

## Exploring the Latent Structure of Strength-Related Attitude Attributes

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“Attitudes determine for each individual what he [or she] will see and hear, what he [or she] will think and what he [or she] will do...They draw lines about, and segregate, an otherwise chaotic environment; they are our methods for finding our way about in an ambiguous universe.”

Gordon W. Allport, 1935, p. 806

It has been nearly 70 years since Gordon Allport famously declared the attitude “the most distinctive and indispensable concept in contemporary American social psychology” (Allport, 1935, p. 798). In the decades since this bold claim, a large literature has accumulated generally reinforcing the notion that attitudes often do, as Allport (1935) suggested, profoundly influence perception, cognition, and behavior. Equally clear from this literature, however, is that attitudes do not always do so. That is, although some attitudes exert a powerful impact on thinking and on behavior, others are largely inconsequential. Similarly, whereas some attitudes are tremendously durable, resisting change in the face of a persuasive appeal and remaining stable over long spans of time, others are highly malleable and fluctuate greatly over time.

The term “attitude strength” is often used to capture this distinction, and researchers have identified roughly a dozen attributes of attitudes that are associated with their strength (see Petty & Krosnick, 1995). These strength-related attitude attributes include attitude importance, knowledge, elaboration, certainty, ambivalence, accessibility, intensity, extremity, structural consistency, and others. A large literature now exists documenting the relations of these attitude attributes with the four defining features of strong attitudes (i.e., resistance to change, stability over time, and a powerful impact on thought and on behavior; Krosnick & Petty, 1995). For example, attitudes to which people attach more personal importance are better predictors of behavior (e.g., Budd, 1986; Parker, Perry, & Gillespie, 1974; Rokeach & Kliejunas, 1972), more resistant to change (Fine, 1957; Gorn, 1975; Zuwerink & Devine, 1996), and more powerfully influence liking of other people (Byrne, London, & Griffitt, 1968; Clore & Baldridge, 1968; Granberg & Holmberg, 1986; Krosnick, 1988b; McGraw, Lodge, & Stroh, 1990), inferences about others’ personality traits (Judd & Johnson, 1981), and many other cognitive processes. Similar sorts of relations have been documented between other strength-

related attitude attributes and the four defining features of strong attitudes (for a review, see Krosnick & Petty, 1995). But considerably less is known about the relations among the strength-related attitude attributes themselves. In fact, a controversy has emerged in the attitude literature in recent years regarding the underlying structure of these attributes.

In this chapter, we review this controversy and the empirical evidence and conceptual assumptions that have fueled it. We then draw on a diverse set of recent studies to shed new light on the conceptual and practical utility of the competing perspectives. Finally, we consider the implications of our findings for the conceptualization of attitude strength and for the methods by which it is studied. We begin below by defining each strength-related attitude attribute and describing how it is typically measured.

### Defining Strength-Related Attitude Attributes

#### Importance

Attitude importance refers to the amount of psychological significance a person ascribes to an attitude (see Boninger, Krosnick, Berent, & Fabrigar, 1995). Because this construct is, by definition, a perception of an attitude, it has typically been measured by asking a person to indicate how personally important an object is to him or her or the extent to which he or she personally cares about the object. Reports of the importance of or concern about the object have been found to be extremely strongly correlated with reports of the importance of and concern about the attitude (see Boninger et al., 1995).

#### Knowledge

Knowledge refers to the information about an attitude object that is stored in memory, ranging in volume from very large to none at all (Wood, 1982; Wood, Rhodes, & Biek, 1995). Knowledge has often been measured by asking people to rate their subjective sense of the amount of knowledge they have about an object. Knowledge has also been measured by asking people to list everything they know about an object and directly assessing the quantity of information generated. And knowledge has sometimes been measured via performance on a factual quiz, on the assumption that people who have more correct information about an object also have more total volume of information about the object stored in memory.

### Accessibility

The accessibility of an attitude refers to how easily or quickly it can be retrieved from memory (Fazio, 1995). The speed of retrieval is presumed to indicate the strength of the link in memory between the representation of the object and the evaluation of it. Accessibility has most often been measured by assessing the length of time it takes a person to report his or her attitude. And accessibility has sometimes been measured by asking people to subjectively rate how quickly their attitudes come to mind when they think of the object.

### Certainty

Attitude certainty refers to the amount of confidence a person attaches to an attitude. It has usually been measured by asking people how certain or how confident they are about their attitudes, or how sure they are that their attitudes are valid, accurate, or correct (see Gross, Holtz, & Miller, 1995).

### Ambivalence

Ambivalence refers to the degree to which a person has both favorable and unfavorable reactions to an object. For example, a person may recognize both admirable and despicable qualities in a particular individual, or may see both pros and cons of a proposed policy. Ambivalence, then, is the degree of evaluative conflict in a person's responses to an object, with maximum ambivalence occurring when favorable and unfavorable responses are both maximally strong (see Thompson, Zanna, & Griffin, 1995). Ambivalence has often been measured by asking people to report the degree to which they subjectively experience feelings of internal conflict. Ambivalence has also been measured by asking people to separately rate the extent of their positive and negative evaluations of an object, which can then be used to calculate ambivalence (Priester & Petty, 1996; Thompson et al., 1995).

### Structural Consistency

Closely related to ambivalence are three aspects of structural consistency involving a person's overall evaluation of an object, the evaluative implications of his or her beliefs about the object's qualities, and the evaluative valence of his or her emotional reactions to the object. Evaluative-affective, evaluative-cognitive,

and affective-cognitive consistency are the terms used to refer to the three possible manifestations of consistency (see Chaiken, Pomerantz, & Giner-Sorolla, 1995). Usually, the three elements have been measured separately and then integrated mathematically to yield quantitative assessments of each type of consistency.

#### Extremity

Attitudes are typically conceptualized as lying on a continuum from very positive through neutral to very negative. Attitudes that lie toward either end of this continuum are considered to be extreme (see Abelson, 1995). Extremity has usually been derived from reports of attitudes on rating scales.

#### Elaboration

Some attitudes are formed as a result of in-depth, highly elaborative thought processes. Others are formed through more superficial, cue-driven processes that require relatively little thought (see Petty, Haugtvedt, & Smith, 1995). The extent of prior elaboration about an attitude object has been gauged by asking people how much they have thought about the object previously.

#### Intensity

Attitude intensity is the strength of the emotional reaction provoked by the attitude object in an individual. It has typically been measured using self-reports of the intensity of feelings a person says he or she has about the object (Cantril, 1944, 1946; Stouffer et al., 1950).

#### Underlying Constructs?

When presented in this fashion, these various attributes seem obviously distinct from one another, with fundamentally different psychological natures and at least somewhat distinct origins and consequences. Some of these attributes are inherently subjective perceptions of the attitude-holder. For example, attitude importance is a personal judgment of significance – for an individual to say that an attitude is extremely important is to say that he or she cares deeply about it and is presumably motivated to protect it and to express it and to be faithful to it in action. Certainty is another subjective judgment, this time about the subjective sense of the justification for holding a particular attitude.

Other dimensions reflect the content and structure of representations stored in long-term memory. For example, knowledge volume is the stockpile of information about an object in memory, which may confer certain abilities to interpret, store, retrieve, and use information to particular ends. Accessibility represents the character of the relation between an object's representation and its evaluation stored in memory, which regulates the speed and ease with which the attitude springs to mind upon encountering the object. Ambivalence and structural consistency refer to the degree of evaluative harmony among the various components of an attitude that are stored in memory.

Extremity is a feature of the attitude itself: where along a bipolar evaluative continuum an attitude falls. And elaboration refers to the nature of the cognitive work a person has previously devoted to an attitude object. Thus, it is a description of psychological processes that have evolved in the past.

When described in these ways, it seems obvious that understanding attitude strength requires an in-depth understanding of the workings of each of these various strength-related attributes. On the other hand, the fact that all of these attributes relate in similar ways to the defining features of strong attitudes (e.g., resistance to change, persistence over time) may suggest that they are surface manifestations of a smaller number of underlying psychological constructs. If this is the case, understanding attitude strength simply requires identifying and investigating these more basic constructs. This issue has sharply divided attitude strength researchers.

### Common-Factor Models

Many researchers have assumed, either implicitly or explicitly, that sets of strength-related attitude attributes reflect a common underlying latent construct. For example, many early researchers treated measures of the various attributes as interchangeable. When setting out to gauge attitude "intensity," some researchers measured certainty (Brim, 1955; Guttman & Suchman, 1947; Katz, 1944; McDill, 1959; Suchman, 1950), whereas others measured extremity (McDill, 1959; Tannenbaum, 1956). To measure "involvement," some researchers assessed importance (Apsler & Sears, 1968; Borgida & Howard-Pitney, 1983; Gorn, 1975; Howard-Pitney, Borgida, & Omoto, 1986), others have assessed knowledge (Stember & Hyman, 1949-1950),

and still others measured elaboration (Bishop, 1990; Petty & Cacioppo, 1979). And whereas attitude “salience” has sometimes been measured by indices of importance (Hoelter, 1985; Jackson & Marcus, 1975; Lemon, 1968; Powell, 1977; Tedin, 1980), it has also been gauged by measuring elaboration (Brown, 1974). Treating measures of different strength-related attitude attributes as interchangeable is reasonable if one assumes that they each reflect the same underlying construct.

The notion of conceptual overlap between attributes has sometimes been advocated more explicitly. Roese and Olson (1994), for example, argued that people’s internal cues regarding subjective perceptions of their attitudes (e.g., how important the attitude is to them) may often be weak and ambiguous. As a result, when people are asked about the personal importance of an attitude, they may be forced to engage in self-perception processes along the lines of those described by Bem (1972). Roese and Olson (1994) suggested that one useful cue in such situations may be the speed and ease with which one’s attitude comes to mind. If an attitude comes to mind quickly, people may infer that it must be important to them, whereas if an attitude comes to mind slowly, people may infer that it must not be very important to them. Haddock and his colleagues (Haddock, Rothman, Reber, & Schwarz, 1999; Haddock, Rothman, & Schwarz, 1996) and Bassili (1996a) have made similar arguments, suggesting that reports of many strength-related attitude attributes (e.g., importance, certainty, intensity) are all derived from a common set of cues, such as the experienced ease with which people are able to retrieve attitude-supportive information from memory.

Evidence. The most pervasive type of empirical evidence presented to advance the notion of overlap among strength-related attributes has been factor analysis. In a number of studies, exploratory factor analyses or principal components analyses have been conducted in order to identify the factor structure underlying various strength-related attitude attributes (e.g., Abelson, 1988; Bass & Rosen, 1969; Bassili, 1996a; Erber, Hodges, & Wilson, 1995; Kokkinaki, 1998; Lastovicka & Gardner, 1979; Pomerantz, Chaiken, & Tordesillas, 1995; Prislin, 1996). Although these studies (listed down the left side of Table 1) each included somewhat different sets of strength-related attributes, most included measures of attitude importance, knowledge, accessibility, certainty, extremity, and elaboration. And in each of these studies, two or three latent factors

emerged. Table 1 indicates upon which latent factor (labeled 1, 2, or 3) each attribute was found to load.

Although attitudes toward disparate objects were examined in a variety of different participant populations and at different times spanning nearly three decades, some striking consistencies emerged: some pairs of attributes consistently loaded on the same factor, whereas other pairs tended to load on different factors. For example, in every one of the 18 analyses that included importance and elaboration, these attributes loaded on the same latent factor (the first factor). And in 74% of the 19 analyses involving both importance and knowledge, these two attributes loaded on the same factor (again, the first factor). Likewise, knowledge and elaboration loaded on the same factor in nearly 70% of the analyses that included them both. Just as strikingly, importance and accessibility did not load on the same factor in a single one of the 11 instances in which they were included in the same analysis. Similarly, knowledge and extremity loaded on the same factor in only two of 17 analyses. Finally, importance and extremity loaded together in only two of 21 analyses. Thus, the cluster of importance, elaboration, and knowledge seems distinct from accessibility and extremity when viewed through this lens.<sup>1</sup>

Based upon these sorts of factor analyses, many investigators have averaged together measures of multiple strength-related attributes to create composite indices of attitude strength, which have then been used to investigate attitude properties and processes (e.g., Bassili, 1996a; Bassili & Roy, 1998; Eagly et al., 2000; Haddock, Rothman, Reber, & Schwarz, 1999; Lavine et al., 1998; Pomerantz, Chaiken, & Tordesillas, 1995; Prislin, 1996). For example, composites called “attitude strength” have been created by averaging measures of importance, certainty, and intensity (Haddock et al., 1996, 1999), measures of importance, certainty, knowledge (and other measures; Eagly et al., 2000; Theodorakis, 1994), measures of extremity, certainty, and accessibility (Bassili & Roy, 1998), measures of importance and certainty (and other measures; Holland, Verplanken, & van Knippenberg, 2002), or measures of importance, knowledge, certainty, and elaboration

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<sup>1</sup> Some inconsistencies across studies also emerged. For example, attitude importance and certainty loaded on the same factor in some studies (e.g., Erber et al., 1995; Prislin, 1996) but on different factors in other studies (e.g., Abelson, 1988; Pomerantz et al., 1995; Visser & Krosnick, 2001). And even within a single investigation, inconsistent results sometimes appeared. For example, Bassili (1996) found importance and certainty to load on a common factor for some attitude



(and other measures; Bassili, 1996a; Prislin, 1996).

Pomerantz et al. (1995) averaged importance and knowledge (and other measures) into a composite called “embeddedness,” and they averaged extremity and certainty (and other measures) to create a composite called “commitment.” Hodson, Maio, and Esses (2001) created an index that they also labeled “commitment” by averaging measures of importance, certainty, and personal relevance. Kokkinaki (1998) averaged measures of importance and elaboration (and other measures) to create an index of “embeddedness,” and she averaged measures of certainty, knowledge, ambivalence, and extremity to create an index of “conviction.” Abelson (1988) gauged “ego-preoccupation” by averaging measures of importance, elaboration, and other variables. And several scholars have created indices that they labeled “involvement” by averaging measures of importance, certainty, and elaboration (and other measures; Miller, 1965), measures of importance, knowledge, and elaboration (and other measures; Verplanken, 1989; 1991), or measures of importance, interest in information, and attitude-expressive behaviors (and other measures; Thompson & Zanna, 1995). In each case, these investigators have then explored the cognitive and behavioral consequences of the composites they created.

