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In Attitude Strength Antecedents and Consequences

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Measures and Manipulations of Strength-Related Properties of Attitudes: Current Practice and Future Directions

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As the chapters in this volume illustrate, a variety of properties of attitudes are associated with the strength-related outcomes of persistence, resistance to change, and impact on judgments and behavior. Investigations of strength-related properties of attitudes include studies of the causes and consequences of these properties and the relations among them. Of course, such investigations rely on the ability of researchers to identify, create, or influence strength properties of attitudes.

In this chapter, we discuss a number of methodological considerations in the study of attitude strength. We describe some common measures and manipulations that have been used to study attitude strength, focusing on those constructs highlighted in this volume. We also note potential problems in the current use of the measurement and manipulation approaches, and we propose future directions for research.

GENERAL TECHNIQUES FOR STUDYING ATTITUDE STRENGTH

Three general approaches to studying attitude strength have been used in the literature: manipulation, measurement, and known groups. In the following sections, we describe the use of these general techniques.

Manipulation

Manipulation refers to the random assignment of research participants to groups that differ in some experimental treatment. Such manipulations are generally designed to vary only one particular strength-related construct (e.g., attitude accessibility).

The manipulation approach has often been used in studies of attitude objects about which research participants have had little or no preexperimental experience, perhaps in part because such stimuli allow the greatest amount of experimental control. This technique has also been used on occasion for attitude objects about which people have a great deal of preexperimental experience. In such cases, the effectiveness of the manipulation is often dependent on the preexisting properties of the attitudes. For example, it might be difficult to create differences in the amount of thought associated with an attitude object if people have already thought a great deal about it. It might be much easier to create such differences if the target attitude object is one about which people have not engaged in much prior thinking. In general, researchers dealing with already formed attitudes should be attentive to the initial level of the construct that they wish to modify. If the baseline level is already quite high (e.g., high attitudinal confidence), manipulation could likely reduce this level (i.e., reduce confidence) but it might be difficult to increase it further. The reverse holds if the baseline level of the construct is quite low.

Measurement

Whereas manipulations of variables related to attitude strength are designed to create differences in strength-related dimensions of attitudes, measurement procedures attempt to assess an individual's (or, in some cases, a group's) existing level of the attitude dimension(s) under study. The measurement approach is often used when a study includes attitude objects for which existing dimensions of attitudes are likely to evidence substantial variability, and when manipulation of the desired attitude dimensions might be difficult.

Perhaps because of the conceptual similarities (and relationships) among some of the dimensions of attitudes related to attitude strength, researchers have sometimes measured differing strength dimensions in very similar ways. For example, Aldrich, Sullivan, and Borgida (1989) used 1984 survey data in which people had been asked to rank 14 political issues in order of their importance to "the country as a whole" and "to themselves personally," as an index of *attitude accessibility* (i.e., how easily the topic comes to mind). This measure, however, is very similar to measures of *attitude importance* that have been used by Krosnick and his colleagues (e.g., Krosnick, 1989). Similarly some researchers have studied *direct experience* with smoking using questions such as, "How often do you talk about smoking cigarettes?" (Sherman, Presson, Chassin, Bensenberg, Corty, &

Olshavsky, 1982), which is quite similar to questions used by other researchers to assess accessibility (e.g., Brown, 1974). Thus, if one simply follows the labels that have been given to measures in the past literature, one might use almost identical measures to index conceptually distinct attitude properties. Our goal for this chapter, therefore, is not to review all of the measures (or manipulations) that people have used to investigate the various dimensions of attitudes related to attitude strength. Instead, we attempt to review measures and manipulations that: (a) are relatively distinct from the measures and manipulations of other attitudinal dimensions, and (b) map relatively directly onto the defining features of the attitudinal dimension under study.

Known Groups

The known groups technique examines attitude strength by identifying groups assumed to differ on a particular variable. That is, some characteristic of a group of people serves as a proxy for the variable of interest. In one of the most well-known uses of this technique, the Sheriffs and their colleagues studied attitudes that were high versus low in "ego-involvement" by comparing the attitudes of individuals who did and did not belong to particular groups (e.g., by comparing prohibition attitudes of members of the Women's Christian Temperance Union with prohibition attitudes of people not belonging to this group; Hovland, Harvey, & Sherif, 1957; see also Sherif, Sherif, & Nebergall, 1965). In studies of direct experience with attitude objects, known groups have been identified by such indices as where people in the group live (in a study of direct experience with a housing crisis; Regan & Fazio, 1977) and whether or not women in the group have given birth on a prior occasion (in a study of direct experience with breastfeeding; Manstead, Proffitt, & Smart, 1983). The known groups technique has not been used as much as measurement or manipulation in research regarding attitude strength. This is likely due to the fact that groups assumed to differ on one strength dimension are likely to also differ on other dimensions.

Although we focus in this chapter on the techniques of measurement and manipulation, this is not because we view the known groups technique as unimportant. The known groups technique has been used profitably in studies of strength-related properties of attitudes such as direct experience (e.g., Manstead et al., 1983; Regan & Fazio, 1977), personal relevance (e.g., Howard-Pitney, Borgida, & Omoto, 1986; Sivacek & Crano, 1982), and attitude extremity (e.g., Judd & Johnson, 1981). In addition, the known groups technique could prove very useful in applications of research findings regarding attitude strength. For example, there might often be situations in which someone implementing a program would want to identify people who differ in strength-related properties of attitudes even though no opportunity for measurement or manipulation exists. In such cases, the person implementing the program might be able to identify known groups that relate to one or more strength properties.

In the purest form of the known groups technique, measurement of the dimension along which the groups are believed to differ would not take place, but some researchers have included a measurement of the construct to verify that the classification was accurate (e.g., see Howard-Pitney et al., 1986; Judd & Johnson, 1981). When this measurement is done, the known groups technique can function in a way identical to the measurement approach presented in the previous section, in that subjects can be classified on the basis of the measured strength property rather than the group classification.

In contrast to the known groups technique, at least in principle the procedures associated with manipulation and measurement can address the problem of confounding alternative dimensions with the dimension under investigation. In the case of measurement, this is achieved through conducting analyses that statistically control for the impact of any variables associated with the variable of interest that might plausibly be responsible for the observed effects of the variable—assuming that these control variables have been measured. The manipulations approach attempts to avert confounding by carefully creating variance only in the dimension under investigation. Unfortunately, ideal manipulations rarely exist. As a result, researchers often include manipulation checks that attempt to isolate the extent to which the construct of interest has been affected by the manipulation above and beyond the effects of the manipulation on other potentially related constructs. In this way, the manipulation and measurement procedures have much in common and have advantages over the use of a known groups procedure in which no measures of the critical and alternative constructs are taken.

MEASURES AND MANIPULATIONS OF SPECIFIC STRENGTH-RELATED DIMENSIONS

In the following sections, we provide examples of measures and manipulations that have been used to examine strength-related constructs in past empirical research. These examples are not exhaustive. Rather, they are a set of exemplars meant to provide a resource for researchers interested in investigating the attitudinal dimensions related to attitude strength that are featured in this volume. In order to accomplish this, we present measures and manipulations that have been commonly used in the literature and that can be applied across multiple attitude domains. When possible, we present the specific wording of questions assessing the construct associated with attitude strength and/or the response alternatives offered. We also include as much detail as possible regarding the procedures used in manipulations of the construct(s).

Each of the following sections begins with a conceptual definition of the construct and presents samples of measures that have been used in the past. Each entry also contains examples or suggestions for manipulations of the construct, with descriptions of both experimental treatments and control (comparison) conditions. To ease location, the strength-related constructs are presented alphabetically.

