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The Importance of Being Selective: Weighing the Role of Attribute Importance in Attitudinal Judgment

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I. Introduction

Attitudes have been defined in a variety of ways, but all definitions share the notion of evaluation. Social psychologists have traditionally conceptualized attitudes as an enduring, relatively stable evaluative response to an object, person, issue, or event (Allport, 1935; Eagly & Chaiken, 1993; Zanna & Rempel, 1988). One traditional theme in attitude research concerns the investigation of the structure of these summary evaluations. In the present chapter we focus on a rather neglected aspect of attitudes, namely the belief structure underlying attitudes. Belief structure generally refers to the cognitions that underlie an individual's attitude or behavioral choice, but can also refer to affective and cognitive components of attitudes, as well as the interplay between these two components. As noted by Petty, Wegener and Fabrigar (1997) much recent work on the structure of attitudes has focused on attitude strength. Issues such as attitude extremity, ambivalence, salience, accessibility, and affective-cognitive consistency have all been studied under the general rubric of "attitude strength." In our view, research on the belief structure of attitudes can help to improve our insight into a number of issues related to attitude strength. These include attitude ambivalence, the accessibility of attitudes, and differences in reactions to counter-attitudinal information between individuals holding identical attitudes in terms of their overall evaluative response.

Attitudes and decisions differ in importance. Attitudes about trivial issues and most decisions in familiar situations tend to be based on impulse, habit, or rule, without much reflection. Probably many attitudes and everyday decisions are of this nature. However, more important attitudes and decisions are presumably based on more careful and deliberate information processing. Our approach focuses on these more important attitudes and decisions. We assume that these attitudes are based on more than one belief or attribute. Answering questions about these attitudes is expected to be preceded by several steps including the selection of beliefs or attributes that are of relevance, assessing these attributes, and integrating these assessments into an overall evaluative

judgment, preference or choice. We thus assume a bottom-up process in which beliefs are combined to form an overall attitudinal judgment.

This more controlled mode of operation can be contrasted with more automatic processes (i.e., processes that operate without much cognitive effort and that are usually unintentional; see e.g., Bargh, 1989). Research in social cognition over the past two decades has enhanced our understanding of automatic processes in social judgment and attitudes. These processes have also been studied in the context of research on attitude strength. The best-known effort in this regard is the work of Fazio and his associates (Fazio, 1989, 1990; Fazio, Sanbonmatsu, Powell, & Kordes, 1986; Fazio & Zanna, 1978). Fazio's (1990) MODE model acknowledges controlled and more deliberate information processing, but most of the research inspired by this model has focused on automatic, more spontaneous information processing. In this approach attitudes are assumed to guide behavior in a spontaneous fashion when motivation to engage in extensive information processing is low or when people are not capable of engaging in more extensive deliberations. Recent research on attitudes has paid considerable attention to automaticity in attitudinal processes, whereas more controlled attitudinal information processing has received only limited attention. The most notable exception concerns work on dual process models of attitude change, an issue we will turn to later in this chapter. We focus on attitudes that are associated with more deliberate information processing, and investigate the attributes or belief structure underlying individual attitudes.

N.H. Anderson's (1971, 1982) information integration and functional measurement theory is an early example of an approach focusing on the relations between beliefs and attitudes. Models of attitude-behavior consistency such as Fishbein and Ajzen's (1975) theory of reasoned action, and Ajzen's (1985, 1991) theory of planned behavior also pay explicit attention to the belief structure underlying attitudes. More specific theories in the area of health psychology such as the health belief model (Janz & Becker, 1984), and protection motivation theory (Rogers, 1975, 1983; Rippetoe

& Rogers, 1987) follow a similar approach, and decompose behavioral preferences into various sets of beliefs concerning the costs and benefits of behavioral actions.

In most of these approaches belief structure is assessed in terms of the likelihood and evaluation of various attributes of an object or person, or various consequences associated with behavioral actions. In the present chapter we propose an additional measure of belief structure, focusing on belief or attribute importance. The main purpose of assessing belief or attribute importance is to differentiate between beliefs that are relatively important or consequential in influencing attitudes versus those that are not, i.e., to identify the considerations that underlie an individual's attitude.

There have been numerous studies designed to identify the important considerations that underlie attitudes relating to topics such as smoking behavior, consumer purchase decisions, AIDS-related risk behavior, family planning behavior, the introduction of new technologies, and dieting, to name just a few. Interestingly, the issue of attribute or belief importance has received only limited attention in the prevailing expectancy-value models of attitude-behavior consistency such of those of Ajzen and Fishbein. Most of these models adopt a framework in which attribute importance is not separately assessed. Our approach is based on expectancy-value approaches to attitudes and decision-making, but it allows for individually assessed attribute importance. It is best characterized as an idiographic approach permitting the assessment of cognitive structure and attitude-behavior correspondence on an individual basis.

We intend to show that assessing attribute importance improves the predictive power of composite attribute-based attitude measures, and provides better insight into the structure of the beliefs that underlie these attitudes. The belief structure underlying attitudes also generates information about how to change these attitudes. Moreover, in our view, assessing attribute importance can also help to improve our understanding of attitude strength and ambivalence.

First, we introduce the general framework within which we investigate attribute importance, and provide a definition of the concept of attribute or belief importance.