#### A Different Perspective

This is not the only approach present in the attitude strength literature, however. In fact, more common are studies that have examined one strength-related attribute at a time, without combining attributes together into a composite index (for reviews, see Krosnick & Abelson, 1992; Raden, 1985). This approach can be justified by the obvious conceptual differences between the various strength-related attitude attributes.

For example, as our earlier review implied, attaching personal importance to an attitude is quite different from simply possessing a large store of knowledge about the attitude object. To attach great importance to an attitude is to care tremendously about it and to be deeply concerned about it. And this deep concern is consequential – perceiving an attitude to be personally important leads people to protect it against attack and use it in processing information, making decisions, and choosing a course of action (see Krosnick & objects but to load on different factors for other attitude objects. Similarly, Bass and Rosen (1969) found importance and

Abelson, 1992). Thus, attitude importance seems to be primarily a motivator: of attitude protection and attitude use. In contrast, knowledge is simply a cache of information stored in memory. As such, knowledge *per se* seems less likely to be motivational in and of itself. Rather, its effects seem more likely to be ability-based in character. Differences of this sort in the psychological nature of the various strength-related attitude attributes have led some scholars to question the wisdom of combining them into composite indices of attitude strength.

Evidence. Supporting this view is evidence from a number of confirmatory factor analyses, which have avoided some of the pitfalls of exploratory factor analyses (e.g. Krosnick et al., 1993; Krosnick, Jarvis, Strathman, and Petty, 1994; Lavine, Huff, Wagner, & Sweeney, 1998; Visser, 1998). In particular, exploratory factor analysis is subject to distortion due to systematic measurement error, because people differ from one another in how they interpret the meanings of the points on rating scales. When the same scale is used to measure different constructs, as has often been the case in exploratory factor analytic investigations of attitude strength, these individual differences in scale point interpretation will produce an artifactual positive correlation between the measures of the constructs across participants (Bentler, 1969; Brady, 1985; Costner, 1969; Green, 1988; Green & Citrin, 1994). This would cause constructs that are perfectly orthogonal to appear to be positively correlated if they are measured using the same rating scale coded in the same direction (as was the case in most past studies). Exploratory factor analysis and related techniques will (incorrectly) presume that this covariation is substantively meaningful, increasing the likelihood that variables measured with a common rating scale will appear to load on the same factor.

To overcome this problem, Krosnick et al. (1993) advocated the use of confirmatory factor analyses that model and correct for systematic measurement error. Following the logic of the multitrait-multimethod approach (Campbell & Fiske, 1959), they proposed that multiple strength-related attitude attributes should be assessed using several different types of rating scales. The attributes can then be represented as latent variables (gauged by multiple indicators), and method factors can be included in the model to account for

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certainty to load on a single factor for one attitude object and to load on different factors for a second object.

covariation between the measures that is due to a common method of measurement (e.g., Alwin & Krosnick, 1985; Andrews, 1984; Green & Citrin, 1994; Green, Goldman, & Salovey, 1993; Jarvis & Petty, 1996). The use of multiple indicators also permits disattenuation of correlations between latent constructs to correct for the impact of random measurement error.

Krosnick et al. (1993) used this approach in three studies to estimate associations among various strength-related attributes of people's attitudes toward several social and political issues. Although a few pairs of attributes were quite strongly correlated, most were weakly or not at all correlated. Krosnick et al. (1993) explicitly tested the possibility that a common underlying construct could account for covariation among sets of strength-related attributes. Specifically, they tested the goodness-of-fit of various structural equation models positing that pairs, trios, or larger sets of attributes load on a single underlying factor, each possibility derived from existing theories and empirical findings. In each case, Krosnick et al. (1993) compared the fit of the common-factor model to that of a model representing the relevant strength-related attributes as separate (albeit correlated) constructs. Across three studies, Krosnick et al. (1993) found virtually no evidence that a group of attributes reflected a common underlying factor. In fact, only two common-factor models received consistent support across all tests of them: self-reported knowledge and objective measures of people's actual stores of knowledge about an object consistently loaded on a single factor, as did attitude extremity and attitude accessibility. But in most tests (30 of 42 tests, or 71%), the common-factor models entailed significant compromises in fit of a factor model to the observed data.

Lavine, Huff, Wagner, and Sweeney (1998) conducted similar analyses and obtained similar results. Lavine et al.'s (1998) confirmatory factor analyses examined the underlying structure of six strength-related attributes: importance, certainty, intensity, frequency of thought, extremity, and ambivalence. These researchers found that a model in which the six attributes were treated as separate constructs fit the data significantly better than did any model in which subsets of attributes were treated as manifestations of a common latent factor.

Empirical findings of this sort have reinforced the notion among some attitude strength researchers

that the various strength-related attitude attributes are distinct constructs in their own right rather than reflections of a smaller number of more general underlying factors. This perspective emphasizes the multidimensionality of attitude strength, and it suggests that efforts to elucidate the origins and consequences of strength should focus on developing a fuller understanding of the origins and consequences of each individual strength-related attribute.

### Reconciling these Divergent Perspectives

As the above discussion implies, the attitude strength literature seems to have come to an impasse. Two bodies of empirical evidence support two contradictory conceptualizations of attitude strength. Exploratory factor analyses suggest that there are two or three basic dimensions of attitude strength and that all of the various strength-related attitude attributes discussed in the literature can be reduced to these basic dimensions. According to this perspective, distinguishing each and every strength-related attribute is a trivial exercise in splitting hairs. In contrast, confirmatory factor analyses suggest that attitude strength is multifaceted and that the strength-related attributes cannot be reduced to a smaller set of more general underlying factors. According to this perspective, combining strength-related attributes into composite indices glosses over meaningful conceptual distinctions among them.

Clearly, the debate over the underlying structure of the strength-related attitude attributes is not likely to be resolved through additional efforts to factor analyze the correlations among them. Such correlations can be used to support either of these two perspectives. In fact, even with a single data set, the decision to conduct exploratory versus confirmatory factor analyses can yield evidence that appears to unambiguously favor one perspective or the other (Krosnick et al., 1993; Visser, 1998). Instead, we propose that the solution may lie in a reformulation of the basic question that attitude strength researchers have set out to address.

Up to this point, the debate over the relations among strength-related attributes has been cast, at least implicitly, in absolute terms – either each strength-related attribute is a distinct construct with unique antecedents and consequences, or sets of attributes are largely redundant, essentially interchangeable reflections of the same underlying construct. But the truth almost certainly lies somewhere between these

extremes. Most pairs of strength-related attitude attributes are likely to be at least partially distinct – arising from at least some unique antecedents and setting into motion at least some distinct cognitive and behavioral consequences. But many pairs of strength-related attributes may share some common variance as well, arising from some of the same antecedents and perhaps exerting some of the same effects on thought and behavior.

The question, then, is whether there is enough unique variance to justify distinguishing among the various strength-related attitude attributes when building theories of the origins and consequences of attitude strength. If very little of the variance in each strength-related attribute is unique and most is shared with other attributes in a set, those attributes must have largely redundant antecedents and consequences. In the interest of parsimony, measures of these attributes could be combined together into an index to more efficiently explore their workings in relation to other psychological constructs. But if the amount of unique variance in each attribute is substantial, this would indicate that the causes of the various attributes are quite different, and it would raise the possibility that the attributes may also exert different sorts of cognitive and behavioral effects.<sup>2</sup> And the more different their origins and consequences, the more misleading the results of an investigation will be if measures of different attributes are combined into a composite index of attitude strength.

A new approach. This logic makes clear that an efficient alternative to factor analysis is direct, simultaneous exploration of the antecedents and consequences of various strength-related attributes. If two attributes appear to be similarly affected by many predictor variables and appear to exert similar kinds of effects on thinking and action, there is little to be gained by maintaining sharp distinctions between them in empirical investigations of attitude strength – even if the attributes are far from being perfectly correlated. But if two attributes have different causes and distinct effects on thought and behavior, there is indeed utility in maintaining the distinction between them in theory-building – even if the attributes are quite strongly correlated.

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<sup>2</sup> Of course, evidence that two attributes arise from different antecedents would not necessarily imply that they also exert different consequences. Distinct constructs can have overlapping sets of effects. But two attributes that reflect a common underlying construct must arise from a common set of antecedents and exert a common set of consequences.

More specifically, evidence that one strength-related attitude attribute is related to a particular cognitive or behavior outcome whereas another attribute is not related to that outcome would clearly challenge the practice of combining the two attributes into an omnibus index of attitude strength. Doing so would yield misleading evidence regarding the distinct functioning of these attributes. Similarly, if one strength-related attribute is positively associated with a cognitive or behavioral outcome and another attribute is negatively associated with that outcome, researchers would be ill-advised to combine the two attributes into a composite index. In this case, doing so is likely to mask entirely these countervailing relations, obscuring the functioning of these independent attributes. Finally, evidence that two strength-related attributes interact to produce a particular cognitive or behavioral outcome would also challenge the practice of combining them into an index. Such an index would yield an incomplete portrait of the relation between the attributes and the outcome.

In our view, this approach – focusing not strictly on the correlations among attributes but on the degree of overlap in their antecedents and consequences – provides a better conceptual match to the basic questions regarding the structure and function of attitude strength that interest attitude researchers. Identifying sets of attributes that arise from a common set of antecedents and that set into motion a common set of cognitive and behavioral consequences would provide an empirically justified conceptual framework for consolidating disparate lines of research on these individual attributes. And findings of this sort would facilitate swift progress in the efficient investigation of the workings of these clusters of attributes.

Evidence that the various strength-related attributes instead arise from distinct causal antecedents and exert different cognitive and behavior effects would also clarify the conceptualization of attitude strength and would facilitate progress in empirical investigations of it. Findings of this sort would suggest that not all strong attitudes are alike, and that careful attention to the bases of attitude strength will have useful payoffs for psychological theory building. It may be, for example, that some attitudes are strong because people attach a great deal of importance to them, which has a particular set of consequences for thinking and action. Other attitudes may be strong because they are based on a substantial volume of attitude-relevant knowledge, which may set into motion a somewhat different set of cognitive and behavioral consequences. And some attitudes

may manifest strength because of the copresence of two or more strength-related attributes, with unique consequences for thinking and action. This multidimensional conceptualization of attitude strength would suggest that composite indices of attitude strength comprised of sets of strength-related attributes will often yield misleading evidence and inaccurate characterizations of strength-related processes, impeding the development of refined theory in this domain.

### Overview of this Chapter

In the remainder of this chapter, we review a set of studies that have directly assessed the degree of overlap in the antecedents and consequences of strength-related attributes, providing a broad set of evidence about the conceptual and practical utility of maintaining distinctions among them. To build this review, we conducted a thorough search of the literature to identify all studies that have directly compared the causes or effects of two or more strength-related attitude features. We describe all such studies in the sections that follow. As will become evident, much of the existing work has compared attitude importance to other attitude features, so our review necessarily tilts in this direction. But even with this tilt, the studies we review seem to provide a broad and solid basis for drawing conclusions about the structure and function of attitude strength.

Importance and knowledge. We begin by describing a program of research exploring the workings of attitude importance and attitude-relevant knowledge. Consistent with the fact that importance and knowledge loaded on the same factor in most exploratory factor analyses, many investigators have averaged together measures of importance and knowledge to yield an index when investigating attitude properties and processes (e.g., Bassili, 1996a; Eagly et al., 2000; Pomerantz, Chaiken, & Tordesillas, 1995; Prislin, 1996; Theodorakis, 1994; Verplanken, 1989, 1991). We will review evidence regarding the degree to which importance and knowledge arise from the same causal antecedents and exert the same kinds of cognitive and behavioral consequences, as the common-factor model assumes.

Importance and certainty. We then review evidence of convergences and divergences in the cognitive and behavioral consequences of attitude importance and certainty. In seven past exploratory factor analyses, these attitude attributes loaded on the same factor (e.g., Bass & Rosen, 1969; Bassili, 1996a; Prislin, 1996).

And many investigators have averaged importance and certainty to create composite indices (e.g., Bassili, 1996a; Eagly et al., 2000; Haddock et al., 1996, 1999; Hodson et al., 2001; Holland et al., 2002; Miller, 1965; Prislin, 1996; Theodorakis, 1994). The evidence we will review assesses the wisdom of this practice.

Importance and accessibility. Next, we review a program of research examining attitude importance and attitude accessibility, in light of Roese and Olson's (1994) suggestion that people may infer the importance of their attitudes by noting how quickly and easily they come to mind and Krosnick's (1989) suggestion that importance may be a cause of accessibility. We review the array of available evidence regarding the antecedents of these attributes, and we review evidence exploring the causal relations between them to gauge their conceptual and procedural independence.

Certainty and accessibility. We then consider similar evidence regarding attitude certainty and attitude accessibility. Specifically, we explore the degree to which these two strength-related attributes arise from a common set of antecedents, and we assess the implications of each attribute for attitude-congruent behavior.

Attitude strength composites vs. their constituents. We then describe a series of studies that explicitly pitted individual strength-related attitude attributes against composites of them. These studies explored the extent to which these attributes (alone or in combination) (1) predicted two defining features of strong attitudes (resistance to change and stability), (2) responded similarly to ease of retrieval manipulations, and (3) regulated responsiveness to question wording and question order effects in attitude measurement. In our review of these studies, we will pay particular attention to the degree to which composite indices may obscure the workings of individual strength-related attributes.

## Attitude Importance and Knowledge

### Hypotheses

#### Common Antecedents and Consequences?

Until recently, no existing evidence disputed the notion that importance and knowledge spring from the same causal antecedents and have the same effects. But this is because no investigation had directly explored the issue. Consider first the existing evidence on antecedents. Three primary causes of attitude



importance had been documented in the literature thus far: (1) the belief that the attitude object impinges on one's material self-interest, (2) identification with reference groups or individuals who attach importance to the attitude object or whose material interests are linked to the object, and (3) recognition of a link between the attitude and one's core values (Boninger, Krosnick, & Berent, 1995). Attitude accessibility, the experienced ease of retrieving attitude-relevant information from memory, and self-esteem maintenance motives have also been posited to regulate attitude importance (Haddock et al., 1996, 1999; Pelham, 1991; Roesse & Olson, 1994). Until recently, no research had tested whether these factors are causes of knowledge as well.

The primary origins of knowledge documented in the literature thus far were (1) direct experience with an attitude object (Fazio & Zanna, 1981), and (2) exposure and attention to information about the object provided by other people, through conversations or mass media (McGuire, 1986; Roberts & Maccoby, 1985). No studies had tested whether importance is enhanced by direct experience or exposure to information from informants; it is conceivable that these causal processes do indeed occur.