Accessibility

Attitude accessibility refers to the ease with which an evaluation comes to mind when one encounters an attitude object (see Fazio, ch. 10, this volume).

Measurement

Response Latency. Researchers often operationalize accessibility as the amount of time between the presentation of an attitude object and the individual's reported evaluation of it (Fazio, Chen, McDonel, & Sherman, 1982). This response latency is typically assessed with a computer that times the delay between presentation of the attitude object and the moment the subject provides an evaluation of the object by pressing a computer key (Fazio, 1986; see Fazio & Williams, 1986, for similar measures using a small microprocessor and a multitrack audio-recorder in the field).

Attitude accessibility has also been measured in computer-assisted telephone interviews. For example, Bassili and Fletcher (1991) had the interviewer press the space bar on a computer keyboard, triggering a computer clock, when he or she uttered the last word in an attitudinal inquiry. A "voice-key" in the computer recorded how long it took the respondent to utter the first sound following the end of the attitudinal inquiry.

To reduce variability in response-time data, one can take the following precautions: instruct research participants to respond as quickly and accurately as possible; include practice trials to familiarize participants with the task; use filler trials so that data adjustments can be made; and use a two-alternative response framework (e.g., yes/no, like/dislike; see Fazio, 1990).

Self-Reports. Although no direct self-report measures of attitude accessibility have been used (e.g., "How easily or quickly does your attitude come to mind when you encounter attitude object X?"), some indirect measures have been developed. For example, one approach to measuring accessibility might be to ask people how often they think or talk about the attitude object. This method assumes that the more accessible the attitude is, the more an individual will report thinking or talking about it. For example, Brown (1974) asked people questions such as: "About how often do you have thoughts about the law?" with response alternatives of "very often," "often," "sometimes," "seldom," and "never."

Manipulation

Experimental Treatments. Manipulations of attitude accessibility typically involve having respondents express the attitude(s) repeatedly. The more often an attitude is expressed, the more accessible it becomes. Consequently, some researchers have asked people to copy their attitudinal responses several times on a number of identical response scales (e.g., Fazio et al., 1982) or to make

numerous responses on scales with different evaluative anchors (e.g., like-dislike, good-bad, approve-disapprove). Responses have been made in writing (e.g., Powell & Fazio, 1984), orally (e.g., Bassili & Fletcher, 1991), or via a computer keyboard (e.g., Fazio, 1986).

Comparison Groups. Researchers generally use comparison groups that evaluate the attitude object on fewer occasions than the high accessibility group (e.g., Fazio et al., 1982). Occasionally, in order to control for the number of times that research participants encounter the attitude object, researchers have asked comparison groups to respond to nonevaluative questions regarding the object on as many occasions as the high-accessibility group responds to evaluative questions. Nonevaluative responding (such as noting whether a word has one syllable or not; see Fazio, Sanbonmatsu, Powell, & Kardes, 1986) does not increase attitude accessibility to the same extent as evaluative responding.

Ambivalence

Ambivalence refers to the extent to which one's reactions to an attitude object are evaluatively mixed in that both positive (favorable) and negative (unfavorable) elements are included (see Thompson, Zanna, & Griffin, ch. 14, this volume).

Measurement

Combining Positive and Negative Reactions. Measures of ambivalence are generally constructed by independently assessing the positive and negative reactions associated with an object and then combining those indices into an ambivalence measure. For example, Hass, Katz, Rizzo, Bailey, and Moore (1992) assessed ambivalence by first asking research participants to fill out a questionnaire that consisted of 10 pro-African-American and 10 anti-African-American statements, each with a 6-point agree-disagree response format (i.e., from 0 = "strongly agree" to 5 = "strongly disagree"). Pro-African-American items included "Many Whites show a real lack of understanding of the problems that Blacks face." Anti-African-American statements included "Black children would do better in school if their parents had better attitudes about learning" (see Katz & Hass, 1988, for the entire set of questions). In order to compute the ambivalence measure, Hass et al. (1992) converted the scores to standard normal (Z) scores using the total sample distribution. Then, the ambivalence score was obtained by multiplying the overall pro and anti scores (see Hass, Katz, Rizzo, Bailey, & Eisenstadt, 1991, for a discussion of this computation of ambivalence scores).

Other ways of combining independent assessments of positive and negative reactions to assess ambivalence have also been proposed (see Breckler, in press, for a review). For example, Kaplan (1972) proposed that ambivalence be assessed as "total affect" toward the object (i.e., the sum of positive and negative reactions) minus the "polarity" toward the object (i.e., the absolute value of the difference

between the number of positive and negative reactions). If one classifies the category of reaction (positive or negative) that has the smaller number as "conflicting reactions" and classifies the category of reaction that has the largest number as "dominant reactions," then Kaplan's (1972) formulation of ambivalence reduces to ambivalence being a function of only the number of conflicting reactions (i.e., the higher the number of reactions that conflict with other reactions, the higher the level of ambivalence).

In contrast, Thompson et al. (ch. 14, this volume) proposed that increased similarity between positive and negative reactions (i.e., a smaller difference between the number of dominant and conflicting reactions) and increased intensity of those reactions [i.e., a higher average of the number of dominant and conflicting reactions—(dominant + conflicting)/2] increases ambivalence. Thus, in order to construct overall ambivalence indices, Thompson et al. compute the difference between intensity of reactions and similarity of reactions (i.e., to the extent that the number of dominant and conflicting reactions are highly similar, less is subtracted from the intensity portion of the model).

Self-Report. Direct assessments of how mixed or conflicted respondents feel toward the attitude object have also been used as measures of ambivalence. For example, Tourangeau, Rasinski, Bradburn, and D'Andrade (1989) asked respondents the dichotomous question, "Would you say that you are strongly on one side or the other on the <blank> issue, or would you say your feelings are mixed?"

Manipulation

One could manipulate ambivalence by providing research participants with differing proportions of positive versus negative information about an unfamiliar attitude object. For example, Priester and Petty (1993) gave people positive and negative traits about a hypothetical target person. Measures of ambivalence, both self-report and those based on combining separately assessed positive and negative reactions (e.g., Kaplan, 1972), increased as the number of traits that conflicted with one another increased.

Certainty

Certainty refers to the confidence with which an individual holds an attitude: The more confidently an individual believes the attitude to be correct, the more certainty is present (see Gross, Holtz, & Miller, ch. 9, this volume).

Measurement

Certainty has generally been measured using self-reports. For example, Sample and Warland (1973) used a 15-item Likert scale to determine people's attitudes toward student government. After completing the scale, respondents were asked

condition the meter registered a response of approximately 70 for each of the five attitude questions.

Comparison Group. For participants in the low certainty condition of Fazio and Zanna (1978b), the meter indicated an average rating of 20 for each of the attitude questions.

Elaboration

Elaboration is the extent to which an individual has carefully scrutinized and thought about the merits of information relevant to the attitude object (see Petty, Haugtvedt, & Smith, ch. 5, this volume).

Measurement

Thought Listing. A primary tool used in the measurement of elaboration is the thought-listing or "cognitive response" procedure (e.g., Brock, 1967; Greenwald, 1968). In this technique, research participants encounter an attitude object and are then given 2 to 3 minutes to list as many thoughts about the object as possible. For example, Petty and Cacioppo (1977) told research participants that:

We are now interested in what you were thinking about during the last few minutes. You might have had ideas all favorable to the recommendation, all opposed, all irrelevant . . . or a mixture of the three. Any case is fine; simply list what it was that you were thinking during the last few minutes. The next page contains the form we have prepared for you to use to record your thoughts and ideas. Simply write down the first idea that comes to mind in the first box, the second idea in the second box, etc. . . . You should try to record only those ideas that you were thinking during the last few minutes. Please state your thoughts and ideas as concisely as possible . . . a phrase is sufficient. Ignore spelling, grammar, and punctuation. You will have 2.5 minutes to write your thoughts.

