest, the correlations between attitudes and single actions ranged from .24 to .42 for participants who fell in the lowest third of the vested interest distribution and from .60 to .74 for participants in the highest third. Using the behavioral aggregate score, the comparable

correlations were .53 and .82, respectively.

In addition to vested interest, direct experience with the attitude object is also found to have a consistent moderating effect on the attitude-behavior relation. Specifically, attitudes based on direct experience are more predictive of subsequent behavior than are attitudes based on second-hand information (Fazio & Zanna, 1981). To illustrate, in one of a series of studies in this research program (Regan & Fazio, 1977), the relation between attitudes and behavior was examined with respect to five types of intellectual puzzles. In the second-hand information condition of the experiment, participants were given a description of each puzzle type and were shown previously solved examples of the puzzles. By way of contrast, in the direct experience condition, participants were given an opportunity to work on the same puzzles. Expressed interest in each puzzle type served as a measure of attitude, and behavior (order and proportion of each puzzle type attempted) was assessed during a 15-minute free-play period. Correlations between attitudes and the two measures of behavior were .51 and .54 in the direct experience condition and .22 and .20 in the indirect experience condition.

Meta-analytic syntheses published more recently have confirmed many proposed moderators of the attitude-behavior relation (see section “Meta-Analyses” at the end of the chapter as well as Table 2; also see Cooke & Sheeran, 2004). Also, in recent years, attention has focused on characteristics of the behavior itself, such as how active or passive a behavior is (Paulson et al., 2012), the complexity of the behavior (Boynton & B. T. Johnson, 2009, cited in B. T. Johnson & Boynton, 2010), and difficulty and social pressure related to the behavior. In a meta-analysis of $k = 466$ effect sizes, lower correlations between attitudes and overt behaviors were due to higher difficulty of the behavior (such as having an abortion), and to greater social

pressure to engage in the behavior (such as graduating high school), each controlling for the other variable (Wallace, Paulson, Lord, & Bond, 2005). These results, however, may be best interpreted as suggesting that complex decisions that depend on having resources and/or support from others are difficult to predict from evaluations of an object such as abortion. Having an abortion requires a number of environmental conditions, such as abortion services and caretakers being accessible, and entails several behaviors, such as identifying a provider, obtaining financial resources, taking time off from work or school, etc.

Even when we can successfully identify moderating variables, however, it must be realized that this success is a mixed blessing. On one hand, work on moderating variables provides information about the processes whereby attitudes guide behavior, and it may thus help us design interventions to increase the likelihood that people will act in accordance with their attitudes. For example, we may be able to strengthen attitude-behavior relations by highlighting the personal relevance of an issue or by encouraging individuals to obtain direct experience with the attitude object or to think carefully about it. On the other hand, when we discover moderating variables, we also identify subsets of individuals and situations for whom attitudes are at best poor predictors of behavior. This problem is compounded by the fact that the moderating effects of many variables depend on yet other variables in higher-order interactions (Snyder & Kendzierski, 1982b; Zanna et al., 1980), further limiting the predictive utility of the attitude construct. For example, self-monitoring tendency was found to moderate the strength of the attitude-behavior relation when individuals were asked to think about their attitudes, but it had no significant moderating effect in the absence of reflection (Snyder & Kendzierski, 1982a).

Evaluative Inconsistency Reconsidered: Thurstone's Explanation

That the various attempts to explain inconsistency between general attitudes and specific behaviors have met with only limited success should not come as a surprise. When Thurstone developed his attitude scaling technique he wrote, "It is quite conceivable that two men may have the same degree or intensity of affect favorable toward a psychological object and that their attitudes would be described in this sense as identical but ... that their overt actions would take quite different forms which have one thing in common, namely, that they are about equally favorable toward the object" (Thurstone, 1931, pp. 261–262). Thus, people who hold the same general attitude can behave in different ways. Consider, for example, two individuals with equally favorable attitudes toward the church. One may express this favorableness by giving money to the church, the other by contributing time. Conversely, starting from the behavioral side of the equation, one person may be observed to donate money to the church and another not, yet they may hold the same attitude toward the church. It is simply that the second expresses his or her attitude differently, perhaps by organizing a church picnic.

The principle of aggregation. As the discussion above emphasizes, we cannot expect strong relations between general attitudes toward an object and any given behavior directed at that object. On close examination, what appear to be inconsistencies at the evaluative level, inconsistencies between general attitudes and specific behaviors with respect to the attitude object, turn out to be more apparent than real. In the early studies reviewed by Wicker (1969), investigators were by and large concerned with broad social issues such as racial integration and discrimination, aggression, conformity, authoritarianism, religiosity, labor-management relations, and so forth. They felt that behaviors in these domains were reflections of broad underlying attitudes. Thus, racial discrimination was assumed to reflect prejudicial attitudes

toward racial or ethnic minorities, that altruistic behavior could be explained by reference to positive attitudes toward helping others, and that adherence to religious traditions reflected favorable attitudes toward religion and the church. The first step, typically, was to develop an instrument, or select an existing instrument, that would assess attitudes presumed to be relevant to the domain of interest. Our discussion suggests that the next step should be to identify a set of behaviors broadly representative of the same behavioral domain. Instead, investigators tended to select a single behavior that they could readily observe and that they believed would be indicative of behavior in the domain of interest. In retrospect, there is reason to doubt that the particular behaviors selected - or for that matter any single behavior - could be representative of the broad behavioral domains under investigation. For example, in studies on racial prejudice and discrimination, investigators often measured attitudes of white participants toward African Americans and then assumed that these general attitudes would predict whether the participants would sign a petition to extend library hours after watching a black or white confederate sign or refuse to sign the petition (Himelstein & Moore, 1963); whether, when given a choice among two white and two black individuals, prejudiced participants would prefer whites over blacks (Rokeach & Mezei, 1966); or whether participants would agree to have their pictures taken with a black person of the opposite sex and to release these picture for a variety of purposes (DeFleur & Westie, 1958; Linn, 1965). Given the idiosyncratic and nonrepresentative nature of the behavioral criteria, it is hardly surprising that investigations of this kind obtained virtually no evidence for a relation between attitudes and behavior. It would be farfetched to conclude, however, that the negative findings can tell us anything about the predictive validity of attitudes in general.

In fact, when the behavioral criterion is broadly representative of the behavioral domain, rather than a single arbitrarily selected action, strong relations between attitudes and behavior are observed. For example, in a study of religiosity (Fishbein & Ajzen, 1974) several instruments were used to assess attitudes toward religion and participants were asked to indicate whether they did or did not perform each of a set of 100 behaviors in this domain. Whereas the general attitudes were typically poor predictors of individual behaviors, they showed strong correlations (ranging from .61 to .71) with an aggregate measure across all 100 behaviors, a measure designed to reflect the general pattern of religiosity. Similar results were reported for abortion activism (Werner, 1978) and for protection of the environment (Weigel & Newman, 1976).

Findings of this kind have done much to dispel the concern that general attitudes toward objects are unrelated to overt action. We now understand that such attitudes can predict behavior, but only if the measure of behavior is broadly representative of the attitude domain. Individual behaviors performed in a particular context tend to be influenced not only by general attitudes but by a wide range of additional factors. By incorporating in our criterion measure a large number of behaviors relevant to the domain of interest, the influence of these additional factors is essentially eliminated, leaving a relatively pure index of the evaluative behavioral disposition. Described in this manner, it may appear that the advantage of aggregation is simply to increase the reliability of the behavioral measure. However, identification of set of behaviors that have evaluative implications and are broadly representative of the domain under investigation not only increases the measure's reliability but also ensures that the behavioral criterion has construct validity. For example, to obtain a measure of discrimination against a group of people such as the mentally ill, any single behavior - even if reliably assessed - cannot

capture the broad meaning of discrimination. To obtain a measure of discrimination against the mentally ill that is not only reliable but also valid, we must observe a variety of behaviors each of which reflects some degree of favorableness or unfavorableness with respect to the mentally ill.

Evaluative Inconsistency: Conclusion

To summarize briefly, we have examined several attempts to explain evaluative inconsistency, attempts designed to understand why general attitudes fail to predict a given behavior with respect to the object of the attitude. Initial reactions focused on the validity of the attitude measure, suggesting either that responses to standard attitude scales were contaminated by social desirability bias and hence failed to capture true attitudes or that these measures provided an incomplete assessment of the attitude construct. The development of various indirect assessment techniques in response to the first concern failed to improve predictive validity, and assessment of multiple components of attitude also failed to improve prediction of behavior. Later approaches took the position that variables in addition to attitude must be taken into consideration, suggesting that attitudes play a very limited role because they are important predictors of behavior only for certain individuals and in certain situations.

The inconsistencies between general attitudes and specific actions that emerged in early research led investigators to question the utility and, indeed, the existence of broad behavioral dispositions or attitudes. Contrary to this pessimistic view, our discussion of the principle of aggregation has shown that it is very useful to think of broad behavioral dispositions and that these dispositions are reflected equally well in verbal responses and overt actions. It is for this reason that we obtain very high correlations between attitudes toward objects and multiple-act

criteria. We expand this discussion below, in the section **Predicting Single Behaviors**.

General Attitudes Across Attitude Objects

The principle of aggregation implies that broad attitudes are adequate to predict broad pattern of behavior. Consistent with the notion of different levels of generality, attitudes have been shown to generalize to an even higher level that cuts across seemingly disparate objects. As researchers have examined cross-cutting attitude patterns, they have become aware that people's attitudes can be similar across different objects. For instance, Hepler and Albarracín (2013) investigated tendencies to generally like or dislike stimuli, defined as systematic variation in attitude valence as a function of the person instead of the object. These dispositional attitudes were assessed by having participants evaluate a large number of stimuli and computing the mean attitudes. From an initial set of 200 attitudes, findings yielded a final scale of 16 items about such diverse objects as taxidermy, politics, and soccer. This scale had high internal consistency as well as high test-retest reliability, and exhibited adequate convergent and divergent validity. As expected, traits associated with positive or negative affect (e.g., extraversion, optimism) correlated with the measure of dispositional attitudes, although all other personality measures accounted for only about 20% of the variance in general attitudes. General or dispositional attitudes are also useful because they can predict unknown attitudes, including attitudes toward completely novel objects (Hepler & Albarracín, 2013; for related concepts, see Albarracín et al., 2008; Albarracín, Hepler, & Tannenbaum, 2011). Further, dispositional attitudes can be expected to predict behavior broadly as well, a possibility examined by Hepler and Albarracín (2014). Participants in two experiments reported their dispositional attitudes and the time they spent on a number of daily behaviors, such as personal care, working, education, and traveling.

Dispositional attitudes predicted the number of behaviors reported. This is a case in which a general attitude that lacks a specific object, a specific time, or a specific context is applicable to all objects, an issue we cover presently (Fishbein & Ajzen, 1974).

PREDICTING SINGLE BEHAVIORS

The principle of aggregation described above is but a special case of a more general rule dealing with the compatibility between measures of attitude and behavior. When we aggregate behaviors with respect to a given object we ensure compatibility with a measure of attitude toward that object. However, investigators are often interested not in a broad multiple-act index of behavior but with predicting and understanding performance of particular behaviors, perhaps hiring a member of a minority group or renting an apartment to the mentally ill. Many examples are found in the health domain where investigators have a substantive interest in understanding and influencing such behaviors as using condoms to prevent AIDS and other sexually transmitted diseases (see Glasman & Scott-Sheldon, Volume 2 of this handbook), cigarette smoking (see White et al., this volume), and breast self-examination; or categories of behavior, such as exercising (see Hagger, Volume 2) or eating a low-fat diet (see Mata, Dallacker, Vogel, & Hertwig, Volume 2). Similarly, in the domain of environmental protection, investigators are concerned with such behaviors as recycling of glass, plastic, and paper; or categories of behavior such as conserving water or reducing the consumption of energy (see Milfont & Schulz, Volume 2 of this handbook).

The Principle of Compatibility

Just as aggregating behaviors produces a criterion that is compatible with general attitudes toward the object, it is possible to obtain compatibility for a single behavior by assessing

attitudes toward the behavior in question. A single behavior can be viewed as involving an *action* directed at a *target*, performed in a given *context*, at a certain point in *time* (Ajzen & Fishbein, 1977, 1980; Fishbein & Ajzen, 1975). For example, we may be interested in understanding why people do or do not enroll (action) in a continuing education course (target) at a local community college (context) the next time it is offered (time). In this example, the four elements are explicitly specified. Alternatively, we may not care where people enroll in a continuing education course but only whether they do so sometime in the next 12 months. In this case, the target and action elements are clearly specified as before, the time element has been expanded, and the context is undefined.

The principle of compatibility (Ajzen, 1988; Ajzen & Fishbein, 1977) requires that measures of attitude and behavior involve exactly the same target, act, context, and time (TACT) elements, whether defined at a very specific or at a more general level. In the above example, we would have to assess attitude to enroll in a continuing education course at a local community college the next time it is offered or, in the more general case, attitude to enroll in a continuing education course in the next 12 months. To the extent that the indicators used to assess attitude and behavior comply with the principle of compatibility, they should correlate highly with each other.

Empirical research has shown that specific behaviors can be predicted quite well from compatible measures of attitude toward the behaviors in question. Earlier, in our discussion of the three-component model of attitudes, we noted that attitudes toward using birth control were found to be good predictors of reported contraceptive use (Kothandapani, 1971). Many other investigations have produced similar results. For example, Manstead, Proffitt, and Smart (1983)

reported a study on infant feeding practices. Toward the end of their pregnancies, women completed a questionnaire that assessed, among other things, their attitudes toward breast feeding (as opposed to bottle feeding) their babies. Six weeks following delivery, a questionnaire sent to each woman ascertained their actual feeding practices during the preceding six weeks. Attitudes toward the behavior of interest were found to have a correlation of .67 with the feeding method employed.

In the domain of illicit drug use, attitudes toward using LSD, amphetamines, cannabis, and ecstasy over the next six months were used to predict self-reported frequency of actual use of these drug during the period in question (McMillan & Conner, 2003). Attitude-behavior correlations across the four drugs ranged from .35 to .58 (all statistically significant). Many studies have examined the relation between attitudes and behavior in the domain of physical exercise. For example, Terry and O'Leary (1995) obtained a measure of attitude toward "exercising for at least 20 minutes, three times a week for the next fortnight" and two weeks later, participants indicated whether they had exercised for at least 20 minutes, three times per week during the past fortnight. The attitude-behavior correlation was .53. In another study (Godin, Valois, Shephard, & Desharnais, 1987), attitudes toward participating in vigorous physical activities were found to have a correlation of .45 with self-reports of the frequency with which participants engaged in such activities.²

These findings contrast with the low and often non-significant correlations between general measures of attitude toward an object and single behaviors with respect to the object. Thus, just as behavioral aggregation made it possible to demonstrate strong attitude-behavior correlations at a global level, the shift from general attitudes toward objects to attitudes toward

behaviors enables us to apply the attitude construct to the prediction of single behaviors. In fact, researchers in various disciplines including industrial psychology (Harrison, Newman, & Roth, 2006), health psychology (Siegel, Navarro, Tan, & Hyde, 2014), environmental education (Carmi, Arnon, & Orion, 2015), and wildlife conservation (Hayman, Harvey, Mazzotti, Israel, & Woodward, 2014) have successfully applied the principle of compatibility to improve prediction of specific behaviors. Nevertheless, many of these studies point out that lessons learned from the compatibility principle are not yet sufficiently integrated into research practices in these various domains (Ajzen, 2011; Harrison et al., 2006; Siegel et al., 2014).

A narrative review of attitude-behavior research (Ajzen & Fishbein, 1977) provided support for the principle of compatibility by showing that correlations between attitudes and behavior were substantial only when these variables were assessed at compatible levels of specificity or generality; when the measures were incompatible, the correlations were very low and usually not significant. The correlation across studies between degree of compatibility and the magnitude of the attitude-behavior relation was found to be .83. However, the most compelling support for the importance of compatibility comes from studies that have directly compared the predictive validity of attitudes that were compatible (i.e., attitudes toward behaviors) or incompatible (i.e., attitudes toward objects) with a single-act criterion. In a meta-analysis of eight studies that manipulated level of compatibility while holding all other variables constant (Kraus, 1995), the prediction of behavior from attitude toward the behavior resulted in a correlation of .54, whereas the correlation between general attitudes and the single behaviors was only .13 (see also Ajzen, 1971; Ajzen & Fishbein, 1970; Fishbein, Thomas, & Jaccard, 1976).