Next we discuss several measures of importance, and the efficacy of these measures will be investigated. We also relate the importance of attributes to their accessibility and to the speed with which important versus less important attributes are judged. We then turn to the benefits of assessing attribute importance at the individual level, and discuss the predictive power of attitude measures based on important versus less important attributes. In this section we also investigate the sensitivity of composite attribute-based attitude measures that incorporate attribute importance in detecting differences between attitude groups. Next we discuss the issue of attitude structure and relate attribute importance to the belief structure underlying attitudes. Implications for attitude change research and practice are then discussed. Finally, attribute importance will be related to attitude ambivalence and attitude strength.

II. Attribute based theories of attitude-behavior consistency

The two prevailing attitude-behavior models in social psychology are the theory of reasoned action (Fishbein & Ajzen, 1975) and the theory of planned behavior (Ajzen, 1985, 1991). Both are expectancy-value approaches, and are based on subjective expected utility (SEU) theory (Edwards, 1954). SEU theory presents a simple mathematical model of decision making in which people are assumed to assess the expected utility or desirability of alternative actions and to select the action with the highest SEU. The SEU is the sum of the perceived likelihood of each outcome multiplied by the utility or desirability of that outcome:

$$\underline{SEU}_j = \sum_{\underline{i}=1}^{\underline{N}} \underline{P}_{\underline{ij}} \cdot \underline{U}_{\underline{ij}} \qquad (1)$$

where $\underline{SEU}_{\underline{j}}$ is the SEU of action or behavioral alternative $\underline{j}$, $\underline{P}_{\underline{ij}}$ is the perceived probability of outcome $\underline{i}$ of action $\underline{j}$, and $\underline{U}_{\underline{ij}}$ is the subjective utility or desirability of outcome $\underline{i}$ of action $\underline{j}$. The SEU of an action thus depends on the likelihood and evaluation of the various consequences of that action. Basically, expected utility principles seem to be in accordance with much of our decision behavior, and rest on the

following three basic ideas. First, the theory assumes that how we value potential outcomes affects our decisions; the more highly valued an outcome is, the more favorably disposed we are toward behavioral actions that will deliver that outcome. Second, there is the effect of uncertainty: Good chances of desirable outcomes move us closer to a behavioral option than do poorer chances. Obviously, probabilities associated with undesirable outcomes have the opposite effect. Finally, there is the notion of combining the influences of both value and uncertainty. The combination rule is multiplicative, which implies that differences in the probabilities of outcomes matter little unless the outcomes are of significant value to us. Similarly, differences in the value component will be enhanced if they are accompanied by larger probabilities.

These basic principles were applied to attitudes and attitude-behavior consistency by Fishbein in the 1960s (Fishbein, 1963). The most comprehensive overview of this approach can be found in Fishbein and Ajzen (1975). Fishbein (1963, 1967) argued that an attitude toward a behavioral alternative is a summative function of the subjective probability (b) and evaluation (e) products for each relevant belief or attribute. A b x e product is computed for each consequence or attribute, and then summed to yield an index of attitude, in the same manner as in SEU theory (see Equation 1). The multiplication of the scores on the two rating scales assumes approximately ratio level measures. This assumption is basic to both SEU-theory and the expectancy-value models of Ajzen and Fishbein.

Ajzen (1985, 1991) incorporated “perceived behavioral control” into his revised model of the theory of reasoned action (the theory of planned behavior), and his extension generally leads to improvements in the prediction of intentions and/or behaviors when behavior is not totally under volitional control (Madden, Ellen, & Ajzen, 1992; Petty, Wegener, & Fabrigar, 1997). Both the Fishbein-Ajzen theory of reasoned action and Ajzen's extension conceptualize attitudes as belief-based. Ajzen (1996) reports over 250 empirical investigations based on the two theories dealing with a wide range of behaviors. Overall, both theories have received good support whenever

their constructs were carefully operationalized (see e.g., Eagly & Chaiken, 1993; Van den Putte, 1991).

In sum, in both models attitudes are assumed to be based on the summed products of the likelihood of the various possible consequences of behavioral actions and the evaluation of these consequences; the more positive the consequences that are associated with a specific behavior and the more likely their occurrence, the more attractive the behavior is. The basic rule of this approach is a compensatory, multiplicative rule. Compensatory rules are those in which positive attributes can be offset by negative attributes, and vice versa. In other words, both theories assume that attitudes are based on a rational, and more-or-less complete cost-benefit analysis of the various (possible) consequences of behavioral alternatives. This analysis requires extensive information processing and it is to that issue that we now turn.

Limits on controlled information processing

Initially, research on social cognition tended to conceptualize the social perceiver as a "naive scientist" who gathers all relevant information, weighs it carefully, and integrates it into an overall judgment or preference (see e.g., Fiske & Taylor, 1984). The often implicit assumption of this research was that both the availability of time and the cognitive capacity of the social perceiver are more or less unconstrained. This viewpoint is also evident in expectancy-value approaches to attitudes and behavior such as those of Ajzen and Fishbein. Generally, these approaches assume that substantial amounts of information are being processed; moreover this information is assumed to be combined using a relatively complex, multiplicative rule. It should be added that Fishbein and Ajzen (1975) did pay some attention to the limits on the human capacity for processing information. On the basis of Miller's (1956) work they assumed that people generally base their attitudes on five to nine salient beliefs. Unfortunately this view did not always have consequences at measurement level; thus participants in studies in this research tradition are often presented with considerable numbers of attributes to be rated in terms of their likelihood and valence (Van der Pligt & Eiser, 1984).

