

Attitude Strength: One Construct or Many Related Constructs?

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A variety of attributes differentiate attitudes that are stable and consequential from those that are not, including extremity, certainty, importance, knowledge, intensity, interest, direct experience, accessibility, latitudes of rejection and noncommitment, and affective-cognitive consistency. Although these dimensions are clearly conceptually and operationally distinct from one another, researchers have often assumed that some are interchangeable, or that two or more reflect common higher-order constructs. Three studies using multitrait-multimethod confirmatory factor analysis assessed the relations among these dimensions. Although some of these dimensions are strongly related, most are not, and a multifactor model seems necessary to account for their intercorrelations. Thus, it seems most sensible to think of all of these dimensions as distinct rather than as multiple manifestations of a smaller set of underlying attributes.

During this century, a great deal of research has demonstrated that some attitudes are firmly crystallized and consequential, whereas others are quite flexible and have few if any effects on thought or action (see, e.g., Raden, 1985). Thus, it appears that some attitudes can be described as *strong*, whereas others are *weak*. Generally, attitude strength has been a metaphor to describe attitudes rather than a formal construct that is defined conceptually and readily operationalized. Recently, however, Krosnick and Petty (1994) have suggested that attitude strength may best be defined in terms of four distinguishing features that strong attitudes possess: They are persistent over time, are resistant to change, have strong impact on information processing, and have strong impact on behavior.

Numerous studies have explored the features of attitudes that distinguish strong ones from weak ones and may therefore be the causes of strength. Ten such features or dimensions have been especially well studied: extremity, affective intensity, certainty, importance, interest in relevant information, knowledge, accessibility, direct behavioral experience, latitudes of rejection and noncommitment, and affective-cognitive consistency.

Our interest in this article is in the relations among these di-

mensions. There is, in fact, a fair amount of disagreement among attitude researchers in terms of which of these dimensions are interchangeable with one another and which dimensions reflect what higher-order constructs. In some cases, disagreement is explicit in the attitude literature, but in other cases, the theoretical perspectives offered by different researchers are implicitly in conflict with one another. It therefore seems sensible to explore these relations carefully and explicitly to promote further understanding of the origins and dynamics of attitude strength generally.

We begin by briefly defining each attitude attribute and describing how it is typically measured. We then review evidence and speculations regarding the relations among them. Finally, we report a series of studies designed to assess these relations more precisely than has been done previously and to explore their latent factor structure.

Dimensions of Attitudes

1. *Extremity*. Attitude extremity is the extent to which an individual's attitude deviates from the midpoint of the *favorable-unfavorable* dimension and is typically operationalized by folding over attitude self-report rating scales (e.g., Judd & Johnson, 1981; Tannenbaum, 1956).

2. *Intensity*. Attitude intensity is the strength of the emotional reaction provoked by the attitude object in an individual and is typically measured using self-reports of the intensity of feelings one has about the object (Cantril, 1944, 1946; Stouffer et al., 1950).

3. *Certainty*. Attitude certainty refers to the degree to which an individual is confident that his or her attitude toward an object is correct and is usually gauged by self-reports of certainty or confidence (Budd, 1986; Krosnick & Schuman, 1988).

4. *Importance*. Attitude importance is the extent to which an individual cares deeply about and is personally invested in an attitude and is ordinarily operationalized by self-reports of personal importance, concern, or caring about the attitude object

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(Cantril, 1944; Tourangeau, Rasinski, Bradburn, & D'Andrade, 1989a).

5. *Interest in relevant information.* Interest refers to the extent to which an individual is motivated to gather information about an attitude object and is gauged by self-reports of interest in or attention to such information (Bradburn & Caplovitz, 1965; Kendall, 1954).

6. *Knowledge.* Knowledge refers to the amount of information about an object that accompanies one's attitude toward it in memory and is assessed by knowledge listings (Wood, 1982), quiz questions (Iyengar, 1990), and self-reports of knowledgeability (Kanwar, Grund, & Olson, 1990).

7. *Accessibility.* Accessibility is the strength of the object-evaluation link in memory and has been measured by the length of time it takes people to report their attitudes toward the object (Fazio, 1986), by the likelihood that people will mention the object in response to open-ended questions (Krosnick, 1988a), or by reports of how often one thinks about or discusses the object (Brown, 1974; Davis & Smith, 1985).

8. *Direct experience.* Direct experience encompasses the degree to which one has participated in behavioral activities related to an object and the amount of direct contact one has had with it. This construct is often measured using self-reports of such behavioral experiences (Regan & Fazio, 1977; Schuman & Presser, 1981).

9. *Latitudes of rejection and noncommitment.* An individual's latitude of rejection refers to the size of the region of the pro-con attitude dimension that an individual finds objectionable, and the latitude of noncommitment is the region that he or she finds neither objectionable nor acceptable. These constructs are typically measured by giving subjects statements ranging across an attitude dimension and asking them to indicate which are acceptable or unacceptable (C. W. Sherif, Sherif, & Nebergall, 1965).

10. *Affective-cognitive consistency.* Affective-cognitive consistency refers to the match between one's feelings about an object and one's beliefs about its attributes (Rosenberg, 1956, 1968). This construct is measured by comparing people's reports of their attitudes toward an object with their reports of the importance of various goals related to it and their perceived probabilities that the object will facilitate or interfere with these goals (Chaiken & Baldwin, 1981; Norman, 1975).

Relations Among the Dimensions

These 10 dimensions have been defined and operationalized in ways that make them clearly distinct from one another. Some are attributes of the attitude itself (e.g., extremity and latitudes of rejection and noncommitment), some describe features of accompanying cognitive structures (e.g., knowledge and affective-cognitive consistency), some constitute subjective states or self-perceptions (e.g., importance and certainty), some involve links in memory (e.g., accessibility), and some involve behavior summaries (e.g., direct behavioral experience). Thus, they seem on the surface to be likely to have unique origins and to contribute uniquely to an attitude's strength.

Interestingly, however, these dimensions have all been shown to be related similarly to all four aspects of strength: persistence, resistance, impact on cognition, and impact on behavior. The

consistency of attitude reports over time is positively related to importance (e.g., Krosnick, 1988b; Schuman & Presser, 1981), certainty (Pelham, 1991), intensity (Schuman & Presser, 1981), interest (Hahn, 1970; Kendall, 1954), direct experience (Watts, 1967), and affective-cognitive consistency (Norman, 1975; Rosenberg, 1968). Resistance to change is positively related to extremity (Ewing, 1942; Osgood & Tannenbaum, 1955), certainty (L. J. Marks & Kamins, 1988; Swann & Ely, 1984), importance (Borgida & Howard-Pitney, 1983; Fine, 1957), interest in relevant information (Ewing, 1942; Knowler, 1936), knowledge (Wilson, Kraft, & Dunn, 1989; Wood, 1982), accessibility (Bassili & Fletcher, 1991), direct experience (Borgida & Campbell, 1982; Wu & Shaffer, 1987), affective-cognitive consistency (Chaiken, 1982; Rosenberg, 1968), larger latitudes of rejection, and smaller latitudes of noncommitment (e.g., J. L. Powell, 1975; C. W. Sherif, Kelly, Rogers, Sarup, & Tittler, 1973).

The impact of attitudes on perceptions of others' attitudes, attitudes toward other objects, and other cognitions is stronger for attitudes of greater extremity (Allison & Messick, 1988; Van der Pligt, Ester, & Van der Lindern, 1983), certainty (Bennett & Harrell, 1975; G. Marks & Miller, 1985), importance (Clare & Baldridge, 1968; Krosnick, 1988a, 1990a), knowledge (Iyengar, 1990; Vallone, Ross, & Lepper, 1985), accessibility (Fazio, Powell, & Herr, 1983; Fazio, Powell, & Williams, 1989), and affective-cognitive consistency (Chaiken & Yates, 1985), and for larger latitudes of rejection and smaller latitudes of noncommitment (e.g., C. W. Sherif et al., 1965). Also, the impact of attitudes on behavior is positively associated with extremity (Fazio & Zanna, 1978a, 1978b; Petersen & Dutton, 1975), certainty (Davidson, Yantis, Norwood, & Montano, 1985; Sample & Warland, 1973), importance (Jaccard & Becker, 1985; Schuman & Presser, 1981), knowledge (Davidson et al., 1985; Kallgren & Wood, 1986), direct experience (Fazio & Zanna, 1978a, 1978b, 1981; Schlegel & DiTecco, 1982), accessibility (Fazio, Chen, McDonel, & Sherman, 1982; Fazio et al., 1989), affective-cognitive consistency (Norman, 1975; Schlegel & DiTecco, 1982), larger latitudes of rejection, and smaller latitudes of noncommitment (Fazio & Zanna, 1978b; C. W. Sherif et al., 1973).

Why might there be such strong similarity among these dimensions in terms of their correlations with the four defining features of attitude strength? One possibility is that all these dimensions reflect a single underlying construct. That is, although the various dimensions are clearly conceptually and operationally distinct from one another, they may all have a small set of common causes. One might therefore think of the confluence of these dimensions as constituting emotional and intellectual engagement in an attitude.

Such engagement could be sparked initially, for example, by recognizing that one's self-interest is at stake in the issue (see, e.g., Krosnick, 1990b). This might instigate a sense of personal importance at first, which might then inspire extensive thinking and information gathering, which might ultimately yield extremity, intensity, expanded latitudes of rejection, and certainty. Thus, all of the attitude dimensions might be uniformly shaped by a set of common causes, thus constituting a single underlying construct. More generally, inducing a high level in any one of these dimensions might, over a period of time, reverberate

throughout the system, ultimately producing high levels in them all. That is, once one dimension is elevated (e.g., an individual attaches personal importance to an attitude), various cognitive and behavioral processes may be set in motion to elevate the other dimensions (e.g., attaching importance may enhance interest in the object, which may lead an individual to gather information about it and to think frequently about it, which in turn may enhance extremity).