Since the original formulation of the compatibility principle as pertaining to action,

target, context, and time, researchers have also explored broader dimensions of compatibility to explain discrepancies between attitudes and behavior. For instance, one study found a compatibility effect for activity level such that when passive behaviors were salient at the time of attitude reports, participants' attitudes were more predictive of passive than of active behaviors and vice versa (Paulson et al., 2012). Similarly, researchers have not only examined whether affective and cognitive components of an attitude are consistent with each other (Fazio & Zanna, 1978a; R. Norman, 1975) but also whether the affective versus cognitive focus of the attitude matches the affective versus cognitive focus of the behavior (Dovidio, Esses, Beach, & Gaertner, 2002; Millar & Tesser, 1986, 1989; Zhou et al., 2013). For instance, attitude reports based on affective factors are more useful for predicting dessert choices than for predicting computer choices. To predict computer choices, an instrumental attitude with a stronger cognitive focus is more helpful. The degree to which these distinctions are useful will become apparent as applications of these principles develop and are useful to change behavior.

From Attitudes Toward Objects to Specific Behaviors: The MODE Model

We have seen that general attitudes toward physical objects, institutions, ethnic or religious groups, and so on are good predictors of behavioral patterns or multiple-act criteria, and that attitudes toward behaviors are good predictors of single actions. Furthermore, if there is one clear conclusion to be derived from work on the attitude-behavior relation it is that general attitudes will usually not provide a good basis for predicting and explaining single behaviors with respect to the attitude object; correlations of single behaviors with general attitudes tend to be modest at best. Nevertheless, many investigators continue to be interested in broad attitudinal dispositions and their possible effects on specific behaviors (Eagly & Chaiken, 1993; Glasman &

Albarracín, 2006).

The most direct and sophisticated attempt to deal with the processes whereby general attitudes may influence performance of specific behaviors can be found in Fazio's (Fazio, 1986, 1990b, 1995; Fazio & Towles-Schwen, 1999) MODE model. A schematic representation of the model appears in Figure 1. Building on past work concerning the effects of attitudes on perceptions and judgments (see Eagly & Chaiken, 1998 for a review), the model assumes that general attitudes can influence or bias perceptions and judgments of information relevant to the attitude object, a bias that is congruent with the valence of the attitude. However, for this bias to occur the attitude must first be "activated." Consistent with the logic of other dual-mode processing theories (see Chaiken & Trope, 1999), the MODE model posits that attitudes can be activated in one of two ways: in a controlled or deliberative fashion and in an automatic or spontaneous fashion. The acronym MODE is used to suggest that "motivation and opportunity act as determinants of spontaneous versus deliberative attitude-to-behavior processes" (Fazio, 1995, p. 257). When people are sufficiently motivated and have the cognitive capacity to do so, they can retrieve or construct their attitudes toward an object in an effortful manner. When motivation or cognitive capacity is low, attitudes can become available only if they are automatically activated. According to the MODE model, such automatic or spontaneous activation is reserved for strong attitudes. Specifically, attitude is defined as a learned association in memory between an object and a positive or negative evaluation of that object, and attitude strength is equivalent to the strength of this association (Fazio, 1990b). Thus, automatic attitude activation occurs when a strong link has been established in memory between the attitude object and a positive or negative evaluation. The stronger the attitude, the more likely it

is that it will be automatically activated and hence be chronically accessible from memory. The degree of accessibility (i.e., attitude strength) is usually operationalized by measuring the latency of responses to attitudinal questions: the faster the response, the more accessible the attitude is assumed to be (e.g., Fazio & Williams, 1986; see also Fazio, 1990a; Fazio, Sanbonmatsu, Powell, & Kardes, 1986).

(Figure 1 about here)

Fazio (1990b) has also suggested that by biasing perception and interpretation of new information, strong attitudes are more likely to be resistant to change than weak attitudes. This is consistent with the general view that strong attitudes involve issues of personal relevance and are held with great conviction or certainty (see Petty & Krosnick, 1995; Raden, 1985). As a result, they are assumed to be persistent over time and be resistant to attack, to impact perceptions and judgements, and to guide overt behavior (Krosnick & Petty, 1995).

Processes that take place in the immediate behavioral situation vary as a function of deliberative versus spontaneous processing mode. When motivation and cognitive capacity to carefully process information are high, attitudes don't have to be chronically accessible because they can be effortfully retrieved. Whether activated automatically or retrieved effortfully, the general attitude is available and can bias deliberations. Individuals who hold favorable attitudes are likely to notice, attend to, and process primarily the object's positive attributes whereas individuals with unfavorable attitudes toward the object are likely to direct attention to its negative qualities. These perceptions of the object (and relevant contextual elements, such as social norms) influence the person's "definition of the event," possibly directing attention to positive or negative consequences of performing the behavior in line with the positive or

negative evaluation of the object. Consistent with an expectancy-value model of attitude (see Earl & Hall, this volume), this process is expected to influence the person's attitude toward the behavior and thus guide behavior in accordance with the valence of the general attitude.

Although in the deliberative processing mode "... the degree to which the individual's attitude toward the object is capable of automatic activation from memory becomes irrelevant to the behavioral decision process" (Fazio, 1990b, p. 93), once activated - whether spontaneously or deliberately - the attitude can automatically bias information processing and judgments, and this is more likely to be the case for strong, highly accessible attitudes than for weak attitudes. As a result, readily accessible attitudes are more likely than relatively inaccessible attitudes to bias the definition of the event, to influence attitudes toward possible behaviors in the situation, and hence to guide performance of specific behaviors with respect to the attitude object.³

Attitude activation is more problematic when motivation or cognitive capacity is low. Under these conditions, attitudes are not likely to be retrieved or constructed in an effortful manner; they can become available, however, if they are automatically activated. As noted above, this is likely to occur only if the attitude is readily accessible in memory. In the spontaneous processing mode, weak attitudes will not be activated and will thus not be available to bias the definition of the event or guide behavior. Instead, behavior will be determined by salient cues associated with the attitude object or the behavioral situation.

Empirical Support for the MODE Model

The MODE model has obvious implications for the prediction of specific behaviors from general attitudes. Whether a person operates in the deliberative or spontaneous processing mode, attitudes toward objects should be good predictors of specific behaviors so long as they are

readily accessible from memory. As a general rule, therefore, attitudes that are readily accessible from memory should be better predictors of specific behaviors than less accessible attitudes, and the difference should be particularly pronounced in the spontaneous processing mode where people lack the motivation or cognitive capacity to effortfully retrieve their attitudes.

Some of the findings regarding moderating variables reviewed earlier can now be reinterpreted in terms of attitude accessibility. Thus, there is evidence that vested interest and involvement, as well as direct experience of interacting with the attitude object, tend to produce relatively strong attitudes, as indicated by low latency of responses to attitudinal questions (see Fazio, 1995). And we saw earlier that, consistent with the MODE model, high vested interest and direct experience do indeed produce stronger attitude-behavior relations than low vested interest or second-hand information.

Studies that were designed to directly test the MODE model's predictions concerning the attitude-to-behavior process (Berger & Mitchell, 1989; Fazio, Chen, McDonel, & Sherman, 1982; Fazio, Powell, & Williams, 1989; Fazio & Williams, 1986; Kokkinaki & Lunt, 1997) have focused on behavior in a deliberative processing mode. The results of these studies are also generally consistent with the model. For example, Fazio and Williams (1986) predicted voting choice in the 1984 Presidential election from attitudes toward the two major candidates (Reagan and Mondale) assessed several months earlier. In addition to attitude valence, the investigators also assessed the accessibility of these attitudes by asking participants to respond as quickly as possible to the attitude questions and recording response latencies. As hypothesized, prediction of voting choice was significantly better for participants with relatively accessible (low latency)

attitudes toward the candidates than for participants with relatively inaccessible attitudes. Similar results were obtained for the prediction of choice among intellectual puzzles from attitudes toward the puzzles (Fazio et al., 1982, Experiment 4), and selection of a product from attitudes toward the product (Berger & Mitchell, 1989; Fazio et al., 1989; Kokkinaki & Lunt, 1997).

Issues Related to the MODE Model

The MODE model provides an elegant account of the processes and conditions under which general attitudes toward objects will or will not influence the performance of specific behaviors. Nevertheless, several important issues have been raised in regard to this approach. First, the assumption that only strong attitudes are activated automatically by mere observation of the attitude object has been challenged in priming research where it was found that all attitudes are activated automatically, irrespective of their strength or accessibility (Bargh, Chaiken, Govender, & Pratto, 1992; Bargh, Chaiken, Raymond, & Hymes, 1996).⁴ In his rebuttal, Fazio (1993, 2001) reexamined the priming results and concluded that they are not inconsistent with the idea that highly accessible attitudes are more likely to be automatically activated. The MODE model's implications for attitude-behavior consistency, however, do not depend on the assumption that only strong attitudes are automatically activated. All we need to assume is that readily accessible or strong attitudes are more likely than less accessible attitudes to bias perceptions and judgments.

Related to this issue, it has been suggested that the magnitude of the attitude-behavior relation may be moderated not by attitude accessibility but by other correlated factors such as certainty, amount of knowledge, or the attitude's temporal stability (see Eagly & Chaiken, 1993).

Support for the superior predictive validity of stable attitudes was provided by Doll and Ajzen (1992). Compared to second-hand information, direct experience with different video games was found to raise the accessibility of attitudes toward playing those games and to increase the temporal stability of the attitudes. The superior predictive validity of the attitude measures following direct as opposed to indirect experience could be explained better by their greater stability than by their higher level of accessibility. A meta-analysis also supported the assertion that direct experience is associated with increased predictive validity of attitudes, an effect which was found to be mediated by attitude stability (Glasman & Albarracín, 2006).

Another issue has to do with the conditions under which the MODE model's predictions have been tested. As noted, the moderating effect of attitude accessibility has been studied primarily in the context of deliberative behavior. The model would predict that this effect will be stronger under low motivation or cognitive capacity to process behavior-relevant information, that is, in the spontaneous mode. Although accessibility has been found to moderate the attitude-behavior relation in a spontaneous setting (driving speed; Elliott, Lee, Robertson, & Innes, 2015), effects of accessibility in deliberative and spontaneous scenarios have, to the best of our knowledge, not been directly contrasted. One study (Schuette & Fazio, 1995) has provided suggestive evidence by showing that the moderating effect of attitude accessibility on the attitude-judgment relation depends on motivation. The moderating effect of accessibility was observed only under low motivation to process the information carefully, that is, only in a spontaneous processing mode.

Any model dealing with the influence of general attitudes on specific behaviors should be able to account for the typically low attitude-behavior relations reported in the literature. As we

noted earlier, investigators have tried unsuccessfully to use measures of general attitudes to predict such behaviors as job absence and turnover, various types of interaction with African Americans, participation in civil rights activities, attendance of labor union meetings, and so forth (see Wicker, 1969). According to the MODE model, the observed low attitude-behavior correlations imply that participants in these studies held relatively weak attitudes, too weak to influence their definition of the event and thus guide their behavior - even if these attitudes were activated. Without further evidence, this supposition cannot be completely discounted, but it seems reasonable to assume that people hold fairly strong attitudes toward their jobs, their labor unions, members of minority groups, and civil rights. Strong attitudes of this kind should be chronically accessible and thus available to guide behavior. However, in actuality, even under these ideal conditions from the MODE model perspective, the observed correlations between general attitudes and specific behaviors are found to be disappointing.

Finally, as Eagly and Chaiken (1993) noted, the processes linking general attitudes to specific behaviors in the MODE model are not spelled out in any detail for the spontaneous processing mode. Fazio (1990b) merely suggested that “the activated attitude can ... color individuals’ immediate perceptions and as a result influence their behavior toward the attitude object” (p. 94). The MODE model provides more detailed information about the way in which general attitudes guide behavior in the deliberative processing mode. Here it is assumed that general attitudes, if they are sufficiently strong, color the perceived consequences of the behavior, and thus influence attitudes toward the behavior. It is for this reason that general attitudes are related to performance of the behavior itself. It may be argued that similar processes occur under conditions of low motivation or low cognitive capacity. Although Fazio

(1990b) assumed that in a spontaneous processing mode “individuals will not be sufficiently motivated to deliberate and construct an attitude toward the behavior” (p. 93), it has been suggested that such processes can occur spontaneously without much cognitive effort (see Ajzen & Fishbein, 2000). The effect of general attitudes on specific behaviors, in deliberative as well as spontaneous processing contexts, may therefore be mediated by attitudes toward the behavior. In line with this proposition, we saw earlier that attitudes toward a behavior are consistently found to have greater predictive validity than attitudes toward the object at which the behavior is directed.

Intentions as Predictors of Behavior

The above discussion indicates that, consistent with the principle of compatibility, performance of specific behaviors can perhaps be best explained by considering the proximal attitude toward the behavior rather the more distal attitude toward the object at which the behavior is directed. Carrying this idea further, a number of theorists have proposed that the intention to perform a behavior, rather than attitude, is the closest cognitive antecedent of actual behavioral performance (e.g., Fishbein & Ajzen, 1975; Fisher & Fisher, 1992; Gollwitzer, 1993; Triandis, 1977). This implies that we should be able to predict specific behaviors with considerable accuracy from intentions to engage in the behaviors under consideration. Many studies have substantiated the predictive validity of behavioral intentions. When appropriately measured, behavioral intentions account for an appreciable proportion of variance in actual behavior. Meta-analyses covering diverse behavioral domains have reported mean intention-behavior correlations of .47 (Armitage & Conner, 2001; Notani, 1998), .53 (Sheppard, Hartwick, & Warshaw, 1988), .45 (Randall & Wolff, 1994), and .62 (van den Putte, 1993). Studies in

specific behavioral domains, such as condom use and exercise, have produced similar results, with intention-behavior correlations ranging from .44 to .56 (Albarracín, Johnson, Fishbein, & Muellerleile, 2001; Godin & Kok, 1996; Hausenblas, Carron, & Mack, 1997; Sheeran & Orbell, 1998). In a meta-analysis of these and other meta-analyses, Sheeran (2002) reported an overall correlation of .53 between intention and behavior.

Low Intention-Behavior Relations

However, notwithstanding these encouraging findings, there is also considerable variability in the magnitude of observed correlations, and relatively low intention-behavior correlations are sometimes obtained. Similarly, changes in intentions are not necessarily related to equivalent changes in behavior: In a meta-analysis of 47 experiments ($k = 8,802$) that successfully produced changes in intentions of $d = 0.66$, the resulting change in behavior was a respectable but much smaller $d = 0.36$ (Webb & Sheeran, 2006; see also Albarracín et al., 2005; Albarracín, Durantini, & Earl, 2006). Several factors may be responsible for low relations between intentions and behavior. Clearly, if there is little or no variance either in intention or in behavior, strong correlations cannot be expected. For example, at a very young age few if any children intend to use illicit drugs (Hornik et al., 2001), and a measure of their intentions can therefore not provide a basis for predicting future drug use.

Stability of intentions. Perhaps more important, if intentions change after they were assessed, they will tend to be poor predictors of later behavior. The time interval between measurement of intention and assessment of behavior is often taken as a proxy for stability because it is assumed that with the passage of time, an increasing number of events may cause intentions to change. Meta-analyses of intention-behavior correlations show the expected pattern

over time, although the effect is not always significant. For example, in research on condom use, prediction of behavior from intention was found to become significantly less accurate with the passage of time (Albarracín et al., 2001; Sheeran & Orbell, 1998). The correlation between effect size and amount of time in weeks between assessment of intention and behavior was $-.59$ in the Sheeran and Orbell (1998) analysis. To illustrate, in a re-analysis of meta-analytic data (Albarracín, Kumkale, & Johnson, 2004), intentions and behaviors correlated $r = .60$ when behaviors were assessed one month after attitude assessment, but only $r = .12$ when the time lag was one year (B. T. Johnson & Boynton, 2010). In a review covering a broader range of behaviors (Randall & Wolff, 1994), intention-behavior correlations declined from $.65$ to $.40$ for intervals of less than a day to one or more years, although this effect reached statistical significance only when objective rather than self-report measures of behavior were obtained.