With regard to the consequences of importance and knowledge, some overlap has been documented. Quantity of attitude-relevant knowledge has been shown to be associated with greater consistency between attitudes and behavior, greater ability to encode new information about an object, reduced reliance on peripheral cues in evaluating persuasive messages, more extensive thinking about attitude-relevant information, greater sensitivity to the quality of arguments in evaluating a persuasive message, and greater resistance to attitude change (Biek, Wood, & Chaiken, 1996; Davidson, 1995; Wilson, Dunn, Kraft, & Lisle, 1989; Wood, 1982; Wood & Kallgren, 1988; Wood, Rhodes, & Biek, 1995). In line with three of these findings, importance has also been shown to be associated with greater attitude-behavior consistency (e.g., Budd, 1986; Parker, Perry, & Gillespie, 1974; Rokeach & Kliejunas, 1972), more extensive thinking about attitude-relevant information (Berent & Krosnick, 1993; Celsi & Olson, 1988; Howard-Pitney, Borgida, & Omoto, 1986), and greater resistance to attitude change (Fine, 1957; Gorn, 1975; Zuwerink & Devine, 1996).

Until recently, other documented consequences of knowledge had not been investigated with regard to importance, raising the possibility that importance leads to these outcomes as well. And various documented

effects of importance (e.g., the motivation to acquire information about the attitude object, Berent & Krosnick, 1993; consistency between attitudes and core values, Jackman, 1977, Judd & Krosnick, 1989) had not yet been investigated as possible consequences of attitude-relevant knowledge.

### Distinct Antecedents and Consequences?

However, when considered less mechanically and more conceptually, there are clearly reasons to expect that the causes and effects of importance and knowledge will be different. Because it reflects the degree of concern, caring, and significance an individual attaches to an attitude, attitude importance should serve to motivate people to use the attitude in processing information, making decisions, and taking action. Consistent with this reasoning, attitude importance has been shown to inspire people to seek out attitude-relevant information (Berent & Krosnick, 1993; Zaichkowsky, 1985) and to think carefully about that information (Berent, 1990). Importance also motivates people to use an attitude: more important attitudes have greater impact on judgments of liking for other people (Byrne, London, & Griffitt, 1968; Clore & Baldridge, 1968; Granberg & Holmberg, 1986; Krosnick, 1988b; McGraw, Lodge, & Stroh, 1990), on voting behavior in elections (Krosnick, 1988b; Schuman & Presser, 1981), and on trait inferences (Judd & Johnson, 1981). And importance has been shown to stimulate attitude-expressive behavior (Krosnick & Telhami, 1995; Schuman & Presser, 1981). Thus, importance appears primarily to be a motivator.

In contrast, knowledge is not in and of itself motivational – it is simply a store of information in memory. And most of its effects appear to be primarily ability-based in character. Knowledge has been shown to enhance recall (e.g., Cooke, Atlas, Lane, & Berger, 1993; Fiske, Lau, & Smith, 1990; McGraw & Pinney, 1990; Schneider, Gruber, Gold, & Opwis, 1993), improve comprehension (Eckhardt, Wood, & Jacobvitz, 1991; Engle, Nations, & Cantor, 1990), increase the speed of judgments (e.g., Fiske et al., 1990; Paull & Glencross, 1997), improve cue utilization in decision tasks (Paull & Glencross, 1997), enable appropriate inferences (Pearson, Hansen, & Gordon, 1979), facilitate the objective processing of attitude-relevant information (Biek, Wood, & Chaiken, 1996) and the learning of new topic-relevant information (Hansen, 1984; Kyllonen, Tirre, & Christal, 1991; Willoughby, Waller, Wood, & MacKinnon, 1993), and

enable the generation of effective counterarguments to a persuasive appeal (Wood, 1982; Wood, Rhodes, & Biek, 1995). Thus, although knowledge seems to enable people to perform various relevant cognitive tasks more effectively, we see no reason to suppose that it should, in and of itself, motivate people to engage in any behavior. These characterizations suggest that importance and knowledge are likely to have distinct effects on thought and behavior.

Importance and knowledge seem likely to be distinct in terms of their origins as well. Knowledge often accumulates simply as the result of exposure to information about an object. Simply being exposed to information is only likely to lead a person to attach importance to an attitude if that information makes a compelling case for the existence of a link between the object and a person's self-interest, reference groups or individuals, or values. Thus, knowledge acquisition is unlikely to have a uniform effect on importance. On the other hand, information acquisition sometimes occurs intentionally – people sometimes seek out new knowledge about a particular object – and people who attach great personal importance to an object are likely to be motivated to gather information about it. Thus, importance may be a cause of knowledge accumulation.

### Evidence

In a series of studies conducted recently with both undergraduate samples and a large, nationally representative sample, Visser, Krosnick, and Norris (2004) compared the causes and consequences of attitude importance and attitude-relevant knowledge and found many divergences.

#### Origins of Importance and Knowledge

Consistent with previous research (Boninger, Krosnick, & Berent, 1995), Visser et al. (2004) found that self-interest, the importance of the issue to reference groups and individuals, and value-relevance each predicted unique variance in the importance that people attached to their attitudes toward legalized abortion. Exposure to news media, on the other hand, was unrelated to the importance people attached to this issue.

In contrast, news media exposure was a significant (and indeed, the strongest) predictor of attitude-relevant knowledge. The importance of the issue to reference groups and individuals was unrelated to knowledge. Interestingly, self-interest and value-relevance did predict a significant amount of variance in

knowledge. Further analyses, however, revealed that the impact of self-interest and value-relevance on knowledge was mediated by attitude importance. Recognizing that material interests or cherished values are at stake in this issue led people to attach importance to their attitudes, which in turn motivated them to seek out relevant information about it and become more knowledgeable.<sup>3</sup>

These results are encapsulated in the causal model presented in Figure 1, the parameters of which Visser et al. (2004) estimated using covariance structure modeling techniques and which fit the data well. As the coefficients in Figure 1 illustrate, self-interest, the importance of the issue to significant others, and value-relevance each led to increased attitude importance, and increases in attitude importance led to increased knowledge about the issue. Knowledge increased as a function of media use, but media use had no impact on attitude importance. These results suggest that importance and knowledge spring from largely distinct proximal sources.

The trajectories of attitude importance and knowledge over time provide another source of evidence regarding the overlap in their causes. If these strength-related attributes arise from a common set of causal antecedents, they should rise and fall together over time, reflecting the modulation of those shared antecedents. But if importance and knowledge arise from different origins, they may rise and fall independently following the distinct ebbs and flows of their separate antecedents. To explore this issue, Visser et al. (2004) took advantage of a unique real-world opportunity provided by the White House Conference on Global Climate Change on October 6th, 1997, which drew a great deal of media attention and sparked a vigorous national debate about global warming. During the subsequent months, hundreds of stories on this issue appeared on television, in newspapers, on the radio, and in news magazines. Advertisements paid for by industry organizations and other advocacy groups further expanded the national discussion.

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<sup>3</sup>Visser et al. (2004) also explored alternative mediational relations. For example, they assessed the possibility that the impact of self-interest on importance may have been mediated by knowledge: recognizing that an attitude object impinges on a person's material interests may directly inspire him or her to gather information about the object. Having accumulated a great deal of such information, people may then come to decide that the attitude is important to them, perhaps in an effort to rationalize having invested the effort in information gathering or through inference processes (e.g., "If I know this much about an object, then it must be important to me."). Visser et al. (2004) found, however, that knowledge did not mediate the relations between any of the antecedents and attitude importance.

The impact of this flood of information was explored by conducting telephone interviews with two nationally representative samples of American adults. The first sample was interviewed just before media attention to global warming surged, and the second sample was interviewed several months later, after the media had turned their attention elsewhere. The same measures were used in both surveys to assess the importance that people attached to the issue of global warming and the amount of knowledge they possessed about this issue, permitting an examination of the changes in each construct over time. Between the first and second waves of data collection, the importance that people attached to the issue increased significantly. But the diversity of opinions expressed during the national discussion of global warming left people feeling no more knowledgeable on this issue: knowledge remained steady between the first and second waves of data collection. Importance and knowledge, then, exhibited different trajectories over time, reinforcing the notion that they spring from different origins that rise and fall independently.

#### Consequences of Importance and Knowledge

Visser et al. (2004) next explored the degree to which importance and knowledge regulate the impact of attitudes on thought and behavior in the same ways. Specifically, these investigators conducted a series of studies examining the effects of importance and knowledge on (1) attitude polarization following exposure to mixed evidence, (2) perceptions of hostile media bias, (3) selective information gathering, and (4) attitude-expressive behavior.

Attitude polarization. Following procedures developed by Lord, Ross, and Lepper (1979), Visser et al. (2004) presented participants with summaries of two scientific studies, one yielding evidence of negative psychological consequences for women who obtained a legal abortion, and the other offering evidence of positive psychological consequences. After reading this mixed set of evidence, participants answered questions measuring their attitudes toward abortion; participants had answered these same questions several weeks earlier as well, which permitted an assessment of attitude change. Participants also reported the degree to which they perceived their attitudes toward abortion to have changed, if at all, as a result of reading about the studies.

Replicating Lord, Ross, and Lepper (1979), Visser et al.'s (2004) participants perceived that the mixed evidence had polarized their attitudes: participants who were initially favorable toward legalized abortion perceived themselves to have become more favorable, and participants who were initially unfavorable toward legalized abortion perceived themselves to have become less favorable. And this perceived polarization was regulated by attitude importance: participants who attached more importance to the issue perceived greater polarization than did participants who attached less importance to their attitudes. In contrast, knowledge was unrelated to perceived attitude polarization.

Also replicating previous findings (e.g., Miller, McHoskey, Bane, & Dowd, 1993), Visser et al. (2004) found that participants' perceptions of their own attitude changes were completely incorrect. Whereas participants perceived their attitudes to have become more extreme, the mixed evidence in fact caused attitude moderation: people who were initially favorable toward legalized abortion became less so after reading the mixed evidence, and people who were initially unfavorable toward abortion became less so as well. Like perceived attitude change, actual attitude change was regulated by attitude importance, but in a way opposite to its effect on perceived polarization: participants who attached a great deal of importance to the issue exhibited less attitude change in response to the mixed evidence than did participants low in attitude importance. Interestingly, whereas importance was negatively associated with attitude change, knowledge was positively associated with change: people who were more knowledgeable about abortion exhibited more attitude moderation in response to the mixed evidence. Consistent with some prior research (for a review, see Wood, Rhodes, & Biek, 1995), more knowledge may have equipped people to objectively recognize the merits of the study that contradicted their own views and to see genuine flaws in the study that supported their views, making them more likely to temper their initial views.

Hostile media bias. Visser et al. (2004) asked participants to evaluate the fairness of media coverage of global warming in an effort to explore the impact of attitude importance and attitude-relevant knowledge on the hostile media bias, which is the tendency to perceive that a balanced presentation of information on a controversial issue is biased against one's own side of the issue (Vallone, Ross, & Lepper, 1985).

Vallone et al. (1985) suggested that the hostile media effect is driven at least partly by knowledge. They argued that when assessing the fairness of media coverage, people compare their own store of information about an issue to the information presented by the media. Because people tend to possess more attitude-congruent than attitude-incongruent information, even a balanced media presentation would appear to have omitted more of the former than of the latter, producing the perception of a bias against one's own side of the issue. And indeed, Vallone et al. (1995) found that people with larger stores of knowledge about the issue manifested a stronger hostile media bias than did people with little knowledge. Consistent with these findings, Visser et al. (2004) found strong evidence of a hostile media bias in people's perceptions of the news coverage of the existence of global warming that was regulated by knowledge: people who were highly knowledgeable about global warming perceived a much stronger hostile media bias than did people who were less knowledgeable about this issue. Importance, on the other hand, did not regulate the magnitude of the hostile media bias.

Selective information gathering. Visser et al. (2004) next explored the hypothesis that attitude importance – but not attitude-relevant knowledge – motivates people to selectively expose themselves to information that will permit them to use the attitude in a subsequent judgment. They told participants that they would receive information about twelve political candidates, each of whom they would later evaluate. For each candidate, participants were permitted to choose three out of six possible issues on which to learn the candidate's positions. As expected, people who attached more importance to the issue of capital punishment requested candidates' positions on that issue significantly more often. Similarly, people for whom legalized abortion was more important requested candidates' positions on that issue more often. In neither case was attitude-relevant knowledge related to information selection. Attaching importance to an issue apparently motivated participants to seek information that enabled them to use their attitudes when evaluating candidates, but possessing knowledge did not.

Attitude-expressive behavior. Performing an attitude-expressive behavior requires sufficient motivation to do so and sufficient knowledge to plan and execute appropriate behavioral strategies.

Importance and knowledge may provide such motivation and ability, respectively. To test this idea, Visser et al. (2004) asked undergraduates whether they had ever performed seven types of behaviors expressing their attitudes toward legalized abortion (e.g., contacting a public official to express their views, wearing a button or t-shirt indicating their views). Similar measures were included in a telephone survey of a representative national sample of American adults, asking about the issue of global warming. As predicted, importance and knowledge were both positively associated with increases in attitude-expressive behavior in both studies. And in both studies, importance and knowledge interacted significantly: the combination of high importance and high knowledge was associated with a pronounced surge in attitude-expressive behavior.

Negative affect. Visser et al. (2004) reasoned that if importance motivates people to protect and express their attitudes, they should experience negative affect when achieving these goals is blocked by impediments in the environment. For example, people who attach importance to a particular political issue should feel upset if the government enacts laws that are contrary to their position. People who simply possess a great deal of information about the issue, on the other hand, should be less likely to experience a negative affective reaction of this sort. And indeed, Visser et al. (2004) found that people who attached a great deal of importance to the issue of legalized abortion reported that they would be very upset if the government enacted a law that contradicted their position on this issue, whereas knowledgeable people were no more likely than those with little knowledge to find this upsetting. Similarly, people who attached importance to their abortion attitudes reported that they would find it distressing to learn that a close friend held a divergent viewpoint on this issue, whereas attitude-relevant knowledge was unrelated to this reaction. And attitude importance (but not knowledge) predicted the intensity of people's negative affective reactions to a compelling counter-attitudinal persuasive message that was difficult to refute: participants who attached great importance to their attitudes reported more negative emotions (e.g., anger, frustration, anxiety) than those who attached less importance to their attitudes.

Biased hypothesis testing. Visser et al. (2004) next explored the hypothesis that people who attach importance to their attitudes are motivated to disconfirm counter-attitudinal assertions, whereas people who



simply possess a great deal of attitude-relevant information have no particular motivation to do so. To explore this idea, Visser et al. (2004) used a modified version of the Wason (1966, 1968) selection task.