If this is so, any departures from perfect association among the dimensions for any given attitude would simply reflect the fact that these sequential processes have not yet completely unfolded. Thus, all associations between these dimensions and attitude strength would be redundant with one another. Alternatively, there may be overlap among just some of the dimensions, such that they may reflect a smaller set of higher-order constructs and may have completely redundant effects on attitude strength.

Consistent with this general approach, attitude researchers have often treated some of these dimensions as interchangeable with one another. For example, a variety of investigators have presumed that attitudinal intensity can be measured using reports of certainty (Brim, 1955; Guttman & Suchman, 1947; Katz, 1944; McDill, 1959; Suchman, 1950), extremity (McDill, 1959; Tannenbaum, 1956), interest (Allport & Hartman, 1925), or direct experience (J. T. Johnson & Judd, 1983). Accessibility has also been measured using reports of importance (Aldrich, Sullivan, & Borgida, 1989). The construct of *involvement* has been measured using questions assessing importance (Apsler & Sears, 1968; Borgida & Howard-Pitney, 1983; Gorn, 1975; Howard-Pitney, Borgida, & Omoto, 1986); interest (Bishop, 1990; Stember & Hyman, 1949–1950); knowledge (Stember & Hyman, 1949–1950); frequency or amount of thought (Bishop, 1990; Petty & Cacioppo, 1979); or the confluence of importance, frequency of thought, commitment, and social support (Miller, 1965).¹ Similarly, researchers have measured *ego-involvement* using latitudes of rejection and noncommitment (C. W. Sherif et al., 1965), intensity (Cantril, 1946; Hurwitz, 1986), and importance (Rhine & Severance, 1970). *Ego preoccupation* has been measured by intensity, importance, and frequency of thought (Abelson, 1988). Attitudinal *salience* has been measured by questions about importance (Hoelter, 1985; Jackson & Marcus, 1975; Lemon, 1968; J. L. Powell, 1977; Tedin, 1980) and frequency of thought (Brown, 1974). And importance questions have been used to measure two other constructs as well: *personal relevance* (Cialdini, Levy, Herman, Kozlowski, & Petty, 1976) and *centrality* (Converse, 1964; Judd & Krosnick, 1982; Krosnick, 1986; Petersen & Dutton, 1975; Schuman & Presser, 1981).

If the 10 dimensions are all in fact perfectly overlapping with one another, it would be most parsimonious to think of them as manifestations of a single latent construct, perhaps what could be called *attitude strength*, *salience*, *involvement*, or *centrality*. This would greatly simplify theory-building and empirical testing in this arena, because the array of dimensions currently being addressed by separate research programs (see Petty & Krosnick, 1994) could be reduced to a single dimension that could then be studied in a much more streamlined fashion. What might appear to be 10 distinct qualities of attitudes could then

be thought of as only one single property, with one set of causes and one set of effects. Future research could then identify and measure the most effective indicators of this underlying dimension, and future theory building could focus simply on that one dimension instead of on a multitude of properties. Given the clear distinctions between the dimensions in terms of definitions and operationalizations, however, such perfect overlap seems unlikely. But some overlap seems quite possible, and some groups of dimensions may indeed reflect single underlying constructs.

Even if the 10 dimensions all represent independent but moderately overlapping constructs, questions would arise about the extent to which relations between individual dimensions and defining features of attitude strength are spurious. For example, it is conceivable that attitude accessibility is the sole determinant of attitude-behavior consistency and that importance and affective-cognitive consistency are only associated with attitude-behavior consistency by virtue of their correlations with accessibility. This sort of theoretical viewpoint has been offered most clearly by Fazio (1989), who suggested that at least some attitude attributes (e.g., certainty and direct experience) may enhance an attitude's impact on behavior and information processing by strengthening the object-evaluation link in memory (i.e., the attitude's accessibility). Therefore, if multivariate analyses were to be conducted to predict attitude-behavior consistency using accessibility, certainty, direct experience, and other attitude attributes, many of these correlates of consistency might turn out not to be causes of it. On the other hand, if the 10 dimensions are completely nonoverlapping, such multivariate analysis would likely leave all bivariate relations unaltered, suggesting that each dimension has unique origins and effects.

To understand which attitude attributes are responsible for attitude strength, one must begin by assessing the overlap among the dimensions. Many studies have gauged the relations among the dimensions and have consistently documented only low-to-moderate positive associations. For example, extremity is weakly positively correlated with intensity (Cantril, 1946; Guttman & Suchman, 1947), certainty (Allport & Hartman, 1925; D. M. Johnson, 1940; McDill, 1959), importance (Brent & Granberg, 1982; Krosnick, 1986, 1988a), accessibility (Fazio & Williams, 1986; Judd, Drake, Downing, & Krosnick, 1991), direct experience (Smith & Swinyard, 1983; Wilson, Hodges, & Pollack, 1991), and latitudes of rejection and noncommitment (Fazio & Zanna, 1978a).²

Similarly, importance is at best modestly correlated with intensity (Raden, 1983), certainty (Pelham, 1991), knowledge

¹ Interestingly, C. W. Sherif (1980, p. 4) presumed that the term *involvement* is an abbreviation for ego-involvement, which would imply a very different measurement procedure (assessing latitudes of acceptance, etc.).

² Bargh, Chaiken, Govender, and Pratto (1992) reported stronger correlations among extremity, ambivalence, and accessibility. However, these correlations were not computed across individuals for single objects, as was done in the rest of research on the relations. Rather, these investigators examined the relations of aggregated values of these variables for a single sample across a set of attitude objects. This difference in approach may account for the discrepancy of their findings from those of previous studies.

(Bradburn & Caplovitz, 1965; Krosnick, 1986; Wood, 1982), accessibility (Krosnick, 1986, 1988a, 1989; Tourangeau, Rasinski, & D'Andrade, 1991), interest (Krosnick, 1986), and direct experience (Krosnick, 1986; Wilson et al., 1991). Certainty is correlated in the same fashion with intensity (Allport & Hartman, 1925; McCroskey, Prichard, & Arnold, 1967–1968), knowledge (Davidson et al., 1985; Pelham, 1991), direct experience (Fazio & Zanna, 1978b; Smith & Swinyard, 1983), and latitudes of rejection and noncommitment (Fazio & Zanna, 1978b). And interest and knowledge are weakly correlated (Bradburn & Caplovitz, 1965; Hyman & Sheatsley, 1947), as are direct experience and latitudes of rejection and noncommitment (Fazio & Zanna, 1978a).

Most strikingly, affective–cognitive consistency appears not to be associated at all with attitude importance (Chaiken & Baldwin, 1981; Norman, 1975), knowledge (Chaiken & Yates, 1985), certainty (Fazio & Zanna, 1978b; Norman, 1975), extremity (Wilson et al., 1991), latitudes of rejection and noncommitment (Fazio & Zanna, 1978b), accessibility (Chaiken & Yates, 1985; Wilson et al., 1991), and direct experience (Fazio & Zanna, 1978b; Wilson et al., 1991).

On the basis of this sort of evidence, Raden (1985) concluded in an extensive literature review that these dimensions are not all reflections of a single underlying, superordinate dimension. For this reason, he suggested that the one-construct view should be abandoned in favor of a multiconstruct view in which the dimensions are essentially independent of one another.

However, it is difficult to know exactly what to make of the zero-order correlations that were the focus of Raden's (1985) study, because they are likely to have been distorted by random and systematic measurement error. Random measurement error attenuates correlations between indicators. Averaging a series of indicators to produce an index increases reliability somewhat, but some random error nonetheless remains in the index. Thus, random measurement error has most likely led correlations between attitude dimensions to appear weaker than they really are. Perhaps, then, the various attitude dimensions are more overlapping than these correlations suggest.

On the other hand, correlated measurement error due to shared method can make correlations more positive or more negative. For example, when two attitude dimensions are measured using the same response scale format, the correlation between them may be artificially more positive because of the common method covariance. But if two rating scales have the same response options (e.g., *agree–disagree*) but oppositely directed stems (e.g., one indicating high certainty and the other indicating low importance), correlated measurement error can make the association between the constructs appear less positive than it really is (after one scale has been recoded in the opposite direction). Several studies have demonstrated the value of taking into account method covariance (e.g., Alwin & Krosnick, 1985; Boruch & Wolins, 1970). For example, by doing so, Krosnick and Alwin (1988) and Green (1988) demonstrated that what appeared at first to be strong positive correlations between latent factors were in fact strong negative ones instead.

Thus, depending on the particular measurement techniques used, method covariance may cause correlations between two dimensions to appear stronger or weaker than they really are.

Consequently, previous reports of zero-order correlations may either overestimate or underestimate correlations between attitude dimensions. Given Cote and Buckley's (1987) evidence that random and systematic measurement error typically account for more than 50% of the variance in psychological measures, it seems quite plausible that zero-order correlations among attitude dimensions are misleadingly attenuated and that there is more overlap among them than Raden (1985) believed there to be.

Even if these correlations are actually generally weak or moderate, however, it is nonetheless possible that the 10 dimensions reflect a smaller number of higher-order constructs. That is, the dimensions may be relatively weak reflections of a set of underlying latent constructs, and those underlying constructs may produce associations with persistence, resistance, and impact on cognition and behavior. In fact, it is still possible for all 10 dimensions to reflect only a single latent construct.