Instead of relying on time interval as an indication of stability, some studies have assessed stability of intentions directly, and these studies have consistently found that the intention-behavior correlation declines substantially when intentions are unstable. In one of these investigations (Sheeran, Orbell, & Trafimow, 1999) undergraduate college students twice indicated their intentions to study over the winter vacation, five weeks apart. After returning from the winter vacation, they reported on how many days a week they had studied. For participants whose intentions remained relatively stable during the five-week period prior to the vacation, the intention-behavior correlation was $.58$ whereas for participants with relatively unstable intentions, it was $.08$. Similar results were reported with respect to attending a health screening appointment and eating a low-fat diet (Conner, Sheeran, Norman, & Armitage, 2000).

Intention-behavior compatibility. Beyond the impact of low variance and temporal

instability on the predictive validity of intentions, lack of compatibility between measures of intention and behavior may also be responsible for some of the weak correlations reported in the literature. The importance of maintaining compatibility is readily apparent in the case of evaluative inconsistency. General attitudes arguably fail to predict specific behaviors because of a lack of compatibility in the action, context, and time elements. That is, general attitudes identify only the target element whereas a specific behavior involves a particular action directed at the target in a given context and point in time.

Lack of compatibility is usually not a serious problem when it comes to predicting behavior from intentions because the measures of intention deal not with a general target but with the behavior of interest. In fact, as we saw earlier, meta-analyses of the intention-behavior relation have revealed generally high correlations. Nevertheless, incompatibility can arise even when dealing with the prediction of behavior from intention. For example, in a study of managers who were enrolled in a physical exercise program for health reasons (Kerner & Grossman, 1998), the frequency with which participants performed a specific prescribed exercise behavior (e.g., climbing stairs or lifting weights) over a 5-months period was only weakly ($r = .21$) related to their intentions to exercise in the next 12 months. Just as general attitudes are poor predictors of specific behaviors, intentions with respect to a behavioral category such as exercising cannot be expected to be good predictors of a single instance of the category. A more compatible measure of intentions in this study would have asked participants to indicate the extent to which they intended to engage in the particular prescribed exercise behavior.⁵

Literal Inconsistency: Intentions Versus Actions

Even when measures of intention and behavior have sufficient variance, are relatively

stable, and meet the criterion of compatibility, we find that some people do not act on their stated intentions. The gap between intentions and behavior in this case is an instance of literal inconsistency: People say they will do one thing yet do something else. Generally speaking, the pattern of literal inconsistency is asymmetric such that people who do not intend to engage in a socially desirable behavior tend to act in accordance with their negative intentions but people who intend to perform the behavior may or may not do so. For example, in a study of the intention-behavior relation (Linn, 1965), female students were asked to indicate whether they would be willing to release photos of themselves with an African American male for a variety of purposes related to improving race relations. Almost without exception, those who were unwilling to do so later signed very few releases. Among the participants who indicated a high level of willingness to release their photographs, however, only about one-half followed through on their intentions. Similarly, research in the health domain has found that participants who do not intend to use condoms, to undergo a cancer screening, or to exercise rarely if ever do so, but of those who intend to engage in these health-protective behaviors, between 26% and 57% fail to carry out their intentions (Sheeran, 2002).

Pseudo-inconsistency: An explanation of literal inconsistency. Perhaps the most ingenious explanation for literal inconsistency was offered by Donald Campbell (1963) who suggested that observed discrepancies between words and deeds may often be more apparent than real. He argued that verbal and overt responses to an attitude object are both indicators of an underlying hypothetical disposition and that one of these responses may be more difficult to perform than the other. Using the LaPiere (1934) study as an example, Campbell assumed that rejecting the Chinese couple in the face-to-face situation (overt behavior) was more difficult than

rejecting a symbolic representation of “members of the Chinese race” in response to a written inquiry. Individuals strongly prejudiced toward the Chinese would be expected to give a negative response in both situations, whereas individuals who are not at all prejudiced should provide a positive response in both. The apparent inconsistency in the LaPiere study reflects, according to Campbell, a moderate degree of prejudice toward the Chinese, sufficiently strong to produce the relatively easy verbal rejection in a letter (negative intention) but not strong enough to generate the more difficult overt rejection in a face-to-face encounter (overt behavior).

(Insert Figure 2 about here)

Campbell (1963; see Figure 2) argued that literal inconsistency arises because people with moderate dispositions tend to display behaviors consistent with the disposition when the behaviors are easy to perform (e.g., express willingness to perform a behavior) but not when they are difficult to perform (e.g., carry out the intention). Although this argument is intuitively compelling, it has rarely been put to empirical test (Ajzen, Brown, & Carvajal, 2004; Sheeran, 2002). Contrary to Campbell’s thesis, recent research has found that participants who display literal inconsistency do not necessarily hold the expected moderate dispositions. In one experiment (Ajzen et al., 2004), participants could agree to contribute money to a scholarship fund under hypothetical as well as under real payment conditions. Literal inconsistency was shown by participants who agreed to make a contribution when the question was hypothetical but chose not to make a contribution in the real payment situation. The attitudes of these participants toward making a contribution were found to be no less favorable than those of participants who agreed to make a contribution under both payment conditions. Similar results were reported by Sheeran (2002) in a reanalysis of data from an earlier study (Sheeran & Orbell, 2000) on the

prediction of physical exercise.

Recent efforts set out to test Campbell's predictions using a behavior-based Rasch model of attitudes in the domain of ecological behavior and found encouraging results (Kaiser & Byrka, 2015; Kaiser, Byrka, & Hartig, 2010). Following Campbell's definition, attitudes were characterized as the latent factor underlying participants' engagement (or lack thereof) in a set of 50 environmental behaviors that were ordered by difficulty. With information about the difficulty of a given behavior and a participant's latent environmental attitude, the model was able to predict the probability of a participant engaging in that specific behavior. These studies show promise for the usefulness of such scales in behavior prediction, but await further empirical confirmation in other domains of behavior. Such an approach, however, does not clearly describe the meaning and the antecedents of the underlying latent factor. Future research may be needed to decide whether these latent factors are best described as attitudes, values, intentions, behavioral tendencies, or a different construct.

In conclusion, despite its elegance, the jury is still out on Campbell's pseudo-inconsistency hypothesis. It is clear however that this hypothesis cannot explain all cases of literal inconsistency.⁶

Implementation Intentions

Evidence for literal inconsistency challenges us to explain why some people fail to carry out the intentions they have formed.⁷ When asked to explain why they failed to act on their intentions, people often mention that they simply forgot or that it slipped their minds (Orbell, Hodgkins, & Sheeran, 1997; Sheeran & Orbell, 1999b). In those instances, a very effective means for closing the intention-behavior gap is to prompt people to form an implementation

intention (Gollwitzer, 1999). Simply asking people when, where, and how they will carry out their intentions greatly increases the likelihood that they will do so. The beneficial effects of implementation intentions have been found with respect to such normal, everyday activities as completing a project during Christmas vacation (Gollwitzer & Brandstätter, 1997), taking a daily vitamin C pill (Sheeran & Orbell, 1999b), and eating healthy food (Verplanken & Faes, 1999); as well as for disagreeable tasks, such as performing a breast self-examination (Orbell et al., 1997) and resuming functional activities following surgery (Orbell & Sheeran, 2000). Formulating an implementation intention has been found of particular benefit for individuals with severe cognitive deficits, such as drug addicts undergoing withdrawal and schizophrenic patients (Gollwitzer & Brandstätter, 1997). Across 94 independent samples ($k = 8,461$), implementation intentions had a medium-to-large effect on goal achievement, $d = 0.65$ (Gollwitzer & Sheeran, 2006).

According to Gollwitzer (1999; Gollwitzer & Schaal, 1998), implementation intentions are effective because they allow people to delegate control of their goal-directed behaviors to the stimulus situation.⁸ Formulation of an implementation intention is assumed to activate the mental representation of a specified situation and make it chronically accessible. Consistent with this assumption, implementation intentions are found to enhance vigilance for relevant situational cues which are well remembered and easily detected (Aarts, Dijksterhuis, & Midden, 1999; Gollwitzer, 1996; Orbell et al., 1997). As a result, when the situational cues are encountered, initiation of the goal-directed action is expected to be swift, efficient, and to require no conscious intent, the hallmarks of automaticity (Bargh, 1996).

Perhaps consistent with this account, implementation intentions may be effective because

they improve memory for the behavioral intention. By specifying where, when, and how the behavior will be performed, implementation intentions provide several specific cues that can enhance recall of the intention and hence make it more likely that the intention will be carried out. Alternatively, it is possible to attribute the effectiveness of implementation intentions to a sense of commitment they engender. When people state explicitly - and publicly - that they will perform a behavior in a certain situation and at a certain point in time, they arguably make a commitment to carry out their intentions. And there is considerable evidence that making a commitment can greatly increase the likelihood that people will perform the behavior to which they have committed themselves (Braver, 1996; Cialdini, 2001; Kiesler, 1971). Consistent with this interpretation, asking people to make an explicit commitment to return a brief survey concerning TV newscasts was found to be just as effective in helping them carry out their intentions as was asking them to form an implementation intention (Ajzen, Czasch, & Flood, 2009). In fact, making a commitment was sufficient to produce a high rate of return, and adding an implementation intention did not further increase intention-consistent behavior. Thus, although there is strong evidence for the power of implementation intentions, more research is needed to determine the mechanism whereby such an intervention achieves its effectiveness.

Behaviors Versus Goals: The Question of Volitional Control

A number of investigators have made a distinction between performing a behavior, such as weight lifting, and attaining a goal, such as losing weight (Ajzen & Fishbein, 1980; Bagozzi & Warshaw, 1990; Bandura, 1997). This distinction has heuristic value, directing our attention to the possibility that intentions are immediate antecedents of behavioral performance but not of goal attainment. Generally speaking, attainment of a goal depends not only on the person's

behavior but also on other factors. Thus, to lose weight, a person may reduce food intake and work out at the gym, but actual weight loss may also depend on physiological and other factors not under the person's control. Factors of this kind are less likely to play a role in the performance of a behavior. In other words, people usually have greater volitional control over performing a behavior than over achieving a goal. On closer examination, however, it becomes clear that what at first glance appears to be a volitional behavior is not, in fact, completely volitional. In fact, it is sometimes difficult to tell whether a given criterion should be considered a behavior or a goal. Despite their best efforts, people may be unable to donate blood if for any reason they are judged to be ineligible. Similarly, driving a car is a behavior whose performance requires possession of a valid driver's license and skills that may turn out to be unavailable. Thus, goals as well as behaviors can involve varying degrees of volitional control, but behaviors typically fall toward the volitional end of the continuum while goals fall toward the non-volitional end. Clearly, a measure of intention is expected to predict performance of a behavior or attainment of a goal only to the extent that these criteria are under volitional control. Some of the low correlations between intentions and behavior reported in the literature may occur when investigators try to predict a criterion over which people have relatively little volitional control.

This discussion implies that we should be able to improve prediction of behavior if we consider not only intention but also the degree to which an individual has control over performing the behavior. Volitional control is expected to moderate the intention-behavior relation such that the effect of intention on behavior is stronger when actual control is high rather than low. In fact, when most people have control over performance of a behavior, intention by itself should permit good prediction. It is only when people vary in the degree to which they

have control can we expect that taking control into account will improve behavioral prediction (Ajzen, 1985).

Unfortunately, it is not at all clear what constitutes actual control over a behavior or how to assess it. Although we may be able to measure some aspects of actual control, in most instances we lack sufficient information about all the relevant factors that may facilitate or impede performance of the behavior. However, it is possible that people's *perceptions* of the extent to which they have control over a behavior accurately reflect their actual control. To the extent that perceived behavioral control is indeed veridical, it can serve as a proxy for actual control and be used to improve prediction of behavior.

Numerous studies conducted over the past 10 years have shown that taking into account perceived behavioral control can improve prediction of behavior. Although, conceptually, perceived control is expected to *moderate* the intention-behavior relation, in practice most investigators have looked at the additive effects of intention and perceptions of control.⁹ Meta-analyses that have examined the contribution of perceived behavioral control for a wide variety of behaviors have found that, on average, perceived behavioral control explains approximately an additional 2% of the variance in behavior (Armitage & Conner, 2001; Cheung & Chan, 2000), a small though significant increase. Of course, as noted earlier, we would not expect perceived behavioral control to be an important predictor for every type of behavior. When volitional control is high, intentions are good predictors of behavior and including a measure of perceived behavioral control accounts for little if any additional variance. When behavior is not under complete volitional control, however, measuring perceptions of control can make a valuable contribution (Madden, Ellen, & Ajzen, 1992). Consistent with this argument, it is found that the

amount of variance in behavior explained by perceived behavioral control varies significantly across behavioral domains (Cheung & Chan, 2000; Notani, 1998). For example, in the case of regularly attending an exercise class (Courneya & McAuley, 1995), the mean level of perceived behavioral control was relatively high and it explained only 1% of additional variance in behavior beyond a measure of intention. In contrast, in a sample of smokers who, on average, perceived that they had relatively little control over not smoking, the measure of perceived behavioral control accounted for an additional 12% of the variance in smoking behavior (Godin, Valois, Lepage, & Desharnais, 1992; see also Madden et al., 1992).

To summarize briefly, our discussion of research on the prediction of behavior from intentions has shown that, as a general rule, when people have control over performance of a behavior, they tend to act in accordance with their intentions. When the behavior is not under complete volitional control and objective measures of actual control are unavailable, assessing perceptions of behavioral control can help improve prediction. Additionally, it is important to ensure compatibility between measures of intention and behavior and to take into account the intention's stability over time because changes in intentions tend to lower their predictive validity.

PREDICTING INTENTIONS: MODELS OF REASONED ACTION

Because intentions are found to be good predictors of specific behaviors, they have become a critical part of many contemporary theories of human social behavior [social cognitive theory (Bandura, 1997, 1998, where Bandura refers to intentions as proximal goals), the health belief model (Rosenstock, Strecher, & Becker, 1994; Strecher, Champion, & Rosenstock, 1997), the information-motivation-behavioral skills model (Fisher & Fisher, 1992), the theory of

interpersonal relations and subjective culture (Triandis, 1977), the theory of trying (Bagozzi & Warshaw, 1990), the prototype/willingness model (Gibbons, Gerrard, Blanton, & Russell, 1998)]. To go beyond prediction and provide an explanation of behavior, these theories also deal with the factors that lead to the formation of intentions. Although the theories differ in detail, there is growing convergence on a small number of variables that account for much of the variance in behavioral intentions (Bandura, 1998; Fishbein, 2000; Fishbein, Triandis, et al., 2001; Petraitis, Flay, & Miller, 1995). These variables can be viewed as representing three major kinds of considerations that influence the decision to engage in a given behavior: the likely positive or negative consequences of the behavior, the approval or disapproval of the behavior by respected individuals or groups, and the factors that may facilitate or impede performance of the behavior.

Considerations of the likely consequences of a behavior have been called behavioral beliefs (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), outcome expectancies (Bandura, 1977), or costs and benefits (Becker, 1974). In the aggregate, these beliefs and their associated evaluations are assumed to produce an overall positive or negative evaluation or attitude toward performing the behavior in question. Specifically, if the perceived advantages of performing the behavior outweigh its perceived disadvantages, people are likely to form a favorable attitude toward the behavior. Conversely, if on balance the perceived disadvantages outweigh the perceived advantages, a negative attitude is likely to be formed. (For a detailed discussion of the process whereby beliefs lead to the formation of attitudes, see Earl & Hall, this volume.)

Considerations that deal with the likely approval or disapproval of a behavior by friends, family members, coworkers, and so forth are usually termed normative beliefs and, in their

totality, they are assumed to lead to perceived social pressure or subjective norm to engage or not engage in the behavior (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). When people believe that most respected others would expect them to perform the behavior or are themselves performing the behavior, the subjective norm will exert pressure to engage in the behavior. Conversely, when most normative beliefs are antagonistic, the perceived social norm will exert pressure not to perform the behavior.

Finally, beliefs concerning the presence or absence of factors that make performance of a behavior easier or more difficult have been termed control beliefs. In their totality, these control beliefs lead to the perception that one has or does not have the capacity to carry out the behavior, referred to variously as self-efficacy and personal agency (Bandura, 1977) or perceived behavioral control (Ajzen, 1991). People who believe that they have the skills and other resources needed to perform the behavior or overcome barriers are likely to develop a strong sense of self-efficacy or perceived behavioral control, while people who believe that they lack some of the requisite resources are likely to have a much weaker sense of personal agency.