The Wason task requires participants to test a particular hypothesis using a limited set of evidence available to them. In the original version of the task, for example, participants were presented with four cards. They were told that a letter is printed on the front of each card and a number is printed on the reverse side of the cards. The cards were arrayed in front of the participant such that the front of two of the cards were visible (revealing letters) and the back of the remaining two cards were visible (revealing numbers). Participants were presented with the assertion, "If a card has a vowel on one side, it has an even number on the other side." Their task was to indicate which card(s) they would need to turn over to determine whether or not the assertion was true.

Although the task is quite simple, participants do surprisingly poorly – in most studies, only about 20% of participants perform the task correctly. The most common errors reflect a confirmatory bias: a tendency to seek evidence that confirms the hypothesis one has set out to test and to neglect information that could potentially disconfirm it (e.g., Wason & Johnson-Laird, 1972). Recent evidence indicates that when participants are intrinsically motivated to disconfirm the hypothesis they are testing, they perform significantly better on the Wason selection task (Dawson, Gilovich, & Regan, 2002).

Visser et al. (2004) constructed a version of the Wason selection task that required participants to test a counter-attitudinal assertion. If attitude importance motivates people to protect and defend cherished attitudes, people who attach more importance to the target attitude should be more motivated to disconfirm the assertion, improving their performance on the task. Possessing a large store of attitude-relevant knowledge, on the other hand, should not confer this motivation, suggesting that knowledge will be unrelated to task performance.

And indeed, this is precisely what Visser et al. (2004) found. Participants who opposed capital punishment were asked to test the hypothesis that all states that use capital punishment have murder rates that are lower than the national average. Replicating past investigations, participants did quite poorly on this task:

only about 30% of participants performed the task correctly, and as in past studies, the errors reflected a confirmatory bias. Consistent with predictions, however, task performance was significantly influenced by attitude importance: 53% of participants who considered capital punishment highly important performed the task correctly, whereas only 19% of participants who considered capital punishment to be unimportant did so. Also consistent with predictions, attitude-relevant knowledge did not moderate task performance. The proportion of participants who performed the task correctly was virtually identical among participants low and high in knowledge: 31% and 32%, respectively.

### Conclusions

Across these various studies, importance and knowledge were both related to various indicators of attitude durability and impactfulness. But these relations were far from identical. In some cases, importance had an effect when knowledge did not. For example, importance was associated with perceived attitude polarization following exposure to conflicting empirical evidence, whereas knowledge was not. Importance was also associated with negative affective reactions when an attitude was threatened, whereas knowledge was not. In other cases, knowledge appeared to regulate an attitude effect when importance did not. For example, more knowledgeable people perceived greater hostile media bias, whereas importance was not related to perceived media bias. And there were instances in which the two attributes related in opposite ways to attitude effects. For example, more knowledge about an attitude object was associated with more attitude moderation in the face of conflicting empirical evidence, whereas attaching more importance to the attitude was associated with less moderation. And the two attributes sometimes interacted to produce an effect: the combination of high importance and high knowledge was associated with a pronounced surge of attitude-expressive behavior.

These attributes also appeared to arise from distinct causal antecedents and fluctuate independently over time. And whereas importance seems to instigate the accumulation of attitude-relevant knowledge, knowledge does not appear to lead to increased importance. Thus, even though these attributes have consistently loaded on the same factor in exploratory factor analyses, importance and knowledge seem better described as different constructs possessing distinct psychological properties, arising from different origins,

producing disparate outcomes, and apparently operating via different causal processes.

### Importance and Certainty

In light of the findings that importance and certainty have often loaded on the same factor in exploratory factor analyses and have frequently been combined into indices, Visser, Krosnick, and Simmons (2003) explored whether this is a sensible strategy by comparing the cognitive and behavioral consequences of attaching importance to an attitude and of holding the attitude with certainty. We review their findings next.

### Hypotheses

Visser et al. (2003) examined whether importance and certainty regulate the degree to which Americans used their attitudes on government policy issues to choose between the candidates who ran for President of the United States in 1996. If importance motivates people to use an attitude, then greater importance attached to an issue such as abortion may have motivated individuals to choose between Bill Clinton and Bob Dole based on their attitudes toward abortion. That is, people who attached more importance to the issue of abortion may have been more likely to use the match between their own stand on the issue and the stands of Bill Clinton and Bob Dole to decide which of these candidates to support.

Uncertainty may cause people to hesitate before using an attitude, so lower certainty may have inhibited people from using their preference on a particular policy issue to choose between the competing Presidential candidates. And an interaction might appear, such that especially powerful impact of a policy preference on candidate evaluations might occur when both importance and certainty are high.

Visser et al. (2003) also explored the possibility that a person whose candidate preference is an expression of many important policy preferences may be more invested in that candidate preference. And if a person's candidate preference is derived from policy preferences that he or she holds with little confidence, he or she may be only minimally invested in that candidate preference. Thus, high importance or high certainty regarding many policy preferences may lead to greater commitment to candidate preferences and therefore more unhappiness if one's preferred candidate is not elected, more efforts to persuade others to vote for one's preferred candidate, greater intention to vote on election day, higher likelihood of actually turning out to vote

in the election, and greater frequency of other attitude-expressive behaviors.

Visser et al. (2003) also explored the possibility that observed differences in the ability of attitude importance and certainty to predict particular cognitive or behavior outcomes may be due to differences in the reliability with which the two constructs were measured. To do this, they used covariance structure modeling techniques to eliminate the distorting impact of random and systematic measurement error when assessing the relations of importance and certainty to four consequences of attitude strength.

### Evidence

Visser et al. (2003) tested the first set of hypotheses using data from 1996 National Election Study conducted by the Center for Political Studies at the University of Michigan. This survey involved interviews with a large, nationally representative sample of American adults during the weeks immediately preceding the U.S. Presidential election that year and again during the weeks following the election.

#### Impact of Policy Attitudes on Candidate Preferences

Visser et al. (2003) first explored whether importance and certainty regulated the degree to which people used their attitudes toward a particular issue when formulating candidate preferences. To do so, they assessed the relative proximity of participants' own attitudes on five different political issues and the attitudes of President Clinton and Senator Dole on those same issues. They also assessed participants' relative candidate evaluations, and they tested the notion that relative proximity to the candidates on issues that are personally important or held with great certainty will have an especially pronounced impact on relative candidate preferences.

As expected, the more importance people attached to an issue, the more impact that issue had on candidate preferences. In addition, attitudes held with greater certainty had more impact on candidate preferences than those held with less certainty. These effects were independent – importance and certainty each accounted for unique variance in candidate preferences – and there was no interaction between importance and certainty.

### Strength of Candidate Preference

Visser et al. (2003) next explored whether candidate preferences based on attitudes that are more important and/or held with more confidence are especially impactful. They constructed indices of total attitude importance and attitude certainty across a set of salient political issues and used these indices to predict various indicators of people's commitment to their candidate preference. And indeed, they found interesting divergences in the consequences of importance and certainty.

For example, the amount of importance people attached to a set of policy attitudes was unrelated to the degree to which they found one of their non-preferred Presidential candidates acceptable, but people higher in certainty were significantly less likely to find any non-preferred candidate acceptable. In contrast, people who attached a great deal of importance to their policy attitudes were more likely to try to convince other people how to vote, whereas people who held their policy attitudes with more certainty were no more likely to do so. And whereas importance and certainty were both positively related to pre-election intentions to turn out to vote, only importance predicted whether people actually voted.

### Distortions Due to Differential Reliability?

Visser et al. (2003) explored the relative impact of attitude importance and attitude certainty on four potential consequences of attitude strength: greater interest in obtaining information about the attitude object, greater attention to such information in the media, greater frequency of discussing the attitude object with friends, and greater effort to obtain attitude-relevant information for use in a subsequent judgment. And because these constructs had been measured with multiple items on several different types of measurement scale, Visser et al. (2003) were able to estimate these relations after parsing out the potentially distorting impact of both random and systematic measurement error. They found that attitude importance was strongly and significantly related to all four of the consequences, whereas attitude certainty was not associated with any of them. They also explored and found no evidence of an interaction between importance and certainty.

### Attitude-expressive Behavior

Using data from a large, representative sample of U. S. adults, Visser et al. (2003) also explored the

moderating impact of attitude certainty and attitude importance on attitude-expressive behavior. They expected that people would be particularly likely to act in accordance with their attitudes when those attitudes were especially important to them and they were unconstrained by attitude uncertainty. And this is precisely what they found: attitude importance and attitude certainty interacted to predict whether people had performed behaviors such as writing a letter to a public official to express their views or attending a meeting to discuss a particular issue. They also found that this two-way interaction was further moderated by household income when they explored the predictors of attitude-expressive financial contributions: among those who had sufficient resources, attitude importance and certainty interacted to predict giving, but among those who were under tight financial constraints, no such interaction emerged.

### Conclusions

Taken together, these results argue against treating attitude importance and attitude certainty as reflections of a single underlying construct. Doing so would have obscured the fact that importance and certainty each predicted unique variance in the impact of a policy attitude on people's candidate preferences and on their turnout intentions. And combining importance and certainty would have masked their distinct patterns of association with other outcomes: importance (but not certainty) predicted whether people turned out to vote on election day, whereas certainty (but not importance) predicted the degree to which people found a non-preferred presidential candidate acceptable. Finally, combining measures of importance and certainty would have obscured the interaction between them in predicting attitude-expressive behaviors. All of this suggests that there is utility in maintaining the distinction between attitude importance and attitude certainty in investigations of attitude strength.

Furthermore, these results continue to reinforce the portrait of attitude importance as a motivator, because it appears to have inspired people to use their attitudes when evaluating candidates and to express those attitudes behaviorally. Uncertainty appears to have operated as a restraint, inhibiting people from using their attitudes to evaluate candidates or to express those attitudes behaviorally. And uncertainty appears to have made people more open to the idea of supporting non-preferred candidates.

### Importance and Accessibility

Four past factor analytic studies included measures of both importance and accessibility and in every case these two attributes loaded on different factors. Furthermore, no past study we have uncovered has averaged importance and accessibility into a single index. Thus, it might appear that these measures are viewed as representing distinct constructs. But Roese and Olson (1994) argued that they may indeed amount to the same construct. We review work on this issue next.

#### Hypotheses

Highly accessible attitudes spring to mind spontaneously when an attitude object is encountered, without intent or cognitive control. Much theorizing about attitude accessibility has focused on the direct consequences of these cognitive processes, which unfold automatically and often non-consciously (e.g., Fazio, 1995). However, a very different literature has also considered accessibility to be consequential, but via perceptions of it in consciousness. For example, Tversky and Kahneman (1974) described the “availability heuristic” as a tool people use – the amount of difficulty a person has in trying to retrieve an instance of something from memory is taken to be diagnostic about the phenomenon being retrieved. Likewise, Schwarz (1998; Schwarz et al., 1991) has proposed that people use their own experience of the ease or difficulty of retrieving cognitive elements from memory as a basis for making inferences and judgments.

In line with this latter perspective, Roese and Olson (1994) proposed that the experience of attitude accessibility may influence people’s judgments about the importance of their attitudes. As we described earlier, these investigators proposed that people’s internal cues regarding the personal importance of their attitudes are often weak and ambiguous. When asked to report the importance of an attitude, people cast about for cues on which to base this judgment. Roese and Olson (1994) suggested that one useful cue in such situations may be the speed with which one’s attitude comes to mind. If an attitude comes to mind quickly, people may infer that it must be important to them, whereas if an attitude comes to mind slowly, people may infer that it must not be very important to them. In this way, attitude importance may be an after-the-fact reflection of attitude accessibility.

In contrast, Krosnick (1989) suggested that importance may be a cause of accessibility. Once a person decides to attach personal significance to an attitude, he or she is likely to seek out information relevant to it and to think deeply about that information and its implications for the attitude. As a result, the attitude is likely to become more accessible over time, springing to mind quickly and effortlessly when an individual encounters the object. Thus, the effect of importance on accessibility may be mediated by selective exposure and selective elaboration.

### Evidence

To test their hypothesis, Roese and Olson (1994) manipulated the accessibility of attitudes and then measured the importance of those attitudes. Specifically, these investigators induced people to express some attitudes repeatedly while not expressing other attitudes at all. Consistent with previous research (e.g., Fazio, Chen, McDonel, & Sherman, 1982), this manipulation increased the accessibility of the former attitudes. The manipulation also increased the degree of personal importance people said they attached to those attitudes.

Roese and Olson (1994) attempted to test the notion that attitude accessibility caused attitude importance reports. These investigators reasoned that if attitude importance judgments are in fact derived from attitude accessibility, then accessibility should have mediated the impact of the repeated expression manipulation on importance reports. That is, repeated expression should have caused increased accessibility, which in turn caused increased importance ratings.

Given their study design, testing this hypothesis required computing two within-subject partial correlations: one correlation of the manipulation with importance controlling for accessibility, and another of the manipulation with accessibility controlling for importance. However, Roese and Olson (1994) instead computed between-subjects partial correlations (N. J. Roese, personal communication, October, 1995), so their results on this point are not informative with regard to causal impact. Therefore, it is possible that the observed increase in importance may not have resulted directly from the increase in accessibility. Rather, it may have resulted from greater thought about the repeatedly expressed attitudes, perhaps leading people to recognize genuine and legitimate reasons to consider the issues more important.



Bizer and Krosnick (2001) conducted a set of studies aimed at resolving this ambiguity. In their first three studies, Bizer and Krosnick (2001) manipulated known antecedents of attitude accessibility and attitude importance and observed the impact on both attributes. If both of these attributes reflect a common underlying construct, then any manipulation that influences one should also influence the other. But if the two attributes represent distinct constructs, then a cause of one will not necessarily influence the other. Finally, if both are influenced simultaneously by a manipulation, then the impact of the manipulation on one attribute may be mediated by the other. Bizer and Krosnick also examined naturally occurring changes in importance and accessibility via a panel survey to see whether one variable predicted subsequent changes in the other. Thus, these studies offered opportunities to explore the latent structure of these attributes in a novel way.