Exploring these possibilities, a number of studies have conducted factor analyses of strength-related dimensions, but their results have been remarkably different. Verplanken (1989, 1991) found that a single factor explained a great deal of the covariation among a set of dimensions including interest, thinking, talking, feeling involved in an issue, frequency of reading about the issue, desire to express one's opinion on the issue, and others. However, Abelson's (1988) analysis of a series of attitude dimensions revealed three distinct clusters of dimensions: emotional commitment (reflected by certainty and relevance to self-concept), ego preoccupation (reflected by frequency of thought, intensity, and importance), and cognitive elaboration (reflected by knowledge). Lastovicka and Gardner (1979) identified three different latent factors: the first is reflected by frequency of talking, knowledge, and interest; the second is reflected by certainty and ego-defensiveness; and the third is reflected by importance and relevance to self-concept. Wilson et al. (1991) found yet another structure of three underlying factors: Abelson's (1988) three dimensions and direct behavioral experience loaded on one factor, accessibility and extremity loaded on a second, and affective–cognitive consistency and latitudes of rejection and noncommitment loaded on a third.

These latter three investigations suggest that the one-factor view of attitude strength may not be viable. However, their findings also are almost certainly distorted by random and systematic measurement error, although in different ways in each study. This may explain why the latent structure of the dimensions appears to be complex and irreproducible across studies. Thus, it is conceivable that controlling for the impact of random and systematic measurement error might reveal a simple and replicable structure organizing the attitude dimensions.

The Present Investigation

In this article, we report three studies that permit more precise assessments of the relations among these various attitude dimensions. In each study, we measured each dimension using the operationalizations typically used in previous research. For each dimension, multiple indicators were assessed, which allowed us to use structural equation modeling techniques to reduce the distorting impact of random measurement error.

We also used a modified multitrait-multimethod approach

to reduce the distorting impact of correlated method variance. Some of the attitude dimensions were assessed using unique techniques. For example, the magnitudes of latitudes of rejection and noncommitment were assessed by asking respondents to indicate which positions on an attitude dimension were acceptable and unacceptable; affective-cognitive consistency was assessed using the multistep multiplicative procedure built on ratings of value relevance and value importance; and knowledge was assessed by gauging the number of pieces of information subjects wrote down in open-ended listing of their thoughts about an object. For these dimensions, each assessment method was uniquely associated with a single dimension, so there was no danger that associations between such dimensions and other dimensions were artificially inflated because of the common method.

The remaining dimensions were assessed using self-perceptions reported on rating scales. Therefore, among these dimensions, this commonality in approach might either inflate or deflate apparent correlations among dimensions, depending on how the rating scales were constructed. To reduce distortion due to this problem, we measured each of the self-perception dimensions using a variety of rating scales, using an assortment of different formats. Given such data, confirmatory factor analysis can be used to generate estimates of correlations between dimensions undistorted by correlated method variance (Alwin, 1974; Boruch & Wolins, 1970; Joreskog, 1974; Kenny, 1979; Marsh & Hocevar, 1983, 1988; Widaman, 1985).

If the various dimensions of attitudes all reflect a single underlying construct, then we would expect the corrected correlations among the dimensions to approach 1.0. Furthermore, a single-factor model should adequately fit the set of corrected correlations. On the other hand, if the dimensions are distinct from one another and do not reflect a single construct, corrected correlations should be significantly less than 1.0, and the fit of a single-factor model should be inadequate. Furthermore, some subsets of dimensions may be correlated with one another in ways suggesting that they reflect a higher-order construct or constructs, even if the entire set of dimensions does not do so. We evaluated the empirical plausibility of all of these possibilities.

Study 1

Method

Subjects

Male and female undergraduates ($N = 288$) participated in this study in partial fulfillment of a course requirement. They completed written questionnaires in groups of 35–45 in a classroom setting.

Questionnaire

Subjects were randomly assigned to answer questions about either abortion or capital punishment. Both versions of the questionnaire contained 230 identically formatted measures of attitude extremity, certainty, importance, knowledge, intensity, latitudes of rejection and noncommitment, interest, direct experience, accessibility (gauged by frequency of talking and thinking about the issue), and affective-cognitive consistency. Multiple indicators of each self-perception construct (i.e., certainty, importance, knowledge, intensity, interest, talking, and think-

ing) varied in terms of question type, question wording, scale length, and scale format. They included 7-point rating scales (with only the endpoints labeled with words); agree-disagree scales (labeled *strongly agree*, *agree*, *disagree*, and *strongly disagree*); thermometer scales (101-point scales with verbal labels on 0, 50, and 100); and fully labeled 5-point (e.g., "Would you say you think about the issue of capital punishment extremely often, often, sometimes, rarely, or never?"), 4-point (e.g., "Would you say that your feelings on the issue of capital punishment are extremely strong, very strong, fairly strong, or not strong?"), 3-point (e.g., "When you keep up with the news by reading magazines or newspapers or by watching television, how closely do you pay attention to stories about the issue of capital punishment? Do you pay very close attention, some attention, or very little attention?"), and 2-point (e.g., "Some people have very definite views on the issue of capital punishment, while others see it as a difficult issue to reach a decision on. Which group would you say you are more like?") scales. (For a more detailed description of the measures, see the Appendix; for the exact wordings of all questions, see Chuang, 1988.)

Analysis

The analytic approach we used required that each subject complete the entire questionnaire to be included. Therefore, failing to answer even a single item caused a total of 31 of our subjects to be omitted, most of whom missed only one or two items. Consequently, for the abortion and capital punishment issues, 128 and 129 subjects were included in our analyses, respectively.

LISREL VII (Joreskog & Sorbom, 1989) was used to conduct a multitrait-multimethod confirmatory factor analysis of the observed correlation matrix among the measured variables. Fifteen factors were included in the analysis: 11 substantive factors (representing the attitude dimensions) and 4 method factors (7-point rating, agree-disagree, thermometer, and 4-point rating scales).³ Each measured variable loaded on only one substantive factor and on one method factor (if the variable involved one of the four methods represented by the method factors). The loadings of the items on the substantive factors were unconstrained.

We imposed two constraints on the model, both of which constitute standard practice in this sort of analysis (see, e.g., Alwin & Krosnick, 1985; Judd & Krosnick, 1982; Krosnick & Alwin, 1988; Widaman, 1985). First, each method factor was specified such that all items loaded on it equally. In substantive terms, this constraint proposes that differences between people in terms of their interpretations of a rating scale's points will produce comparable amounts of between-subjects error variance on all measures involving that scale. This constraint reduces the likelihood that the structural equation analysis will mislabel sub-

³ We included only these method factors because relatively few dimensions were assessed using other rating methods, which would make it more difficult for a structural equation analysis to distinguish trait from method variance. However, including additional method factors would only improve the model's fit beyond what is already quite good, and it would only further weaken the apparent correlations among the self-perception dimensions. The analyses reported below were performed using the complete set of measures we collected. However, we also replicated the analyses using only the self-perception measurement methods that were used across all dimensions: the 7-point rating scales, the agree-disagree scales, and the 101-point thermometers. The corrected correlations generated by this latter analysis were essentially identical to those reported in the text. Specifically, the correlation between the associations among dimensions reported in the text and the comparable associations produced by this alternative approach were .99 for both abortion and capital punishment. Also, the goodness-of-fit statistics and model comparison results were comparable to those reported in the text.

stantive covariance among the attitude dimensions as correlated error variance due to a common measurement method. Second, the method factors were specified to be uncorrelated with each other and with the substantive factors. This constraint is implicit in Campbell and Fiske's (1959) conception of the multitrait-multimethod approach (see Kenny & Kashy, 1992) and again helps the structural equation analysis to differentiate substantive covariance from method-induced correlated error.⁴

Results and Discussion

In the first model we estimated, all of the substantive factors were allowed to correlate freely with one another; we call this a *saturated model*. For this model, chi-squared statistics indicated statistically significant differences between the observed and predicted covariance matrices for abortion and capital punishment, $\chi^2(1,165, N = 128) = 1,654.16, p < .001$, and $\chi^2(1,166, N = 129) = 1,683.43, p < .001$, respectively. However, it is well-known that chi-squared statistics offer overly conservative estimates of the goodness of fit of a model (e.g., Burt, 1973, p. 148).

A variety of alternative approaches have been proposed, including Wheaton, Muthen, Alwin, and Summers's (1977) suggestion of examining the ratio of the chi-squared value to its degrees of freedom. Wheaton et al. suggested that a ratio of 5:1 or less indicates adequate fit; Carmines and McIver (1981) argued that a more stringent criterion of 2:1 is desirable. Our ratios are 1.42 and 1.44 for abortion and capital punishment, respectively, well within the acceptable range. Bentler and Bonett (1980) suggested an alternative approach, a nonnormed incremental fit index, ρ , for which values of approximately .9 or greater indicate excellent fit. This index also supports the conclusion that our model fits the present data quite well ($\rho = .91$ for both issues). Furthermore, the loadings of the measured variables on the latent factors were significantly different from zero in all cases for capital punishment and in all but one case for abortion. And most of the standardized loadings (76% for abortion and 73% for capital punishment) were greater than .70. Thus, it seems that our specification of the factor structure of the measured variables adequately describes the observed correlations among them.

The corrected correlations among the strength dimensions are shown in Tables 1 and 2 for abortion and capital punishment, respectively. All of these correlations are significantly less than 1.0, although the talking-thinking pair for capital punishment ($r = .96$) comes very close. The remaining correlations are notably lower than 1.0, and some are close to zero.

It may be tempting to interpret the correlations in Tables 1 and 2 according to the usual criteria in the social sciences, which would suggest that anything above .3 is huge. However, these correlations are quite different from typical ones, because they have been adjusted for the impact of random and systematic measurement error. It is therefore fully reasonable to expect to see these correlations approach 1.0, as some of them do. Thus, departures from 1.0 are more meaningful in this context than they typically are. Furthermore, even a seemingly strong correlation of .80 indicates that only 64% of the variance in the underlying constructs is shared. Therefore, although the associations in Tables 1 and 2 are quite a bit larger than those Raden (1985) examined, it nonetheless seems most sensible to view

them as consistent with his contention that the underlying dimensions are remarkably nonoverlapping.