The Reasoned Action Approach

The process described above whereby people arrive at their intentions represents a “reasoned action” approach to the explanation and prediction of social behavior in the sense that people’s behavioral intentions are assumed to follow reasonably from their beliefs about performing the behavior. These beliefs need not be veridical; they may be inaccurate, biased, or even irrational. However, once a set of beliefs is formed it provides the cognitive foundation from which attitudes, perceived social norms, and perceptions of control - and ultimately intentions - are assumed to follow in a reasonable and consistent fashion.

It is important to realize that the behavioral, normative, and control beliefs people hold about performance of a given behavior are influenced by a wide variety of cultural, personal, and situational factors. Thus, we may find differences in beliefs between men and women, young and old, black and white, educated and uneducated, rich and poor, dominant and submissive, shy and outgoing, and between individuals who have an individualistic or collectivistic orientation. In addition, they may be affected by the physical environment, the social environment, exposure to information, as well as such broad dispositions as values and prejudices.

Figure 3 depicts one way in which the antecedents of intentions and behavior can be represented (Ajzen, 1991, 2012; Fishbein, 2000). Implicit in this model are several fundamental assumptions: (1) Intention is the immediate antecedent of actual behavior. (2) Intention, in turn, is determined by attitude toward the behavior, subjective norm, and perceived behavioral control. (3) These determinants are themselves a function, respectively, of underlying behavioral, normative, and control beliefs. And, (4) behavioral, normative, and control beliefs can vary as a function of a wide range of background factors.

(Insert Figure 3 about here)

The solid arrow pointing from actual control to the intention-behavior link indicates that volitional control is expected to moderate the intention-behavior relation such that the effect of intention on behavior is stronger when actual control is high rather than low. Also, as noted earlier, to the extent that perceived behavioral control is veridical, it can serve as a proxy for actual control and be used to improve prediction of behavior. This possibility is shown by the dotted arrows in Figure 3 that connect actual control to perceived control and perceived control to the intention-behavior link.

For the sake of simplicity, several important relations are not shown in the diagram. First, performance of a behavior can provide new information about the likely outcomes of the behavior, about expectations of others, and about issues of control. These feedback loops are of course likely to influence future intentions and behavior, and they are partly captured by including past behavior among the background factors that influence beliefs.

Second, once formed, attitudes toward a behavior can work backwards to influence the formation of new behavioral beliefs (see Marsh & Wallace, 2005 in the previous edition of this handbook). That is, existing attitudes can bias perception and interpretation of new information, sometimes through a process of “wishful thinking” or rationalization, and thus influence the formation of new behavioral beliefs (cf. McGuire & McGuire, 1991). Similar feedback processes may apply to subjective norms feeding back on normative beliefs, and to existing perceptions of control influencing formation of new control beliefs.

Third, attitudes, subjective norms, and perceptions of control, although conceptually independent, can correlate with each other because they may be based in part on the same information. For example, if a behavior is thought to produce favorable health outcomes, people may form a positive attitude toward the behavior and they may also infer that their spouses or other relevant referents would want them to perform it. Similarly, people who believe that they lack the skills required to perform a behavior may anticipate failure and thus may develop a negative attitude toward the behavior. Fourth, the diagram fails to show the relative weights or importance of attitude, subjective norm, and perceived control in the prediction of intention. It is assumed that these weights vary as a function of the particular behavior and the population under consideration. Thus, one behavior may be influenced primarily by attitudinal considerations,

whereas another behavior may be primarily under the influence of normative or control factors. In fact, in some applications, one or another of the three predictors may be irrelevant and make no significant contribution to the prediction of intention. Similar effects may be observed as we move from one population to another. When this happens, it merely indicates that for the behavior or population under investigation, the factor in question is not an important consideration in the formation of intentions. Such a finding should not be considered evidence inconsistent with a reasoned action approach.

Note also that at the core of the model depicted in Figure 3 is a causal chain of effects starting with the formation of behavioral, normative, and control beliefs. These beliefs are assumed to influence attitudes, subjective norms, and perceived behavioral control which, in turn, produce intentions and behavior. Behavior thus rests ultimately on the information people have relevant to the behavior, and it is in this sense that behavior is reasoned. However, this should not be taken to mean that people consciously review every step in the chain each time they engage in a behavior. Once formed, attitudes, norms, perceptions of control, and intentions can be highly accessible and readily available to guide performance of the behavior. That is, people do not have to review their behavioral, normative, or control beliefs for these constructs to be activated. For example, a previously formed attitude toward lifting weights is automatically activated and can be readily available in the future without having to consider all the likely advantages and disadvantages of this behavior (see Ajzen & Fishbein, 2000, for a discussion of automatic processes in reasoned action).

Empirical Evidence

Research conducted over the past 35 years has provided strong support for the utility of

the reasoned action approach. In this period of time, literally thousands of studies have attempted to predict behavior in various domains from one or more of the core constructs described above. We have already seen that intentions are found to be good predictors of behavior, particularly when the behavior is under volitional control. In addition, a great number of studies conducted in the context of Bandura's (1977) social cognitive theory have documented that self-efficacy is a good predictor of behavior (e.g., Garcia & King, 1991; Longo, Lent, & Brown, 1992; Sadri & Robertson, 1993). Further, as we noted, measures of perceived behavioral control or self-efficacy are often found to improve prediction over and above intention (Armitage & Conner, 2001; Cheung & Chan, 2000), and this is particularly true when the behavior is not under complete volitional control (Madden et al., 1992). We now turn to research dealing with prediction of intentions.

Because much of the research on the determinants of behavioral intentions has been conducted in the context of the theories of reasoned action (Ajzen & Fishbein, 1980; Fishbein, 1967; Fishbein & Ajzen, 1975) and planned behavior (Ajzen, 1985, 1991), most of the relevant data comes from tests of these theories. Several meta-analyses of the empirical literature have provided evidence to show that intentions can be predicted with considerable accuracy from measures of attitudes toward the behavior, subjective norms, and perceived behavioral control or self-efficacy (Albarracín et al., 2001; Armitage & Conner, 2001; Godin & Kok, 1996; Hagger, Chatzisarantis, & Biddle, 2002a; Sheeran & Taylor, 1999; Sheppard et al., 1988; van den Putte, 1993). For a wide range of behaviors, attitudes are found to correlate well with intentions; across the different meta-analyses, the mean correlations range from .45 to .60. For the prediction of intentions from subjective norms, these correlations range from .34 to .42, and for the prediction

of intention from perceived behavioral control, the range is .35 to .46. In the original theory of reasoned action, prior to the introduction of perceived behavioral control, the multiple correlations for predicting intentions from attitudes and subjective norms ranged from .66 to .70. After the addition of perceived behavioral control, multiple correlations were found to range from .63 to .71. Although these results appear to indicate no improvement by the addition of perceived behavioral control, it must be recognized that the findings come from different data sets. When all variables were measured in the same study, perceived behavioral control accounted, on average, for an additional 6% of the variance in intentions (Armitage & Conner, 2001).¹⁰

Relative importance of attitudes, norms, and control as predictors of intention. The model described above suggests that the relative contributions of attitudes, subjective norms, and perceptions of control (or self-efficacy) to the prediction of intentions can vary as a function of the behavior and the population under investigation. For example, we saw that, across a variety of different behaviors, perceived behavioral control contributes significant variance to the prediction of intentions. On closer inspection, however, it is found that the amount of additional variance explained depends greatly on the type of behavior under consideration. Perceived behavioral control takes on greater importance when issues of actual control are associated with performance of the behavior. Thus, control is found to contribute relatively little to the prediction of intentions to consume common foods (Sparks, Hedderley, & Shepherd, 1992) but to be an important predictor of intentions to lose weight (Netemeyer, Burton, & Johnston, 1991).¹¹

The relative importance of norms has been considered in relation to social identity (e.g.,

J. R. Smith & Louis, 2009). A social identity approach to the attitude–behavior relation states that norms have a stronger influence on behavior when the norms stem from salient and important reference groups. These effects have been obtained in a variety of areas, including binge drinking (Johnston & White, 2003), healthy eating (Åstrøm & Rise, 2001; Louis, Davies, Smith, & Terry, 2007), and sustainable land use (Fielding, Terry, Masser, & Hogg, 2008; see Fielding & Hornsey, 2016). When a social identity defines the self, group norms guide behavior; when a social identity does not define the self, personal beliefs will determine behavior. Key to this dynamic, however, is the motivation to reduce uncertainty (J. R. Smith & Louis, 2009). Smith, Hogg, Martin, and Terry (2007) investigated the influence of self-relevant uncertainty on conformity to group norms. People who were induced a state of uncertainty after thinking about an unresolved life dilemma were presented with group norms that were attitude consistent or inconsistent. As predicted, these norms only influenced behavior when participants experienced uncertainty. Research on social identity has also looked at the influence of injunctive and descriptive norms coming from a valued group or ingroup versus an outgroup (J. R. Smith & Louis, 2008). When norms come from a valued group, perceiving that the group supports a behavior and actually engages in it both influence behavior. These effects, however, are not apparent when the normative information pertains to outgroups.

The relative importance of attitudes may depend on how these attitudes are connected to values. Values are attitudes towards abstract entities and can guide attitudes and behaviors in a number of contexts. Research conducted in Brazil, New Zealand, and South Africa gauged the value-to-attitude-to-behavior pathways within which attitudes are the concrete mediators of the influence of abstract principles on behavior (Milfont, Duckitt, & Wagner, 2010). Across

countries, self-interest values correlated with negative attitudes towards environmental issues, whereas altruistic values correlated with favorable attitudes towards environmental issues. These attitudes had a moderate correlation with environmental behavior, and carried the indirect effect of altruistic values on environmental behavior. In addition to the implications of this study for environmental attitudes, this research showed how attitudes may be embedded within a network of values that influence behavior.

Turning to the joint contributions of attitudes and subjective norms to the prediction of intentions, one of the first tests of the reasoned action approach (Ajzen & Fishbein, 1970) experimentally induced cooperative or competitive orientations in the context of a prisoner's dilemma game. Intentions to choose the cooperative alternative were controlled primarily by subjective norms in the cooperative condition and by attitudes in the competitive condition. Similarly, after priming the accessibility of either the private or the collective self, intentions to use condoms during sexual intercourse were found to be more under the control of attitudes in the former condition and more under the control of subjective norms in the latter (Ybarra & Trafimow, 1998).

There is also some evidence that individuals differ consistently in the amount of weight they place on attitudinal and normative considerations. Within-subjects multiple regression analyses across 30 different behaviors (Trafimow & Finlay, 1996; see also Finlay, Trafimow, & Moroi, 1999) showed that for some individuals, attitudes were better predictors of intentions than were subjective norms whereas for other individuals, subjective norms were better predictors than attitudes. Also, social groups may differ in the degree to which attitudes, subjective norms, and perceived control influence intentions, and the degree to which intentions and perceived

control predict behavior (Albarracín et al., 2004; Glasman & Albarracín, 2003). For example, when women lack actual control over a behavior such as condom use, perceived control has a strong influence (Albarracín et al., 2004; Glasman & Albarracín, 2003).

The role of background factors. According to a reasoned action approach, the major predictors of intentions and behavior follow reasonably from — and can be understood in terms of—behavioral, normative, and control beliefs. This approach, however, does not address the origins of these beliefs. Clearly, a multitude of variables could potentially influence the beliefs people hold: age, gender, ethnicity, socio-economic status, education, nationality, religious affiliation, personality (see Briñol & Petty, this volume), mood, emotion, general attitudes and values, intelligence, group membership, past experiences, exposure to information, social support, coping skills, and so forth. In our discussion of the MODE model earlier in this chapter, we noted that general attitudes toward objects can influence performance of a specific behavior by biasing perception of the behavior's likely consequences and hence affecting the attitude toward the behavior. In a similar fashion, such general attitudes may also sometimes be found to exert an effect on normative or control beliefs and thus again influence behavior indirectly by changing subjective norms or perceptions of behavioral control.

As was illustrated in Figure 3, a reasoned action approach recognizes the potential importance of various kinds of background factors. However, the dotted arrows in the diagram indicate that, although a given background factor may in fact influence behavioral, normative, or control beliefs, there is no necessary connection between background factors and beliefs. Whether a given belief is or is not affected by a particular background factors is an empirical question. In light of the vast number of potentially relevant background factors, it is difficult to

know which should be considered without a theory to guide selection in the behavioral domain of interest. Theories of this kind are not part of a reasoned action approach but can complement this approach by identifying relevant background factors and thereby deepen our understanding of a behavior's determinants (see Petraitis et al., 1995).

This discussion implies that background factors influence intentions and behavior indirectly by their effects on behavioral, normative, or control beliefs and, through these beliefs, on attitudes, subjective norms, or perceptions of control. Many studies have obtained patterns of results consistent with this expectation. Although investigators occasionally report significant direct effects of certain background factors after controlling for the reasoned action variables, for the most part the influence of background factors can be traced to their impact on the proximal determinants of intentions. For example, based on self-determination theory (Deci & Ryan, 1985), Hagger, Chatzisarantis, and Biddle (2002b) examined the effects of controlling (i.e., extrinsic) versus autonomous (i.e., intrinsic) motives on adolescents' intentions to engage in physical activity. When considered simultaneously, only the autonomous motive was found to be significantly related to intention. More importantly, consistent with expectation, the effect of the autonomous motive on intentions was completely mediated by its impacts on attitudes and perceived behavioral control. In another study (Conner & Flesch, 2001), it was found that compared to women, men had significantly stronger intentions to have casual sex, but after controlling for the predictors in the theory of planned behavior, the effect of gender was no longer significant. In an investigation of adolescents' intentions to use marijuana (Fishbein et al., 2002), a number of background factors were assessed, including time spent with friends who tend to get into trouble, sensation seeking, and parental supervision. As might be expected,

intentions to smoke marijuana increased with the amount of time spent in the company of friends who tend to get in trouble and with sensation seeking, and decreased with amount of parental supervision. Consistent with a reasoned action approach, however, the effects of these variables on intentions could be traced to their influence on one or more of the proximal determinants of intentions (i.e., attitudes, subjective norms, and perceived behavioral control). When these determinants were statistically controlled, the background factors no longer correlated significantly with intentions.

Issues Related to the Reasoned Action Approach

Perhaps because it provides a useful framework for understanding and predicting a wide variety of behaviors, the reasoned action approach has stimulated a great deal of interest and research. Many investigators (e.g., Eagly & Chaiken, 1993; Kiesler, 1981; Petraitis et al., 1995) have noted that the theories of reasoned action and planned behavior have produced very encouraging results, providing “the most complete informational analysis of attitudes and, of equal importance ... a coherent and highly useful model of the relationships among beliefs, attitudes, and behaviors” (Petty & Cacioppo, 1981, p. 204).

Questions Regarding the Causal Model and Its Major Concepts

Causality. Despite or perhaps because of its success, investigators have raised a number of important conceptual as well as empirical concerns (see Eagly & Chaiken, 1993 for a discussion). One general issue has to do with the validity of the assumed causal chain that links beliefs to behavior. Most research on the theories of reasoned action and planned behavior, whether cross-sectional or prospective, is correlational in nature and does not provide direct evidence for causal effects. Evidence regarding causality is, however, available in several recent

theory-based behavior change interventions (e.g., Bamberg & Schmidt, 2003; Brubaker & Fowler, 1990; Fishbein, Hennessy, et al., 2001; Fishbein, Ajzen, & McArdle, 1980; Jemmott, Jemmott, Fong, & McCaffree, 1999; Sanderson & Jemmott, 1996; van Ryn & Vinokur, 1992). For recent meta-analyses of interventions based on the reasoned action approach, see Steinmetz, Knappstein, Ajzen, Schmidt, and Kabst (2016) and Sheeran and colleagues (2016).

In most interventions of this kind, information relevant to one or more of the theory's predictors is provided, and its effect on behavior is traced through the theoretical antecedents. For example, Brubaker and Fowler (1990) exposed male college students to a theory-based tape-recorded message designed to encourage testicular self-examination (TSE) and compared the effects of this intervention to an information only condition and a no-intervention control group. As expected, the theory-based intervention produced significantly higher rates of TSE than either of the other two conditions. A structural equation analysis showed that, consistent with the assumption of a causal chain of effects, the intervention significantly affected beliefs, which in turn influenced attitudes toward TSE, subjective norms, and perceived behavioral control. Changes in these determinants led to changes in intentions and finally to a significant increase in the proportion of participants who performed TSE.