In the 1980s, social psychologists began to take greater account of the cognitive constraints of human on-line information processing and short-term memory. These constraints affect both the amount of information that can be processed, and the way in which information is integrated to form an overall evaluative judgment. Generally, people can hold only a limited amount of information in short-term memory (Miller, 1956). Moreover, processing information, and especially information that has to be integrated in a relatively complex manner, as in expectancy value-models, requires considerable cognitive effort. It seems inevitable that people use satisficing strategies with respect to the amount of information that they process, and with respect to how they integrate the relevant information. As argued by Taylor (1998), the serious limitations of short-term (as opposed to long-term) memory, and of on-line processing, led to the recognition that human inference is often accomplished through rapid, efficient, or even unconscious methods of relating current data to representations stored in long-term memory. Earlier research on human decision making by Hammond and his colleagues (Hammond, Stewart, Brehmer, & Steinmann, 1975) distinguished between analytical and intuitive decision making. These authors argued that the strategies available to a decision maker can be placed on a continuum ranging from intuition (with rapid and limited data processing, low cognitive control and limited awareness of processing) to analysis (slow data processing, high levels of control and high awareness of processing). Generally, attitudinal research in the 1970s emphasized one end of this continuum (analysis, or controlled information processing), whereas more recent research has tended to emphasize the other end of the continuum (intuition), as exemplified by research on the automaticity of attitudinal judgment.

Limitations of our information processing capabilities have been known to cognitive psychologists for some time (Fischhoff, 1976; Tversky & Kahneman, 1974), but it took a while before these considerations were explicitly discussed in the context of expectancy-value models of attitudes and behavior. Fischhoff, Goitein, and Shapira (1982) and Van der Pligt and Eiser (1984) argued that the assumptions of expectancy-value models such as those of Fishbein and Ajzen are not supported by results obtained

in the area of cognitive psychology and decision making. The multiplicative rules presumed by SEU theory and expectancy-value approaches to attitudes are quite difficult, and it seems unrealistic to expect people to apply these rules, especially when there are many relevant outcomes or consequences and varying probabilities associated with each of these outcomes. As argued by Jaccard, Radecki, Wilson, and Dittus (1995) the use of these compensatory rules seems to be the exception rather than the rule.

Strictly speaking, the inclusion of considerable numbers of attributes in one's attitude measure does not pose a problem for Fishbein and Ajzen's expectancy-value approach to the measurement of attitudes. Composite scores based on the subjective probability and evaluation of a set of attributes can (and often do) provide adequate estimates of a person's attitude, but they should not be seen as reflecting the actual decision-making process underlying the attitude. This is in accordance with research on subjective expected utility (Edwards, 1954, 1961; Savage, 1954). As noted by Yates (1992), no one ever took seriously the idea that people literally perform the calculations implicit in SEU theory. Instead it is often argued that people behave as if they make these computations; the details of how they exactly arrive at their decisions are likely to be different from the arithmetic of multiplicative models. On the other hand, it seems reasonable to argue that it would be preferable to develop attribute-based assessments of attitudes that are more in line with human information processing capabilities.

More detailed studies of how people assess probabilities and values, and integrate these two constituents to form an overall evaluative judgment, show various flaws in SEU theory and related expectancy-value approaches of attitudes and behavioral choice (e.g., Dawes, 1998; Fischhoff, Goitein, & Shapira, 1982; Luce, 1992). The conclusion to be drawn from this line of research is that people often base their decisions on pragmatic decision-making strategies, and use simplifying heuristics and/or decision rules that take a limited number of attributes or consequences into account. One of the aims of the present chapter is to investigate the possibility of developing attribute-based composite measures of attitudes that are more in accordance with our information-processing capabilities.

Heuristics in attitudinal judgment

Although attitude research has paid some attention to heuristic information processing, this has been largely in the context of attitude change processes. As noted by Chaiken and Stangor (1987) and Fishbein and Middlestadt (1995), expectancy-value approaches to the study of attitude formation and change were challenged in the 1980s. Since then, most research has distinguished between two types of persuasion, one emphasizing controlled information-processing and the other de-emphasizing detailed cognitive processing. Thus, Petty and Cacioppo (1986) introduced two distinct routes to attitude change: A central route with an emphasis on the information a person has about the attitude object or issue under consideration; and a peripheral route in which attitude change tends to occur "without any active thinking about the attributes of the issue or object under consideration" (pp. 255-256). The peripheral route refers to a wide variety of mechanisms of attitude change, including classical or operant conditioning, suboptimal information processing, affect-based mechanisms, and responding to less relevant, superficial cues associated with the persuasive message.

Chaiken (1980, 1987) also distinguishes two routes to persuasion which she calls systematic and heuristic processing. Her usage of the term systematic processing is virtually identical to what Petty and Cacioppo (1981, 1986) term central processing. The term heuristic processing refers to persuasion that is mediated by simple decision rules such as the "length-strength" heuristic: The longer the persuasive message, the more likely it is to be correct. All in all the peripheral route and heuristic information processing refer to a wide variety of suboptimal cognitive and non-cognitive processes, but research in these traditions has paid only limited attention to the cognitive short-cuts used to process information about attributes associated with the attitude-object (see also Manstead & Van der Pligt, 1999). Thus, strategies that limit the number of attributes to be considered or that rely on simplified rules to integrate the various attributes into an overall evaluative judgment have attracted only limited attention in recent research on attitudes. Research on behavioral decision-making more explicitly addresses the issue of simplified strategies in judgment and choice.