To assess whether a single underlying factor can account for these correlations, we fit a single-factor model to the abortion and capital punishment data. This model specified that all of the first-order attitude dimension factors loaded on a single second-order factor that was uncorrelated with the method factors. The second-order factor's loadings were unconstrained, and there were no residual correlations among the first-order factors. If this model can account for the covariation among the strength dimensions just as well as the saturated model can, then it would seem that a single-factor structure is plausible for these dimensions.

However, this turns out not to be the case. For abortion, the single-factor model fit is significantly worse than the saturated model, $\Delta\chi^2(44) = 169.48, p < .001$. The single-factor model for the capital punishment data also fit significantly less well than the saturated model, $\Delta\chi^2(44) = 219.71, p < .001$.⁵ Thus, not surprisingly, it seems that the attitude dimensions we examined do not reflect a global, unitary strength construct and instead have a more complex factor structure.

Although the single factor model does not afford an adequate description of the covariation among the dimensions, it is nonetheless informative to examine the loadings of the first-order factors on the second-order factor (see the first two columns of Table 3). These loadings indicate the degree to which each dimension shares variance with the primary second-order factor. For both issues, importance and intensity are strongly associated with the underlying dimension. Interest and thinking are slightly less related to the underlying dimension; talking and knowledge are even a bit less related to it. Certainty and extremity are associated with it even more weakly, and latitudes of rejection and noncommitment and affective-cognitive consistency are hardly related to it at all. Thus, although the factor structure of these dimensions is complex, there is clear consistency across issues in these regards.

The only notable difference between the results for abortion and capital punishment involves direct experience. In the case of abortion, direct experience is the single dimension most strongly related to the underlying construct. However, for capital punishment, direct experience is more weakly related to that construct.

In an effort to identify the complex factor structure apparent in these data, we conducted exploratory factor analyses of the first-order factors. However, the results of these analyses were not very helpful or even comparable across the two issues. For both issues, extremity and certainty loaded on the same second-order factor. And for both issues, latitudes of rejection and non-

⁴ We also estimated the model using a variety of alternative constraints, such as those suggested by Kenny and Kashy (1992), and obtained nearly identical results to those reported below. In addition, we estimated the model with no constraints on the correlations between the method factors and the substantive factors, and again we obtained results comparable with those reported in the text.

⁵ The goodness-of-fit indices for the abortion single-factor model were $\chi^2(1,209) = 1,823.64, p < .001, \chi^2/df = 1.51, \rho = .89$. The goodness-of-fit indices for the capital punishment single-factor model were $\chi^2(1,210) = 1,903.14, p < .001, \chi^2/df = 1.57, \rho = .89$.

Table 1
*Study 1: Correlations Among Latent Attitude Dimensions Corrected
 for Random Error and Method Covariance—Abortion*

Dimension	1	2	3	4	5	6	7	8	9	10	11
1. Talk	—										
2. Think	.82*	—									
3. Interest	.65*	.70*	—								
4. Knowledge	.47*	.59*	.42*	—							
5. Intensity	.53*	.56*	.64*	.46*	—						
6. Importance	.55*	.62*	.76*	.47*	.83*	—					
7. Certainty	.28*	.27*	.17	.32*	.63*	.37*	—				
8. Extremity	.13	.22*	.19*	.26*	.43*	.35*	.44*	—			
9. Direct experience	.75*	.81*	.71*	.81*	.62*	.83*	.39*	.25	—		
10. Latitudes of rejection and noncommitment	.10	.06	.08	.06	.10	.08	.15	.14	.06	—	
11. Affective-cognitive consistency	.01	.01	.07	.10	-.01	.00	.01	-.29*	.08	.02	—

* $p < .05$.

commitment and affective-cognitive consistency each loaded independently on their own factors. The remaining dimensions loaded on an additional factor, but their loadings were not especially large or consistent, and a substantial amount of shared variance was left unexplained by the factor structure. It therefore seems that the factor structure of these dimensions is not easily discernible using purely exploratory techniques. Nonetheless, these results suggest rejecting the single-factor model, and, as we shall see below, a variety of intermediate models as well.

Study 2

In Study 1, almost all of our measures were comparable to the operationalizations of the attitude dimensions most commonly used in past research. Specifically, interest, intensity, importance, certainty, extremity, direct experience, latitudes of rejection and noncommitment, and affective-cognitive consistency are typically measured using self-reports, just as we did above. However, knowledge and accessibility are frequently measured by means other than self-reports. Knowledge has often been measured by assessing the quantity of information output when respondents are asked to write down everything they know about the issue. Accessibility has typically been measured by assessing the length of time it takes people to report their attitudes; shorter latencies are taken to indicate greater accessibility.

It is conceivable that these latter two measures produce less biased assessments of the relevant constructs, whereas the self-reports examined in Study 1 may be distorted by self-presentational concerns or other such motivations. It is therefore possible that our findings would have been quite different had we used these measurement methods instead. Consequently, we conducted a second study incorporating these more elaborate assessment methods. Because this study addressed a different issue (i.e., defense spending), it provided an opportunity to assess the generalizability of the findings of Study 1 as well.

Method

Subjects

Male and female undergraduates ($N = 107$) participated in this study in partial fulfillment of a course requirement.

Procedure

Measurement of response latencies. On arrival at our laboratory, subjects were first seated individually in cubicles and received instructions on a computer screen. They were asked to respond to a series of attitude phrases by pressing one of two computer keys marked *favor* and *oppose* for each. The computer recorded both responses and their temporal latencies. The response times for three phrases addressing defense spending (“increased defense budget,” “an arms buildup,” and “more money for national defense”) were treated as multiple indicators of the accessibility of defense spending attitudes.

For analysis, we followed Fazio’s (1990) advice and transformed the response latencies to maximize their validity. First, any latency longer than 10 s or shorter than .75 s was treated as missing data on the assumption that it does not represent a meaningful decision time. Second, we subjected the latencies to a logarithmic transformation, which converted generally skewed distributions into more normal ones. Finally, we subtracted from each transformed latency the respondent’s average transformed latency in responding to 24 attitude phrases addressing topics other than defense spending. This was done to reduce between-subjects differences in defense spending latencies due to subjects’ general dispositions to be quick or slow in reporting attitudes.

Questionnaire. After completing the computer task, subjects completed a questionnaire including 141 items on defense spending. The questionnaire again contained measures of 11 attitude dimensions: extremity, certainty, importance, knowledge, intensity, latitudes of rejection and noncommitment, interest, direct experience, talking, thinking, and affective-cognitive consistency. Each of the 11 dimensions was again assessed with multiple indicators that varied according to question type, question wording, scale length, and scale format.

The questionnaire was very similar to that used in Study 1, although a few items that had relatively low factor loadings were removed to shorten administration time and permit more elaborate measurement of accessibility and knowledge. Knowledge was measured in the questionnaire by asking subjects to search their memories for all the information they had about defense spending and to write it all down.

Table 2
Study 1: Correlations Among Latent Attitude Dimensions Corrected for Random Error and Method Covariance—Capital Punishment

Dimension	1	2	3	4	5	6	7	8	9	10	11
1. Talk	—										
2. Think	.96*	—									
3. Interest	.77*	.83*	—								
4. Knowledge	.67*	.70*	.71*	—							
5. Intensity	.59*	.70*	.70*	.65*	—						
6. Importance	.62*	.73*	.80*	.56*	.86*	—					
7. Certainty	.43*	.54*	.50*	.58*	.78*	.68*	—				
8. Extremity	.36*	.46*	.50*	.47*	.75*	.65*	.78*	—			
9. Direct experience	.51*	.47*	.76*	.62*	.63*	.69*	.49*	.51*	—		
10. Latitudes of rejection and noncommitment	.26*	.27*	.13	.19*	.11	.14	.19*	.03	.00	—	
11. Affective-cognitive consistency	.01	-.04	-.15	.03	-.11	-.13	-.09	-.17	-.13	.09	—

* $p < .05$.

Subjects were given as long as they needed to complete this task (for a detailed description of the multitrait-multimethod matrix design, see the Appendix).

Analysis

Eighteen subjects who did not complete the questionnaire or who did not have valid response latencies for all three target phrases were dropped from the analysis, yielding 89 subjects whose data were used to generate a matrix of correlations. This matrix was then subjected to multitrait-multimethod confirmatory factor analysis using LISREL VII as in Study 1. Seventeen factors were included in the analysis: 13 substantive factors representing the attitude dimensions (response latencies and knowledge dump results were treated as indicators of distinct dimensions) and 4 method factors (7-point rating scale, 4-point rating scale, agree-disagree, and thermometer).

Results and Discussion

Again, the standardized factor loadings of the saturated model supported our assumption that the dimensions were well defined by their indicators. All of the factor loadings were significantly different from zero, and 75% of the standardized loadings were greater than .70. The overall fit of the model was again quite good, $\chi^2(999, N = 89) = 1,545.71, p < .001, \chi^2/df = 1.55, \rho = .85$.

The corrected correlations among the 13 attitude dimensions are shown in Table 4. Most of the correlations are significantly greater than zero, and all of them are significantly less than 1.0. As in Study 1, latitudes of rejection and noncommitment and affective-cognitive consistency were essentially uncorrelated with the other dimensions. Intensity and importance were again strongly correlated with one another and with the others. But they were surpassed this time by thinking and interest. Talking and self-reported knowledge remained somewhat more weakly associated, followed by certainty and extremity. Direct experience was much more weakly associated with the other dimensions, replicating the finding in this regard involving capital punishment in Study 1.