Meaningfulness of attitude toward a behavior. Some investigators have been uneasy about the shift in focus from broad behavioral dispositions to attitudes toward a behavior. As we noted in our discussion of the attitude-behavior relation, early work was centered on general attitudes toward institutions, policies, ethnic groups, and so on. We saw that such broad attitudes correlate well with equally broad, aggregated measures of behavior but, unfortunately, they tend to be rather poor predictors of specific behaviors. It is for this reason that in the context of

reasoned action models, attention turned to behavior-focused attitudes that are compatible with the behavioral criterion in terms of target, action, context, and time elements. Some investigators bemoan this move, fearing that attitudes toward a behavior are too specific to have much psychological significance.

This concern reflects, in large part, a misunderstanding of the principle of compatibility. This principle is sometimes mistakenly interpreted to mean that accurate prediction requires extremely specific behavioral criteria in terms of target, action, context, and time elements, and that the measure of attitude must be equally specific. In reality, the principle of compatibility merely stipulates that predictors and behavioral criteria must be defined at the same level of generality or specificity. The investigator's operationalization of the behavioral criterion determines how specific or general the measure of attitude must be. Thus, an investigator studying energy conservation should construct an aggregate index of this type of behavior as the criterion and then assess attitudes toward the general construct of energy conservation. However, if the behavioral criterion is operationalized as recycling paper every week, then the compatible attitude would be the more specific attitude toward this behavior, that is, attitude toward recycling paper every week. It is up to the investigator to decide at what level of generality or specificity to operate.

The nature of attitude, subjective norm, and perceived behavioral control. Issues have also been raised with respect to the structure of the theory's three major determinants of intentions: attitude, subjective norm, and perceived behavioral control. It is now generally recognized that attitude toward a behavior contains instrumental (e.g., *desirable - undesirable, valuable - worthless*) as well as experiential (e.g., *pleasant - unpleasant, interesting - boring*)

aspects (Ajzen & Driver, 1992; Crites, Fabrigar, & Petty, 1994), and that attitude measures should contain items representing these two sub-components. Similarly, investigators have distinguished between two types of norms: injunctive (i.e., perceptions of what others think one should do) and descriptive or behavioral (i.e, perceptions of what others are doing - Cialdini, 2003; Heath & Gifford, 2002; Kashima & Gallois, 1993). Items designed to tap both types of norms are needed in order to obtain a complete measure of subjective norm.

More controversial is the nature and measurement of perceived behavioral control. Here too, there appear to be two identifiable factors. Items concerned with the ease or difficulty of performing a behavior, or confidence in one's ability to perform it, tend to load on one factor whereas items that address control over the behavior, or the extent to which its performance is up to the actor, load on the other (e.g., Armitage & Conner, 1999; Manstead & van Eekelen, 1998; Terry & O'Leary, 1995). Some investigators concluded that the first factor reflects beliefs about internal control issues while the second deals with external control issues. However, there is no reason to assume that an item asking whether performance of a behavior is difficult (first factor) refers to internal control, nor that an item asking whether you feel in complete control over performing the behavior (second factor) refers to external control.

A second, parallel interpretation is sometimes given to the two control factors in which the first factor is said to represent self-efficacy beliefs and the second control beliefs (Armitage, Conner, Loach, & Willetts, 1999; Manstead & van Eekelen, 1998). This interpretation, too, is problematic. The proposed inclusion of items assessing ease or difficulty as indicators of self-efficacy is inconsistent with Bandura's (1997) conceptualization of this construct. According to Bandura, "... highly self-efficacious individuals may view certain undertakings as inherently

difficult but believe firmly that they can succeed through ingenuity and perseverant effort” (p. 127).

Although the nature of the two empirically identified factors remains unclear, items representing the two control factors are found to be correlated, and measures that combine both types of items often reveal high internal consistency (Sparks, Guthrie, & Shepherd, 1997; see Ajzen, 2002, for a review). Thus, similar to the measurement of attitudes and subjective norms, a comprehensive measure of perceived control is obtained by including items representing both factors.¹²

The Question of Sufficiency

The concerns discussed thus far have dealt with issues related to the causal structure of the theories of reasoned action and planned behavior, and to the nature of the constructs comprising these theories. We now turn to the argument that these constructs may not be sufficient to fully explain people’s intentions and actions (cf. Conner & Armitage, 1998). Indeed, one of the most frequently addressed questions in tests of these theories is the prospect of increasing the amount of explained variance in intentions or behavior by adding one or more predictors.

In many studies, investigators have considered background factors such as demographic variables or personality traits in addition to the predictors in the theories of reasoned action and planned behavior. We noted earlier that factors of this kind can further our understanding of the behavior by providing insight into the origins of underlying beliefs, but their effects on intentions and behavior tend to be indirect. Indeed, even when a background factor is found to explain additional variance in intentions or behavior, the amount of variance accounted for is usually

very small, and rarely have investigators proposed that personality or demographic variables be considered proximal determinants of intentions and actions.

A number of other variables, however, have been proposed as additions to the theory's basic predictors. Like the basic components of the theory, the proposed additions are defined at a level compatible with the behavior under investigation. In earlier treatments of the theories of reasoned action and planned behavior (Ajzen, 1991; Ajzen & Fishbein, 1980), this possibility was explicitly left open. In fact, the theory of planned behavior was developed in this fashion by adding perceived behavioral control to the original theory of reasoned action.

Some of the proposed additional predictors essentially focus on one aspect of a component already contained in the theory. For example, several investigators (Corby, Jamner, & Wolitski, 1996; Jamner, Wolitski, Corby, & Fishbein, 1998; Nucifora, Kashima, & Gallois, 1993) interested in HIV prevention have assigned a special role to the normative expectations of one's partner (partner norm), separate from other normative beliefs or measures of subjective norm. In other areas of research, investigators have isolated anticipated regret, independent of other outcome expectancies (Parker, Manstead, & Stradling, 1995; Richard, de Vries, & van der Pligt, 1998; Richard, van der Pligt, & de Vries, 1996; Sheeran & Orbell, 1999a). And in his model of interpersonal relations, Triandis (1977; see also Richard, van der Pligt, & de Vries, 1995) included expected emotional responses or affect in his attempt to predict behavioral intention. Like anticipated regret these anticipated emotions can be considered a subset of behavioral beliefs (Bandura, 1977; Conner, Black, & Stratton, 1998).

While, with respect to normative considerations, some theorists have focused on partner norms, others have proposed to add the concept of moral norm (e.g., Beck & Ajzen, 1991;

Gorsuch & Ortberg, 1983; Harrison, 1995; Manstead, 2000; Warburton & Terry, 2000; Zuckerman & Reis, 1978), and again, doing so tends to increase the proportion of explained variance. Note, however, that partner norms as well as moral norms are applicable only to certain classes of behavior, that is, to behaviors that involve a partner in the case of partner norms and behaviors that have a moral component in the case of moral norms. Indeed, to the best of our knowledge, partner norms have been given the status of a separate component only in STD/HIV research, and most of the studies that have shown a residual effect for moral norm have dealt with behaviors that have a clear moral dimension: shoplifting, cheating, and lying (Beck & Ajzen, 1991); returning an erroneous tax refund to the IRS or, for seminary students, to take a job that requires working on Sundays (Gorsuch & Ortberg, 1983); volunteering to work in a homeless shelter (Harrison, 1995) or to provide other community services (Warburton & Terry, 2000); and donating blood (Zuckerman & Reis, 1978).

Other proposed additions to the theories of reasoned action and planned behavior can perhaps best be viewed as alternative measures of existing constructs. Closely related to intentions are measures designed to capture such constructs as behavioral expectations (Warshaw & Davis, 1985), willingness to perform a behavior (Gibbons et al., 1998), personal norm with respect to the behavior (Bamberg & Schmidt, 2003; Parker et al., 1995; Vermette & Godin, 1996), and identification with the behavior or? self-identity (e.g., Armitage & Conner, 1999; Conner, Warren, Close, & Sparks, 1999; Fekadu & Kraft, 2001; Sparks & Guthrie, 1998). Measures of these constructs tend to correlate highly with behavioral intention, and consequently they are found to account for little additional variance in the prediction of behavior. For example, it has been hypothesized that behavioral expectations are better predictors of behavior

than are behavioral intentions because the former are more likely to take into account possible impediments to performance of the behavior (Sheppard et al., 1988; Warshaw & Davis, 1985). In this research, such items as “I intend to ...,” “I will try to ...,” and “I plan to...” have been used to assess intentions while such items as “I expect to...” and “I will...” to assess behavioral expectations (Warshaw & Davis, 1985). Different meta-analyses have failed to provide support for the superiority of behavioral expectation measures over measures of behavioral intention. In studies concerned with the prediction of condom use, Sheeran and Orbell (1998) found no difference in the mean amount of variance accounted for by behavioral expectation (18%) and by behavioral intention (19%). A meta-analysis of a much broader set of behaviors (Armitage & Conner, 2001) also found no difference in the predictive validity of expectations and intentions, and adding a measure of behavioral expectation failed to improve prediction of behavior.

In short, it is possible to consider the addition of various behavior-specific constructs to the theories of reasoned action and planned behavior. Often, these additions are found to slightly improve the prediction of intentions over and above the level obtained by considering attitude, subjective norm, and perceived behavioral control; and in some cases, the proposed additions explain variance in behavior beyond intention and perception of control. However, it is worth noting that, for the sake of parsimony, additional predictors should be proposed and added to the theory with caution, and only after careful deliberation and empirical exploration.

Past Behavior and Habit

One other issue related to the question of sufficiency is worth discussing. It is well known that past behavior can be a good predictor of later action. Of greater importance, the relation between prior and later behavior is often not fully mediated by the predictors in the

theories of reasoned action or planned behavior (Ajzen, 1991; Albarracín et al., 2001; Bagozzi, 1981; Bentler & Speckart, 1979; Fredricks & Dossett, 1983; for reviews, see Conner & Armitage, 1998; Ouellette & Wood, 1998). For example, in a study of exercise behavior (P. Norman & Smith, 1995) undergraduate college students completed a theory of planned behavior questionnaire on two occasions, six months apart. Without past exercise, the theory of planned behavior variables accounted for 41% of the variance in later exercise behavior. Adding past exercise behavior to the prediction equation raised the proportion of explained variance to 54%, a highly significant increase.

Based on findings of this kind, some investigators have suggested that past behavior be added to the theories of reasoned action and planned behavior. It should be clear, however, that past behavior does not have the same status as the other predictors. Unlike attitude, subjective norm, perceived behavioral control, and intention, frequency of past behavior cannot be used to explain performance of later action. To argue that we behave the way we do now because we performed the behavior in the past begs the question as to why we previously behaved that way. In fact, investigators who have proposed the addition of past behavior have usually done so under the assumption that the frequency with which a behavior has been performed in the past can be used as an indicator of habit strength. With repeated performance, behavior is said to habituate, and it is habit strength—rather than past performance frequency as such—that is assumed to influence later action (see Aarts, Verplanken, & Knippenberg, 1998; Ouellette & Wood, 1998; Triandis, 1977). Specifically, with repeated performance, behavior is assumed to come under the control of stimulus cues, bypassing intentions and perceptions of behavioral control.

There are, however, serious problems with this analysis of the role of habit in the context of reasoned action models (see Ajzen, 2002b for a discussion). First, the fact that a behavior has been performed many times is no guarantee that it has habituated. To substantiate this claim, we would need an independent measure of habit strength (Eagly & Chaiken, 1993, p. 181). Research has been conducted to develop valid measures of habit strength that are independent of past performance frequency (see Verplanken & Orbell, 2003). Second, even if habituation occurred, we could not be sure how habit strength is related to the frequency of past performance because low frequency of past performance, just as high frequency, may also be an indication of a strong habit. For example, consistent failure to wear a seatbelt may be indicative of a strong habitual pattern of behavior, not of the absence of habit (cf. Mittal, 1988).

At least two reasons may be suggested for the unmediated, residual impact of past on later behavior in the context of reasoned action models (see Ajzen, 2002b). The first is methodological, having to do with our measures of intention and behavior. Whereas past and later behavior are typically assessed in terms of frequency of performance over some period of time, measures of intention usually rely on expressions of perceived performance likelihood or subjective strength of the intention. There is thus greater scale compatibility between measures of past and later behavior than between measures of intention and behavior (Courneya & McAuley, 1993). The greater shared method variance between measures of past and later behavior may be at least in part responsible for the residual effect of past behavior.

Some evidence for this argument can be found in a study on the prediction of physical activity conducted in the framework of the theory of planned behavior (Courneya & McAuley, 1994). In this study, participants reported the number of times they had engaged in physical

activity in the past four weeks, and did so again four weeks later. At the first interview, they also indicated their intentions to engage in physical activity during the next four weeks. These intentions were assessed on a likelihood scale (7-point *extremely unlikely* - *extremely likely*) and on a numerical scale (the number of times respondents intended to exercise in the next four weeks). Clearly, the numerical scale was more compatible with the measure of behavior than was the likelihood scale. Consistent with expectations, the numerical intention scale correlated more highly with later behavior ($r = .60$) than did the likelihood scale ($r = .44$). More importantly, in a mediational analysis, the strong correlation between prior and later behavior ($r = .62$) was reduced only slightly (to $.55$) when the likelihood measure was held constant, but much more so and significantly (to $.34$) when the numerical measure was held constant.

Beyond scale compatibility, the residual effect of past on later behavior may also be due to the possibility that intentions undergo change as people try to implement an intended action. When people encounter unanticipated consequences or difficulties, they may revert to their original pattern of behavior, thus lending predictive validity to prior behavior (see Ajzen, 2002b for a discussion). Consider, for example, a person who has not exercised regularly in the past but forms the intention to do so in the future. Initial attempts to carry out the intention may reveal this behavior to be more difficult or less beneficial than anticipated. As a result, the person may abandon the plan, no longer intending to exercise. The measured intention would fail to predict the person's actual behavior but a measure of prior behavior would afford accurate prediction. If a sufficient number of participants in a study changed their intentions in this manner, the relation between past and later behavior would not be fully mediated by the original intention.

The Assumption That Action is Reasoned

The issues and concerns discussed thus far had to do with some of the details of a reasoned action approach: the nature of the theory's predictors and the question of their sufficiency. Some investigators, however, have challenged this approach more broadly, questioning the basic assumption that human behavior can be described as reasoned. According to this critique, the theories of reasoned action and planned behavior are too rational, failing to take into account emotions, compulsions, and other non-cognitive or irrational determinants of human behavior (e.g., Armitage, Conner, & Norman, 1999; Gibbons et al., 1998; Ingham, 1994; Morojele & Stephenson, 1994; van der Pligt & De Vries, 1998).

It is true that much of the research conducted in the framework of the theories of reasoned action and planned behavior has devoted little attention to the role of emotion in the prediction of intentions and actions. This is not to say, however, that emotions have no place in theories of this kind. On the contrary, within these theories emotions can have a strong impact on intentions and behaviors, but like other background factors, this influence is assumed to be indirect. It is well known that general moods and emotions can have systematic effects on beliefs and evaluations: People in a positive mood tend to evaluate events more favorably and to judge favorable events as more likely than people in a negative mood (e.g., Forgas, Bower, & Krantz, 1984; E. J. Johnson & Tversky, 1983; Schaller & Cialdini, 1990, see also Clore & Schnall, this volume). In a reasoned action approach, such effects would be expected to influence attitudes and intentions and thus to have an impact on behavior.