#### Impact of Repeated Attitude Expression on Importance and Accessibility

In two studies, participants repeatedly expressed two attitudes and did not repeatedly express two others. Later, attitude accessibility and attitude importance were each assessed. As expected, repeated attitude expression rendered participants' attitudes more accessible in both studies. However, repeated expression did not increase importance ratings in either experiment. The manipulation had no effect on importance ratings in Study 1, and it tended to *decrease* importance ratings in Study 2. Because importance did not increase in either study, there was no need to examine whether accessibility mediated the impact of the manipulation on importance. And the fact that accessibility increased without a parallel increase in importance demonstrates that the attributes arise from at least somewhat distinct sources.

#### Impact of Personal Relevance on Accessibility and Importance

Bizer and Krosnick (2001) next manipulated participants' self-interest in an issue and explored the impact of this manipulation on attitude importance and on attitude accessibility. Participants were given the opportunity to read news articles from a "computerized bulletin board service." Two articles discussed policies that were going to be instituted at their own university, whereas two other articles discussed policies that had been rejected at a far-away university. Thus, two of the policies were related to participants' own material outcomes, and two were not. Participants were permitted to select which articles they wished to read

from a list of headlines and could spend as much time reading and thinking about the articles as they wanted. When they finished one article, participants could press a key to return to the list of articles, at which time they could select another article or end the reading portion of the experiment. Participants then reported their attitudes toward the four target policies, and a computer measured response latencies of these reports. Finally, participants completed a paper-and-pencil questionnaire that assessed their perceptions of the likelihood that each of the four policies would be enacted at their university and how important each issue was to them personally.

As expected, policies that were described as personally relevant to participants were indeed perceived to be more likely to be implemented at participants' own university than the other policies. Furthermore, attitudes toward the more relevant policies were more personally important and were reported more quickly than were attitudes on non-relevant issues. To identify the causal processes responsible for the effect of the relevance manipulation on importance and accessibility, Bizer and Krosnick (2001) estimated the parameters of the structural equation model shown in Figure 2. In light of findings reported by Boninger et al. (1995), Bizer and Krosnick (2001) expected that the personal relevance manipulation would influence perceptions of the likelihood of the policies being implemented at the participants' university, which would in turn influence the importance they attached to each issue.

Bizer and Krosnick (2001) also allowed for the possibility that the manipulation of personal relevance might impact accessibility. Reading a headline indicating that a story's topic was personally relevant may have increased the likelihood that people would choose to read the story. And reading the story would have increased participants' exposure to information about the target policy, which may have caused people to access their attitudes toward the policy. This would in turn increase the accessibility of those attitudes, even if some people ultimately concluded that the policy was not likely to be implemented at their own university or that the issue was not personally important to them for some other reason. Therefore, a direct influence of the manipulation on selective exposure was included in the model, and selective exposure could in turn affect accessibility.

According to the logic of instrumental variable analysis, this empirical context also affords the opportunity to statistically separate the reciprocal effects of importance and accessibility on one another (see Kenny, 1979). In particular, Bizer and Krosnick (2001) tested two key hypotheses: that importance might cause accessibility, and that accessibility might cause importance. The former effect would occur if high importance causes people to think more about the policy and their attitude toward it, which would in turn enhance accessibility. The effect of accessibility on importance could occur via the self-perception processes outlined by Roese and Olson (1994).

As the parameter estimates in Figure 2 indicate, enhancing the personal relevance of a policy increased perceptions of the likelihood that it would be implemented at participants' own university, which increased the amount of personal importance participants attached to their attitudes toward the policy. And as expected, enhancing the personal relevance of a policy in a story headline increased the likelihood that participants would choose to read about it, which in turn increased accessibility.

Attitude importance exerted a positive effect on attitude accessibility, but the effect of accessibility on importance was not significant. Thus, there is no evidence here that people inferred that their attitudes were more important because they came to mind more quickly. Instead, these data are consistent with the notion that importance inspired thought about the target policies, and this additional thought increased the accessibility of participants' attitudes toward the policies.

#### The Causes of Naturally Occurring Changes

In a final study, Bizer and Krosnick (2001) analyzed the data from the global warming survey described earlier. During each interview, participants reported their attitudes toward global warming and reported how important this issue was to them personally. Using a technique developed by Bassili (1996b), interviewers marked the length of time between the completion of asking the attitude question and the beginning of participants' answers, which was treated as a measure of attitude accessibility.

The flow of information on global warming between the two interviews offered Americans the opportunity to talk, think, and learn about the issue. During this time, people could have been selective in their

exposure to and processing of this information, and we would expect people for whom the issue was more important to attend more to this information than people who initially attached little importance to the issue. Thus, high initial levels of importance may have led to increases in the subsequent accessibility of global warming attitudes.

As the parameter estimates in Figure 3 indicate, attitude importance evidenced a moderately high level of stability over time, and accessibility manifested a somewhat lower but nonetheless reliable level of stability. Furthermore, initially higher attitude importance predicted subsequent increases in accessibility, consistent with the notion that importance is a cause of accessibility. Interestingly, initial levels of attitude accessibility did not predict subsequent changes in importance. Thus, greater initial accessibility was not associated with subsequently increasing importance.

### Conclusions

Bizer and Krosnick's (2001) first two studies pose a strong challenge to the general claim that people infer attitude importance from attitude accessibility, presuming that an object must be important to them if their attitude toward it came to mind quickly. Although repeated attitude expression increased attitude accessibility in both studies, it had no impact on attitude importance in Study 1, and repeated expression tended to decrease importance in Study 2. In Study 3, increased accessibility did not cause increases in importance, though the reverse causal process did occur. And in Study 4, increases in importance led to increases in accessibility over time, whereas accessibility did not influence subsequent attitude importance. All of this is inconsistent with the notion that importance and accessibility reflect a single construct. Furthermore, these studies provide additional evidence that importance is a motivator of information exposure and elaboration.

### Accessibility and Certainty

As with attitude importance, some scholars have argued that judgments of the certainty with which people hold their attitudes are derived from the accessibility of those attitudes (e.g., Bassili, 1996a). The notion is that if an attitude comes to mind quickly and effortlessly, people are likely to infer that they must

hold the attitude with great certainty. In contrast, if an attitude requires time and effort to call to mind, people may conclude that they are not very certain of their evaluation of an object or issue. Consistent with this view, attitude accessibility and attitude certainty have sometimes loaded on the same latent factor in exploratory factor analyses (e.g., Bassili, 1996a; Pomerantz et al., 1995). Berger (1992) explored this possibility more directly, and we describe her work next.

### Hypotheses

Like Visser et al. (2003), Berger (1992) conceptualized uncertainty as an inhibitor, rendering individuals reluctant to rely on their attitudes when faced with the task of forming a judgment or choosing a behavior. Drawing on past research, Berger (1992) posited that attitude certainty is determined at least in part by the volume and perceived reliability of attitude-supportive information stored in memory. Specifically, she suggested that when an attitude is supported by a sufficiently large base of reliable information, people will feel confident that their attitude is valid.

In contrast, Berger (1992) speculated that exposure to attitude-relevant knowledge does not, in and of itself, strengthen the link in memory between an individual's representation of an attitude object and his or her evaluation of the object. People can and often do process new information about an object without retrieving from memory their stored attitude toward the object, leaving attitude accessibility unaffected by the new information. In particular, she proposed that the frequency with which people are exposed to a set of information will determine the likelihood that their attitudes will be retrieved. When the information is being encountered for the first time, people are less likely to retrieve their attitudes and instead will devote their cognitive resources to encoding the information. When they have encountered the information several times and have therefore had ample opportunity to encode it, people are more likely to activate their attitudes toward the object when confronted by the information. And indeed, Berger and Mitchell (1989) demonstrated that moderate increases in exposure to attitude-relevant information do not increase attitude accessibility. Only when the frequency of exposure to new information becomes sufficiently high that new information is no longer being encoded does additional exposure encourage the activation of the attitude, increasing attitude

accessibility.

Thus, Berger (1992) predicted that moderate increases in exposure to new information would increase attitude certainty but would have no affect on attitude accessibility. In contrast, Berger (1992) expected that repeated attitude expression would increase the accessibility of people's attitudes, and she did not expect repeated expression to regulate attitude certainty.

Berger (1992) also anticipated distinct consequences of accessibility and certainty. Drawing on Fazio's (1990) theoretical and empirical work, Berger (1992) anticipated that attitude accessibility and attitude certainty would regulate attitude-behavior correspondence in different ways. In particular, following the tenets of the MODE model (Fazio & Towles-Schwen, 1999), Berger (1992) predicted that attitude accessibility would regulate the attitude-behavior relation when behaviors were spontaneous. That is, attitudes that come to mind quickly and effortlessly will guide spontaneous behaviors, whereas attitudes that are less accessible will have little impact on such behaviors. In contrast, she predicted that when people have the motivation and ability to thoughtfully contemplate a behavior, certainty (and not accessibility) will regulate attitude-behavior correspondence. That is, when they are carefully choosing a behavior, people will be relatively unaffected by the sheer accessibility of their attitudes and will instead choose to behave in accordance with those attitudes that they hold with great certainty.

#### Evidence

Berger (1992) enlisted research participants in the ostensible task of evaluating a set of five candy bars that were not currently available in their area but would be coming on the market in the near future. For each candy bar, participants were shown one print advertisement containing a photograph of the candy bar as well as product information. Some participants saw each advertisement one time, and others saw each advertisement three times. After they had seen the advertisements, participants expressed their attitudes toward each candy bar. Some participants accessed and expressed their attitudes toward each candy bar three times, whereas others accessed and expressed their attitudes toward the candy bars only once. Participants also rated the certainty with which they held their attitudes toward each candy bar. Participants next

completed a computer task that included measures of the accessibility of participants' attitudes toward the five candy bars. After they had completed this final task and had been paid for their participation, participants were directed to a large tray containing ten each of the various candy bars and, out of the sight of the experimenter, were invited to help themselves to seven candy bars as a parting gift.

As expected, participants who repeatedly expressed their attitudes subsequently exhibited greater attitude accessibility than those who had expressed their attitudes only once. Repeated expression had no impact on attitude certainty, however. Also as expected, repeated exposure to information about the candy bars increased the certainty with which participants held their attitudes, but it did not render those attitudes any more accessible. Furthermore, attitude certainty and attitude accessibility were uncorrelated in each of the experimental conditions and in the sample as a whole. Finally, attitude certainty moderated the relation between attitudes and behaviors: people who held their attitudes with confidence were much more likely to act in accordance with those attitudes when selecting candy bars, whereas people who held their attitudes with less confidence exhibited weaker attitude-behavior correspondence. Attitude accessibility was entirely unrelated to attitude-behavior correspondence.

### Conclusions

These findings dovetail with the work of Visser et al. (2003), reinforcing the notion that uncertainty may operate as an inhibitor, rendering people hesitant to use their attitudes as guides to behavior. These findings are also in harmony with the work of Bizer and Krosnick (2001), suggesting that subjective judgments regarding strength-related properties of one's attitudes (e.g., importance, certainty) are not simply derivative byproducts of attitude accessibility. Instead, these results offer compelling evidence that attitude certainty and attitude accessibility are distinct psychological constructs with at least partially unique antecedents and at least some distinct behavioral consequences.

### Attitude Strength Composites and their Constituents

Several studies have compared the relations of a cognitive or behavioral consequence of attitudes with either individual strength-related attributes or a composite index of those attributes. If a set of strength-related

attributes all relate in the same way to specific cognitive or behavioral consequences of attitudes, little is lost by combining the various attributes into an index. But evidence that different attributes relate in different ways to a cognitive or behavioral consequence would suggest that composite indices obscure the true structure and function of strength-related attitude attributes. We next review evidence of this sort.

#### Ease of Retrieval Effects on Importance, Intensity, and Certainty

Wänke et al. (1996), Haddock et al. (1996), and Haddock et al. (1999) explored the impact of the ease of information retrieval on reports of attitude importance, intensity, and certainty. Specifically, these researchers manipulated the experienced ease of producing attitude-congruent or attitude incongruent arguments: some respondents were asked to do a difficult task (to list seven arguments supportive of or opposed to a particular policy), while other respondents were asked to do an easier version of the same task (list only three arguments).

Wänke et al. (1996), Haddock et al. (1996), and Haddock et al. (1999) expected that the experienced difficulty of generating arguments would influence respondents' perceptions of attitude importance, intensity, and certainty. Having found it very difficult to generate seven arguments consistent with their own opinion, people might reason, "If I had a strong opinion on this issue, I ought to have an easy time generating facts to back up my opinion. But since it was tough for me, maybe I don't feel all that strongly on this issue, maybe I'm not very certain about where I stand, and maybe the issue isn't very important to me." But if people find it easy to generate three supportive arguments, there would be no reason for self-doubt in these regards. Likewise, the experience of easily generating three arguments challenging their own viewpoints might lead people to doubt the validity of their own opinions, thereby reducing perceived confidence, intensity, and importance. But if people have difficulty generating seven counter-attitudinal arguments, they again have no reason for self-doubt.

To test these hypotheses, Haddock et al. (1996) and Haddock et al. (1999) averaged together measures of certainty, intensity, and importance to yield a single composite. This composite had an alpha reliability of .91, which was consistent with Haddock et al.'s (1999) finding from an exploratory factor analysis that the



three dimensions loaded on a single factor. Further, this composite measure varied as expected according to the ease of argument generation. People who generated three attitude-supportive arguments had higher composite scores than people who generated seven attitude-supportive arguments, whereas people who generated seven counter-attitudinal arguments had higher composite scores than people who generated only three counter-attitudinal arguments.

However, an interesting pattern emerged in Haddock et al.'s (1999) study when the three strength-related attitude attributes were analyzed separately. Although the expected effects appeared significantly for certainty and intensity ratings (see also Wänke et al., 1996), importance ratings did not manifest the expected effect of the argument generation manipulation significantly in either of the two studies.

One possible explanation for the failure of importance to manifest the same effects evident in certainty and intensity is that the latter two dimensions may have been measured more reliably than was the former. However, in Haddock et al.'s (1996) and Haddock et al.'s (1999) studies, each attribute was measured by two questions, and all six questions employed the same seven-point ratings scale, ranging from "not at all" to "very." Therefore, it seems unlikely that notable differences between the dimensions in measurement reliability were present. Interestingly, use of the same response scale for all items raises the possibility that the coefficient alpha for the composite measure may have been inflated due to correlated measurement error shared across the six items (see Brady, 1985; Green & Citrin, 1994).

This study therefore offers further reason to draw a distinction among strength-related attitude attributes. Certainty and intensity ratings were identically influenced by the argument generation manipulation, which is consistent with the claim that they reflect a single underlying construct. However, the evidence suggesting that importance was not influenced by the manipulation indicates that it is a distinct construct. Collapsing the strength-related attributes into an index masked an interesting finding – that importance responded to a manipulation differently than did the other attributes.