Following listing of the thoughts, either the research participants or independent judges categorize the thoughts into meaningful units (e.g., thoughts favorable, unfavorable, or neutral toward the advocacy of the persuasive message; Cacioppo, Harkins, & Petty, 1981). Some researchers have indexed the amount of elaboration by counting the number of thoughts generated about the attitude object (e.g., Burnkrant & Howard, 1984), with greater elaboration being indicated by a larger number of generated thoughts.

At the group level, a profile of thought favorability might be used to index the extent of thinking, even if the total number of thoughts does not differ across conditions. For example, if the study employs a manipulation of argument quality (e.g., Petty & Cacioppo, 1979b), greater elaboration would be indexed within each condition by a profile of thoughts that better reflects the quality of the issue

to indicate on a scale of 1 (not certain) to 5 (very certain) how certain they were of each of their 15 responses. The 15 certainty items were then averaged; people with an average of 4 or higher on the certainty scores were considered highly certain, whereas people with an average of less than 4 were considered low in certainty.

Another measure of certainty involves asking respondents to make one overall rating of the certainty of their attitudes. For instance, Fazio and Zanna (1978a) assessed individuals' attitudes toward participating in psychological experiments. After they completed this scale, respondents were then asked "How certain do you feel about your attitude toward volunteering to act as a subject?" on a 9-point scale anchored with 1 = "certain" and 9 = "not certain." Similarly, Fazio and Zanna (1978b) asked research participants to rate their overall certainty in five attitudinal responses on a 7-point scale with 1 = "no confidence at all" and 7 = "extreme confidence." Because some researchers have regarded certainty as the strength of the belief system underlying the attitude, those researchers have measured the certainty of beliefs directly, instead of measuring the certainty of the attitude. Fishbein and Ajzen (1975) used a two-step process to determine the certainty of beliefs. First, beliefs about an attitude object were elicited in a pretest measure, and subsequently people were asked to rate the probabilities that the attributes were actually associated with the object. The greater the probability that an attribute is associated with the object, the more certain the belief.

Manipulation

Experimental Treatment. Manipulations of certainty involve changing the confidence people have in their attitudes. For example, Fazio and Zanna (1978b) told research participants that the study involved assessment of attitudes and certainty of attitudes toward five different puzzle-type problems. Research participants were then told that "People have been able to devise physiological measures of certainty, and since we want to get as accurate measurements as we can, we decided to couple a self-report measure of attitude with a physiological measure of certainty." Participants were shown the supposed certainty instrument, told that it would measure both heart rate and skin conductance via two electrodes attached on the fingers, and then were notified of its similarity to a lie detector.

The instrument was actually a meter with points demarcated every five units from -100 to +100. Participants were told that the negative end of the scale was the part used for lie detection and that it was not connected for the experiment because people were not expected to lie. The experimenter then explained that the positive half of the scale was the confidence measure—the larger the scale reading, the more confidence an individual had in his or her attitude. Finally, participants were given the attitude scales referring to the 5 problems and were instructed to write down the certainty rating indicated by the certainty instrument next to each of their attitudinal responses. For subjects in the high certainty

relevant arguments presented (e.g., a greater proportion of favorable thoughts in response to strong as opposed to weak arguments within a certain level of the variable under study; see Petty & Cacioppo, 1986). Elaboration can also be measured by correlating a favorability index of the thoughts (e.g., subtracting the number of unfavorable thoughts from the number of favorable thoughts and dividing by the total number of thoughts, see Cacioppo et al., 1981) with the favorability of respondents' attitudes. Stronger correlations between thoughts and attitudes indicate that the attitude reflects greater message-relevant thinking (e.g., Chaiken, 1980; Petty & Cacioppo, 1979b).

Argument Quality. Because greater elaboration is associated with greater scrutiny of information relevant to the attitude object, the level of elaboration in a group has also been inferred from the extent to which strong (compelling) reasons in support of a position are more effective at persuading people to support the position than are weak (specious) reasons (Petty, Wells, & Brock, 1976). Argument quality is empirically defined according to the profile of thoughts elicited by the arguments when pretest subjects are instructed to think carefully about the content of the message (i.e., with strong arguments eliciting primarily favorable cognitive responses and weak arguments eliciting primarily unfavorable cognitive responses; see Petty & Cacioppo, 1986).

Self-Reported Cognitive Effort. One of the simplest methods for measuring elaboration is by asking respondents how much effort they expended in processing information relevant to the attitude object. For example, research participants might be asked "How much effort did you put into evaluating the communication?" (see Fukada, 1986; Petty, Harkins, Williams, & Latané, 1977). Alternatively, research participants might be asked the extent to which they generated "many thoughts" or "few thoughts" about a persuasive message (Batra & Ray, 1986).

Individual Differences in Need for Cognition. One might also measure individual differences in the likelihood of elaboration using the Need for Cognition scale (Cacioppo & Petty, 1982). This scale measures the extent to which people enjoy and engage in effortful cognitive endeavors using items such as "Thinking is not my idea of fun." This item is reverse-scored on a scale from 1 ("extremely uncharacteristic of me") to 5 ("extremely characteristic of me"). The most common form of the Need for Cognition scale consists of 18 items (see Cacioppo, Petty, & Kao, 1984), although subsets of the items have also been used with some success in survey research (e.g., Verplanken, 1991).

Manipulation

Experimental Treatments. Perhaps the most direct method for manipulating the amount of elaboration is to instruct research participants to think carefully about the information presented about the attitude object. Instructions of this sort

have often been used in pretests of argument quality (see Petty & Cacioppo, 1986). Less direct instructions have also been used. For example, Pratkanis, Greenwald, Leippe, and Baumgardner (1988) asked subjects to "read each paragraph in the article twice. Read each paragraph first for what is said (content). Then read the same paragraph again (before going on to the next), this time paying attention to how it is said (style). As you read, underline the main point of each paragraph" (p. 213). Similar instructions were also used by Gruder, Cook, Hennigan, Flay, Alessis, and Halamaj (1978) and Watts and McGuire (1964).

In addition to instructions to elaborate, there are many variables known to affect the level of elaboration given to persuasive appeals. Many of these are reviewed by Petty et al. (ch. 5, this volume; see also Eagly & Chaiken, 1993; Petty, Priester, & Wegener, 1994). One variable that affects the extent of elaboration in a relatively direct manner is the level of distraction present in the context of the persuasive appeal (with higher levels of distraction corresponding to lower levels of ability to engage in elaborative thought). For example, research participants in Petty et al. (1976; Experiment 2) listened to a persuasive message while they attempted to record the location of Xs that appeared on a screen. In high-distraction conditions, Xs appeared every 5 seconds during the message whereas in the low distraction condition Xs appeared every 15 seconds. Another variable that has influenced the amount of message elaboration is the amount of personal responsibility respondents feel for evaluating the attitude-relevant information. For example, research participants in the high personal responsibility conditions of Petty, Harkins, and Williams (1980; Experiment 2) were told that they were the only person responsible for evaluating an editorial message, whereas low responsibility subjects were told that they were part of a group that was responsible.

Comparison Groups. When direct instructions to think are used to create high levels of elaboration, such conditions might be compared with conditions in which no such instructions are given. Comparison groups for distraction manipulations have included fewer distracting events or no distracting events (Petty et al., 1976). Low levels of personal responsibility have been created by telling research participants that many people share the responsibility of evaluating the message (Petty et al., 1980).