Certainly the most surprising results here involve the discrep-

ancies between the various measures of accessibility and knowledge. Although we presumed that response latencies, talking, and thinking were all measures of accessibility, the first of these factors was only weakly related to the second ($r = .34$) and third ($r = .49$). Furthermore, the correlations between response latencies and the other dimensions are relatively weak as well, certainly much weaker than the comparable correlations between talking and thinking and the other dimensions. Thus, the most commonly used operationalization of accessibility appears to be quite distinct from self-reports of relevant dimensions, which suggests caution when treating multiple operationalizations of this construct as interchangeable (e.g., Aldrich et al., 1989; Krosnick, 1988a).

A similar and even stronger pattern of results can be observed

Table 3
Standardized Factor Loadings of First-Order Attitude Dimensions on Single Second-Order Factor

Dimension	Study 1: Abortion	Study 1: Capital punishment	Study 2: Defense	Study 3: Abortion
Direct experience	.91*	.72*	.51*	.61*
Importance	.88*	.89*	.91*	.92*
Intensity	.84*	.89*	.90*	.90*
Interest	.81*	.87*	.93*	.91*
Think	.80*	.87*	.86*	.83*
Talk	.74*	.78*	.78*	.69*
Knowledge	.61*	.75*	.79*	.55*
Certainty	.46*	.74*	.78*	.52*
Extremity	.37*	.70*	.43*	.49*
Latitudes of rejection and noncommitment	.13*	.19	.01	
Affective-cognitive consistency	.01	-.10*	-.16	
Knowledge dump			.20	
Response latency			.38*	
N	128	129	89	195

* $p < .05$.

with the knowledge dump measure. As would be expected, this measure was most strongly correlated with self-reports of knowledge ($r = .28$), but even this correlation is surprisingly weak. Furthermore, the only other dimensions with which the knowledge dump measure is significantly correlated are talking ($r = .19$), thinking ($r = .19$), and importance ($r = .19$). This again contrasts with the results regarding self-reports of knowledge, which correlated much more strongly with the other dimensions. Thus, the direct measure of knowledge again appears to be quite distinct from self-reports of knowledge levels.

To assess the validity of the one-factor view, we again estimated the parameters of a single second-order factor model. Here, this model fit significantly less well than the saturated model, $\Delta\chi^2(65) = 164.16, p < .001$.⁶ Thus, it again seems that a single-factor structure cannot account for the covariation among the dimensions. The second-order loadings from this model (shown in Table 3) reinforce the picture of the between-dimension associations indicated by the corrected correlations in Table 4. The ordering of the dimensions in terms of strength of association with the first underlying factor is nearly identical to those yielded by Study 1.

We again conducted exploratory factor analyses to ascertain the underlying structure of the dimensions. And as in Study 1, we found evidence that latitudes of rejection and noncommitment and affective-cognitive consistency loaded on independent factors, extremity and certainty loaded on a third factor, response latency and knowledge dump loaded on a fourth factor, and the remaining dimensions loaded on a fifth factor. However, this factor structure was again not especially clear, and it did not explain a great deal of the observed covariance. Consequently, we were again inclined to conclude that the underlying structure of these dimensions is more complex than exploratory factor analysis can usefully reveal.

Study 3

The results of Study 2 were complementary to those of Study 1 with regard to independence between the dimensions. Study 2's results also reinforced Study 1's implications about which dimensions seem to be especially strongly or weakly correlated with one another. However, there is a factor that may complicate our interpretation of these results: question order.

In Studies 1 and 2, the order of items in the questionnaires was constant for all subjects. The order used was selected arbitrarily, but it may have influenced our results. Specifically, a post hoc analysis revealed that the smaller the distance between the questions measuring any pair of constructs in the questionnaire, the stronger the correlation was between these two constructs. A rank-order correlation between closeness in the questionnaire and strength of construct relation was .30 ($p < .01$) for the abortion, capital punishment, and defense spending results combined. Thus, it is conceivable that consistency pressures during questionnaire completion led to somewhat stronger associations between adjacent constructs (for some supportive evidence on this point, see Budd, 1987). On the other hand, it could be that our ordering of constructs in the questionnaires coincidentally placed more strongly related constructs closer to one another, so the strong correlations reported above may simply be coincidental.

To explore these two possibilities, we conducted a third study in which we varied the order of questions so as to equate the average distance between each pair of dimensions.

Method

Subjects

Male and female undergraduates ($N = 197$) participated in partial fulfillment of a course requirement. Subjects completed questionnaires in groups of 25–35 in a classroom setting.

Questionnaire

Subjects were randomly assigned to 1 of 15 question orders, each generated using a table of random numbers. After we collapsed across these various orders, the average distance between each pair of constructs was essentially equal across all pairs.

The questionnaire included 43 items addressing legalized abortion, a reduced set of the items used in Study 2. Included were measures of extremity, certainty, importance, knowledge, intensity, interest, direct experience, talking, and thinking. Affective-cognitive consistency, latitudes of rejection and noncommitment, response latency, and knowledge dump were omitted from this study because they were especially time consuming to measure and because they were essentially unrelated to all the other dimensions and were therefore least vulnerable to criticism based on question order effects (for a detailed description of the multitrait-multimethod matrix design, see the Appendix).

Analysis

Two subjects were dropped from the analyses because of incomplete data. Analyses identical to those conducted in Studies 1 and 2 were conducted here using LISREL VII. Thirteen factors were included in the saturated model: nine substantive factors representing the attitude dimensions and four method factors (7-point scales, 4-point scales, 3-point scales, and agree-disagree scales).

Results and Discussion

The standardized factor loadings for the saturated model supported our assumption that the dimensions were well-defined by their indicators. All of the factor loadings were significantly different from zero, and 78% of the standardized loadings were greater than .70. The overall fit of the model was very good, $\chi^2(554, N = 197) = 752.86, p < .001, \chi^2/df = 1.36, \rho = .95$.

The corrected between-dimension correlations are shown in Table 5. All of these correlations are significantly different from zero, and all are significantly less than 1.0. Intensity and importance were again strongly correlated with one another and were strongly correlated with the other dimensions. Interest, thinking, talking, and knowledge were moderately correlated with the other dimensions, as was direct experience. Extremity and certainty were again strongly correlated with one another and were relatively weakly correlated with the other dimensions. Thus, the basic pattern of results observed in our previous studies was replicated here, despite the random ordering used in Study 3's questionnaires.

Did the random ordering affect these results at all? Perhaps

⁶ The goodness-of-fit statistics for this model were: $\chi^2(1,064) = 1,709.87, p < .001, \chi^2/df = 1.61, \rho = .83$.

Table 4
 Study 2: Correlations Between Latent Attitude Dimensions Corrected
 for Random Error and Method Covariance—Defense Spending

Dimension	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Talk	—												
2. Think	.84*	—											
3. Interest	.78*	.76*	—										
4. Knowledge	.79*	.76*	.75*	—									
5. Knowledge dump	.19*	.19*	.15	.28*	—								
6. Response latency	.34*	.49*	.28*	.25	.11	—							
7. Intensity	.58*	.74*	.83*	.66*	.16	.34*	—						
8. Importance	.60*	.77*	.86*	.64*	.19*	.26	.87*	—					
9. Certainty	.49*	.71*	.68*	.59*	.08	.26*	.77*	.75*	—				
10. Extremity	.33*	.37*	.31*	.22	.11	.35*	.46*	.38*	.55*	—			
11. Direct experience	.56*	.30*	.57*	.54*	-.04	.18	.40*	.40*	.31*	.21	—		
12. Latitudes of rejection and noncommitment	.07	.04	-.01	.03	.11	-.20	-.04	-.01	.03	-.10	-.06*	—	
13. Affective-cognitive consistency	-.02	-.02	-.14	-.17	-.05	.24	-.22	-.14	-.05	-.38*	-.10	.00	—

* $p < .05$.

the most useful way to answer this question is to compare the correlations in Table 5 with the comparable ones in Table 1, which also address the abortion issue. The Pearson product-moment correlation between these results is .78 ($N = 36$ correlations), so they are in fact quite similar. We suspected that the random question ordering might reduce the variance among the correlations by making the average distance between all pairs of constructs approximately equal. However, this did not occur, $F(1, 35) = 1.33$, ns , nor was the mean correlation altered, $t(36) = 0.74$, ns . Thus, it seems that the conclusions we drew from Studies 1 and 2 are not byproducts of artifacts induced by question ordering.

Using the Study 3 data, we again estimated the parameters of a single-factor model and found the fit to be significantly worse than that of the saturated model, $\Delta\chi^2(27) = 169.28$, $p < .001$.⁷ Therefore, we must again reject the single-factor model. The loadings of the single-factor model again confirmed the relative ordering of dimensions suggested by our previous studies (see Table 3). Importance, intensity, and interest were strongly associated with the other dimensions. Thinking and talking were somewhat less strongly associated with the others; and knowledge, certainty, and extremity had even weaker associations.

Exploratory factor analyses revealed a pattern different from those seen above. Thinking, talking, and attention appeared on one factor. Certainty and extremity appeared on a second factor. And direct experience and knowledge appeared on a third factor. Here, importance and intensity did not appear on a fourth factor; rather, they loaded strongly on both the first and second factors. Thus, these results further reinforce the notion that the factor structure of these dimensions is not readily identifiable through exploratory factor analysis.