Research in this tradition has emphasized the point that people use a variety of (simplified) decision rules when confronted with a choice between alternatives that can be described in terms of several attributes. Most of these require less cognitive effort than a complete cost-benefit analysis of the available alternatives. The conjunctive decision rule is an example of such a simplifying rule. It requires the decision-maker to specify a criterion value for each attribute (e.g., a car should have at least four airbags, room for five passengers, etc.). Any alternative that does not meet this minimally required value on one or more attributes is dropped from the list of remaining possible alternatives. The disjunctive decision rule is the mirror image of the conjunctive rule. In this case the chosen alternative must have at least one attribute that meets the criterion whereas the remaining, rejected alternatives fail to meet the criterion value. Thus an alternative is chosen because it meets the criterion value on one outstanding attribute. Another example is the elimination by aspects rule (Tversky, 1972). First, the most important attribute is selected. All alternatives that fail to meet the criterion on this attribute are eliminated, and then this procedure is repeated for each of the remaining attributes, until only one alternative remains.

These decision rules require considerably less cognitive effort than the rule required by SEU models and expectancy-value models of attitudes. Simplifying rules appear to be used quite often in everyday decision making and can provide adequate short-cuts in complex decision environments. In this context Payne, Bettman, and Johnson (1992, 1993) stress the constructive nature of human decision making. Both personal experience and characteristics of the problem at hand will determine the decision strategy. Payne et al. (1992) use the term contingent decision making to describe the process by which people select a strategy by weighing up the cognitive costs and benefits of the various strategies they might use. Basic questions in this choice concern the balance between cognitive effort and accuracy, but factors such as decisional avoidance and accountability also influence strategy selection.

The three simplified decision rules discussed above focus on choice as opposed to (attitudinal) judgment. They could in principle be applied to attitudinal judgment,

however. For instance, people could be favorably inclined to an attitude object/behavior if it has a specific positive attribute or is associated with a particular consequence (disjunctive decision rule), or could be unfavorably inclined to an attitude object or behavioral action if it has a specific negative attribute. The three rules discussed above are most likely to be applied when the attributes or consequences are considered important for one's choice or preference.

This brings us to the issue of attribute importance. Focusing on a limited number of important outcomes or attributes could be a functional and quite rational way of making attitudinal decisions. Although it now seems to be generally accepted that research methods requiring respondents to combine large sets of behavioral beliefs and outcome evaluations do not provide an adequate description of the processes by which people form attitudes or make decisions (see also Baron, 1994; Edwards, 1992; Fischhoff, Goitein, & Shapira, 1982; Fishbein, 1993; van der Pligt, 1996), research practice suggests otherwise. Studies using the models of Ajzen and Fishbein often require respondents to rate 20 or more possible consequences of their behavior. In their overview, Van der Pligt and Eiser (1984) described studies that included as many as 50 consequences to be rated in terms of their probability and desirability. They argued that it is difficult to know the significance of being able to predict behavior on the basis of such large numbers of consequences associated with behavioral alternatives, because it is extremely unlikely that respondents actually use all these aspects in their decision-making. Van der Pligt and Eiser proposed that we should assess which attributes are seen as important or salient for specific individuals. They argued that such an approach could improve our insight into the structure of attitudes and reduce the analysis of the decision-making process to more manageable and more realistic proportions.

In the next section we turn to the salience or importance of beliefs or attributes. Assessing the subjective importance of attributes could help to simplify the decomposition of attitudes, and relate overall evaluative judgments to a limited number of attributes. This would be more in line with what we know about the limitations of our information-processing capabilities.

III. Defining attribute importance

There are many ways of defining belief or attribute importance. Most theorists would agree with Fishbein and Ajzen's (1975) view, in which beliefs are conceptualized as a stimulus-response association. These associations are organized according to Hull's concept of a habit-family hierarchy (Fishbein, 1967, pp. 389-390), with stronger stimulus-response associations having a more dominant position within the hierarchy. Fishbein and Ajzen (1975, pp. 220-222) described three different ways in which the term "importance" has been used in the research literature. These are (a) the perceived importance of a specific attribute for the person; (b) the perceived importance of an attribute as a defining characteristic of the attitude object; and (c) the perceived importance of an attribute as a determinant of the person's attitude. In their view, the first usage is likely to be highly related to the polarity of the attribute's evaluation, whereas the second usage is closely (but not perfectly) related to the subjective probability of an association between the object and the attribute. In their view the third usage (the impact of an attribute on one's overall attitude) cannot be adequately assessed because people have only limited insight in what determines their attitudes.

We focus on the third usage of the term, i.e., the perceived importance of a belief or attribute of the attitude object as a determinant of one's attitude. We expect these important attributes to be closely related to the overall attitudinal response. In terms of the $\underline{b}$ x $\underline{e}$ scores described earlier, one would expect the $\underline{b}$ x $\underline{e}$ scores for important attributes to be more closely related to a direct measure of attitudes than the $\underline{b}$ x $\underline{e}$ scores of less important attributes.

Our usage of the term attribute importance is closely related to how Jaccard et al. (1995) approach this issue. They refer to the strength of the belief-attitude object association, and prefer to assess attribute importance at the individual level. In terms of what Jaccard et al. (1995) call the relational approach to the assessment of attribute importance, an attribute is seen as important for an attitude if it is a primary cause of

that attitude. Some beliefs about attribute-attitude object links, when changed, yield little or no change in attitude, and these can be regarded less important than those that, when changed, yield substantial changes in attitude. We also expect important attributes to have this characteristic; i.e., changes in subjectively important attributes should be accompanied by more attitudinal change than changes in less important attributes.