Extremity

Attitude extremity is the degree to which the favorability of an individual's attitude diverges from neutral (i.e., neither favorable nor unfavorable)—the further away from neutral the more extreme, regardless of valence (see Abelson, ch. 2, this volume; Judd & Brauer, ch. 3, this volume; and Tesser, Martin, & Mendolia, ch. 4, this volume).

Measurement

Measures of attitude extremity have generally assessed the amount by which an individual deviates from the midpoint of an attitude scale or scales. For example, Downing, Judd, and Brauer (1992) assessed extremity by calculating an absolute deviation score from the midpoint of a 29-point attitude scale anchored at 1 ("oppose") and 29 ("support") for each of 15 social issues (e.g., abortion rights, animal rights). Similarly, Van der Pligt, Ester, and Van der Lindern (1983) asked participants to report their attitudes toward building more nuclear power stations on a 5-point scale ranging from "strongly opposed" to "strongly in favor." People who responded either "strongly opposed" or "strongly in favor" were classified as holding extreme attitudes toward the object.

Manipulation

Experimental Treatments. Because increasing attitude extremity involves moving attitudes further from the neutral point on a scale, manipulations of attitude extremity might be viewed as producing attitude change. As such, any technique discussed in the attitude change literature (e.g., presenting participants with strong arguments delivered by a credible source, see Petty & Cacioppo, 1986, for a review) could be used to manipulate attitude extremity. However, one might view manipulations that do not provide recipients with any additional information about the object, such as repeated attitude expression, as relatively "pure" manipulations of attitude extremity, though it is possible for individuals to generate new thoughts on the issue even with these "pure" procedures.

Downing et al. (1992) demonstrated that having participants repeatedly express their attitudes on a dichotomous response scale (e.g., bad-good, harmful-beneficial) led to greater extremity in later expressions of attitudes on continuous response scales. In some cases, however, repeated attitudinal expression might not lead to greater extremity (e.g., repeating attitudes on a 9-point bipolar scale might allow respondents to recall the relative extremity of past responses, with commitment pressures leading to no extremity changes in later responses; see Downing et al., 1992).

One could also use mere exposure of the attitude object to make attitudes toward the object more extreme. For relatively novel stimuli (e.g., unfamiliar faces, foreign words, nonsense syllables), mere exposure (i.e., presenting the object to participants repeatedly) generally leads to increased positivity of opinions of the object, even if people who encounter the attitude object(s) do not recognize that they have seen the object(s) before (Kunst-Wilson & Zajonc, 1980; see Bornstein, 1989, for a review). For more meaningful stimuli, however, increased repetition of exposure enhances the dominant cognitive response to the object. For example, attitudes toward negative words (e.g., "hate") become more unfavorable, but attitudes toward positive words (e.g., "love") become more favorable, at least until the point of tedium (see Grush, 1976; Sawyer, 1981).

Similarly, research on mere thought has shown that instructing people to think about an initially likable or dislikable attitude object leads people to view the likable object more favorably and the dislikable object less favorably (Tesser, Martin, & Mendolia, ch. 4, this volume). Research has also indicated, however, that both moderation and polarization of attitudes can result from mere thought. Specifically, polarization (i.e., increased extremity) occurs only if participants have relatively well-integrated and consistent schemas to guide thought, and if participants are motivated to utilize their issue-relevant knowledge (Liberman & Chaiken, 1991; Tesser & Leone, 1977).

Comparison Groups. If persuasive messages are used to create extreme attitudes, then one might provide either no message or an ineffective message (i.e., a message that does not change attitudes) in the control condition (see Petty & Cacioppo, 1986). If one is using repeated attitude expression as a manipulation of extremity, the control group could consist of individuals who either did not complete any scales referring to the attitude object, completed fewer scales than the "extreme" group, or were asked nonevaluative questions about the object (similar to comparison groups used in manipulations of attitude accessibility; see Downing et al., 1992). Similarly, comparison groups for a mere exposure technique could simply encounter the attitude object on fewer occasions than high-exposure groups (Kunst-Wilson & Zajonc, 1980). If one uses mere thought as a manipulation of attitude extremity, the control group might not be instructed to think about the object or might be distracted from doing so (e.g., Sadler & Tesser, 1973).

Importance

Attitude importance refers to a person's perception of the amount of personal importance he or she attaches to an attitude (see Boninger, Krosnick, Berent, & Fabrigar, ch. 7, this volume).

Measurement

Attitude importance has generally been measured using self-reports of concern or caring about the attitude object (see Boninger et al., ch. 7, this volume, for the rationale for asking about the importance of the attitude object rather than the importance of the attitude itself). Researchers have used three basic types of questions to measure perceptions of importance. These include: (a) how important is the attitude object to you personally? (b) how deeply do you care about the attitude object? and (c) how concerned are you about the attitude object? (Krosnick, 1989). For example, Krosnick, Boninger, Chuang, Berent, and Carnot (1993) asked research participants: "How important would you say the issue of capital punishment is to you personally?" accompanied by a 7-point scale from 1 ("Extremely important") to 7 ("Not too important"). Similarly, they asked research participants "How much do you personally care about the issue of capital

punishment?" accompanied by a 7-point scale anchored at 1 ("A great deal") and 7 ("Not at all").

Manipulation

Although no research has attempted to convince people that a particular issue should or should not be important to them, some researchers have manipulated the proposed origins of attitude importance. Personal relevance (stemming from self-interest, social identification, or value relevance; cf. Petty, Cacioppo, & Haugtvedt, 1992) has been identified as a proximal cause of attitude importance (Boninger, Krosnick, & Berent, in press). Therefore, manipulations of personal relevance (or of the factors that make up personal relevance) might serve to manipulate attitude importance.

Experimental Treatments. Consistent with the idea that personal relevance is an origin of attitude importance, manipulations of high personal relevance have also created high levels of perceived personal importance (e.g., Brickner, Harkins, & Ostrom, 1986; Haugtvedt & Wegener, 1994).

Alternatively, Boninger et al. (in press) manipulated importance by using an imagination technique (Anderson, 1983). Research participants in the relevant scenario condition were instructed to imagine themselves in a horrific car accident, and then draw a series of five cartoon pictures depicting the accident and its aftermath. Participants were then asked to draw another sequence of five pictures depicting the same events in a different way. This increased the importance attached to attitudes on traffic safety.

Comparison Groups. As described in a subsequent section of this chapter, comparison groups for manipulations of personal relevance often consist of topics that are being considered for a distant location or for some time in the future. In experiments that have manipulated importance through imagination scenarios, the comparison group consisted of research participants who imagined a scenario irrelevant to the topic of interest. For example, Boninger et al. (in press) had participants in the irrelevant scenario condition draw a sequence of cartoons about a spring vacation that did not go well.

Knowledge

Knowledge typically refers to the information stored in memory regarding an attitude object. Such information could include beliefs about attributes of the object, memories of one's past behaviors relevant to the object, or memories of feelings associated with the object (see Davidson, ch. 12, this volume; Wood, Rhodes, & Biek, ch. 11, this volume).

Measurement

Knowledge Listing. One method researchers have used for indexing this construct is the knowledge-listing task. For example, subjects are often given a brief period of time (e.g., 2 minutes) to list the characteristics and facts they believe to be true about the attitude object or issue, previous behaviors relevant to the object that they can recall, and so forth (e.g., Wood, Kallgren, & Preisler, 1985; see also Davidson, Yanits, Norwood, & Montano, 1985). Judges can then assess the number of distinct items listed by each respondent (e.g., Wood, 1982).