Tests of Intermediate Models

Given the evidence that a single factor model cannot account for the relations among the attitude dimensions as well as a saturated model can, we proceeded to test a series of intermediate-range higher-order factor models suggested by the findings of

Studies 1, 2, and 3, and by previous studies. Each of these models, listed in Table 6, proposes that two or three of the attitude dimensions may reflect a single higher-order factor. Four models were suggested by the patterns of correlations in Tables 1, 2, 4, and 5. First, frequency of thinking and talking were highly correlated with one another and are thought to reflect accessibility, so they might represent a single underlying factor. Second, interest was strongly correlated with frequency of thinking and talking, suggesting a larger cluster. Third, intensity and importance were strongly correlated with one another, which suggests that a single factor may underlie the pair. And finally, certainty and extremity were especially strongly correlated with one another and might therefore be univocal.

A second set of models we tested was suggested by previous empirical studies of the structure of these dimensions and by previous treatment of these dimensions. Specifically, Abelson (1988) found that frequency of thought, intensity, and importance loaded on a single factor, which he called *ego-preoccupation*. Lastovicka and Gardner (1979) found that frequency of talking, knowledge, and interest seemed to represent a single factor. Wilson et al. (1991) found that affective-cognitive consistency and latitudes of rejection and noncommitment seemed to represent a single factor, as did knowledge and direct behavioral experience and as did response latency and extremity. As we described above, a number of authors have presumed that intensity can be measured using certainty or extremity (e.g., Brim, 1955; Tannenbaum, 1956) and thereby represent a single construct. It seemed plausible that self-perceptions of knowledge and knowledge dump might reflect a single underlying construct. And it seemed that frequency of talking and thinking might reflect the same underlying construct (i.e., accessibility) as response latency.

We tested these various possibilities explicitly by specifying models proposing that each set of two or three dimensions rep-

⁷ The goodness-of-fit statistics for this model were: $\chi^2(581) = 922.14$, $p < .001$, $\chi^2/df = 1.59$, $\rho = .98$.

Table 5
*Study 3: Correlations Among Latent Attitude Dimensions Corrected
 for Random Error and Method Covariance—Abortion*

Dimension	1	2	3	4	5	6	7	8	9
1. Talk	—								
2. Think	.77*	—							
3. Interest	.65*	.80*	—						
4. Knowledge	.49*	.52*	.52*	—					
5. Intensity	.55*	.67*	.81*	.49*	—				
6. Importance	.60*	.77*	.85*	.44*	.86*	—			
7. Certainty	.21*	.27*	.38*	.30*	.63*	.48*	—		
8. Extremity	.16*	.29*	.41*	.25*	.56*	.46*	.65*	—	
9. Direct experience	.51*	.56*	.51*	.60*	.53*	.52*	.40*	.42*	—

* $p < .05$.

resents a single higher-order construct. These models were estimated using data from each of our three studies, and the results are shown in Table 6. In each case, a change in the chi-squared statistic tests the difference between the proposed model and the saturated model.⁸ If this test statistic is not significant, we cannot reject the null hypothesis that the proposed model is just as good at accounting for the observed data as is the less restricted saturated model. This would lend credibility to that model. However, if this test statistic is significant, we must reject the null hypothesis that the proposed model is just as good at accounting for the observed data as the less restricted saturated model. Thus, the proposed model would be discredited.

As is apparent from the figures in Table 6, all but two of the models we tested must be rejected in at least one test. Four models are rejected in four tests, one is rejected in three of four tests, two are rejected in two of four tests, and three are rejected in one test. Thus, the vast majority of the models we examined do not seem to be able to account for the observed data adequately.

Only two of the models we tested cannot be rejected. The first proposes that self-reported knowledge and amount of dumped knowledge reflect a single underlying construct. The second proposes that extremity and response latency represent a single underlying factor. However, we tested both of these models in only one of our studies: Study 3. Therefore, we are reluctant to express much enthusiasm about either one until further tests of them are performed.

In the cases in which a model is rejected in one or more tests while not being rejected in one or more others, one might be led to wonder about the reliability or believability of the tests. After all, is it not plausible that all the tests will produce comparable results if they are indeed valid? In fact, this is not so, for at least two reasons. First, it is conceivable that the relations among the dimensions vary depending on the attitude object involved. That is, some models may fit for some attitude objects and not for others. However, our goal was to assess generally whether any pair or triad of dimensions are interchangeable. Thus, any single disconfirming instance is reason enough to reject it as a general proposition, although such a proposition might hold in some cases. However, if the general proposition does not hold, it means that researchers should recognize the possibility of non-interchangeability when initiating new investigations.

There is a second reason why these test results might reasonably vary from study to study. Each test is based on the patterns of correlations between two or three specific dimensions (e.g., talking and thinking) that might represent a higher-order construct (e.g., accessibility) and all other dimensions measured in that study. If those other dimensions vary from study to study (as they do here), then a different test is being performed in each case. Therefore, we cannot conclude that all variation in results from study to study is due to variation in the attitude object. Only studies holding dimension assessment precisely constant can assess variation in results due to object. Because Study 1 allows for such a comparison and did indeed yield slightly different results for abortion and capital punishment, it does seem that dimension structure may vary across objects. But because we have no strong theoretical basis for anticipating or interpreting such variation, we prefer simply to acknowledge that possibility for now and leave it to future research to assess its plausibility more formally.

We could have tested a series of additional, more complex models suggested by prior treatment of these dimensions in the attitude literature. For example, as we discussed in the introduction, the construct of "involvement" has been gauged by importance, interest, knowledge, and frequency of thought. However, each such plausible and more complex model subsumes one or more of the models tested and rejected in Table 6. Because these simpler subsets seem not to adequately fit the observed data, any more complex models subsuming them could do no better and therefore need not be tested.

General Discussion

Our studies provide more precise estimates of the relations between these attitude dimensions than have past studies, and we found that nearly all were significantly smaller than 1.0, with most being a great deal smaller. Furthermore, we found that a single-factor model could not account for the covariation among these dimensions. Thus, the notion of a single attitude

⁸ These comparisons are appropriate because the proposed models are covariance matrices nested within the saturated models (see Bentler & Bonett, 1980; Bollen, 1989).

Table 6
Change in Chi-Squared Tests of Hypotheses That Specific Attitude Dimensions Represent Higher Order Constructs

Attitude dimensions proposed to load on a single higher order factor	Study 1: Abortion		Study 1: Capital punishment		Study 2: Defense		Study 3: Abortion	
	$\Delta\chi^2$	<i>df</i>	$\Delta\chi^2$	<i>df</i>	$\Delta\chi^2$	<i>df</i>	$\Delta\chi^2$	<i>df</i>
Talking, thinking	7.22	8	6.18	8	40.70	10**	4.96	6
Talking, thinking, interest	47.08	16**	38.62	16**	85.61	20**	34.11	12**
Intensity, importance	31.64	8**	18.39	8*	5.82	10	20.45	6**
Certainty, extremity	8.84	8	32.37	8**	330.45	9**	4.09	6
Thinking, intensity, importance	116.69	16**	93.02	16**	62.30	20**	81.56	12**
Talking, knowledge, interest	49.88	15**	39.19	15**	62.93	20**	40.84	12**
Latitudes, affective-cognitive consistency	7.49	8	15.83	8*	5.88	10		
Knowledge, direct experience	16.96	8*	7.80	8	29.40	10**	4.23	6
Extremity, response latency					14.10	10		
Intensity, certainty, extremity	28.94	16*	48.74	16**	336.82	19**	52.11	12**
Knowledge, knowledge dump					9.04	10		
Talking, thinking, response latency					51.42	20**		
<i>N</i>	128		129		89		195	

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

strength construct is not sustained by our evidence. We are therefore inclined to conclude that the dimensions we examined are all distinct but, in most cases, related to one another.

Although we did uncover some consistent patterns in the relations among these dimensions, we were unable to detect any stable structure underlying these correlations. Exploratory factor analyses did not produce reliable evidence of a relational framework organizing these dimensions, and none of our studies replicated the factor analysis results of Abelson (1988), Las-tovicka and Gardner (1979), Verplanken (1989, 1991), or Wilson et al. (1991). Because these prior studies did not examine the same attitude objects, it is conceivable that the inconsistency in results is due to variability in the factor structure across attitude objects.

However, we suspect instead that this inconsistency is best understood in light of evidence that exploratory factor analysis solutions can be influenced dramatically by which pool of items happen to be included in or excluded from a given analysis. Unless an underlying factor structure is quite simple and clear, adding or removing just a few items can dramatically alter obtained solutions (e.g., Velicer & Fava, 1987). This reasoning suggests that the underlying structure of the attitude dimensions we examined may be quite complex. However, nearly all of our attempts at grouping dimensions into univocal pairs or triplets met with failure. This suggests to us that there is unlikely to be any stable factor structure underlying these dimensions. Rather, they seem to be independent attitude attributes, among which there may well be numerous multidirectional causal relations.

We are therefore inclined to recommend against the use of terms such as *involvement* or *ego-involvement* or *centrality* or *salience* or *ego-preoccupation* or even *attitude strength* to refer to bunches of these dimensions. Instead, our findings tell us that researchers should stick to terminology and conceptual approaches that are closer to the operationalizations they use in a particular study. Furthermore, rather than devoting further effort to identifying a latent factor structure underlying attitude

dimensions such as those examined here, we recommend that future research be devoted to exploring the antecedents and consequences of each dimension individually and the causal relations among them. Certainly, it seems reasonable to use the term *attitude strength* as a shorthand way of saying that some attitudes are stable and consequential and others are not, or as a term for describing the group of constructs that differentiate strong attitudes from weak ones. But to view attitude strength as a formal latent construct reflected by these dimensions with conceptual and operational integrity and uniqueness, seems inappropriate.