Our definition thus refers to the subjective importance of an attribute as a determinant of one's own attitude. Moreover, we opt for an idiographic approach to assessing attribute importance.

IV. Measuring attribute importance

A variety of approaches to measuring attribute importance have been used in research on attitudes and behavioral decision-making. Here we briefly review the prevailing methods in the two literatures. Interestingly, there is hardly any research in the context of expectancy-value models of attitudes on the assessment of subjective importance. Fishbein and Ajzen (1975) concluded that none of the three interpretations of belief importance discussed in the previous section can be used to derive measures that will identify individually important versus less important attributes. They reject direct meta-attitudinal measures of belief importance. Another possible way of assessing the perceived importance of an attribute as a determinant of one's attitude would be to rely on the outcomes of statistical analyses. Fishbein and Ajzen, however, also reject the standard statistical way of deriving an index of importance, i.e., correlate the b x e (belief x evaluation) outcome of each attribute with the overall attitude. These correlations are often considered to be objective indices of importance (at group level) but provide no evidence about causality. Fishbein and Ajzen (1975) stated that it is "inappropriate to assume that a high correlation indicates an important determinant of attitude, or that a low correlation is evidence that the belief is not an important determinant of attitude" (pp. 222, italics as in original). Moreover, Fishbein and Ajzen (1975, Chapter 5) argued that subjective estimates of perceived importance in this

sense, or relative weights, bear little resemblance to empirically derived weights. Thus, subjective estimates of the relative importance of an attribute are not likely to exhibit a high correspondence with the weights obtained in a multiple regression analysis. It is worth noting that Fishbein and Ajzen's approach to attitudes was developed in a period in which the quality of introspection was very much in doubt. The work of Nisbett and Wilson (1977), Nisbett and Ross (1980), and Zajonc (1980) raised considerable doubts about the accuracy of self-knowledge about the determinants of our actions, beliefs, and feelings. This distrust of introspection is also reflected in Fishbein and Ajzen's view on the assessment of belief importance. They argued against assessing the subjective importance of beliefs because of the assumed limited insight into the importance of the various considerations for one's attitude.

The main strategies that have been used to assess attribute importance vary on a number of dimensions. A first category relies on free elicitation methodology. Second, a number of techniques derive subjective importance from a series of decomposed judgments (e.g., conjoint measurement, paired comparisons). A third strategy relies on direct assessments of perceived importance and thus on introspection (e.g., rating or ranking the various attributes in terms of their importance). Finally, some methods rely on statistically derived weights. Some of these methods require categorical information, others ordinal or even ratio-scale information.

Free elicitation methods. One often used procedure for identifying the attributes or beliefs that underline an individual's attitude is based on free elicitation. Generally, individuals are asked to spontaneously generate outcomes, consequences, or attributes that they think are associated with the attitude object. Important or salient attributes are expected to be elicited first.

Fishbein and Ajzen (1975) presented considerable evidence in support of this approach, which is partly derived from Hullian learning theory. As noted above, Fishbein conceptualized beliefs as a stimulus-response association. These associations are organized according to Hull's concept of a habit-family hierarchy, with stronger stimulus-response associations having a more dominant position within the hierarchy.

Beliefs that are elicited by an individual in a free elicitation procedure are therefore likely to be those that are highest in the habit-family hierarchy, and will be most likely to determine the individual's attitude or decision. This usage can also be related to Krech and Crutchfield's (1948) description of how a person's beliefs and attitudes vary in "salience," whereby salient beliefs are more prominent in the cognitive field and enter thought more readily. Bruner (1957) also argued that more accessible knowledge is more likely to be used in judgment.

There is some evidence suggesting that the order in which attributes or beliefs are spontaneously generated is also related to their relative importance. Kaplan and Fishbein (1969) found that the earlier a belief is elicited, the higher its position in the habit-family hierarchy. The presumed relationship between order of elicitation and importance is consistent with research on the availability heuristic (Tversky & Kahneman, 1974). More recent research findings also provide some support for this view (e.g., Jaccard & Sheng, 1984; Szalay & Deese, 1978). Following this reasoning one could also use response latencies to assess the salience of beliefs or attributes (see e.g., Bargh, Bond, Lombardi & Tota, 1986). We will discuss this issue in more detail in the next section of this chapter.

This general method of eliciting attributes or beliefs that "come to mind" in relation to an attitude-object or behavioral action has often been used to assess salient attributes of attitudes (e.g., Breckler, 1984; Cronen & Conville, 1975a, 1975b; Eagly & Mladinic, 1989; Hackman & Anderson, 1968; Jaccard & Fishbein, 1975). Eagly, Mladinic, and Otto (1994), and Esses, Haddock, and Zanna (1993) applied this technique to the measurement of both cognitive beliefs and affects underlying attitudes and behavioral preference. The free elicitation procedure is also frequently used in survey research where individuals are asked to generate the advantages and disadvantages of behavioral actions, or to list reasons why they have a specific behavioral preference. Examples of such research are Rosenberg and Oltman (1962), Johnson and Jaccard (1981), and Cunningham and Lopreato (1977). The underlying assumption of this strategy is that the consequences mentioned by an individual are

important in determining his or her attitude and behavioral preference, and that consequences not mentioned are less (if at all) important.