#### Effects of Importance, Intensity, and Certainty on Resistance to Attitude Change and of Attitude Stability

Another study illustrating the same sort of disparity among constituents in their consequences was

reported by Bassili (1996b). His composite of importance, knowledge, certainty, intensity, and other variables failed to predict attitudes' resistance to change and stability over time in a series of tests. But when certainty, importance, and intensity were treated as separate and distinct predictors of resistance to change and persistence over time, all three variables had statistically significant effects in the expected direction. That is, higher importance, intensity, and certainty were associated with more resistance to change and more stability over time, just as other studies had previously shown for importance and certainty individually (importance: Fine, 1957; Gorn, 1975; Zuwerink & Devine, 1996; certainty: Marks & Kamins, 1988; Swann & Ely, 1984; Swann, Pelham, & Chidester, 1988). Thus, creating a composite again clouded the appearance of effects that were apparent when treating the constituents separately.

#### Moderators of Response Effects in Attitude Measurement

A final set of studies explored whether effects of the order in which questions are asked and the wordings of those questions are moderated by strength-related attitude features. Many scholars have presumed that such response effects are most likely to appear in reports of weak attitudes (c.f., Cantril, 1944; Converse, 1974; Payne, 1951). The basis of this argument is the notion that question changes may alter people's perceptions of their attitudes. If people's internal psychological cues revealing their attitudes are weak, then those cues might be easily overwhelmed by aspects of the question encouraging certain responses.

In one test of this notion, Krosnick and Schuman (1988) analyzed 27 experiments conducted in national surveys. These surveys included question manipulations known to cause response effects. Surprisingly, measures of attitude importance, intensity, and certainty did not reliably predict the magnitude of the impact of most question wording, format, and order manipulations on responses. In a series of similar experiments, Bishop (1990) found evidence supporting the same conclusion.

However, for one type of response effect, moderation did reliably appear. This response effect involves offering or omitting a middle alternative (e.g., "keep things as they are now") between two polar opposite viewpoints (e.g., "make divorce laws stricter than they are now" and "make divorce laws less strict than they are now"). Krosnick and Schuman (1988) and Bishop (1990) found that people for whom attitudes

were highly important or intense were relatively immune to whether the middle alternative was offered or omitted in such questions. In contrast, people whose attitudes were low in importance or intensity were especially likely to be attracted to the middle alternative when offered.

Lavine, Huff, Wagner, and Sweeney (1998) later presented evidence suggesting that a different type of response effect might be regulated by strength-related attributes as well. In their study, people were first asked a series of context questions and a target attitude was then measured. The context questions were designed to promote either liberal or conservative responses to the target attitude question. Lavine et al. (1998) found that inter-attitudinal embeddedness – a construct not previously investigated – moderated the question order effect. People who perceived strong implicational relations between the target attitude and attitudes toward other social and political attitudes were less susceptible to the context manipulation than were people who perceived weaker inter-attitudinal links. More strikingly, an average of several strength-related attitude attributes (including importance, certainty, and extremity) regulated the question order effect as well. Lavine et al. (1998) argued that this moderation appeared because their measure of embeddedness and their aggregation of strength-related constructs were more “broad in bandwidth” (p. 369) than were the measures used by Krosnick and Schuman (1988) and Bishop (1990).

One can view Lavine et al.’s (1998) findings as validating the claim that when an attitude is weak, reports of it are especially likely to be susceptible to all sorts of response effects. But another possibility is that Lavine et al.’s (1998) results are confined to the specific response effect they examined – a particular type of question order manipulation. Lavine et al.’s (1998) target attitudes were toward welfare and the rights of people accused of committing crimes. Before expressing their views on these issues, participants first answered a series of questions designed to bring to mind considerations that supported either liberal or conservative stands on the target issues. These kinds of question order effects seem likely to have occurred because the weights attached to various considerations in deriving the target attitudes were altered by the context questions (see Tourangeau et al., 1989; Tourangeau & Rasinski, 1988). That would suggest that this particular type of question order manipulation leads to real changes, at least temporarily, in people’s

evaluations of the target attitude object. And attitudes that are tightly linked to a set of related attitudes may be invulnerable to this type of response effect because people may recognize that changing such an attitude could create logical coherence problems in their system of related attitudes. More required movement in other cognitive elements should be a direct inhibitor of attitude change.

The individual strength-related attributes that composed Lavine et al.'s (1998) composite included importance, elaboration, certainty, extremity, ambivalence, and intensity. Each of these attributes has been shown to be correlated with resistance to attitude change. Thus, as expected, when each attribute was examined individually, Lavine et al. (1998) found strong and significant context effects for both target issues among participants who were highly ambivalent, low in prior elaboration, low in attitude certainty, low in attitude extremity, and low in intensity. In contrast, context effects were rarely significant for participants high on each of these strength-related attributes. Nonetheless, with one exception, the overall interactions between each strength-related attribute and the context manipulation were not statistically significant. As we reported above, however, aggregating these six attributes did yield a significant interaction between attitude strength and the context manipulation. This may suggest none of these attributes provided as reliable an assessment of attitudinal embeddedness as the direct measure that Lavine et al. (1998) developed, and the joint presence of importance and certainty and prior elaboration and the other constructs included in the composite also may have provided a better approximation of embeddedness. This is consistent with the notion that these attributes were each more indirect measures of the moderating construct at work.

Other question wording and order manipulations may operate through different processes, and may not be moderated by attitude embeddedness. For example, some question order effects seem likely to be driven in large part by self-presentational concerns rather than true changes in people's attitudes (see Schuman & Presser, 1981). People prefer to appear consistent in their attitudes and beliefs, so responses to initial questions may constrain subsequent responses as people strive to maintain consistency across a set of responses. Prior questions can also make salient particular norms to which people may want to appear to adhere. For example, people are more likely to say that reporters from communist countries should be

permitted to come to the United States and file reports in their home countries if this question is directly preceded by a question about whether U.S. reporters should be permitted to go into communist countries and file reports about that country back in the U.S. (Hyman & Sheatsley, 1950; Schuman & Presser, 1981). Apparently, answering the initial question about U.S. reporters invokes a norm of reciprocity or even-handedness, making it uncomfortable for people to say that reporters from communist countries should be treated differently than U.S. reporters. Question order effects of this sort seem less likely to be moderated by inter-attitudinal embeddedness.

Similarly, some question wording effects may be driven not so much by real changes in people's attitudes, but by changes in the perceived extremity of the response options. For example, people may perceive "forbidding" a particular behavior to be more extreme than "not allowing" that same behavior (see Hippler & Schwarz, 1986). If this type of question wording effect is driven by changes in the perceived extremity of the response options, it seems unlikely to be moderated by embeddedness. Instead, it may be moderated by attitude extremity or intensity, with people who hold moderate or less intense attitudes more likely to shy away from endorsing the extremely worded response.

Interestingly, the response effects investigated by Krosnick and Schuman (1988) and Bishop (1990) also seem unlikely to have resulted from the momentary alteration of the weights attached to specific attitude-relevant considerations that presumably yielded Lavine et al.'s (1998) question order effect (see Krosnick, 1991). Therefore, inter-attitudinal embeddedness may not have been a relevant moderator, but other strength-related attitude attributes may have been.

All of this suggests that different response effects may be moderated by different attitude attributes, depending upon the particular cognitive mechanism that is responsible for the response effect. So the mere existence of a response effect does not necessarily mean that the attitudes being measured are weak. And the particular attitude attribute that regulates one response effect may not regulate another response effect.

Bassili and Krosnick (2000) set out to investigate these possibilities using a wide range of strength-related attributes and a range of different sorts of response effects. In Bassili and Krosnick's (2000) study, a

random sample of University of Toronto students was interviewed by telephone to assess four types of response effects. The first was a question order effect involving abortion items. All respondents were asked whether a married woman who does not want any more children should be permitted to obtain a legal abortion. Some respondents were simply asked this question, whereas others were first asked whether it should be possible to obtain a legal abortion if there is a strong chance of a serious defect in the baby. Asking the birth defect question first renders people less likely to support the married woman's right to a legal abortion (Schuman & Presser, 1981).

Second, the impact of offering or omitting a middle alternative was observed by measuring respondents' attitudes regarding whether penalties for marijuana use should be made stricter or less strict. Some respondents were offered a middle alternative (i.e., "keep laws about the same"), and others were not. People are more likely to select a middle option when it is presented to them than to volunteer this response when the response option is not presented explicitly (Schuman & Presser, 1981).

Third, acquiescence response bias was measured by asking respondents whether they agreed or disagreed with one of two opposite statements about the primary cause of crime and lawlessness in America: "individuals" or "social conditions." For respondents given one of the statements, blaming "individuals" for crime and lawlessness should have resulted in selecting the "agree" response option. For respondents given the other statement, blaming "social conditions" should also have resulted in an "agree" response. Because some people agree with just about any statement, regardless of its content, this design permitted assessment of the extent of such acquiescence (Schuman & Presser, 1981).

Finally, to measure the effects of tone of wording, respondents were asked whether anti-democracy speeches should be either allowed or forbidden. People are less likely to endorse "forbidding" a policy than to say it should not be allowed (Schuman & Presser, 1981).

For each of the four experiments, seven strength-related attitude attributes were assessed, including importance, knowledge, certainty, intensity, likelihood of attitude change, extremity, and accessibility (via response latencies). To test Lavine et al.'s (1998) claim about broad band coverage, a meta-attitudinal

aggregate was computed by averaging the measures of importance, knowledge, certainty, intensity, and likelihood of change.

No single strength-related property regulated all four of the response effects. Instead, one or two single attributes regulated each effect (see Figure 3). For example, extremity regulated the question order effect and acquiescence; certainty and knowledge regulated the middle alternative effect; and intensity regulated the tone of wording effect. The meta-attitudinal aggregate only proved reliable in moderating response effects for two of the four questions (question order and middle alternative); and in both of these cases, an individual attitude attribute evidenced just as much moderation.

In each case, stronger attitudes manifested weaker effects of question form, wording, or order, but different strength-related attributes moderated the various response effects. These findings challenge the notion that broadband coverage is necessary to observe moderation by strength-related attitude properties. Also, reaction time measures of accessibility did not predict the magnitude of any of the response effects, disconfirming Bassili's (1996a) implication that operative measures such as this will succeed in specifying attitude dynamics when meta-attitudinal measures fail.

Because individual strength-related attributes predicted particular response effects, and different attributes regulated the various response effects, these results reinforce the general notion that strength-related attributes are best viewed as distinct constructs. Furthermore, the failure of attribute aggregations to moderate any better than individual constituent properties challenges Lavine et al.'s (1998) claim that treating multiple attributes as surface manifestations of underlying constructs will improve the validity of results obtained. Indeed, in the case of the tone of wording effect, individual properties successfully moderated effects, but combining them with other properties into an index masked the effects.

#### General Discussion

In their 1998 chapter in the Handbook of Social Psychology on "Attitude Structure and Function," Eagly and Chaiken reviewed the existing literature on the latent structure of strength-related attitude properties and noted that factor analytic studies had suggested a distinction between cognitive dimensions of attitude

strength and affective dimensions (p. 291). But these authors noted as well that “although several findings have ... suggested the utility of distinguishing cognitive from affective aspects of attitude strength, subsequent work may well yield other useful distinctions beyond, or within, these two broad dimensions (p. 291).” Eagly and Chaiken (1998) called upon researchers to “go beyond the question of strength’s dimensionality to the question of whether such distinctions matter. If all aspects of attitude strength produced the very same effects, the theoretical importance of distinguishing types of strength would be hollow (p. 291).” The current review was done in the spirit of Eagly and Chaiken’s (1998) recommendation, confirming their expectation. We have seen repeatedly that individual strength-related attributes have distinct origins and different effects on thinking and behavior.

More specifically, we have seen that antecedents of one attribute were often unrelated to other attributes. For example, perceiving that important others cared deeply about an issue was associated with greater attitude importance, but it was unrelated to attitude-relevant knowledge. Similarly, in several studies, repeated attitude expression increased attitude accessibility, but repeated expression did not affect attitude importance, nor did it affect the certainty with which people held their attitudes. In contrast, repeated exposure to attitude-relevant information increased attitude certainty but had no impact on attitude accessibility. And the ease or difficulty of generating attitude-relevant arguments influenced attitude certainty and attitude intensity but was unrelated to attitude importance. In those few cases where an antecedent was related to two strength-related attributes, different mediators were shown to be at work. Finally, pairs of attributes fluctuated independently over time, reinforcing the notion that they have distinct antecedents.

Strength-related attributes also related to cognitive and behavioral outcomes in distinct ways. In many instances, pairs of attributes exerted uncoupled effects. For example, importance was associated with perceived attitude polarization in response to conflicting empirical evidence, and with negative affective reactions when an attitude was threatened, whereas knowledge was unrelated to both of these phenomena. In contrast, knowledge was positively associated with the hostile media bias, whereas importance was unrelated to this phenomenon. In addition, importance (but not certainty) predicted whether people turned out to vote on



election day, whereas certainty (but not importance) predicted the degree to which people found a non-preferred presidential candidate acceptable. And attitude certainty regulated the correspondence between attitudes and a deliberative behavior, but attitude accessibility did not.

In other cases, two attributes related in opposite ways to an outcome. For example, attitude-relevant knowledge was positively associated with attitude moderation in the face of conflicting evidence, whereas attitude importance was negatively associated with moderation. And in still other cases, attributes interacted to predict a cognitive or behavioral outcome. For example, the combination of high importance and high knowledge was associated with an especially pronounced surge of attitude-expressive behavior.

This evidence sharply conflicts with the notion that two or more strength-related attributes can be treated as interchangeable manifestations of a more general underlying construct. To the contrary, the evidence we have reviewed suggests that doing so will yield inaccurate characterizations of strength-related processes, obscuring meaningful distinctions in the operation of the various strength-related attributes. Instead, the extensive body of evidence that we have reviewed supports a view of strength-related attributes as distinct constructs in their own right.

Meta-attitudinal indices of attitude strength. One particularly popular view regarding overlap among strength-related attributes involves attributes that reflect people's subjective judgments about their attitudes, which Basilli (1996a) dubbed "meta-attitudinal" indices of attitude strength (e.g., importance, certainty, perceived volume of attitude-relevant knowledge stored in memory). Some scholars have suggested that these attributes are all constructions, built from blurry introspective glances, simply reflecting the extent to which an attitude seems to its holder to be mushy or firm (e.g., Bassili, 1996a; Haddock et al., 1996, 1999). Regardless of whether people are asked about the importance they attach to an attitude or their confidence in holding it or how much relevant information they possess or how strong their feelings are about the object, says this view, people look to internal psychological cues for any vague sense of attitudinal crystallization and use that sense to derive an answer to whatever question has been posed. If this is true, then self-reports of such features are all manifestations of that vague introspective impression.