Quizzes. Other researchers have identified people's levels of knowledge by determining the accuracy of their responses to quizzes about the object or the general domain to which the object belongs. For example, Wilson, Kraft, and Dunn (1989; Experiment 1) asked respondents to answer open-ended factual questions about political candidates (e.g., "Which presidential candidate has been endorsed by the Teamsters Union?") to measure political knowledge. Quizzes utilizing multiple-choice questions have also been used. For example, Sidanius (1988) asked questions such as "What is the name of the major Black opposition group in South Africa? (a) The Congress of Racial Equality, (b) The African Peace and Freedom Congress, (c) South Africans for Freedom, (d) African National Congress, (e) None of the above" (see Sidanius, 1988, pp. 50-51; see also Lusk & Judd, 1988; Zaller, 1990).

Self-Perceptions. Self-reports of how knowledgeable people feel they are about an object have also been used. For instance, Davidson et al. (1985, Study 2) asked subjects to report how well-informed they were about an available flu shot on a 4-point scale ranging from "completely uninformed" to "completely informed" (see also Cacioppo & Petty, 1980). One might also use self-reports to assess how many memories people have that include the attitude object. For example, researchers have asked respondents to estimate the number of behaviors that they have performed toward the attitude object (e.g., Davidson et al., 1985; Fazio & Zanna, 1978a).

Manipulation

Experimental Treatments. Manipulations of knowledge involve presenting research participants with new information about the object or with new experiences of the object. Some manipulations of knowledge have enhanced the sheer amount of general attitude-relevant information that participants encounter. For example, Lewan and Stotland (1961) provided people in the high-knowledge group with information about the attitude object—a European region called Andorra (e.g., the region's geography, language, fiscal systems, etc.; see also Johnson, in press).

Other manipulations of knowledge have attempted to provide more specific information that enables recipients to scrutinize claims made about the object. For example, McMichael (1992) gave people information on the current status of their university (e.g., that currently, 30% of students find a job in their most preferred field immediately after graduation) that enabled them to determine whether a recommendation for the university (e.g., instituting comprehensive exams that would have the effect of making 60% of students find jobs in their most preferred field immediately after graduation) was merited or not.

Manipulations have also given people a greater amount of direct contact with the attitude object. For example, Regan and Fazio (1977; Study 2) gave research participants direct-experience with five puzzles that they were to "get acquainted with" by having participants work the puzzles for approximately 5 minutes (see also Songer-Nocks, 1976). Similar manipulations have been created by asking some research participants to taste a food product (e.g., Berger & Mitchell, 1989; Wu & Shaffer, 1987).

Comparison Groups. Some researchers have used a low-knowledge comparison group that receives information about an object other than the one of interest. For instance, Lewan and Stotland (1961) gave subjects in the low-knowledge condition information about a European region (i.e., Etruria) other than the region of interest. The pieces of information were from the same categories as those given to high-knowledge participants. Other researchers have used a low-knowledge group that receives no information about any object (e.g., McGuire, 1964).

Comparison groups for manipulations of direct experience often involve giving people information that is similar to that provided by the direct contact with the object but that includes no direct contact. For example, in the control group of the Regan and Fazio (1977) experiment, the experimenter orally presented 5 minutes of information about how the puzzles could be solved, including the completed solutions to each puzzle. When manipulations of direct experience involve experiences such as taste of a food product, indirect-experience participants are often given information about the taste and other qualities of the product derived from other participants' self-reports of their direct experiences with the product (e.g., Berger & Mitchell, 1989; Wu & Shaffer, 1987). In these cases, the amount of knowledge is held somewhat comparable, but the basis of the knowledge is varied (i.e., direct vs. indirect experience).

Personal Relevance

Personal relevance refers to the extent to which people believe that a topic or attitude object holds significant consequences for some aspect of their lives (e.g., their outcomes, values, possessions, groups; see Petty & Cacioppo, 1990; Petty et al., 1992). When the attitude topic has personal relevance, people are said to

be personally involved with it (see Thomsen, Borgida, & Lavine, ch. 8, this volume). Some research has focused on particular components of personal relevance such as the extent to which the issue is connected to personal outcomes (e.g., in studies of vested interest, see Crano, ch. 6, this volume).

Measurement

Assessments of personal relevance have generally asked how likely the attitude object or issue is to affect the respondent personally, how relevant respondents perceive the issue to be, or how likely it is that a proposal affecting the respondent will be instituted (see Petty & Cacioppo, 1986). For example, Haugtvedt and Wegener (1994) asked research participants to rate their views of the topic of a communication on 11-point scales anchored with 1 ("not personally relevant" and "will not affect me") and 11 ("personally relevant" and "will affect me").

Similarly, in order to assess research participants' perceptions of personal relevance of the topic of instituting senior comprehensive exams, Sivacek and Crano (1982) asked participants to respond to 7-point scales assessing the extent to which respondents agreed with the statement: "It is very likely that I would have to take senior comprehensive exams if they become required as planned" (see also Petty & Cacioppo, 1984). Sivacek and Crano (1982) also used a 7-point scale asking to what extent respondents perceived the recommendation as likely to affect them (i.e., they provided ratings of agreement with the statement: "The issue of whether or not to require senior comprehensive exams at Michigan State University directly affects me").

Manipulation

Experimental Treatments. Manipulations of personal relevance have generally varied what Thomsen et al. (ch. 8, this volume) call self-interest, what Crano (ch. 6, this volume) calls vested-interest, and what Johnson and Eagly (1989) call outcome-involvement. For example, Petty and Cacioppo (1984) presented research participants with a message supposedly from the chairperson of the University Committee on Academic Policy at their university. Participants were informed that the function of the committee was to advise the chancellor on changes in academic policy that should be instituted. High personal relevance was created by further informing participants that the committee was working on academic changes that were to be initiated the next year, whereas low relevance subjects were told that the committee was making recommendations to take effect in 10 years. Similar variations in personal relevance have been created by describing changes as likely to occur either at the research participants' university or at a distant university (e.g., Apstler & Sears, 1968; Haugtvedt & Wegener, 1994; Petty & Cacioppo, 1979b).

Ostrom and Brock (1968) utilized a manipulation of high relevance in which beliefs about the attitude object were manipulated to become related to important

values rather than immediate outcomes. That is, research participants first received a message that introduced the participant to a position (i.e., opposing Greenland's admittance into the Pan-American Bank), and were then given statements from the message a second time—each statement from the message being paired with a statement of a value potentially relevant to the message about Greenland's application. Participants were asked to rate the level of appropriateness between the excerpt from the message (i.e., the statement about Greenland) and the value on a 6-point scale from "completely appropriate" to "not at all appropriate." Next, participants were asked to circle a key word in each of the two statements in the pair and to draw a connecting line between them. High as opposed to low personal relevance was created by presenting different sets of value statements in this task. That is, high relevance was created by presenting value statements that had been rated as highly important by an earlier set of respondents.

Personal relevance has also been manipulated through variations of "outcome dependency." These manipulations generally lead research participants to believe that they will be interacting with a target person in some way and that experience with that person will have personal consequences for the research participant. For instance, Omoto and Borgida (1988) created high personal relevance of a target person by leading participants to believe that they were to date the target person for a series of three dates. In a related paradigm, Erber and Fiske (1984) created high personal relevance by instructing participants that a \$20 prize would be given to each member of the pair that was able to work together to generate the best educational games for 8-year-olds using some wind-up toys available in the laboratory.