Free elicitation techniques are used in two different ways. Some of the above studies rely on an open response format allowing respondents to generate their own set of attributes which in turn are related to their overall attitude and/or behavior. Fishbein and Ajzen (1975), however, conclude that it is impossible to obtain a precise measure of the set of beliefs that determine an individual's attitude because the number of salient beliefs may differ between people. (Their summative rule does not allow for different numbers of beliefs for different individuals). They therefore developed an adaptation of the free elicitation method for use in their expectancy-value approach. Individually important beliefs or attributes are derived in a free elicitation task in order to compile a modal set of attributes that incorporates most of the attributes regarded as important by the population under investigation. In other words, expectancy-value approaches generally do not assess belief or attribute importance at the individual level. Modal importance is assessed at group level and it is basically assumed that all these modally salient attributes are equally important, or that their subjective importance is reflected in the perceived probability and/or evaluative ratings of the attributes.

Functional measurement techniques. Information integration theory (N.H. Anderson, 1971) was the first approach to the study of social judgment that explicitly addressed the importance of attributes or beliefs. In its simplest form, information integration theory states that an attitude toward a behavioral option is a function of the information the individual has with respect to that alternative. More specifically,

$$\underline{A}_{\underline{o}} = \sum_{\underline{i}=1}^{\underline{N}} \underline{w}_{\underline{i}} \cdot \underline{s}_{\underline{i}} \Big/ \sum_{\underline{i}=1}^{\underline{N}} \underline{w}_{\underline{i}} \qquad (2)$$

where $\underline{A}_{\underline{o}}$ refers to the attitude toward behavioral option o, s refers to the scale value of the ith piece of information or attribute, w is a weighting coefficient reflecting the importance of the ith attribute, and N is the number of attributes. One drawback of this research tradition is that the nature of information integration processes has

typically been assessed in situations in which respondents were confronted with a hypothetical choice situation. A typical analysis involves presenting descriptions of hypothetical objects based on the factorial manipulation of a limited set of attribute dimensions. For example, a set of five personal computers might be described in terms of three dimensions (cost, speed, size of hard disk), each with three levels. Each stimulus is then related to a response dimension (e.g., favorability), and the relative importance of each attribute is statistically derived. For instance, Zhu and Anderson (1991) used N.H. Anderson's (1981, 1982) approach and derived attribute weights by systematically varying the levels of three attributes and also assessing the overall evaluation of each configuration.

Jaccard and Becker (1985) also used N.H. Anderson's information integration theory to assess attribute importance and compared it to an expectancy-value model solution. Their findings largely supported Anderson's theory, but it should be added that the procedures entailed in functional measurement methodology are difficult to apply to large-scale attitudinal research, due to their complexity and time-consuming nature.

Paired comparisons. A third method involves presenting respondents with pairs of attributes and asking them to indicate which member of each pair is more important to them in evaluating an object or issue. All possible pairs of a set of attributes are presented, and then paired-comparison analysis is used to yield importance scores at interval level. One can also obtain a complete ranking of attributes from a set of pairwise comparisons. An important drawback of this method is its time-consuming nature; the required number of pairwise comparisons needed to obtain a complete ranking increases rapidly as a function of the number of attributes. For instance, for 15 attributes one would need 105 paired comparisons, and for 10 attributes one would still need 45 paired comparisons.

Direct-weight assessments. A fourth group of approaches to measuring belief importance relies on direct assessments of attribute weights. One method simply requires respondents to rate the importance of each attribute on a continuum ranging from extremely unimportant to extremely important. These ratings have been used to

compare subjective assessments of attribute weights with statistically derived, objective attribute weights (e.g., Wiggins, 1973). They have also been compared to a related measure of attribute importance, namely the allocation of points to attributes. One standard procedure for doing this is to distribute 100 points over the attributes so that the points reflect the relative "share" of importance (see e.g., Edwards & Newman, 1982; Von Winterfeldt & Edwards, 1986). A further variant requires respondents to rank attributes in terms of their importance. Ranking is generally seen as easier than allocating precise weights and is possibly more reliable (see Eckenrode, 1965). Moreover, there is doubt about whether people are willing and/or able to assign sufficiently precise numerical weights in methods such as point-allocation (see e.g., Kirkwood & Sarin, 1985).

Some researchers (e.g., Eckenrode, 1965) argued that ranking attributes in terms of their importance is easier for respondents, and is likely to be more reliable than methods that require the assignment of precise numerical weights. This is also reflected in research showing that people tend to ignore the range of presented attributes. Weights should be sensitive to scale changes. For instance, if the range of an attribute is reduced by one half, its effective weight should be doubled to compensate for this reduction. Research on the sensitivity of elicited weights to the range of presented attributes shows that they do not vary greatly as a function of attribute range (see for instance Fischer, 1995; Mellers & Cooke, 1994).

Ranking has also been compared to rating. Evidence in the context of the measurement of values is mixed with some studies showing superior validity of rating (e.g., Maio, Roese, Seligman, & Katz, 1996), and others indicating that ranking is superior (e.g., Krosnick & Alwin, 1988). Ranking versus rating has also been studied in the context of comparing alternative courses of action or objects. Findings obtained in this field of research generally show that rankings yield higher-quality data than ratings. Rankings are more reliable, and have higher discriminant and predictive validity than ratings (Krosnick, 1999).