The evidence that we have reviewed poses a strong challenge to that view. Much of this evidence involved explicit comparisons of meta-attitudinal measures of importance to and certainty and we saw consistent evidence of unique antecedents and divergent cognitive and behavioral consequences. Although there is little doubt that these subjective judgments, like virtually all others, can sometimes be momentarily influenced by salient contextual features (e.g., Haddock et al., 1996, 1999; Wänke et al., 1996), the results that we have reviewed indicate that people's subjective judgments about their attitudes largely reflect psychologically meaningful variability in strength-related attitude properties.

#### Never Create Composite Indices?

Does all of this suggest that researchers should never create composite indices of strength-related attitude factors by combining measures of different strength-related attributes? Not necessarily. Comprehensive comparisons have not been conducted for every pair of strength-related attributes, so it remains possible that some attributes do in fact arise from largely overlapping antecedents and set into motion essentially the same consequences via the same mechanisms. Indeed, commonalities were occasionally observed in the evidence reviewed here. For example, in two separate studies, manipulating the ease with which people generated pro- and counter-attitudinal arguments affected attitude certainty and intensity in comparable ways (Haddock et al., 1999; Wänke et al., 1996). And Visser et al. (2003) found that importance and certainty were related to some of the same outcomes. Both regulated the impact of particular issues on people's candidate preferences, for example, and both predicted their intentions to turn out to vote on election day. Thus, continuing the quest for parsimony in this domain may well be sensible and fruitful.

It seems quite possible that combining sets of strength-related attributes may sometimes be a prudent strategy. For example, there are only a limited number of distinct cognitive processes by which people can resist attitude change (e.g., generating counterarguments, bolstering one's original attitude, derogating the source of a persuasive message). Because strength-related attributes appear to outnumber distinct processes of resistance, there is likely to be overlap in the mechanisms by which different strength-related attributes lead to resistance. It may therefore be possible to identify clusters of strength-related attributes that lead to the same

outcome through the same processes. This approach may yield a taxonomy of strength-related attributes based not simply on covariation (the criterion that has been used in much prior work), but based instead on the impact that they have, and on the mechanisms by which they operate. Thus, our position is not that researchers can never justify creating composite indices of strength-related attributes. But correlations among those attributes do not provide adequate justification for doing so.

Having said that, it is worth noting that although pair-wise comparisons of all strength-related attributes have not yet been conducted, the existing evidence seems to suggest that overlap in antecedents and consequences of attributes is the exception rather than the rule. As we have seen, even attributes that are quite strongly correlated and that reliably loaded on the same factor in exploratory factor analyses nonetheless exhibited very different effects on thought and behavior. It seems sensible, therefore, for researchers to adopt a starting assumption that the various attributes are distinct constructs until clear and compelling evidence of their overlap is documented.

Importantly, this also suggests that we should be cautious when interpreting the results of past investigations of strength-related processes that involved composite indices. The evidence we have reviewed suggests that such results may obscure sharp divergences in the consequences of the individual attributes from which the composites were constructed. And indeed, this danger has been demonstrated in some of the investigations we have reviewed.

For example, Pomerantz et al. (1995) combined measures of importance, knowledge, value-relevance, and centrality to the self to yield an index of attitude strength and found that this index was not associated with attitude change in the Lord et al. (1979) paradigm. Visser et al. (2004) replicated this null result when they combined measures of importance and knowledge into a single index of attitude strength and used it to predict attitude change within the Lord et al. (1979) paradigm. But as we reported above, when Visser et al. (2004) decomposed the composite index, they found clear evidence that knowledge was unrelated to attitude change, whereas importance was strongly related to it. Similarly, Visser et al. (2003) demonstrated that whereas importance increased as the result of the national debate on global warming, a composite index constructed

from measures of importance and certainty registered no change. This set of evidence suggests that claims about the antecedents or consequences of composite indices of attitude strength should be interpreted with caution (see, e.g., Bassili, 1996; Bassili & Roy, 1998; Eagly et al., 2000; Hodson, Maio, & Esses, 2001; Holland et al., 2002; Pomerantz et al., 1995; Prislin, 1996; Theodorakis, 1994; Thompson & Zanna, 1995; Verplanken, 1989, 1991)

#### Further Distinctions?

As it is premature to conclude that various pairs or sets of strength-related attributes reflect a common underlying factor, it may also be premature to conclude that the various strength-related attributes we have examined are themselves unidimensional constructs. And in fact, some scholars have challenged this notion.

Dimensionality of attitude importance. Although generally treated as a unitary construct, attitude importance may be multidimensional, with multiple functional bases. Attitude importance that arises from the recognition of a connection between an attitude object and one's core values may be distinct in terms of its phenomenology and its consequences from attitude importance that arises from the perception of a link between an attitude object and one's material interests. And both may be distinct from attitude importance that arises from the perception that one's reference groups or individuals view an attitude as important. Each may inspire discrete motivations: to *protect* the attitude that expresses one's core values, to hold the *correct* attitude toward the object that impinges on one's self-interest, and to *remain in step* with important others with regard to the attitudes they deem important.

Johnson and Eagly (1989) explored such a distinction between value-relevant involvement (defined as the activation of attitudes that are linked to a person's important values) and outcome-relevant involvement, (defined as the activation of attitudes toward issues or objects that are relevant to a person's currently important goals or outcomes) in meta-analysis. They concluded that value relevance led to increased resistance to attitude change (particularly when the arguments were strong), whereas outcome relevance led to more attitude change when arguments were strong and less attitude change when arguments were weak. These results suggest that value relevance may have led to biased processing of the persuasive messages, whereas

outcome relevance inspired objective processing (see, e.g., Petty & Cacioppo, 1986).

There are a number of reasons to hesitate before accepting the conclusions drawn from this evidence, however. Several potentially significant confounds in the design of this investigation make it difficult to know what to make of these findings. For example, almost all of the studies of outcome relevance were experimental and involved direct manipulations of outcome relevance, whereas the studies of value relevance were correlational (Petty & Cacioppo, 1990). Furthermore, most of the value relevance studies did not actually include measures of value relevance – instead, many of these studies were judged by the investigators to be value-relevant based on the topic addressed in the study. Third, unlike the outcome relevance studies, almost none of the value relevance studies implemented an argument quality manipulation. Instead, participants in a separate study rated the strength of the arguments post-hoc. This makes it difficult to know with confidence what impact argument quality had, because a post-hoc determination of argument may be susceptible to confounding with other aspects of the message such as satirical content, message discrepancy, and source credibility. Nevertheless, Lampron, Krosnick, Shaeffer, Petty, and See (2003) implemented an experiment that measured and manipulated both outcome relevance and value relevance and found results consistent with Johnson and Eagly's (1989) conclusions.

Because value-relevance and outcome-relevance as defined by Johnson and Eagly (1989) strongly resemble two of the primary causal antecedents of attitude importance, these results suggest that the route by which one comes to attach importance to an attitude may influence the psychological nature of attitude importance. And the nature of the importance one attaches to an attitude may determine its specific consequences.. This raises the possibility that importance is a multi-dimensional construct.

However, in an experimental investigation of this issue, Krosnick et al. (1995) found evidence inconsistent with the multidimensional view of attitude importance. They found that manipulations of one of the causal antecedents of importance reverberated through participants' cognitive structures, impacting other antecedents of importance. Specifically, Krosnick et al. (1995) found that increasing the degree to which an attitude impinged on participants' material interests also led them to view the attitude as more closely linked to

their core values. This suggests that the causal antecedents of attitude importance are related to one another and that changes in one can result in changes in others. This evidence challenges the notion that the causal underpinnings of attitude importance are discrete and lead cleanly to distinct “types” of importance. Instead, an attitude that is outcome relevant may also come to be seen as value relevant as well.

Nevertheless, conclusions on this matter should be drawn with utmost caution, given the dearth of empirical evidence. Additional research addressing this issue clearly seems warranted. And here, too, we contend that the critical issue to be explored is not the factor structure of these various types of attitude importance but rather, whether these types of importance do in fact arise from distinct causal antecedents and whether they set into motion different sorts of cognitive and behavioral consequences. To the extent that they do, differentiating among them would clearly seem warranted.

Differentiating meta-attitudinal from operative measures. Bassili (1996a) distinguished meta-attitudinal from operative measures of strength-related attitude features, and he presumed that each dimension is inherently either meta-attitudinal or operative. This is certainly true for dimensions like importance and certainty, which are defined as a person’s perceptions of his or her attitude. But other dimensions, such as knowledge volume, accessibility, and ambivalence can be measured either meta-attitudinally or operatively. That is, we can measure knowledge volume by asking a person how much he or she knows about an object, or we can ask him or her to list all such knowledge and count up the pieces, without ever telling the person we plan to do such counting. Likewise, we can measure response latency without ever saying we’re doing so, or we can ask a person how quickly his or her attitude comes to mind. And we can measure the conflict between the extents of people’s favorable and unfavorable reactions to an object, or we can ask them how ambivalent they feel toward it.

Krosnick et al. (1993) reported confirmatory factor analysis tests that indicated meta-attitudinal and operative measures of knowledge volume tapped the same construct. But very new work by Holbrook and Krosnick (2003) showed that meta-attitudinal and operative measures knowledge volume, accessibility, and ambivalence are all associated with distinct cognitive and behavioral consequences that fit sensibly with

faithful conceptualizations of these measures. For both knowledge volume and ambivalence, the relation between the meta-psychological and operative measures of the construct was moderate in size, but for accessibility, the relation was never significantly different from zero, suggesting that people may not be aware of or able to accurately report the accessibility of their own attitudes and that their perceptions of accessibility come from a different source. Furthermore, the effects of the six measures (meta-attitudinal and operative measures of knowledge volume, accessibility, and ambivalence) on the false consensus effect, hostile media bias, the similarity-attraction effect, resistance to attitude change, and attitude-behavior consistency were never identical. This suggests that it is worthwhile to abandon the notion that the meta-attitudinal and operative measures of these constructs are interchangeable and instead to build separate theories to account for the causes and consequences of perceived and actual knowledge volume, perceived and actual accessibility, and perceived and actual ambivalence.

#### Attitude Extremity: A Special Case?

Attitude extremity is unique among strength-related dimensions, because whereas the other dimensions refer to attributes of or judgments about the attitude, extremity refers to the attitude itself (where, along a bipolar continuum, the attitude falls). Thus, extremity is the only dimension that is not independent of the content of the attitude: attitudes that differ in extremity are, by definition, different attitudes.

Abelson (1995) has argued that extremity is conceptually rich, conveying (1) the intensity of feeling a person experiences with regard to the attitude object, (2) the degree to which a person holds an unqualified position, (3) the lengths a person believes his or her group should go in defending its position, and (4) the lengths to which one would go in defending the position. One might therefore wonder whether extremity may subsume some or all of the other strength-related dimensions of attitude strength, thus providing a reasonable index of overall attitude strength. And indeed, some researchers have presumed this to be the case: attitude extremity has sometimes been used as an omnibus measure of attitude strength (e.g., Edwards & Smith, 1996).

Of course, this line of thinking represents a return to the single-factor view of attitude strength, and the evidence we reviewed suggests that no single dimension can adequately capture the dynamics of attitude

strength. More specifically, a single dimension cannot account for the uncoupled, oppositely-valenced, or interactive effects that we routinely observed when pairs of strength-related attitude attributes were examined simultaneously. Thus, attitude extremity appears unlikely to subsume any of the pairs of attributes that we have examined.

More importantly, in several of the investigations that we have reviewed, the original authors replicated all of their primary analyses with attitude extremity included as a control variable (e.g., Berger, 1992; Visser et al., 2003; Visser et al., 2004), and this never meaningfully altered the results. This provides further evidence that attitude extremity cannot account for the associations between the various strength-related attributes and the attitude effects that we have reviewed.

### Implications

Resolving the debate over the underlying structure of strength-related attributes is not just a matter of “intellectual aesthetics.” That is, our motivation for the current review is not simply to clear up a technical dispute about how attitude strength ought to be measured. To the contrary, achieving clarity regarding the conceptualization of attitude strength is of fundamental importance for both basic and applied attitude research.

Conceptual implications. Assumptions about the underlying structure of strength-related attitude attributes set the agenda for research in this domain. If clusters of strength-related attributes are assumed to reflect a small number of more general constructs, the primary objective within the attitude literature becomes identifying these general dimensions and exploring their origins and consequences. This assumption further suggests that there is no need to continue fine-grained explorations of individual strength-related attributes (e.g., Krosnick, 1988a, 1988b; Wood, 1982). Instead, disparate lines of such research can be consolidated according to the assumed latent structure.

A multidimensional view of attitude strength charts quite a different course for attitude researchers in the future. Our primary objective would be to clarify the workings of each strength-related attribute, alone and in combination. We would pay close attention to the bases of attitude strength and develop refined predictions



regarding specific attitude effects given the nature of particular strength-related attitude attributes.

The work reviewed here provides strong support for this latter conceptualization of attitude strength, and illustrates the potential value of this approach. Individual lines of research fill in some details in the psychological portraits of various strength-related attributes. For example, attitude importance appears to be, at its core, a motivation to protect and use one's attitude, whereas knowledge appears to reflect a reservoir of ability, facilitating behavioral strategizing, critical analysis of new information, and more. We have also seen some illustrations of what a construct is not. For example, knowledge seems not to attenuate cognitive biases such as the false consensus effect, while accessibility seems not to be a regulator of the magnitude of response effects in attitude measurement. Lastly, we have seen evidence regarding the mechanisms by which effects occur. For example, self-interest and value-relevance affect knowledge only by inspiring increased importance. We hope that cataloging these sorts of findings along with others will eventually lead to a full and rich account of the origins and consequences of attitude strength.

Future research on this topic might borrow two of the approaches employed here and apply them in new contexts. One design is that used by Bizer and Krosnick (2001): implement an experimental manipulation narrowly designed to alter just one strength-related attribute (e.g., importance), and observe the consequences that follow for that attribute and various others. Other studies might employ the technique used by Visser et al. (2003; 2004) and Bassili and Krosnick (1999), whereby multiple dimensions are measured, and multivariate analysis is used to isolate their independent and interactive effects. When many studies employing these and other approaches document the full range of causes and effects of various attributes, we will be in a good position to build a general, integrative theory of attitude strength.