Comparison Groups. For manipulations of personal relevance that inform research participants that some policy will affect them in the near future, comparison groups have generally been told that the policy will either be implemented far in the future or in some other location (e.g., Axsom, Yates, & Chaiken, 1987; Petty & Cacioppo, 1979b). When manipulations of relevance include linking of attitude-relevant statements to important beliefs, the comparison group has been formed by providing value statements for the value-bonding task that have been rated as relatively unimportant by additional respondents (Ostrom & Brock, 1968). For manipulations of personal relevance that involve outcome dependency, the comparison group involves some condition in which the actions of the target person have relatively little effect on rewards and/or punishments to the research participant (e.g., playing a short puzzle game; Omoto & Borgida, 1988).

Structural Consistency

Structural consistency refers to the extent to which an attitude is evaluatively consistent with other attitudes (interattitudinal consistency; see Eagly & Chaiken, ch. 16, this volume), or with the beliefs, affect, or behavior associated with the

attitude object (intra-attitudinal consistency: evaluative-cognitive, evaluative-affective, and evaluative-behavioral; see Chaiken, Pomeranz, & Giner-Sorolla, ch. 15, this volume).

Measurement

Intra-Attitudinal Consistency. Measures of intra-attitudinal structure have usually assessed consistency between the overall evaluation and one of the component classes of underlying structure (e.g., evaluative-affective consistency).

Measures of intra-attitudinal consistency have generally included an evaluation (attitude) measure that is either a single index of overall favorability toward the attitude object (e.g., a 9-point scale anchored with very favorable at one end and very unfavorable at the other end with the neutral point explicitly indicated; Norman, 1975) or a set of semantic-differential attitude scales (e.g., 7-point bipolar scales anchored with good vs. bad, positive vs. negative, etc.; e.g., Chaiken & Baldwin, 1981). The affective component of an evaluative-affective consistency measure typically assesses the extent to which the attitude object makes people feel particular affective states (e.g., Breckler & Wiggins, 1989). For example, Crites, Fabrigar, and Petty (1994) assessed research participants' feelings associated with a variety of attitude objects (e.g., snakes, capital punishment) by providing them with a set of semantic-differential affective scales (i.e., 7-point bipolar scales anchored with general emotions that could be associated with objects such as angry vs. relaxed, joy vs. sorrow, etc.; see also Chaiken et al., ch. 15, this volume). An overall evaluative-affective consistency index is formed by rescaling the evaluative and affective components to a common metric (e.g., through standardizing the scores) and computing a difference score between the evaluative and affective component measures (e.g., see Chaiken et al., ch. 15, this volume; Crites et al., 1994).

The cognitive component of an evaluative-cognitive consistency measure typically assesses the extent to which the attitude object possesses traits or attributes that hold favorable or unfavorable evaluative implications. For example, Crites et al. (1994) assessed research participants' cognitions associated with a variety of attitude objects by providing them with a set of semantic-differential cognitive scales (i.e., 7-point bipolar scales anchored with various general attributes of objects such as useful vs. useless, safe vs. unsafe, etc.; see also Erber, Hodges, & Wilson, ch. 17, this volume). The overall evaluative-cognitive consistency index is formed by rescaling the evaluative and cognitive components to a common metric and computing a difference score between the evaluative and cognitive component measures. This procedure parallels the assessment of the evaluative-affective consistency index just described.

Expectancy-value assessments (e.g., Fishbein & Ajzen, 1975) have also been used to assess the cognitive component of evaluative-cognitive consistency, although a parallel affective procedure has not been developed. In the expect-

tancy-value procedure, the goals relevant to the attitude are determined in a pretest. Participants in the primary study rate both the extent to which the attitudinal position helps versus hinders attainment of the goal (instrumentality) and the desirability of goal attainment (value). A sum of the instrumentality \times value products represents the cognitive component of evaluative-cognitive consistency (see Chaiken & Baldwin, 1981; Chaiken et al., ch. 15, this volume; Norman, 1975; Rosenberg, 1968). The overall evaluative-cognitive consistency measure could either be formed as previously described or by using the two-step procedure introduced by Rosenberg (1968). That is, research participants can be rank ordered in terms of their evaluation scores and again in terms of their cognitive scores. Then, the absolute value of the discrepancy between each participant's position in these two rankings serves as his or her evaluative-cognitive consistency score (Rosenberg, 1968).

Interattitudinal Consistency. Traditionally, interattitudinal consistency has been evaluated at a group level through correlations among measures of attitudes (with higher correlations presumably indicative of higher levels of consistency; e.g., Converse, 1964). Unfortunately, this measure of between-group differences suffers from at least three distortions due to: (a) between-group differences in measurement error, (b) differences in response variation, and (c) variations in the structural relations that people see among attitudes (i.e., different people might view the same attitudes as relating to one another in different ways; see Judd & Krosnick, 1989, pp. 103–107). In order to avoid these difficulties, one might assess interattitudinal consistency using analyses of covariance structures that correct for the impact of measurement error and response variance (e.g., Judd & Krosnick, 1982). In addition, one might utilize unstandardized regression coefficients that are less affected by response variance, estimate the reliabilities of the variables in each group and disattenuate the unstandardized regression coefficients, and examine only individuals who agree on the implicational relationships among attitude objects (Judd & Krosnick, 1989).

Few individual-level measures exist that assess interattitudinal consistency. In some cases, however, researchers have successfully used self-reports of the implicational links among attitude objects for this purpose. For example, Judd, Drake, Downing, and Krosnick (1991) asked research participants "If you knew where someone stood on Issue A, how confident would you be in predicting where he or she stood on Issue B?" The response options on a 7-point scale were anchored at "very confident" (1) and "not at all confident" (7).

Manipulation

Experimental Treatments. Although little work manipulating intra-attitudinal structure has taken place, there are at least a couple of methods that one might consider for doing so. For example, it has been proposed that mere thought

(Tesser, 1978) increases the consistency of stored knowledge underlying the attitude. That is, although some relatively well-integrated knowledge structure is required for the mere thought-polarization effect (e.g., Tesser & Leone, 1977), the knowledge base underlying the attitude becomes even more organized and consistent through mere thought about the object (see also McGuire, 1960a, 1960b). One might even be able to accomplish this within the categories of knowledge potentially underlying the attitude. For example, one could identify people who hold primarily affectively or cognitively based attitudes (e.g., Millar & Millar, 1990) and enhance consistency of the affective or cognitive base underlying the evaluation by having individuals think about the affective or cognitive bases of their attitudes.

Alternatively, one might attempt to manipulate intra-attitudinal structure by providing people with information about a novel attitude object that is either evaluatively consistent or inconsistent. A variety of possibilities exist. The information could be consistent or inconsistent with the attitude toward the object (i.e., creating differences in evaluative-affective or evaluative-cognitive consistency). In such a case, however, the new information about the object would have to be incorporated into the person's knowledge structure underlying the attitude without changing the attitude (or else people might end up with differences in attitude valence but no difference in intra-attitudinal consistency).

Consistency or inconsistency of intra-attitudinal structure could also be either within or across dimensions of information. For example, one might present research participants with affective information followed by evaluatively consistent or inconsistent cognitive information (creating differences in affective-cognitive consistency) or by evaluatively consistent or inconsistent affective information (creating differences in consistency of affective information). Importantly, in cases where both affective and cognitive information are presented, the order in which the information is received might create differences in the underlying base of the attitude, which has important consequences for which kinds of persuasive attempts successfully change the attitude (see Edwards, 1990; Millar & Millar, 1990).

Research attempting to manipulate interattitudinal structure has also been sparse. In a recent study, however, Judd and Downing (1990) asked people to repeatedly think about the relationships between pairs of attitude positions. That is, research participants were told that each screen of a computer program would present a question (e.g., "If you knew that someone favored 'Star Wars,' do you think they would favor or oppose capital punishment?") and that their job was to answer each question as quickly and accurately as possible. Presumably, the greater the number of repetitions of such responses, the greater the strength of the relations among attitudes (i.e., the higher the interattitudinal consistency).