Several methods have been developed for determining approximate weights that make explicit use of rank information (e.g., Barron & Barrett, 1996; Stillwell, Seaver, & Edwards, 1981). The formulae used in this field of research help to differentiate between the importance of the first selected attribute, the second selected attribute, etc. Some, however, argue that assigning equal weights to attributes produces (predictions of) decisions that are as good as solutions based on more complicated weighting techniques (e.g., Dawes, 1979; Dawes & Corrigan, 1974).

Objective weights. A fifth set of approaches to the assessment of attribute weights is based on correlational analysis. These weights are often called objective weights, as opposed to the subjective weights described above. In the context of expectancy-value approaches this means correlating the b x e score associated with a specific attribute with the overall attitude. In this case the absolute correlation gives an indication of the objective weight or importance of an attribute at group level. Similarly, the various b x e scores could be entered into a multiple regression equation. The standardized regression coefficients could be seen as reflecting the importance of each attribute in determining the attitude. Jaccard (1981) describes a number of problems with the use of regression weights as indices of importance and points to the mixed evidence in the literature, with some studies exhibiting high degrees of convergence between regression-based and subjective weights (e.g., Birnbaum & Stegner, 1981), and others revealing low levels of convergence (e.g., Summers, Taliaferro, & Fletcher, 1970). Dawes (1979, p. 571), on the other hand, advocates the use of regression analysis. Regression weights are probably the most common way of deriving true weights at group level; the predictor variables are weighted in such a way as to maximize the correlations between the subsequent weighted composite score and the criterion (see also Dawes & Corrigan, 1974; Einhorn & Hogarth, 1975).

Most of the methods discussed so far fall into the category of what Jaccard et al. (1995) call structural approaches. There is one method often used in behavioral decision making research that comes close to what they term the relational approach, namely the swing weight method. Here the decision maker rank-orders the attributes in terms of

their associated value ranges. This is accomplished as follows: Assuming that each attribute is at its worst possible level, the decision maker is asked which attribute (s)he would most prefer to change from its worst to its best level; this is then asked for the remaining attributes, and so on. The order of the selected attributes is assumed to reflect their subjective importance.

In sum, research on attribute importance has resulted in a wide variety of direct and indirect measures of attribute importance. The methods vary enormously in terms of their complexity; some require information at categorical level only, others at ordinal, interval, or at ratio-scale level. Some methods (e.g., swing-weight method, point-allocation, rank-based approximation methods) are used most often in research on multi-attribute utility (Barron & Barrett, 1996; Doyle, Green & Bottomly, 1997; Weber & Borcherding, 1993). Others are used more often in social psychology (conjoint measurement, direct-rating, free elicitation); examples of applications of these techniques in social psychology research are Jaccard and Sheng (1984) and Esses, Haddock, and Zanna (1993). Methods such as direct rating and ranking have also been used in survey research (see e.g., Infante, 1973; Knapper, Cropley, & Moore, 1976). A number of studies have compared two or more of the techniques described in this section. The general conclusion of this research is that the obtained weights tend to be highly dependent upon the elicitation method. As suggested by Slovic (1995), weights seem to be constructed in the actual process of elicitation. This conclusion has been derived from a large number of studies, both in social psychology and in behavioral decision making (Borcherding, Schmeer, & Weber, 1995; Doyle, Green & Bottomly, 1997; Einhorn & McCoach, 1977; Horsky & Rao, 1984; Jaccard & Sheng, 1984; Jaccard, Brinsberg, & Ackerman, 1986; Jia, Fischer, & Dyer, 1998; Johnson & Jaccard, 1981; Schoemaker & Waid, 1982; Weber & Borcherding, 1993). However, closer inspection of the results of these studies also suggests that simpler ways of assessing attribute weights are both more reliable and more valid. The superiority of more complicated methods of assessing attribute weights has mainly been ascertained in simulation studies focusing on how well the various methods can perform. Empirical

studies tend to favor simpler methods due to their reliability and validity. In the next section we propose a simple direct measure of attribute importance that could easily be incorporated in expectancy-value approaches to attitudes. This method will also be compared with other techniques for assessing attribute importance.

A simple solution

As noted in the previous paragraphs, there is some evidence that the more complex methods of deriving precise numerical weights reflecting attribute importance are simply beyond the average respondent. Thus there are good reasons for using a simpler task than the elicitation of precise weights. These reasons are both theoretical and practical. Theoretically there is some doubt about whether the decision maker is willing and/or able to assign sufficiently precise numerical weights. Practically, some of the elicitation methods are quite demanding and time consuming. Some are demanding in terms of the complexity of the task (e.g., the swing-weights method, allocating points to reflect attribute weights); others are simpler but take considerable amounts of time (e.g., paired comparisons, conjoint-measurement, functional measurement techniques).