Although these conclusions are in harmony with our findings and those of others, some aspects of our results are nonetheless unexpected. Perhaps most obviously, the independence of latitudes of rejection and noncommitment from importance, intensity, and direct experience is particularly surprising. In their original conception of ego-involvement, M. Sherif and Hovland (1961) considered it to reflect the degree to which an attitude is related to an individual's self-conception and measured this construct using latitudes of rejection and noncommitment. Thus, it would seem quite likely that latitude magnitudes would be revealed at least somewhat by ratings of attitude importance (see M. Sherif & Hovland, 1961, p. 129). However, we found that the sizes of individuals' latitudes of rejection and noncommitment were not related to ratings of importance or intensity at all.

Strictly speaking, this result does not conflict with Sherif's (e.g., M. Sherif & Hovland, 1961; C. W. Sherif et al., 1965), because he did not measure importance or intensity. Rather, he typically studied members of groups of people known to have high or low behavioral involvement in an issue. For example, people who were actively involved in the civil rights movement were considered to be ego-involved in the issue, and they were shown to have especially small latitudes of noncommitment and especially large latitudes of rejection. Although Sherif never demonstrated that these individuals considered the civil rights

issue to be especially personally important and to have especially strong feelings about it, it would seem quite likely. Furthermore, Sherif's findings suggest that we should have observed strong correlations between direct experience and latitudes of rejection and noncommitment, which we did not. We therefore look forward to further investigations of the relations among importance, intensity, and ego-involvement, as measured using both latitude sizes and the "own categories" method (C. W. Sherif et al., 1965), to resolve this paradox.

Also surprising is the independence of response latency from other presumed indicators of attitude accessibility: frequency of thinking and talking about an attitude. Most definitions of attitude accessibility assert that frequent activation of an attitude enhances its accessibility (e.g., Higgins & King, 1981; M. C. Powell & Fazio, 1984). Furthermore, greater accessibility should enhance the likelihood that an attitude will come to mind spontaneously during conversation or thought. Therefore, we would expect more frequent thinking and talking about an attitude to be associated with enhanced accessibility. We did observe such a relation in Study 2 here, but it was much weaker than would be expected. Consequently, it seems that self-report questions assessing the frequency of thinking and talking about an attitude should not be treated as interchangeable with response latency as indicators of attitude accessibility. And, by implication, researchers should probably be cautious about viewing frequency of mentioning an object in response to an open-ended question as equivalent to response latency in gauging accessibility (e.g., Aldrich et al., 1989; Krosnick, 1988a).

It may also be initially surprising that self-assessments of knowledge were only very weakly related to actual amount of knowledge apparently stored in memory. We are especially inclined to take this result seriously, because it is corroborated by a few prior studies (see Kanwar et al., 1990, for a review). Although Kanwar et al. (1990) demonstrated that there are conditions under which the accuracy of knowledge self-assessments is enhanced, it never appears to reach a very high level. This finding certainly raises a question about the match between self-perceptions and reality in general, an issue that has been the subject of debate regarding other sorts of self-assessments (e.g., Birnbaum & Stegner, 1981; Blood, 1971; Cook & Stewart, 1975) and that undoubtedly can be debated with regard to knowledge assessments as well. In the meantime, however, we are not especially troubled by this discrepancy; we are inclined to view our evidence as suggesting that self-assessed knowledge level and objective knowledge level are quite distinct constructs, although possibly reflecting a single underlying dimension.

Limitations

Although our results represent an advance over prior work in this area, there are nonetheless a variety of limitations inherent in our approach. First, we chose to concentrate on only one type of attitude: evaluations of socially significant and controversial government policies. We made this choice partly to be consistent with the vast majority of prior research on attitude dimensions, which has been focused on just this sort of attitude (see, e.g., Krosnick & Abelson, 1992). Furthermore, we made this choice because a great deal of prior research has demonstrated

substantial variance in such attitude dimensions on these sorts of issues among college students, the population we intended to study (see, e.g., Krosnick, 1986, 1989). To assess the relations among these dimensions, it was necessary for such variance to exist. And finally, we examined these sorts of attitudes because we wanted our findings to have immediately apparent and direct implications for the literature on political public opinion (see, e.g., Kinder & Sears, 1985). It is conceivable that although our results hold for political attitudes, they may not hold for other sorts of attitudes, so we look forward to future research attempting to generalize our findings in other object domains.

It is useful to note as well that variation in the latent structure of these dimensions across attitude objects could account for our inability to detect a replicable factor structure across our three studies. That is, Study 1's and 2's factor analysis results regarding abortion, capital punishment, and defense spending could have differed from one another because of variation in the attitude object. However, Studies 1 and 3 both examined abortion attitudes, and even they failed to replicate the same factor structure. Therefore, we suspect that our inability to clearly discern a replicable structure is due more to the lack of any such structure than to systematic variation in it across attitudes. Nonetheless, if a set of theory-based hypotheses regarding variation in structure across attitude objects could be constructed, it would be useful for future studies to explore them.

A second possible limitation of our work involves the exclusive use of college student samples. Again, our approach on this point is consistent with the vast majority of previous studies of attitude dimensions, and previous studies of attitude dimensions in student populations have yielded findings quite consistent with studies of nationally representative samples of adults (see, e.g., Krosnick, 1990b; Krosnick & Abelson, 1992). Nonetheless, it is conceivable that our results might have been different had we examined more heterogeneous samples of adults. So we look forward to future research on this point as well.

A third possible limitation of our studies involves our use of multiple measurement methods to assess the various attitude dimensions. Multitrait-multimethod analysis can distinguish trait from method variance most effectively if all traits are measured using a very heterogeneous set of methods (Campbell & Fiske, 1959). Because we wished to stick close to the operationalizations used in previous research on these dimensions, complete crossing of dimensions with measurement methods was not possible. Specifically, extremity, latitudes of rejection and noncommitment, affective-cognitive consistency, dumped knowledge, and response latency were each measured using a technique that cannot readily be used to measure any other dimension. These dimensions could conceivably have been assessed using self-reports. For example, subjects could have been asked, "How extreme is your attitude?" or "How consistent are your beliefs about legalized abortion with your overall attitude toward abortion?" However, such operationalizations would clearly be less desirable than those conventionally used, because these constructs are not defined in terms of self-perceptions. Furthermore, that each of these dimensions was assessed using a unique measurement approach means that associations between these dimensions and others are unlikely to be artificially

inflated because of common method variance (although these associations may have been attenuated by unique method variance). Therefore, the unique pairing of dimensions with measurement methods in these cases generally seems sensible and desirable.

The remaining dimensions we examined (i.e., frequency of talking and thinking, interest, knowledge, intensity, importance, certainty, and direct experience) were all measured in terms of self-perceptions. To reduce correlated measurement error, we used a variety of response scales and incorporated method factors in our structural equation models. However, these method factors cannot extract any covariation common to all these measures because they all involve self-perceptions. It is therefore not especially surprising that these dimensions were more strongly correlated among themselves than they were with other, non-self-perception dimensions (e.g., response latency, amount of knowledge, affective-cognitive consistency, latitudes of rejection and noncommitment, and extremity).

One might be inclined to view this pattern as suggesting a halo-like effect, whereby subjects' perceptions of various attitude dimensions are all based on a common set of cues, thus leading them to be highly correlated. However, any such halo effect is not a methodological artifact that could be overcome by "better" measurement procedures. This is so because most of these dimensions are defined as self-perceptions, so self-reports are the optimal assessment methods for them. Nonetheless, it is easy to conceive of unique ways to assess some of these dimensions. For example, frequency of talking and thinking could be gauged by asking subjects to record the details of their everyday thoughts and conversations in diaries for a period of time. Interest in information could be gauged by offering subjects information on a range of topics and observing which they chose to hear about. Such methods would again be linked uniquely to single dimensions rather than being usable for measuring a range of dimensions. Yet the use of such heterogeneous methods in future research may help to clarify whether the strong associations we observed among the self-perception dimensions are partly due to a halo-like effect.

Yet another potential limitation of our studies involves the cognitive demands our questionnaires made of some of our subjects. Specifically, in Study 1, subjects were asked to complete a 230-item questionnaire in one 50-min session. Even though all subjects were able to complete their questionnaires in the allotted time periods, doing so probably demanded a fair amount of effort on their parts. This demand may have led some subjects to "satisfice" (see Krosnick, 1991), expending less than the optimal amount of effort required to provide fully accurate reports. Given the nature of our questionnaire, satisficing may have inspired one of two response strategies. First, subjects may not have differentiated as much among the rating scales as they might otherwise have done, thus perhaps enhancing the apparent positivity of associations among the dimensions being measured (Krosnick, 1991; Krosnick & Alwin, 1988). On the other hand, they may have resorted to "mental coin-flipping" or purely random responding, thereby reducing the strength of the apparent dimensions. It is therefore difficult to anticipate exactly how satisficing might have affected our conclusions. And consistent with this ambiguity, the questionnaires used in Stud-

ies 2 and 3 here were quite a bit shorter than the one used in Study 1, yet the substantive conclusions supported by their results are the same. Most convincing, the study with the shortest questionnaire (Study 3) yielded essentially the same average correlation among the self-report dimensions ($r = .52$) as was obtained using the longest questionnaire addressing the same issue (Study 1's abortion data, $r = .51$). Nonetheless, future studies might attempt to replicate our findings by measuring only a few attitude dimensions in a series of short questionnaires completed during brief administrations spread over the course of a few days.

Implications

This investigation was inspired primarily because of our sense that there has been a fair amount of disagreement among attitude strength researchers with regard to the working assumptions that shape their research. As we described above, we felt that researchers had a variety of quite different views about which dimensions of attitudes are interchangeable with one another. We also felt that researchers disagreed with one another about the latent constructs reflected by these dimensions. We therefore set out to conduct this research in the hope that our findings would inspire researchers in the area to reconsider and make more explicit their assumptions on these matters and to put those assumptions to empirical tests.