The presence of strong emotions may also help explain why people sometimes seem to act irrationally in the sense that they fail to carry out an intended behavior that is in their best interest. For example, people may realize the benefits of staying calm in the face of provocation

yet, in the “heat of a confrontation,” lash out verbally or physically. To understand how emotions may help account for such apparently irrational behavior, it is important to make a distinction between contemplating performance of a behavior (e.g., when filling out a theory of planned behavior questionnaire) and its actual performance in a real-life context. For one, the beliefs that are activated while filling out a questionnaire may differ from the beliefs that are accessible during behavioral performance (Ajzen & Sexton, 1999; Gold, 1993). As a result, the attitudes and intentions that are assessed by the questionnaire may turn out to be poor representations of the attitudes and intentions that exist in the behavioral situation and thus to be poor predictors of actual behavior. More serious still, when filling out a questionnaire people may find it virtually impossible to correctly anticipate the strong drives and emotions that may compel their behavior in real life. Thus, new Army recruits may believe that they will be able to perform well under fire, and intend to go fearlessly into battle, but their actual conduct may differ greatly from this imagined scenario when bombs begin to explode. It is for this reason that the military conducts training exercises with live ammunition. If sufficiently true to life, such exercises will not only help soldiers adapt to battlefield conditions, but also lead to the formation of more realistic behavioral expectations.

The potential discrepancy between responses provided on a questionnaire and responses in a behavioral context can be viewed as largely a question of proper measurement. If, when filling out a questionnaire about behavioral performance, respondents could be induced to be realistic in their expectations, the beliefs, attitudes, and intentions assessed should permit prediction of actual behavior in the performance context (Millar & Tesser, 1986; Shavitt & Fazio, 1991). The effectiveness of asking participants to form implementation intentions

(Gollwitzer, 1999) or to engage in process simulation (Taylor & Pham, 1998) may be due in part to increased realism.

Not all intention-behavior discrepancies, however, can be eliminated. Even though we may be able to anticipate some of the strong forces that are likely to influence our behavior in a real-life context, there is sometimes little we can do about it. For example, it has been argued that a reasoned action approach cannot account for people's frequent failure to use condoms with casual partners. Confronted with a decision to engage or not to engage in sexual intercourse when a condom is unavailable, individuals may "in the heat of passion" be unable to resist the impulse despite their ability to anticipate this eventuality and their intentions to the contrary expressed on a questionnaire. While there is undoubtedly some truth to this argument, the empirical evidence is actually quite supportive of a reasoned action approach even in this case. For example, in a longitudinal study of condom use in such high-risk populations as drug users and commercial sex workers (von Haefen, Fishbein, Kasprzyk, & Montano, 2000), 72.5% of participants who intended to always use condoms with their casual partners (or clients) reported doing so. This compares to a 37.5% consistent condom use among participants who did not intend to always take this protective measure. With regard to condom use across diverse populations, a meta-analytic review of 96 data sets (Albarracín et al., 2001) found a respectable correlation of .45 between intended and actual behavior.

Another factor that can produce a discrepancy between measured intentions and actual behavior is the influence of alcohol or drugs. Whereas beliefs, attitudes, and intentions are generally assessed when participants are sober, such behaviors as driving or unprotected sex may be performed under the influence of alcohol or drugs. Indeed, alcohol consumption has been

shown to decrease the likelihood of condom use during casual sex (MacDonald, Zanna, & Fong, 1996), a finding interpreted as consistent with alcohol myopia (Steele & Josephs, 1990)—the tendency for alcohol intoxication to decrease cognitive capacity so that people are likely to attend only to the most salient situational cues. Interestingly, alcohol intoxication was also found to increase measured *intentions* to engage in unprotected sex (MacDonald et al., 1996; Scott-Sheldon et al., 2016) and measured *intentions* to drink and drive a short distance (MacDonald, Zanna, & Fong, 1995). Nevertheless, because we usually assess attitudes and intentions when respondents are sober, our measures may not permit very accurate prediction of behavior performed while intoxicated.

EXPLICIT VERSUS IMPLICIT ATTITUDES

Our review of the literature up to this point has shown that work on the attitude-behavior relation conducted over the past four decades has restored faith in the utility and predictive validity of the attitude construct. However, in recent years a renewed challenge to the postulated relation between attitudes and behavior can be discerned, particularly in the domain of prejudice and discrimination (Fiske, 1998). Work in this field has led investigators to argue that expressions of stereotypical beliefs and prejudicial attitudes have declined markedly over the past decades (e.g., Dovidio, 2001; Schuman, Steeh, Bobo, & Krysan, 1997), yet discrimination against historically disadvantaged racial and ethnic groups continues to be evident in employment, education, housing, healthcare, and criminal justice (e.g., Bushway & Piehl, 2001; Crosby, Bromley, & Saxe, 1980; Daniels, 2001; Hacker, 1995; Landrine, Klonoff, & Alcaraz, 1997; Myers & Chan, 1995; see also Gawronski & Brannon, this volume; Krosnick, Judd, & Wittenbrink, this volume).¹³

Although widely accepted, evidence for the disparity between a decline in broad societal patterns of prejudicial attitudes accompanied by continued discriminatory behaviors is indirect and mostly circumstantial. To the best of our knowledge, only one study (Dovidio & Gaertner, 2000) has examined this issue directly. In this study, conducted at a Northeastern liberal arts college, prejudicial attitudes toward African Americans were found to decline slightly, but significantly, from the 1988-1989 to the 1998-1999 academic year. In contrast, hiring recommendations regarding black and white job candidates with ambiguous qualifications favored the white candidate over the black candidate to the same extent in both time periods. Note, however, that it is impossible to assess changes in overall discrimination by examining a single judgmental bias. Had the investigators selected a different indicator of discrimination, perhaps voting to elect a black versus white candidate to student office, the results might have been very different.¹⁴ To make a convincing case that, over the years, prejudice has declined more than discrimination, we would have to construct broad measures of these constructs, standardize them, and observe changes in average values over time. If we did this, we might find that discriminatory behavior has declined just as much—or perhaps even more—than expressed prejudice.

Despite the lack of firm empirical support, many investigators accept the proposition that prejudice has declined much more than discrimination. As in the 1950s, the immediate reaction to the apparent inconsistency between racial attitudes and behavior was to question the validity of our attitude measures (e.g., Crosby et al., 1980; McConahay, Hardee, & Batts, 1981): Because of self-presentational concerns, people were presumably reluctant to express their true (negative) feelings. There was also an assumption, however, that the nature of racial prejudice

had changed to become more subtle and nuanced, milder than the blatant racism of the past (McConahay, 1986). Also, prejudice might be expressed indirectly and symbolically, for example as opposition to preferential treatment for minorities (Sears, 1988). Other theorists proposed that racial attitudes had become ambivalent or aversive, containing explicit egalitarian elements as well as more subtle and unacknowledged negative beliefs and feelings (Gaertner & Dovidio, 1986).

This revised view of the nature of contemporary prejudice provided a ready explanation for the apparent gap between low professed prejudice and high levels of discrimination. The high levels of discrimination suggested that prejudice was still very much present but that because it had become very subtle, standard attitude scales—which measure *explicit* stereotypes and prejudice—were incapable of capturing these *implicit* dispositions. The contrast between implicit and explicit levels of prejudice plays an important role in Devine's (1989; Devine, Monteith, Zuwerink, & Elliot, 1991) dissociation model. According to this model, prejudiced and non-prejudiced individuals are equally familiar with prevailing cultural stereotypes, and these implicit stereotypes are activated automatically in the actual or symbolic presence of stereotyped group members. Non-prejudiced individuals are assumed to differ from prejudiced individuals in their explicit rejection of the cultural stereotypes and their greater motivation to inhibit the influence of automatically activated stereotypes on judgments, feelings, and actions. A similar line of reasoning underlies application of the MODE model to the relation between prejudice and discrimination (Fazio & Dunton, 1997; Fazio & Towles-Schwen, 1999). Whereas in Devine's dissociation model what is automatically activated are culturally shared stereotypes, in the MODE model the individual's own stereotype is automatically activated. As in Devine's

model, however, whether or not this implicit stereotype affects judgments and behavior depends on the individual's motivation to control seemingly prejudiced reactions (Dunton & Fazio, 1997; see also Devine & Monteith, 1999).

These models of prejudice are consistent with the proposition that people can hold two attitudes at the same time, one implicit and often unrecognized, the other explicit and under conscious control (Wilson, Lindsey, & Schooler, 2000). The implicit attitude is assumed to be automatically activated whereas activation of the explicit attitude is said to require cognitive effort. Prejudicial attitudes, according to this view, may be held implicitly and be activated automatically but, given sufficient motivation and cognitive resources, the more favorable, egalitarian attitude may be retrieved and override the effect of the implicit prejudicial attitude.

The concern with implicit attitudes in research on prejudice and discrimination is consistent with other theorizing on attitudes and social cognition that emphasizes automatic, unconscious processes assumed to function in parallel with, or in place of, deliberative action (e.g., Bargh, 1989; Bargh & Chartrand, 1999; Fazio, 1990b; Greenwald & Banaji, 1995; Langer, 1978; Wegner & Wheatley, 1999). Research on subtle aspects of prejudice received a further boost with the development of new measurement techniques that rely on reaction times to probe for implicit attitudes, most notably the implicit association test (Greenwald, McGhee, & Schwartz, 1998) and evaluative priming (Dovidio, Evans, & Tyler, 1986; Fazio, Jackson, Dunton, & Williams, 1995; see Fazio & Olson, 2003 for a review). It now became possible to compare implicit and explicit attitude measures and to examine their ability to predict actual behavior (see Gawronski & Brannon, this volume, for a review).

Although contemporary models of stereotyping and prejudice differ in detail, they agree in their overall expectations regarding the predictive validity of explicit and implicit attitude measures. Generally speaking, implicit attitudes—being automatically activated—are assumed to guide behavior by default unless they are overridden by controlled processes. Because prejudicial attitudes and behavior with respect to racial and ethnic minorities are usually discouraged in contemporary American society, many people try to inhibit their expression. It follows that implicit prejudicial attitudes should predict primarily behaviors that are not consciously monitored or that are difficult to control (e.g., facial expressions, eye contact, blushing, and other nonverbal behaviors), as well as behaviors that people do not view as indicative of prejudice and thus are not motivated to control. In contrast, behaviors that are under volitional control and whose implications for prejudice are apparent should be better predicted from explicit than from implicit measures of prejudice (see Dovidio, Brigham, Johnson, & Gaertner, 1996).

Thus far, only a small number of studies have directly tested these hypotheses, but the results have been generally consistent with predictions (see Fazio & Olson, 2003 for a review). First, as would be expected if we are dealing with two relatively independent attitudes, several studies have reported low or at best modest correlations between explicit and implicit measures of prejudice (e.g., Cunningham, Preacher, & Banaji, 2001; Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997; Fazio et al., 1995; Greenwald et al., 1998; Karpinski & Hilton, 2001; Wittenbrink, Judd, & Park, 1997). Second, and more important, implicit measures of prejudice have been found superior to explicit measures for the prediction of such nonverbal behaviors as blinking and eye contact (Dovidio et al., 1997), the number of times whites handed a pen to a

black person as opposed to placing it on the table (Wilson et al., 2000), as well as the friendliness of white participants in their interactions with a black person, judged by the black person on the basis of the white person's nonverbal behavior (smiling, eye contact, spatial distance, and body language) (Fazio et al., 1995). A similar effect was obtained in a study dealing with behavior whose implications for prejudice was ambiguous (Sekaquaptewa, Espinoza, Thompson, Vargas, & von Hippel, 2003). The critical behavior in this study was white males' choice of stereotype-consistent or inconsistent questions in a mock job interview with a black female applicant. In this situation, an implicit measure of prejudice toward African Americans predicted choice of stereotype-consistent questions better than did an explicit measure. Note, however, that implicit attitude measures tend to have relatively low correlations even with nonverbal behaviors that are not consciously monitored; for the studies reviewed here, the correlations between implicit attitudes and nonverbal behaviors ranged from .25 to .48. This should not come as a surprise, of course, given the lack of compatibility between the general measures of prejudice and the specific behavioral criteria employed in these studies

Support for the superiority of explicit over implicit measures in the prediction of well-controlled behaviors is less persuasive in that most studies have dealt with judgments rather than actual behaviors. Still, the results are consistent with expectations. Thus, it has been found that, in comparison to implicit measures of prejudice, explicit measures are better predictors of judgments concerning the verdict in the Rodney King trial involving police brutality and attractiveness ratings of facial photographs of black and white individuals (Fazio et al., 1995), as well as ratings of the guilt of African American defendants in a simulated jury trial (Dovidio et al., 1997). In a domain unrelated to prejudice, a behavior under clear volitional control (choice

of candy bar versus apple) was predicted from explicit but not from implicit measures of attitude toward these products (Karpinski & Hilton, 2001). The correlations between explicit attitudes and judgments or behavior in these studies were modest, ranging from .24 to .54, a finding that may again be attributable to low compatibility between the measures of attitude and behavior.

Since the publication of the first handbook, implicit attitudes have continued to attract attention. In particular, a meta-analysis of the association between implicit attitudes and behavior revealed an average correlation r of .15 or .12 for racial and intergroup attitudes (Oswald, Mitchell, Blanton, Jaccard, & Tetlock, 2013). Although earlier estimates of these associations were moderately higher (r s = .24 and .20 for racial and intergroup attitudes; Greenwald et al., 2009), the recent low correlations suggest a very small impact on behavior, at least with the current measurement instruments (Oswald et al., 2013; see also Greenwald, Banaji, & Nosek, 2015). For discussions of other implicit measures, see Cameron, Brown-Ianuzzi, and Payne (2012), Galdi and colleagues (2012), and Meissner and Rothermund (2013).

The compatibility principle has been the key to resolving debates about dissociations between implicit and explicit attitudes. Payne and his colleagues (Payne, Burkley, & Stokes, 2008) observed a dramatic mismatch between the use of a Likert scale or a feeling thermometer as a measure of explicit attitudes and an IAT or evaluative priming task as a measure of implicit attitudes. Low correlations between implicit and explicit measures may originate from a number of factors, including the fact that explicit measures are verbal and noncomparative and implicit ones are pictorial and comparative. In addition, the use of different instructional sets (hit a computer key when a photo appears vs. rate how warm you feel towards this social group) may introduce random sources of error that are later interpreted as dissociations (low correlations).

Payne and colleagues designed the Affect Misattribution Paradigm (AMP) to reduce this lack of measurement compatibility and produce better estimates of correlations between implicit and explicit attitudes. In this task, participants are presented with a Chinese ideogram and either black or white faces. In the explicit measure of racial attitudes (direct AMP), participants are asked to rate the person, whereas in the implicit measure (indirect AMP), participants are asked to rate the ideogram. As is generally found, the indirect AMP had low correlations with explicit measures of attitudes, namely the attitude towards blacks and modern racism measures ($r_s = .25$ and $.24$). In contrast, the indirect AMP correlated $.64$ with the direct AMP, supporting the idea that low compatibility is a source of the apparent implicit/explicit dissociation (Payne et al., 2008; Study 1). Further, carefully manipulated forms of compatibility aligned well with the size of the implicit-explicit correlations. Explicit measures using pictures correlated more highly with a picture AMP than did a verbal thermometer measure (Payne et al., 2008; Study 2).

Correspondingly, a verbal thermometer measure correlated more highly with a verbal (group label) AMP than did a pictorial explicit measure. In fact, the correlation between structural fit and the correlation between implicit and explicit attitudes was $r = .90$ (Payne et al., 2008; Study 2).

Implicit Attitudes and the Prediction of Behavior: Conclusions

Research on implicit attitudes was initially stimulated in part by an apparent discrepancy between declining levels of expressed prejudice and continuing patterns of discrimination against racial, ethnic, and other historically disadvantaged groups. Two major findings support the idea that people may express unprejudiced attitudes yet, at an implicit level, continue to harbor negative feeling toward these groups. First, measures of explicit and implicit attitudes are found

to correlate weakly with each other and, second, implicit attitudes tend to predict subtle expressions of prejudice, such as nonverbal behaviors, better than explicit attitudes. It has been suggested that, in interracial contexts, such nonverbal behaviors as nervousness, tone of voice, facial expressions, and seating distance are indicative of affective reactions to the interaction partners (Butler & Geis, 1990; Dovidio et al., 1996; Weitz, 1972; Word, Zanna, & Cooper, 1974). If implicit measures of prejudice can be assumed to reflect the degree of discomfort people experience in relation to African Americans, gay people, or other minority groups, this would explain their ability to predict nonverbal behaviors better than explicit measures.