Comparison Groups. If one were using mere thought to increase intra-attitudinal consistency, the comparison group would consist of individuals who either were not asked to think about the attitude object or were distracted from doing so

(e.g., Sadler & Tesser, 1973). If one were to present information about novel attitude objects, the low-consistency group would receive information that is evaluatively inconsistent (cf., section on ambivalence). When researchers use repetition of thought about implicational relationships as a manipulation of interattitudinal consistency, the comparison group might be asked to think of each pair of attitudes few or no times.

INFERENCES BASED ON MEASURES AND MANIPULATIONS

Advances in the study of attitude strength depend on the ability of researchers to adequately identify, create, or influence dimensions of attitudes related to their strength. An equally important aspect of studies of attitude strength is the inferences that people make regarding the role of specific strength-related dimensions. That is, most of the attitude strength literature consists of measures or manipulations of a focal dimension that is found to relate to some hypothesized strength-related outcome. Upon finding this result, researchers often draw conclusions about the role of the specific dimension in affecting the strength-related outcome.

If research on attitude strength is to advance, however, it is necessary for researchers in the field to scrutinize the inferences that are made based on our current manipulations and measures. Perhaps the most important aspect of scrutinizing current conclusions regards potential confounds in manipulations and measures of strength-related attitude dimensions. In the following sections, we discuss the implications of this problem for manipulation and measurement procedures, and we present classes of future research that might improve our understanding of the manipulations and measures currently in use.

Measurement

Controlling for Confounds

It is always possible that measures of one attitude dimension covary with measures of other constructs. If so, confounded constructs could be responsible for an observed relation between the construct of interest and some strength-related outcome(s). To address this concern, in a complete measurement procedure, one would want to assess not only the dimension(s) of interest but also any competing variable(s) that might be responsible for the relation(s) between the dimension(s) of interest and the dependent measure. For example, consider a researcher who wishes to study the impact of attitude accessibility per se on attitude persistence using the measurement technique but realizes that differing amounts of thought given to the issue might also be responsible for the association between accessibility and persistence. Such a researcher should measure not only attitude accessibility and persistence but also amount of thought given to the

issue. By taking these additional measures, the researcher can statistically control for the competing dimension (i.e., amount of thought) and thus better estimate the unique impact of the attitudinal property being studied (i.e., attitude accessibility).

In many cases, however, researchers include only measures of the focal dimension of interest (with no measures of alternative variables that might be responsible for the effects of interest in the study). In such cases, one cannot be sure that associations between the measured dimension and the outcome of interest are not due to an unmeasured third variable. This is not to say that one could reasonably expect researchers to measure *all* constructs potentially responsible for the effects of the variable under study—often the relations among these variables are not yet known, or practical considerations keep one from including the large number of measures that would be required to exhaust the range of variables potentially at work. Yet, researchers using the measurement approach should keep in mind that a relationship between a measured dimension and an outcome of interest could be due to an unmeasured third variable.

Importantly, when one measures dimensions of attitudes associated with attitude strength, the most likely dimensions to covary with such measures (and the most likely to provide potentially competing explanations of the data) are other dimensions of attitudes related to strength. Thus, if one attempts to investigate the *unique* impact of some strength-related dimension, measures of other strength-related properties are often the crucial constructs that must be statistically paralled in tests of the hypothesis under study. If this is not done, one might reach conclusions about one attitude dimension that are actually due to another attitude dimension.

Comparability of Measures

In developing measures of attitudinal dimensions related to strength, researchers must make both conceptual and methodological decisions. For instance, researchers must consider (and often define) the conceptual nature of the construct they wish to measure. At times, however, the nature of the construct might be broad enough to include measures that tap into aspects of the construct that might or might not cohere conceptually. Consider the construct of attitude-relevant knowledge. A variety of measures of knowledge have been proposed and used in the literature (e.g., knowledge listing, quizzes, self-reports). Do these varied measures index the same construct? To be sure, the measures are all related to and likely index differences in attitude-relevant knowledge. It might be, however, that aspects of these measures map onto classes of knowledge that have demonstrably different strength-related consequences.

Knowledge listing tasks are generally focused on information about the specific attitude object, whereas knowledge quizzes are often about a class of information that is related but not directly associated with the attitude object.

Also, quizzes tend to focus on the assessment of "accurate" information, whereas knowledge listings index the amount of information associated with an object whether accurate or not. Thus, although the two measures might be generally related, one can easily conceive of instances in which the two measures diverge (e.g., when one has a great deal of accurate general political knowledge but knows little or nothing about a particular political issue). One can imagine a variety of ways in which mechanisms associated with these two measures of knowledge might also differ. For example, subjective knowledge about a particular object might provide counterarguments to a persuasive appeal about the object (which could encourage resistance to change), whereas accurate knowledge about a domain of expertise related to the object (but not directly connected to the object) might or might not provide counterarguments to a persuasive appeal about the object. On the other hand, general knowledge might be more closely tied to resistance due to inter-attitudinal consistency pressures (see Eagly & Chaiken, ch. 16, this volume) than is object-specific knowledge.

Of course, similar issues arise for any attitudinal dimensions measured through self-reports of perceptions of the attitudinal dimension versus measures directed at quantifying the actual amount of the dimension. In the case of attitude-relevant knowledge, the actual information that people have associated with the object might have important meaning above and beyond the simple perception of having a large amount of knowledge, and the mere perception of being informed might sometimes have an impact beyond one's actual knowledge on an issue. Similar differences might be realized for other attitude dimensions such as perceived ambivalence versus the actual existence of conflicting reactions toward the attitude object, or perceived accessibility rather than the actual time it takes to retrieve one's attitude.

Manipulation

The informative value of a manipulation is determined at least in part by the purity of that manipulation. That is, a manipulation of a strength-related dimension is most informative to the extent that it creates differences only in the conceptual construct under investigation rather than in related constructs that potentially affect the outcome measure(s) in the study.¹ If a manipulation creates differences in more than one property of the attitude, the results of that study can only be interpreted as they relate to all of the dimensions affected by the

¹In this context, it is important to note that random assignment serves only to equate groups on dimensions that have not been impacted by the manipulation. For example, consider an experiment in which attitude accessibility is examined using a manipulation that creates differences in attitude accessibility and direct experience. In such a case, random assignment equates the groups on factors other than direct experience and attitude accessibility, but differences in direct experience might be responsible for the results even though the manipulation was aimed at creating differences only in attitude accessibility.

manipulation.² Importantly, in studies of attitude strength, other strength-related properties of attitudes are the primary dimensions that might have been altered by manipulations of the focal attitude property.

Because manipulations of dimensions of attitude strength, like all manipulations, might affect more variables than is intended, evaluation of such studies should include some thought about related properties of attitudes that might also have been affected by the manipulation. If multiple properties of the attitude are likely affected by a given manipulation, scrutiny must be given to the extent to which the various attitude properties provide conflicting explanations for the effect(s) of the manipulation.

There are a variety of ways in which the effects of a manipulation might be investigated. One that has been used is for the researcher to collect manipulation checks that assess induced differences in the construct of interest. Collection of measures of the focal construct alone are not sufficient for assessing the purity of the manipulation, however. One would also need to measure other constructs that might be affected by the manipulation and that might be responsible for the observed relation between the manipulated variable and the dependent variable. Through use of such procedures, either relatively pure manipulations of the construct of interest might be developed or differences in related constructs might be statistically controlled in order to assess the unique role of the construct of interest. In this way, manipulation procedures can also involve the same steps that are necessary in optimal use of the measurement procedure.