Practical implications. Clarifying the structure of strength-related attributes also has important practical implications. Consider just one real-world context in which the assumptions we make about the structure of attitude strength are likely to be tremendously important: public health. Public health officials have increasingly come to recognize that many of the leading causes of death in the United States could be drastically reduced if Americans would make a few simple changes in their behavior. In fact, an investigation

recently published in the Journal of the American Medical Association concluded that approximately half of the deaths in the U.S. can be attributed to a small number of preventable behaviors such as smoking, inactivity, poor diet, and alcohol consumption (Mokdad, Marks, Stroup, & Gerberding, 2004). Because of this, public health advocates have increasingly turned to the social and behavioral sciences for insight into behavior modification.

In some cases, people already possess positive attitudes toward healthy behaviors and negative attitudes toward unhealthy behaviors. But these health-positive attitudes do not always manifest themselves in the relevant health behaviors (see, e.g., Fisher & Fisher, 1992). The challenge for public health advocates, then, involves strengthening such existing attitudes so that they motivate and guide behavior and shape the way new information is processed, as well as resist change and persist over time. If many strength-related attributes reflect a common underlying construct, distinguishing among them would be unnecessary: interventions that brought about increases in any one attribute would result in increases in the others, so public health advocates could focus their efforts on the attribute that can most easily be modified.

The evidence reviewed here indicates that increasing one strength-related attribute will not necessarily increase others. This implies that public health advocates should broaden their efforts and target many strength-related attributes. Such advocates should be sensitive to differences in the ways in which strength-related attributes – alone and in combination – lead most reliably to attitude-behavior correspondence.

The case of AIDS in the United States provides an excellent illustration. Initially, public health officials assumed that if they could educate people about the disease and how to avoid it, the appropriate behaviors would follow (Helweg-Larsen & Collins, 1997). So they launched a massive public education campaign to increase the amount of *knowledge* people had about the disease (for review, see Fisher & Fisher, 1992). And it was tremendously successful – surveys show that virtually all U.S. adults now know what AIDS is, have some sense of how it is transmitted, and know what steps can be taken to avoid exposure (DiClemente, Forrest, Mickler, & Principal Site Investigators, 1990; Rogers, Singer, & Imperio, 1993). Yet such educational campaigns often yielded virtually no reliable effects on behavior (e.g., Mann, Tarantola, & Netter, 1992).

Knowledge, in and of itself, wasn't sufficient to instigate attitude-congruent behavior.

The research we reviewed suggests solutions to this problem. By recognizing knowledge as one of many distinct strength-related attributes, the multidimensional view acknowledges multiple avenues through which the attitude-behavior link can be strengthened. This view encourages public health advocates to focus not simply on increasing knowledge levels, but on increasing other strength-related attributes as well. And it suggests that particular combinations of strength-related attributes may be especially effective. In two studies involving different attitude objects and different subject populations, the combination of possessing a great deal of knowledge about an attitude object *and* attaching importance to the attitude was associated with a surge of attitude-expressive behavior far exceeding the impact of either attribute alone (Visser, Krosnick, & Norris 2004). Other strength-related attributes may similarly interact to produce stronger attitude-behavior links than any of the strength-related attributes produce in isolation.

There are also cases in which promoting healthy behavior requires changing existing attitudes that are counterproductive to healthy living. The multidimensional view acknowledges many avenues by which attitudes can be weakened, thereby facilitating persuasion. By reducing some of the strength-related attributes of people's attitudes, public health advocates may find subsequent efforts to induce attitude change more effective. Furthermore, by understanding the processes by which particular strength-related attributes confer resistance to change, promoters of public health may be better able to tailor persuasive campaigns to be maximally effective within their target audience.

### Conclusion

Attitude strength has been a focus of serious empirical interest among psychologists for decades, yet our understanding of this complex construct, its constituents, and the causal processes in which it plays a part is at an early stage. Much work remains to be done to illuminate the nature, structure, and function of attitude strength. As this research is conducted, it will do much to enhance the field's account of how, when, and why attitudes are the powerfully consequential psychological forces that fascinated Allport (1935).

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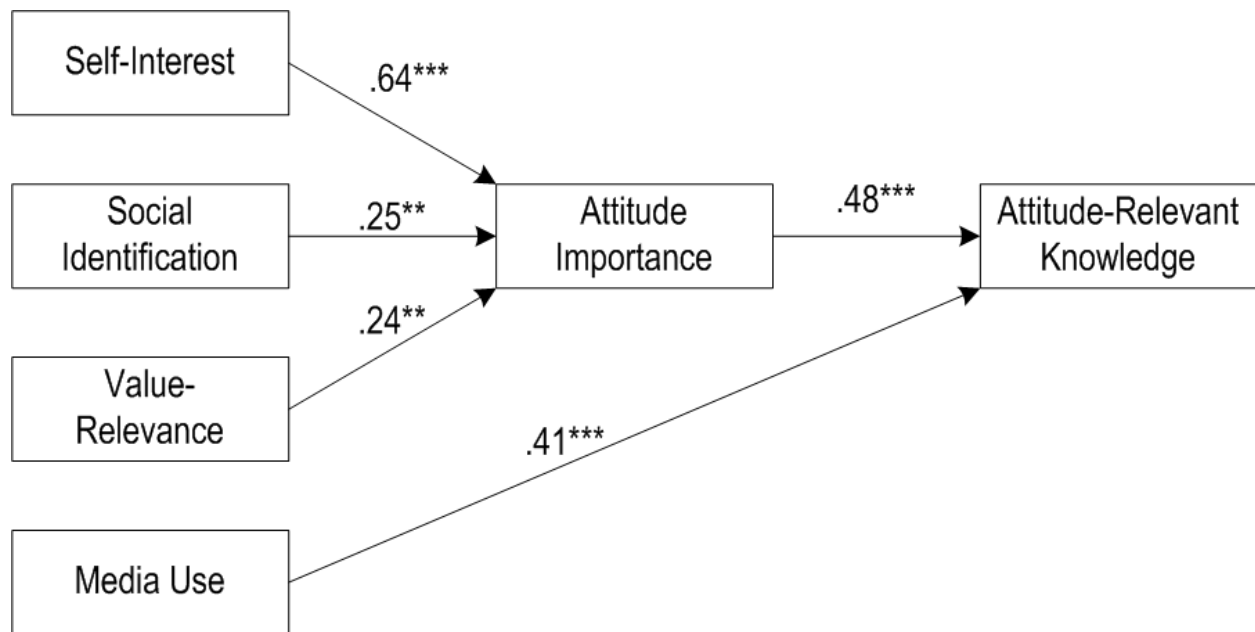
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Table 1. Comparison of Results from Exploratory Factor Analyses

Study	Issue	Researchers' Name for Factor	Strength-related Attitude Attributes					
			Importance	Knowledge	Elaboration	Certainty	Extremity	Accessibility
Prislin (1996)	Affirmative action	Generalized attitude strength Extremity Ease of attitude expression	1	1	1	1	2	3
Prislin (1996)	Abortion	Generalized attitude strength Extremity Ease of attitude expression	1	1 2	1	1	2	3
Prislin (1996)	Euthanasia	Generalized attitude strength Extremity Ease of attitude expression	1	1	1	1	2	3
Bassili (1996a)	Hiring quotas	Meta-attitudinal Operative	1	1	1	1	2	2
Bassili (1996a)	Pornography	Meta-attitudinal Operative	1	1	1	1	2	2
Bassili (1996a)	Hate speech	Meta-attitudinal Operative	1	1	1	1 2	2	2
Erber, Hodges, & Wilson (1995)	Ronald Reagan	Conviction Factor 2	1	1	1	1	2	2
Pomerantz et al. (1995)	Capital punishment	Embeddedness Commitment	1	1		2	2	2
Pomerantz et al. (1995)	Abortion	Embeddedness Commitment	1	1		2	2	2
Pomerantz et al. (1995)	Environment	Embeddedness Commitment	1	1		2	2	2
Pomerantz et al. (1995)	Gay men	Embeddedness Commitment	1	1		2	2	
Pomerantz et al. (1995)	Election forecasts	Embeddedness Commitment	1	1		2	2	
Kokkanaki (1998)	European Monetary Union	Embeddedness Conviction Internal consistency	1	2	1	2	2 3	
Krosnick et al. (1993)	Abortion (Study 1)	Factor 1 Factor 2	1	1	1	2	2	
Krosnick et al. (1993)	Death penalty	Factor 1 Factor 2	1	1	1	2	2	
Krosnick et al. (1993)	Defense spending	Factor 1 Factor 2 Factor 3	1	3	1	2	2	3
Krosnick et al. (1993)	Abortion (Study 3)	Factor 1 Factor 2 Factor 3	1 2	3	1	2	2	
Abelson (1988)	South Africa, nuclear power, God, abortion, welfare, strategic defense initiative, Nicaragua, AIDS	Ego preoccupation Cognitive elaboration Emotional commitment	1	2	1	3		
Lastovicka & Gardner (1979)	Consumer products	Importance Familiarity	1	2				
Bass & Rosen (1969)	Study 1 - George Romney	Involvement Confidence	1		1	2	2	
Bass & Rosen (1969)	Study 2 – Academics	Involvement Confidence	1		1	2	2	
Bass & Rosen (1969)	Study 2 – Quarter system	Involvement Confidence	1		1	2	2	
Bass & Rosen (1969)	Study 2 – Farm subsidies	Involvement/confidence	1		1	1	1	
Bass & Rosen (1969)	Study 2 – George Romney	Involvement Confidence	1		1	2	2	

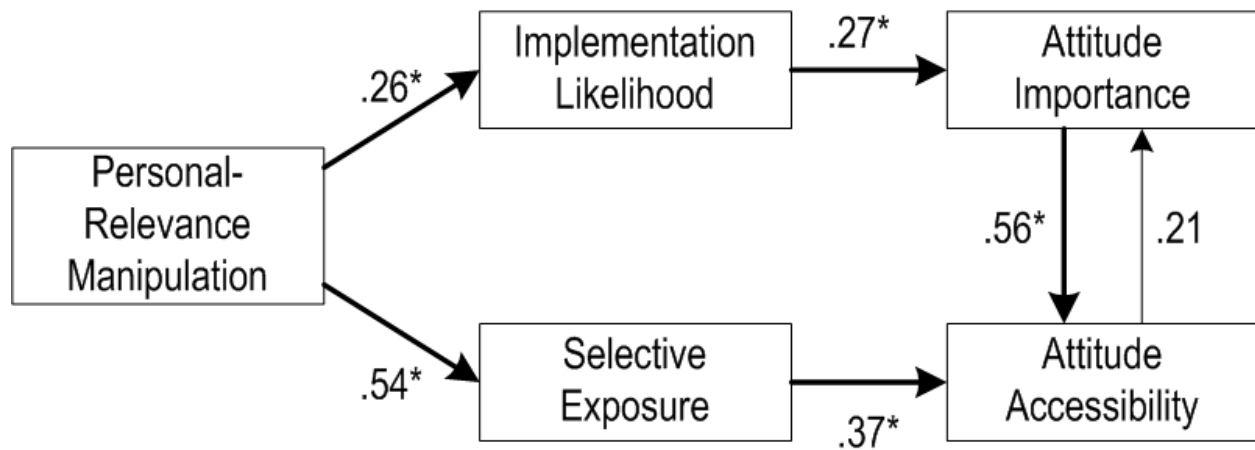
Note: Cell entries of “1” indicate that an attitude attribute loaded on the first factor. “2” indicates that an attitude attribute loaded on the second factor, and “3” indicates that the attribute loaded on the third factor.

Figure 1. Documenting the Causes of Attitude Importance and Knowledge



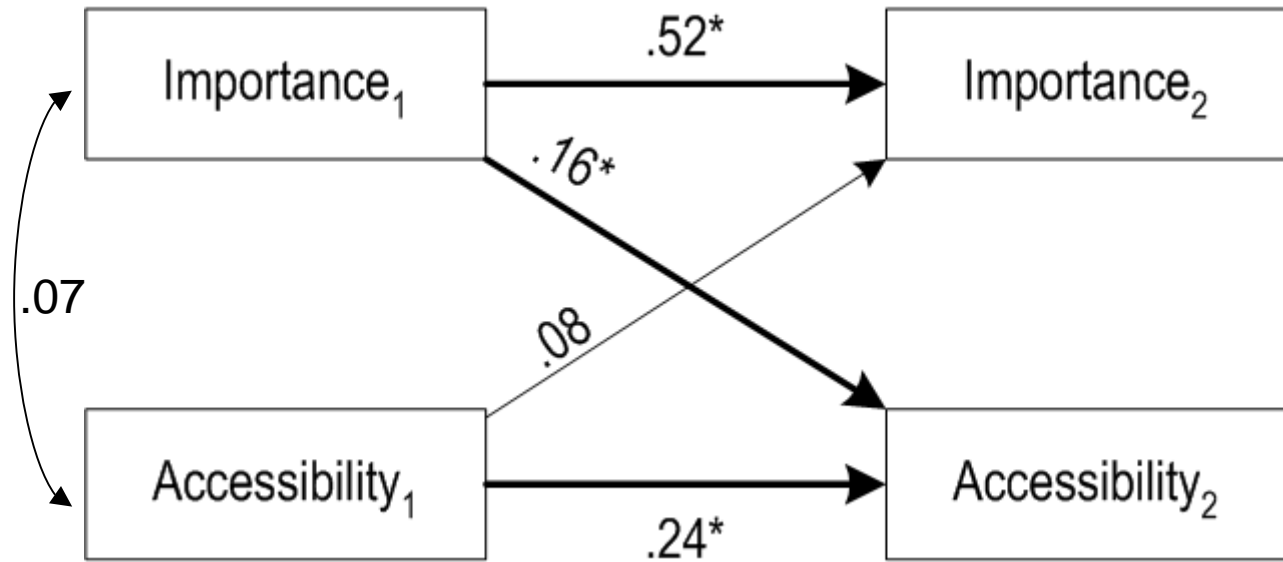
\*\*p < .01  
\*\*\*p < .001

Figure 2. Documenting the Impact of a Manipulation of Personal Relevance on Perceived Likelihood of Policy Implementation, Attitude Importance, and Accessibility



\*p < .05

Figure 3. Documenting the Impact of Attitude Importance and Accessibility on One Another



\*p < .05

Figure 4. Moderators of Response Effects