Although interesting and suggestive, findings regarding implicit attitudes must be interpreted with caution. In contrast to the failure of earlier disguised measures, such as physiological responses or projective tests, many investigators assume that assessment techniques based on response times provide valid attitude measures that can overcome self-presentation biases and elicit a person's true underlying attitude. Although sequential evaluative priming and the implicit association test represent promising developments in the search for valid attitude assessment, the jury is still out on their ability to live up to their promise (for critiques, see Blanton et al., 2009; Blanton, Jaccard, Gonzales, & Christie, 2006; Oswald, Mitchell, Blanton, Jaccard, & Tetlock, 2015). Not unlike projective tests and some other indirect assessment techniques (cf. Kidder & Campbell, 1970), reaction time measures of attitude tend to suffer from relatively low reliability (Cunningham et al., 2001; Kawakami & Dovidio, 2001) and it is perhaps for this reason that tests of convergent validity have also been disappointing (Brauer, Wasel, & Niedenthal, 2000; Fazio & Olson, 2003). Only when corrections are made for their unreliability are different types of implicit measures shown to correlate with each other

(Cunningham et al., 2001). These findings are disconcerting from a pragmatic perspective because they suggest that implicit attitude measures can be expected to have only modest predictive validity even in relation to subtle behaviors over which people do not exercise conscious control. The limited research findings available thus far tend to bear out this pessimistic expectation.

META-ANALYSES

Across several decades, a multitude of researchers has drawn on the rich attitude-behavior literature to meta-analyze the correlation between attitudes and related behaviors. Targeting all behaviors or only specific domains, pre-established or newly formed attitudes, they overall found significant though highly heterogeneous effect sizes and have contributed to important theoretical discussions about moderators of the attitude-behavior relation (Table 1).

(Tables 1 and 2 about here)

Meta-analyses published in the 1990s found that the average attitude-behavior correlation was quite substantial – certainly large enough to counter Wicker’s (1969) fundamental doubts about the usefulness of attitudes as an explanatory construct. It should be noted however, that the studies reviewed by Wicker mostly used broad attitudes to predict specific actions toward the target of the attitude, whereas in more recent analyses, studies involving behavior-focused attitudes were also included. Kim and Hunter (1993) took special care to correct their estimates for attenuation due to unreliability and to artificial dichotomization and found a corrected effect size estimate of .79, whereas their original (uncorrected) effect size was .47. A second meta-analysis (Eckes & Six, 1994) included many more studies and found slightly smaller correlations, $r = .39$ uncorrected and $.49$ corrected for attenuation due to low reliability, but not

dichotomization. Kraus's (1995) unweighted estimate of the attitude-behavior relation was similar in size, r can .36. Two subsequent meta-analyses found similar effect sizes: Unweighted $r = .36$ in an analysis by Wallace and colleagues (2005) and $r = .51$ in an analysis by Glasman and Albarracín (2006). The latter was a review which included only attitudes towards new, unfamiliar attitude objects and behaviors. Overall, then, syntheses of research on the attitude-behavior relation have produced estimates that are quite sizable and provide confidence that attitudes can contribute to the explanation of behavior.

Other meta-analyses have focused on the attitude-behavior relation in specific substantive domains. One such analysis included only studies that used an IAT measure of attitudes, but also coded for traditional, explicit measures of attitudes (Oswald et al., 2013). Whether implicit or explicit, correlations of attitude with measures of overt behavior were low (implicit: $r = .14$, explicit: $r = .19$, ns.), particularly for microbehaviors (implicit: $r = .07$, ns., explicit: $r = .04$, ns.). Another topic-specific meta-analysis, this one on health behaviors (McEachan, Conner, Taylor, & Lawton, 2011), found a corrected correlation coefficient of .31, which is high compared to the results of the IAT meta-analysis, but rather low compared to the corrected effect size estimates of earlier, broader meta-analyses (Eckes & Six, 1994; Kim & Hunter, 1993). Divergent findings across areas of research can be due to various factors, both methodological (e.g., the measures that are traditionally used in one area may not meet the principle of compatibility as well as measures used in another area) and substantial (e.g., behavior in some domains may be guided more by social norms than by attitudes, see also Wallace et al., 2005).

Other reviews have addressed the question of how strongly implicit measures of attitudes correlate with behavior. Greenwald and colleagues (2009) presented a meta-analysis of IAT

relations to a wide range of criteria, including behaviors, judgments, and physiological measures (see criticisms of this outcome definition and a reanalysis in Carlsson & Agerström, 2016, in which the authors found only small effects comparable to those of Oswald et al., 2013, when using a more stringent definition of discriminatory behavior). Their analyses indicated that where traditional explicit attitude measures correlated .36 with these outcomes, the correlation for the IATs was .27. Another meta-analysis of implicit attitudes revealed similarly low correlations with behavior (Cameron et al., 2012). Cameron and colleagues synthesized a particular set of methods of computerized sequential priming tasks (e.g., AMP, evaluative priming, lexical decision tasks, Eriksen flanker, and shooter tasks) and averaged across both behavior and intention criteria. The correlation between implicit attitudes and the average of behavior and intentions was .28. Oswald and colleagues' (2013) meta-analysis aimed to be an extension of Greenwald and colleagues' meta-analysis and, as mentioned previously, found only small effects of both implicit ($r = .14$) and explicit attitude measures ($r = .19$) on behavioral outcomes in the domain of race and ethnicity. These low correlations again document the importance of compatibility between measures of attitude and behavior. Research in this domain typically involves broad attitude measures of prejudice whereas the discriminatory behaviors to be predicted are quite specific.

The meta-analyses reviewed above and many others also provide evidence for moderating variables and confirm the importance of moderators identified in primary research (see Table 2): personal relevance, attitude stability, level of certainty or confidence in one's attitude, direct experience with the attitude object, and degree of accessibility. All of these factors were found to influence the attitude-behavior relation in one or more meta-analyses (see

also Cooke & Sheeran, 2004, for a meta-analytic review of several theoretically posited moderators). On the methodological side, self-reported behaviors and behaviors that are assessed concurrently or after the fact with the attitudes are usually better predicted by attitudes than behaviors that are observed or measured with a delay (Albarracín, Fishbein, & Middlestadt, 1998; Albarracín et al., 2001, 2004). Finally, attitudes towards behaviors are better predictors of the corresponding behaviors than are attitudes towards objects, as would be predicted by the principle of compatibility.

DISCUSSION AND CONCLUSIONS

The field of social psychology has, over the years, witnessed marked shifts in the types of issues and problems addressed by investigators: conformity and group cohesion, prejudice and discrimination, communication and persuasion, causal attribution, group decision making, interpersonal attraction and intimate relationships, conflict resolution, cognitive consistency, judgmental biases and errors, and so forth. Throughout these changes the attitude construct has remained a central and vital element in theoretical as well as applied work, based in large measure on the assumption that attitudes can explain and predict social behavior in all of these domains. When empirical evidence concerning the attitude-behavior relation appeared to challenge this assumption, some investigators came to the defense of the attitude construct by questioning the validity of the instruments used to assess attitudes. Other investigators either resigned themselves to the conclusion that attitudes are poor predictors of behavior or suggested that their impact on behavior is moderated by situational factors, by personality traits, or by characteristics of the attitude itself.

The problem of low attitude-behavior correlations was resolved in part when it was

realized that, although general attitudes are poor predictors of single behaviors, they correlate strongly with multiple-act criteria or behavioral aggregates. In a parallel fashion, it was shown that single behaviors can be predicted quite well from compatible measures of attitude, that is, attitude toward the behavior. Investigators reacted in one of two ways to these developments. Perhaps influenced by Allport's (1935) argument that general attitudes exert "... a directive or dynamic influence upon the individual's response to all objects and situations with which it is related" (p. 820) one line of research examined the processes whereby general attitudes can influence or guide performance of a specific behavior. The most sophisticated account of these processes can be found in Fazio's (1986, 1990b; Fazio & Towles-Schwen, 1999) MODE model. This approach has been highly influential, directing attention to the roles of biased information processing, attitude accessibility, and spontaneous versus deliberative processing modes as important elements linking global attitudes to specific behaviors. We saw, however, that more work is required at a conceptual level to explain the effects of general attitudes on specific behaviors when motivation or ability to process information is low, and to test the moderating effect of attitude accessibility under these conditions.

A second line of research took the single, specific behavior as its starting point and tried to identify the determinants of such a behavior. This work has been guided in large part by a reasoned action approach, in particular the theories of reasoned action and planned behavior (Ajzen, 1991, 2012; Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). For investigators interested in predicting, understanding, and changing specific behaviors, this line of research has provided a useful conceptual framework and a workable methodology. It has directed attention to the roles of beliefs, attitudes, norms, perceived behavioral control, and intentions as important

antecedents of specific behaviors. We also noted, however, that a reasoned action approach has its limits. Lack of volitional control can prevent people from carrying out an intended behavior; inaccurate information can produce unrealistic beliefs, attitudes, and intentions; unanticipated events can lead to changes in intentions; and strong emotions in a behavioral context can activate beliefs and attitudes that were not anticipated while completing a questionnaire.

The principles of aggregation and compatibility, the work linking general attitudes to specific actions, and the reasoned action approach to the prediction of specific behaviors have advanced our understanding of the attitude-behavior relation and have demonstrated the importance of attitudes as determinants of behavior. Recently, however, investigators have reopened this issue by suggesting that there is a disparity in contemporary society between high levels of discriminatory behavior and low levels of explicit prejudice. Now as in the past, a major line of defense is to question the validity of our attitude measures. Contemporary investigators again assume that if we could only measure prejudicial attitudes free of social desirability bias and other self-presentational concerns, we would be able to predict discriminatory behavior. The added twist in current theorizing is the idea that people may not be aware of their true attitudes and may thus be unable to explicitly report them even if they wanted to.

Contemporary research on the effects of prejudice on behavior, like early work on the attitude-behavior relation, focuses on general attitudes, primarily on prejudice with respect to ethnic or racial groups, old people, gay men, etc. In contrast to research in most other behavioral domains, where investigators have found it useful to assess behavior-specific dispositions, in the area of discrimination researchers continue to concentrate almost exclusively on broad

prejudicial attitudes. It is not clear that a focus on general prejudice is the only or most fruitful approach to dealing with problems of discrimination. Instead, we might identify a few particularly problematic discriminatory behaviors, such as biases in hiring or access to health care, and assess dispositions relevant for the behaviors in question. Many investigators in other behavioral domains have employed a reasoned action approach to examine such behaviors as using condoms, getting a mammogram, voting, using illicit drugs, adhering to a medical regimen, and so forth. Taking this kind of approach does not preclude consideration of broad dispositions and their effects on the behavior of interest. An investigator studying discriminatory hiring decisions would first assess the proximal determinants of that decision, that is, beliefs, attitudes, subjective norms, perceived control, and intentions with respect to hiring members of a minority group. The investigator could then examine how general prejudice toward members of the group in question influences these proximal determinants of the discriminatory behavior. Prejudice thus is treated as a background factor that can influence hiring decisions indirectly.

To be sure, current research on prejudice and discrimination has produced interesting ideas concerning the nature of prejudicial attitudes, a distinction between implicit and explicit prejudice, as well as methods for the assessment of implicit attitudes. We have seen in this chapter that general attitudes can provide useful information to predict and explain broad patterns of discriminatory behavior. However, as in earlier research, investigators in this domain have tried to relate these general attitudes not to broad patterns of discrimination but rather to single behaviors or judgments in a particular context. Theory and research regarding the attitude-behavior relation suggest that such an approach is bound to produce disappointing results. Indeed, theorists have again had to invoke moderating variables, suggesting that the

effect of broad implicit attitudes on specific behaviors depends on the nature of the behavior (spontaneous or deliberative) and on such individual differences as motivation to control prejudiced reactions. It is only when the behavior is not consciously monitored or when motivation to control prejudiced reactions is relatively low that implicit attitudes are expected to predict behavior. It follows that for a wide range of behaviors, and for many individuals, broad implicit attitudes will lack predictive validity. Indeed, *implicit* measures of general attitudes are found to encounter the same problems as *explicit* measures when it comes to the prediction of specific behaviors. Our understanding of the attitude-behavior relation could perhaps be advanced if researchers used the advances made in social cognition to focus on such proximal determinants of specific actions as attitudes toward the behavior and behavioral intentions rather than on general attitudes toward an object.

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Table 1
A Selection of Meta-Analyses of the Attitude-Behavior Relation.

Study	Short description	<i>k</i>	<i>N</i>	Effect size type	Effect size	Measure of variance	Corrected effect size	Measure of variance
Kim & Hunter (1993)	Various domains	138	90,808	<i>r</i>	.47	<i>SD</i> = .14	.79	
Eckes & Six (1994)	Various domains	396	156,598	<i>r</i>	.39	<i>SE</i> = .04	.49	
Kraus (1995)	Various domains	88	22,106	Unweighted <i>r</i>	.38	<i>SD</i> = .21		
Wallace, Paulson, Lord, & Bond (2005)	Various domains; Behavioral outcome variables only	466	—	Unweighted <i>r</i>	.36			
Glasman & Albarracín (2006)	Newly formed attitudes (towards unfamiliar attitude objects) and behaviors	128	4,598	<i>r</i>	.51	[.48, .54]		
Greenwald, Poehlmann, Uhlmann, & Banaji (2009)	IATs about attitudes, belief, self-concept, or self-esteem, correlated with explicit outcome measures (including, but not limited to, observed behavior)	184	14,900	<i>r</i>	.27	[.25, .30]		
	Explicit attitude, belief, self-concept, or self-esteem measures, correlated with explicit outcome measures (including, but not limited to, observed behavior)	156	13,068	<i>r</i>	.36	[.31, .42]		
McEachan, Conner, Taylor, and Lawton (2011)	Various health behaviors	209	—	<i>r</i>	—	—	.31	<i>SD</i> = .16
Cameron, Brown-Iannuzzi, & Payne (2012)	Sequential priming tasks, correlated with behavior or intentions	86	—	<i>r</i>	.28			
Oswald, Mitchell, Blanton, Jaccard, & Tetlock (2013)	Interracial/-ethnic IATs (includes both attitude IATs, which measure evaluative associations, and stereotype IATs, which measure semantic associations) and interpersonal behavior	11 effects nested within 6 samples	796	<i>r</i>	.14	[.03, .26]		
	Interracial/-ethnic IATs (includes both attitude IATs, which measure evaluative associations, and stereotype IATs, which measure semantic associations) and	96 effects nested within 21 samples	3,879	<i>r</i>	.07	[-.03, .18]		

microbehaviors				
	9 effects nested within 3 samples	769	<i>r</i>	.19 [-.03, .41]
Explicit interracial/-ethnic attitude measures and interpersonal behavior	92 effects nested within 18 samples	3,868	<i>r</i>	.04 [-.04, .11]

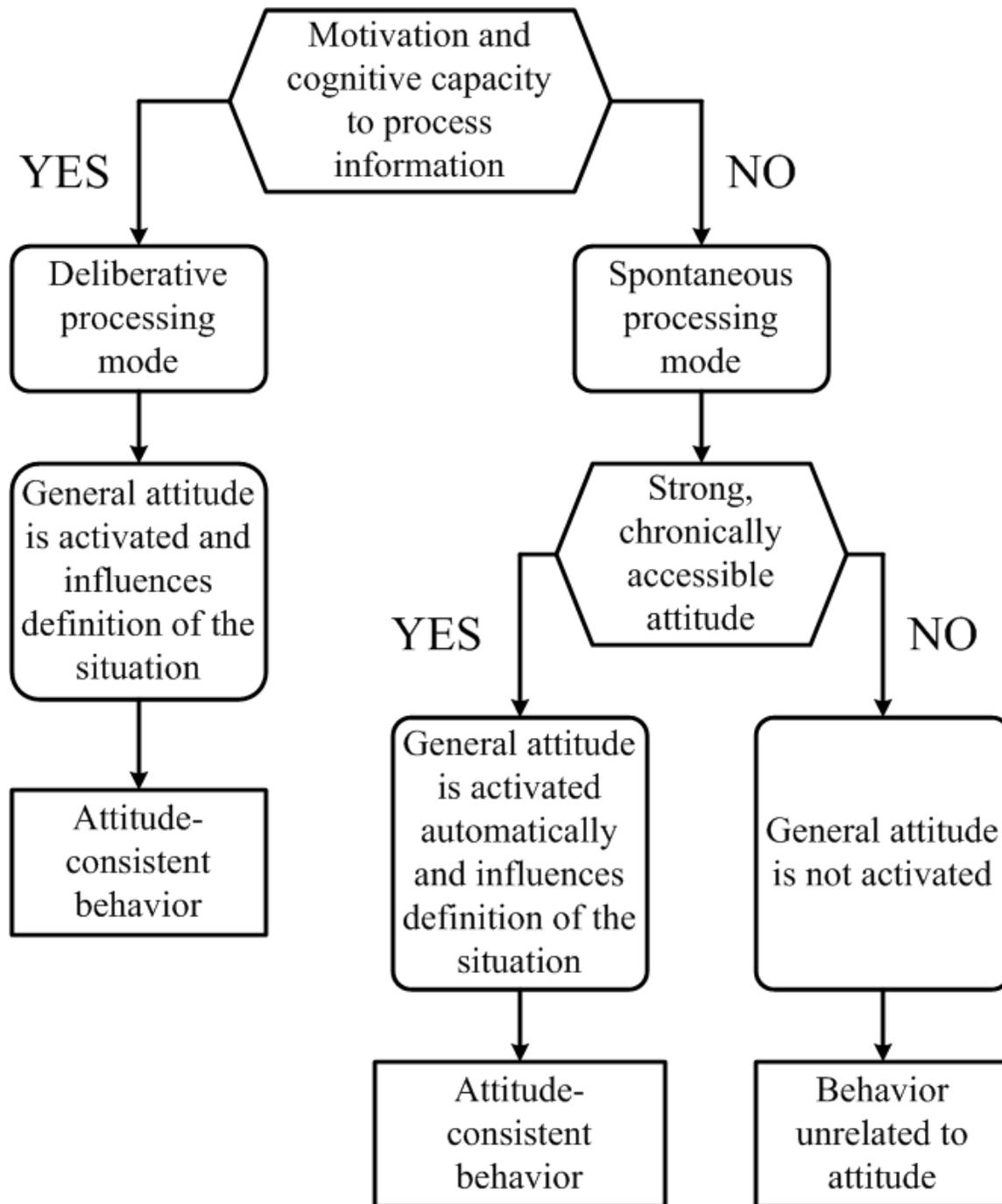
Note. With the exception of the Greenwald et al. (2009) and Cameron et al. (2012) meta-analyses, where such a distinction could not be made, only overt behavior was included and outcomes such as judgments, physiological reactions, or measures of intention were excluded from this table. Values in brackets represent 95% confidence intervals.