Thus, one of the important refinements for future research on attitude strength is to investigate the extent to which manipulations used in such studies affect more than the primary construct assumed to be associated with the manipulation. As one example of this, consider research on repeated attitude expression. As noted in the earlier sections on attitude accessibility and extremity, each of these constructs can be affected by repeated expression of the attitude (at least under certain conditions). Thus, it is important to note that researchers typically have been careful to separate accessibility from extremity effects (see Fazio, ch. 10, this volume).

Recent research suggests, however, that manipulations of repeated expression can create differences in other strength-related constructs as well. For example, Roese and Olson (1994) found that differences in attitude accessibility (as a result of repeated attitude expression) led to differences in respondents' perceptions of importance of the attitude topic. It might be that differences in attitude

²Of course, across a number of experiments, a researcher might use different manipulations that vary the dimension of interest along with some other dimension (e.g., one manipulation that varies accessibility and direct experience, one that varies accessibility and amount of elaboration, one that varies accessibility and attitude extremity, etc.). To the extent that the same results are obtained using these varied manipulations, one might argue that differences in attitude accessibility constitute the most parsimonious explanation of the results (especially if the dimensions confounded with accessibility would not each also reasonably produce the same result).

importance as a result of repeated attitude expression have consequences related to attitude strength. For example, if people seek out and process information more, to the extent that the topic of the information is perceived as more important or relevant, then increases in repeated expression might bring about increases in elaboration. Consistent with this possibility, Priester, Fabrigar, Wegener, and Petty (1994) found that higher levels of repeated attitude expression on the topic of vegetarianism led to higher levels of processing of a later persuasive message on the topic (as evidenced by greater persuasion when strong as opposed to weak arguments were presented in favor of vegetarianism). Regardless of whether perceived importance or relevance is identified as a mediator of this effect, the results of this study suggest that results of repeated expression manipulations might be due in part to differences in elaboration elicited by the repeated expression. Thus, it appears that the manipulation of repeated attitude expression might be related to a variety of strength-related properties of attitudes (i.e., accessibility, extremity, importance, and elaboration).

One potential next step for this research is to investigate the extent to which the various attitudinal dimensions might be responsible for the effects of repeated expression manipulations. For example, researchers might take measures of the attitudinal dimensions in order to index the unique impact of each dimension statistically controlling for the others. Alternatively, researchers might add manipulations that selectively eliminate differences in one or more of the dimensions in order to investigate the contributions of that dimension (e.g., engaging in repeated attitude expression concurrent with a distraction task or not in order to affect the level of spontaneous elaboration of attitude-relevant knowledge that occurs during the repeated expression procedure).

Similar procedures might prove useful for investigating the qualities of manipulations of many of the strength-related dimensions of attitudes. For example, manipulations that increase the amount of general attitude-relevant knowledge that a person possesses have been shown to increase the amount of elaboration given to new information about the attitude object (e.g., see Johnson, in press; Lewan & Stotland, 1961). Because the knowledge given to research participants is often not directly related to the subsequent information (e.g., in a persuasive message), the increase in elaboration could be because of an increase in curiosity about the object or an increase in perceived importance of the object. Are the strength-related effects of these manipulations due to knowledge or due to elaboration? Such questions are likely to be addressed in future research.

Are Measures and Manipulations Interchangeable?

For most of the dimensions of attitudes related to strength, both measures and manipulations have been developed in the literature. These measures and manipulations are often discussed in terms of the same underlying constructs (and are named as such, as in the current chapter). Thus, it would appear that re-

searchers assume that the measures of a strength-related dimension are tapping into the same fundamental construct that is being influenced by manipulations of that strength-related dimension. In many cases, this is probably accurate. One way to refine and improve our studies of attitude strength, however, is to investigate instances in which measures and manipulations might tap somewhat different constructs (and thus might lead to differing strength-related effects).

Consider, for example, measures and manipulations of attitude accessibility. Manipulations of attitude accessibility through repeated attitude expression have been associated with many of the same effects as measures of attitude accessibility through response latency (see Fazio, ch. 10, this volume). Are the two necessarily interchangeable, however? Response latency measures of attitude accessibility are likely to index differences in the ease with which an evaluation of an object comes to mind, but might also be likely to index other properties of an attitude. This is because a variety of dimensions of attitudes might be associated with how often an attitude comes to mind. For example, if people view the attitude object as interesting or relevant to them, it would stand to reason that they would think about the object more often and to a greater extent (e.g., Rener, 1988). Thus, for example, attitudes measured as high in accessibility could be those attitudes perceived as more important (Krosnick, 1989) and for which more thought has occurred. Other factors might also affect how often the attitude comes to mind (e.g., how much knowledge people have about the object, how interested they are in the object, how many links exist between the attitude object and other pieces of information, etc). Therefore, it is possible that attitudes measured as high in accessibility also tend to be high on a variety of other strength-related properties of attitudes.

If this is the case, one might imagine some cases in which results associated with measures of response latency would differ from those associated with manipulations of attitude accessibility. Consider resistance to counterpersuasion, for example. Results from a variety of studies suggest that increases in resistance are due at least in part to increases in counterarguing of the counterpersuasive appeals (e.g., Haugtvedt & Petty, 1992; Haugtvedt & Wegener, 1994; McGuire, 1964). Without the ability to counterargue the threatening appeal, favorable responses to the appeal are likely to dominate and produce persuasion. Thus, if measures of differences in attitude accessibility also gauge differences in variables that are associated with the availability of counterarguments (e.g., attitude-relevant knowledge or level of elaboration given to the attitude object), measures of accessibility might be more likely to be associated with resistance to counterpersuasion (e.g., Bassili & Fletcher, 1991; Fazio, ch. 10, this volume) than would manipulations of accessibility per se. Importantly, if such differences were found, they would be because of differences in the fundamental constructs being tapped by the measures and manipulations.

Similar issues could be raised concerning measures and manipulations of other strength-related dimensions of attitudes. For example, manipulations of knowl-

edge that do not provide information relevant to claims about the merits of the attitude object are unlikely to produce differences in ability to counterargue persuasive appeals, whereas listing measures of knowledge might often be associated with (and could be coded for) ability to scrutinize persuasive appeals.

CONCLUSION

Many advances have been made investigating the dimensions of attitudes related to attitude strength, yet many important questions remain unresolved. Among the most important of these questions are how our measures and manipulations of strength-related dimensions relate to the constructs we mean to study. At times, single manipulations or measures might affect or assess multiple constructs related to attitude strength. To the extent that this is the case, inferences regarding the unique contributions of each strength-related dimension await procedures that experimentally or statistically control for the confounded dimensions.

In some cases, however, researchers must decide whether their interest is in understanding the unique contribution that one dimension makes to variance in some outcome, or in understanding mediation. That is, in some instances, the crucial role of a strength-related dimension of an attitude is to create differences in another strength-related attitude dimension. In such cases, differences in the two dimensions might not be considered alternative explanations (i.e., confounds) but rather as one dimension mediating the effects of the other dimension. When this occurs, conceptual and empirical advances might be necessary in order to specify the ordering of effects that ultimately result in the strength-related outcomes of interest. Various chapters in this book have offered speculations about some possible causal orderings. Within any such mediational studies, however, the issues raised in this chapter concerning appropriate use of (and inferences based on) manipulation and measurement will be pertinent. Future advances in the study of attitude strength will depend on refinement of current manipulations and measures and will also depend on development of new manipulations and measures that isolate the particular attitudinal dimensions that result in strength-related outcomes.

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