Consequently, we view our findings as a starting point much more than as an ending point. We have not solved all of the measurement problems plaguing assessment of the relations among these dimensions and of the structure of these dimensions, which are issues for future research. At least as important, comprehensive investigations should explore the dimensions' relations to the defining characteristics of attitude strength: persistence, resistance, impact on behavior, and impact on information processing. Our results suggest that multivariate analyses may reveal a variety of independent effects of the attitude attributes on these strength-related characteristics. Furthermore, a range of interactive and mediated effects are likely to turn up in such investigations.

Consistent with this view, some research has already been done indicating that some strength-related attitude dimensions cause others. For example, direct behavioral experience with an attitude object causes enhanced attitudinal certainty (Fazio & Zanna, 1978b) and attitude accessibility (Fazio et al., 1982), although not self-reported knowledge (Regan & Fazio, 1977). Repeated attitude expression (akin to frequent talking about an attitude) leads to enhanced attitude accessibility (Fazio et al., 1982; M. C. Powell & Fazio, 1984) and extremity (Downing, Judd, & Brauer, 1992; Judd et al., 1991). And thinking about an attitude increases its extremity (Tesser, 1978).

Studies have begun to reveal interesting distinctions between the effects of various dimensions as well. For example, although attitude importance, intensity, and certainty generally do not regulate the magnitude of question wording effects (Bishop, 1990; Krosnick & Schuman, 1988), affective-cognitive consistency (Chaiken & Baldwin, 1981) and extremity (Hippler & Schwarz, 1986) do seem to exert such regulatory influences. More strikingly, whereas greater frequency of thought about a serious personal trauma is associated with decreased health,

greater frequency of talking about a trauma is associated with increased health (Pennebaker & Hoover, 1985; Pennebaker & O'Heeron, 1984). Furthermore, these dimensions sometimes interact with one another. For example, Tourangeau et al. (1989a; Tourangeau, Rasinski, Bradburn, & D'Andrade, 1989b) showed that question order effects are especially likely to occur among people who both are high in ambivalence and consider an attitude to be highly personally important. Similarly, Biek (1992) showed that attitude-defensive biased processing of a persuasive message is most likely among respondents high in knowledge and intensity. And Petty, Cacioppo, and Haugtvedt (1992) described interactions between amount of thought and latitudes of rejection and noncommitment in regulating attitude change. As this sort of evidence continues to accumulate, psychologists will be in a much better position to understand the sources of attitude strength and the processes by which strength evolves.

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(Appendix follows on next page)

Appendix Measurement Details

Measures Used in Study 1

Extremity

Subjects rated the attitude object (either legalized abortion or capital punishment) on four bipolar adjective scales: *good–bad*, *foolish–wise*, *harmful–beneficial*, and *favor–oppose*. Subjects also reported the extent to which they favored or opposed the object, and they checked the most acceptable statement in an ordered set of nine statements ranging from *extremely favorable* to *extremely unfavorable* toward the object. Extremity was assessed by calculating the absolute value of the deviation of responses from the midpoints of these attitude scales.

Certainty

Subjects reported how certain they were of their feelings on the issue, how sure they were that their opinions on the issue were right, how firm their opinions were on the issue, how easily their opinions could be changed, how definite their views were, and how convinced they were on the issue.

Importance

Subjects were asked how important the issue was to them personally, how much they personally cared about the issue, how important a candidate's position on the issue would be if they were voting, how much the issue meant to them, and how important the issue was to them compared with other issues.

Knowledge

Subjects were asked how knowledgeable they considered themselves on the issue, how much information they had about the issue, how long a list would be of everything they knew about the issue, and how expert they considered themselves on the issue compared with other issues.

Intensity

Subjects reported how strongly they felt on the issue, how strong their feelings were on the issue compared with other public issues, how strong their feelings were compared with how most other people felt on the issue, and how intense their attitudes were on the issue.

Latitudes of Rejection and Noncommitment

Again using the list of nine statements ranging from *extremely unfavorable* to *extremely favorable* on the issue, subjects indicated which ones they found acceptable and unacceptable. The number of statements a subject found unacceptable represented his or her latitude of rejection. The latitude of noncommitment was computed by subtracting the number of acceptable and unacceptable statements from the total number of statements. Because latitude of acceptance has been shown to be more weakly correlated with the other two latitudes and with criterion variables such as attitude extremity (e.g., Eagly & Telaar, 1972; Koulack, 1970; F. A. Powell, 1966; C. W. Sherif et al., 1965), we used only the latitudes of rejection and noncommitment in our analyses.

Interest

Subjects reported how closely they paid attention to information on the issue, how interested they were in obtaining information about the issue, how closely they paid attention to stories about the issue when keeping up with the news, and how important information about the issue was to them.

Direct Experience

Subjects were asked how involved they were in activities related to the issue, and whether they had ever had a personal experience relating to the issue. Subjects also indicated whether they had ever written a letter to a public official expressing their views on the issue, given money to an organization concerned with the issue, joined an organization concerned with the issue, participated in a protest march or rally on the issue, or attended a group meeting to discuss the issue.

Accessibility: Talking

Accessibility was assessed using two sets of questions, the first of which addressed frequency of discussing the issue. Subjects reported how often they discussed the issue with others, how often the issue came up during informal conversations, how many times in the past year they had talked about the issue, and how much time they spent talking about the issue compared with other issues.

Accessibility: Thinking

The second set of accessibility measures addressed frequency of thought about the issue. Subjects were asked how much they thought about the issue, how often they thought about the issue compared with other issues, how often they had thought about the issue in the past year, and whether they thought about the issue at least weekly.

Affective–Cognitive Consistency

As Norman (1975) did, we used the absolute value of the difference between each subject's standardized affective score and standardized cognitive score as our measure of affective–cognitive consistency. Subjects' affective scores were obtained by calculating the mean of their responses on the four attitude scales (three bipolar adjective scales and an 11-point rating scale described above).

Subjects provided four different cognitive scores obtained using four different sets of statements. First, subjects ranked Rokeach's (1968) 18 terminal values in order of importance. Next, they rated the extent to which each of these values would be achieved or blocked by legalized abortion or capital punishment. A cognitive index was created by multiplying subjects' two scores for each value and summing the resulting 18 products (Rosenberg, 1968). A second cognitive index was obtained using the same procedure for Rokeach's (1968) 18 instrumental values. The last two cognitive indexes were derived using similar product terms (importance ratings multiplied by achieve and block ratings) for two sets of five values that were specifically relevant to the issues of abortion and capital punishment.

Multitrait-Multimethod Matrix Design

Study 1

Three rating scale formats were used to assess each of the self-perception dimensions: two 7-point rating scales, one agree–disagree scale, and

one 101-point thermometer. In addition, some dimensions were assessed using other scale formats as well. Specifically, 4-point rating scales measured talking, knowledge, intensity, and importance. Three-point rating scales assessed interest, importance, and certainty. A 2-point scale assessed certainty, and a 5-point scale gauged thinking.

Direct experience had three indicators: subjects' ratings of their involvement in relevant activities on a 7-point scale, their reports of whether they had ever had a personal experience involving the issue (a 2-point scale), and the number of specific activities (e.g., writing a letter on the issue) they reported having performed.

Multiple indicators were available to assess all of the other dimensions as well. Extremity had five indicators: the deviations of the five attitude reports from neutrality. The number of statements in the latitude of rejection and the number of statements in the latitude of noncommitment were treated as indicators of a latent dimension. And affective-cognitive consistency had four indicators. Each involved the discrepancy between the same affect measure (the mean of the five attitude reports) and a different cognitive measure: (a) the Rokeach terminal values, (b) the Rokeach instrumental values, (c) the first five issue-specific values we inquired about, and (d) the second five issue-specific values we asked about.

Study 2

Three rating scale formats were used to assess each of the self-perception dimensions: one 7-point rating scale, one agree-disagree scale, and one 101-point thermometer. In addition, some dimensions were assessed using other scale formats as well. Specifically, 4-point rating scales measured talking, knowledge, direct experience, and intensity; 3-point rating scales assessed interest, importance, and certainty; and a 5-point scale gauged thinking. Direct experience had three indicators, just as in Study 1.

Multiple indicators of the other dimensions were again similar to those used in Study 1. Extremity had five indicators: the deviations of

the five attitude reports from neutrality. The number of statements in the latitudes of rejection and the number of statements in the latitude of noncommitment were again treated as indicators of a single factor. The amount of available knowledge gauged through the knowledge dump had three indicators: the total number of words, sentences, and ideas (each the average of two judges' independent counts) mentioned by the subject. Response latency had three indicators: the adjusted response times to the three target phrases on defense spending. And affective-cognitive consistency had four indicators: each involved the same affect measure (the mean of the five attitude reports) with a different cognitive measure: (a) the Rokeach terminal values, (b) the Rokeach instrumental values, (c) the first five issue-specific values we inquired about, and (d) the second five issue-specific values we asked about.

Study 3

We again administered multiple indicators of each measured construct. For the self-report dimensions, the items again varied in terms of question type, question wording, scale length, and scale format. Three rating scale formats were used to assess each of the self-perception dimensions: two 7-point rating scales (with only the endpoints labeled with words), one agree-disagree scale (*strongly agree*, *agree*, *disagree*, and *strongly disagree*), and one 4-point fully labeled scale. In addition, some dimensions were assessed using other scale formats as well. Specifically, 3-point fully labeled rating scales measured certainty, interest, and importance; 4-point scales measured intensity, talking, and knowledge; a 5-point scale measured thinking; and a 2-point scale measured certainty. Direct experience was again measured as it had been in the previous studies, yielding three indicators. Extremity had four indicators: the deviation of four attitude reports from neutrality.

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