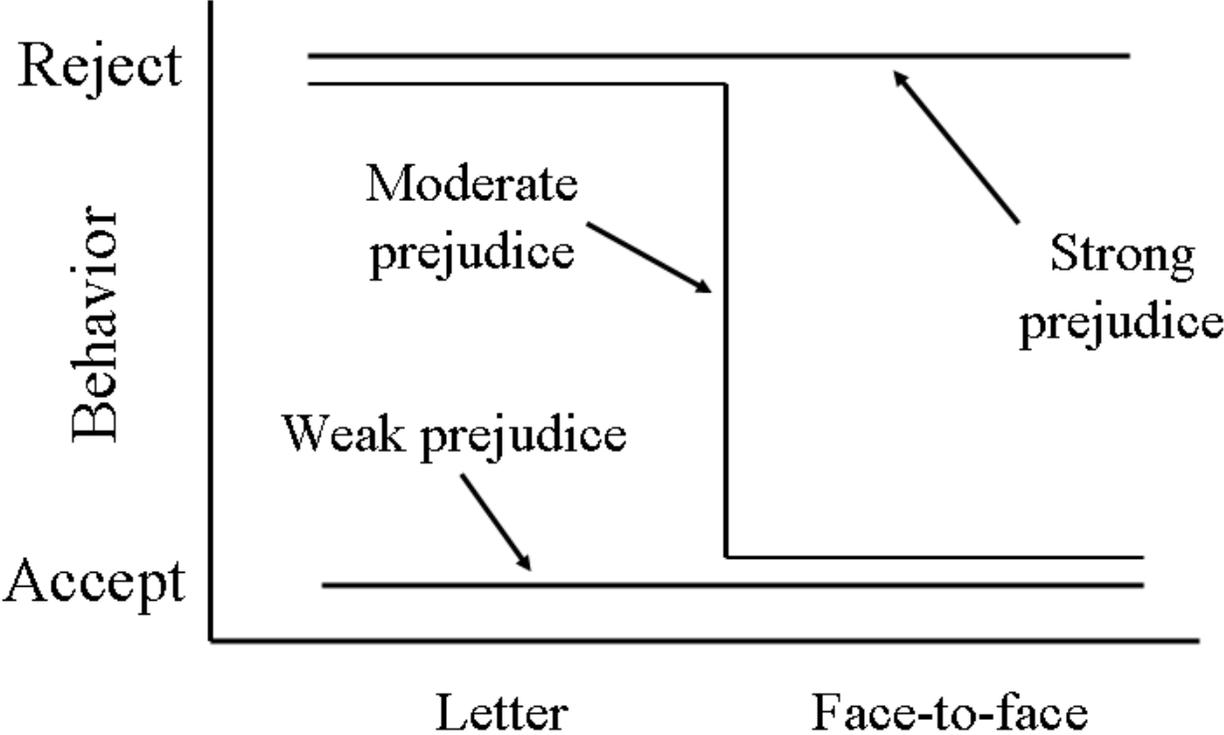
Table 2
Moderators of the Attitude-Behavior Relation in Meta-Analyses.

Study	Moderators
Kim & Hunter (1993) Eckes & Six (1994)	Higher attitudinal relevance Attitudes about objects (rather than behavior) (but: the reverse was true in studies that measured both kinds of attitudes simultaneously) Behavior domains: highest for socio-political activism, lowest for altruism and leisure activities) Behavior is a dichotomous choice (rather than a gradation of actions) Survey studies (rather than field studies or lab experiments (possibly due to larger sample sizes in surveys) Behavior assessed through retrospective self-report (rather than simultaneous self-report or objective measures) Simultaneous assessment of behavior (rather than a time lag of one day or more) Publication between 1970 and 1975 (rather than up to 1969 or 1976-1990) Self-report instead of observed behaviors Non-student samples Later year of publication (potentially because later studies were more likely to use self-report) Correspondence between attitude and behavior measures Higher stability Higher certainty Higher affective-cognitive consistency Direct experience Stronger accessibility Content domain
Kraus (1995) Wallace, Paulson, Lord, & Bond (2005)	Low trait self-monitoring No moderator analyses of this specific outcome variable (overt behavior) reported For a mix of overt behavior and behavioral intentions: Attitudes about behaviors (rather than objects) Journal articles (rather than dissertations or presentations) Lab experiments (rather than naturalistic settings) Self-report instead of observed behaviors Multiple measures of behavior Simultaneous assessment of behavior (rather than in a separate session with a time lag) Studies that did not report participant gender Child or adult samples (rather than college students)
Glasman & Albarracín (2006)	Repeated expression or report of attitudes; mediated by accessibility Direct behavioral experience (not significant in RE; negative effect when not controlling for all other variables); mediated by accessibility Higher attitude stability

	Behavioral relevance of attitudes; mediated by attitude stability
	More one-sidedness of information participants received or thought about (not significant in RE); mediated by attitude stability
	Higher confidence mediated by attitude stability
	Higher levels of outcome and value relevance
	Less concentration (not significant in RE)
Greenwald, Poehlmann, Uhlmann, & Banaji (2009)	For IAT measures <ul style="list-style-type: none"> Behavioral domain: political preferences Behavioral domain other than close relationships or gender/sexual orientation Stronger correlation between implicit and explicit attitude measures Greater complementarity of the two categories within the IAT measure Greater correspondence between the IAT and the outcome measure Lower social sensitivity of the construct For explicit measures <ul style="list-style-type: none"> Behavioral domain: political preferences Behavioral domain other than race or intergroup behavior Stronger correlation between implicit and explicit attitude measures Greater complementarity of the two categories within the IAT measure Greater correspondence between the attitude measure and the outcome measure Lower social sensitivity of the construct Higher controllability of the outcome measure Attitude predictor (rather than belief, self-concept, or self-esteem measures) Larger mean sample size Self-reported (rather than observed) behavioral outcome Smaller number of effect sizes
McEachan, Conner, Taylor, and Lawton (2011)	Behavior domain: Physical activity (significantly higher than safe sex) Adult sample (rather than adolescent sample; only significant for dietary behaviors) Shorter follow-up (only significant for physical activity) For physical activity: Self-reported behavior (rather than an objective measure)
Cameron, Brown- Iannuzzi, & Payne (2012)	Stronger correlation between implicit and explicit attitude measures
Oswald, Mitchell, Blanton, Jaccard, & Tetlock (2013)	No moderator analyses of these specific outcome variables reported

Note. RE = random-effects model





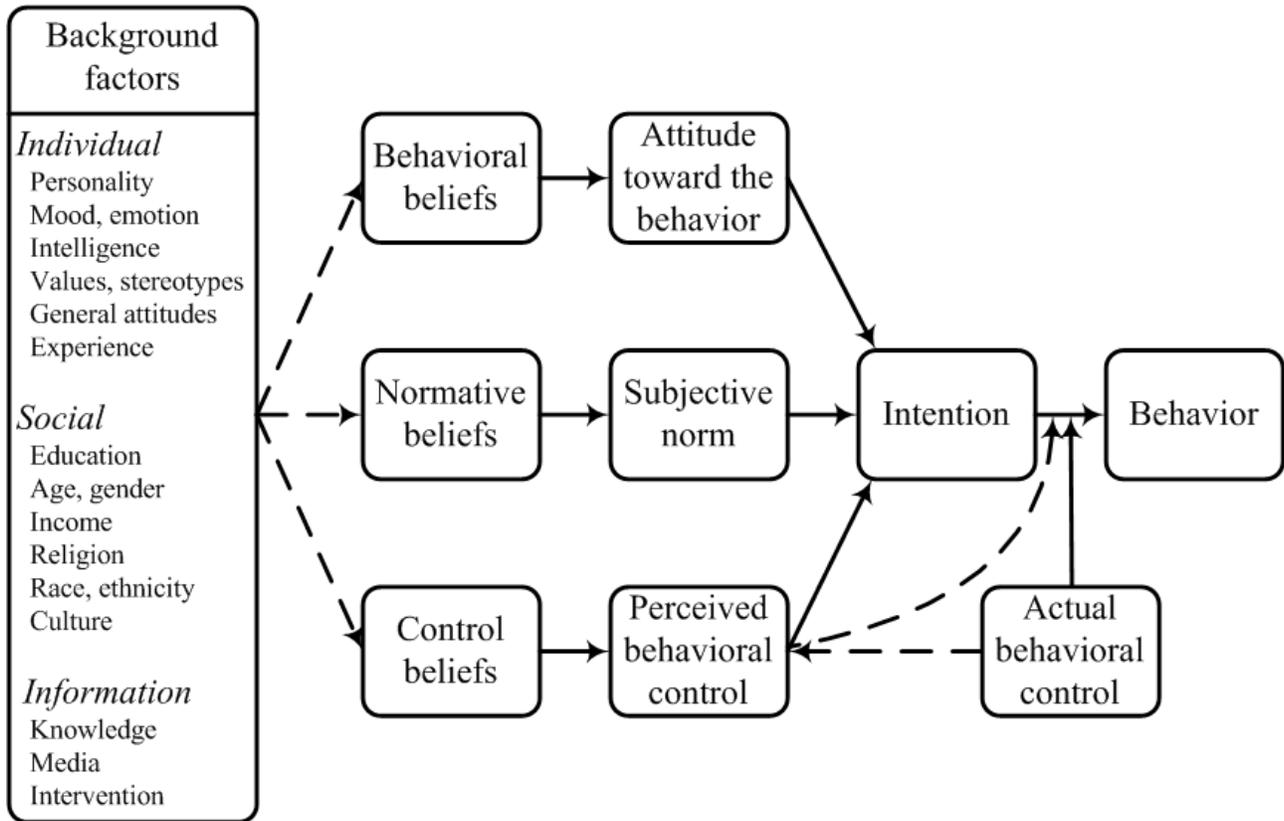


FIGURE CAPTIONS

Figure 1. Fazio's (1990b) MODE model.

Figure 2. Pseudo-inconsistency (after Campbell, 1963).

Figure 3. The theories of reasoned action and planned behavior.

FOOTNOTES

¹ Breckler (1984) obtained evidence for discriminant validity between the affective component of attitudes toward snakes on one hand and the cognitive and conative components of these attitudes on the other. However, this was the case only in the presence of a live snake, not when the snake was merely imagined. Moreover, no attempt was made in this study to predict actual behavior toward snakes.

² The variability in the magnitude of the reported attitude-behavior correlations in different studies may at least in part be due to the degree of compatibility between the obtained measures of attitude and behavior. For example, attitudes are usually assessed by asking participants how good or bad it is to perform a given behavior, whereas the measure of behavior often involves the frequency with which it was performed. Respondents who hold very positive attitudes should be very likely to perform the behavior, but there is no expectation that they will necessarily perform the behavior more frequently than respondents who hold less positive attitudes.

³ In his more recent theorizing, Fazio (e.g., Fazio & Dunton, 1997; Fazio & Towles-Schwen, 1999) has suggested that deliberation permits other motives such as fear of invalidity or motivation to control seemingly prejudiced reactions to override the expression of even strong, chronically accessible attitudes, thus depressing the observed attitude-behavior relation. We will return to this issue in our discussion of implicit versus explicit attitudes.

⁴ Similarly, work with the semantic differential on the measurement of meaning (Osgood, Suci, & Tannenbaum, 1957) has shown that attitude or evaluation is the most important aspect of any

concept's connotative meaning, and just as the denotative meaning of a concept with which a person is familiar is activated automatically, so too is its evaluative meaning.

⁵ Note also that, because all participants in this study were enrolled in an exercise program, the measures of exercise intentions and behavior were likely to have suffered from restriction of range.

⁶ Unpublished data (Fishbein, personal communication) from a study on prediction of marijuana use provided some support for Campbell's hypothesis. Attitudes of participants who intended not to use marijuana but actually did fell in between those of participants who acted in accordance with their intentions to use marijuana and those who acted in accordance with their intentions not to use marijuana.

⁷ Our discussion focuses on the failure to carry out a positive intention. It should be clear, however, that literal inconsistency is also observed when people who do not intend to perform a behavior are found to do so. For example, many people who intend not to start smoking later take up the behavior, and some people who do not intend to eat chocolate or ice cream nevertheless engage in these behaviors.

⁸ According to Gollwitzer (personal communication), implementation intentions can also transfer control over a behavior to internal cues, such as moods or emotions.

⁹ The reason for this practice is that empirically, even when an interaction is present in the data, statistical regression analyses only reveal only main effects. To obtain a statistically significant interaction requires that intention and perceived control scores cover the full range of the

measurement scale. For most behaviors, however, a majority of respondents fall on one or the other side of these continua.

¹⁰ Beyond the scope of the present chapter, there is also good evidence to support the effects of beliefs on attitudes, norms, and perceived control, as shown in Figure 3. Some relevant discussions can be found in other chapters of this book dealing with the effects of beliefs on attitudes (Earl & Hall, this volume) and on behavior (Johnson, Wolf, Maio, & Smith-McLallen, this volume).

¹¹ As we noted earlier, volitional control is expected to be relatively lower for attaining a goal such as losing weight than for performing a behavior such as eating a common food.

¹² Another issue related to the measurement of perceived behavioral control is use of an easy-difficult item. This item should be used with caution because it is sometimes more highly related to evaluative judgments than to perceived behavioral control (Leach, Hennessy, & Fishbein, 2001; Yzer, Hennessy, & Fishbein, 2004).

¹³ Similar arguments have also been made in relation to discrimination based on gender and sexual preference (e.g., Ellis & Riggle, 1996; Herek, 2000; Herek & Capitanio, 1999; Huddy, Neely, & Lafay, 2000; Ridgeway, 1997).

¹⁴ Dunton and Fazio (1997) have developed an instrument to assess individual differences in motivation to control seemingly prejudiced reactions. A second instrument was developed by Plant and Devine (1998; Devine, Plant, Amodio, Harmon-Jones, & Vance, 2002) to distinguish between internal (personal) and external (normative) motivation to respond without prejudice.

With the development of these scales, it has become possible to test some of these hypotheses.