We propose the use of a simple selection task in which a limited set of attributes is selected from a larger set. The larger set constitutes the modal set of attributes; depending on the purpose of one's research, one could vary the maximum number of attributes to be selected, or leave the maximum number to be selected to the respondent. We have used this measure in a number of studies (e.g., Eiser & Van der Pligt, 1979; Van der Pligt, Eiser & Spears, 1986a, 1986b; Van der Pligt & De Vries, 1998a, 1998b; Van der Pligt, De Vries, & Van Harreveld, 1999a; Van Harreveld, Van der Pligt, & De Vries, 1999a, Van Harreveld, Van der Pligt, De Vries, & Andreas, 1999). Overall, the results of these studies show that a composite attitude measure based on an individually selected subset of attributes adequately predicts attitudes and behavior. In a series of studies Van der Pligt, De Vries and Van Harreveld (1999a) showed that more complicated techniques such as direct-rating, point-allocation, and rank-based approximation weights do not perform better than our simple measure that relies on a

straightforward categorical judgment (i.e., does an attribute belong to a subset of important attributes or considerations?). The studies included attitudinal issues such as safe sex, student selection, and smoking cigarettes. For each of these issues respondents were asked to select a subset of either three or five important attributes out of a larger set of 15 or more attributes, and to rank these in terms of their importance. They were also asked to rate all attributes in terms of their importance and to allocate points to their selected subset of 3 or 5 selected attributes. In sum, participants were required (a) to select important attributes out of a larger set, (b) to rank these attributes, and (c) to allocate points to these selected attributes. Finally, they were asked (d) to rate all presented attributes in terms of their importance on a 9-point scale.

First, Van der Pligt et al. investigated the correspondence between an equal weights solution, rank-based approximate weights (varying in the extent to which differential weights are assigned to attributes as a function of rank-order position), point allocation, direct-rating, and objective, statistically derived weights. Direct rating was included because it is one of the few methods that exhibited some convergent validity with one or more other measures in Jaccard and Sheng's (1984) study. Generally, respondents enjoy this task more than ranking and are more satisfied with its (subjective) validity, despite the evidence indicating that ratings yield lower-quality data than rankings (Krosnick, 1999). A final reason for including this task is that direct rating is a simple task that can be applied to larger sets of attributes. Ranking more than 10 attributes and allocating points to such a set of attributes is difficult and time-consuming.

Overall, statistically derived weights showed modest levels of differentiation between the selected attributes. For instance, correlating the b x e score of each of the selected attributes with a direct attitude measure showed that statistically derived weights for the first three attributes were all around .30, whereas both rank-based approximate weights and the allocation of points resulted in a much wider range of weights. Rank-based approximate weights varied from .61 for the first selected attribute to .11 for the third selected attribute. Point-allocation resulted in a similar profile (.52

for the first selected attribute, .19 for the third attribute). Direct rating resulted in only marginal differences between the weights; the most important attribute received a weight of .35, the third selected attribute a weight of .32. These weights were very similar to the statistically derived weights. Van der Pligt et al. also related weighted and unweighted composite attribute-based attitude scores to a direct attitude measure and to behavior. Table 1 summarizes the results of one of their studies. As can be seen, the predictive value of the various measures hardly differed at all. In this particular study an equal weights solution for the selected attributes was compared with three rank-based approximate weights, the allocation of points to the selected attributes, and a direct rating of importance of the selected attributes and of all attributes included in the modal set. The results of this study supported the use of the selection-task, a task that is based on a simple categorical judgment, entails minimal measurement assumptions about response metrics, yields composite scores that are as predictive as measures based on more complex attribute weighting methods, and is hence more efficient than these other methods.

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insert Table 1 here

In other words, it is not necessary to take the whole set of modal attributes into account when predicting attitudes and/or behaviour. Adequate prediction can be achieved on the basis of a subset of individually selected, important attributes. Assigning precise numerical weights to these selected attributes by means of more elaborate measures is not likely to improve the predictive power of composite attribute-based measures of attitude. Similarly, methods that require respondents to rank the selected attributes, or to rate all or the selected attributes in terms of importance do not improve the predictive power of the composite measure. Although respondents generally find rating a simpler and more pleasant task than ranking, rating tends to result in lower quality data (Krosnick, 1999). This might explain the finding that a composite score based on the importance ratings of all attributes is not more predictive

of attitudes and behavior than a composite score based on a small unweighted set of selected, important attributes.

One final issue concerns the possible redundancy of a measure of attribute importance with the perceived likelihood of the attribute-attitude object link and/or the evaluative extremity of the attribute. As noted in section III of this chapter, Fishbein and Ajzen (1975) expected that adding a measure of attribute importance could well result in scores that are closely related to either the evaluative extremity of the attribute, or its perceived likelihood, or both. Some other researchers have also argued that the overlap between importance and the perceived likelihood and/or evaluative extremity reduces the usefulness of a separate measure of perceived importance (see e.g., Eagly & Chaiken, 1993; Eagly et al., 1994).

To test this Van der Pligt, De Vries, and Van Harreveld (1999b) correlated the importance score of each of the 15 attributes included in their study with its likelihood score, and the extremity of the evaluative rating. Similar analyses were carried out by Van der Pligt and De Vries (1998), and Van Harreveld, Van der Pligt, De Vries, and Andreas (1999). Mean correlations between importance ratings and likelihood scores were generally in the .30 to .40 range, with lower point-biserial correlations between likelihood scores and attribute importance if importance was measured in terms of whether the attribute was selected as one of the subset of individually important attributes. These latter correlations were usually in the .20 range. Similar correlations were obtained when correlating attribute importance with evaluative extremity. Generally, these correlations were significant, but their magnitude did not warrant the conclusion that one should discard attribute importance due to the overlap between this measure and the attribute's perceived likelihood and/or evaluative extremity.

In sum, we conclude that it is useful to add a simple measure of individual importance to the usual measures of the likelihood of attributes and their evaluation, in order to derive a belief-based measure of attitude that takes account of known limitations in cognitive capabilities. We still assume a compensatory rule, but this rule is limited to a small number of attributes. In the next section we show that individually

selected, important attributes are also more accessible, and that judgments of these attributes are associated with shorter response times than judgments of non-selected, less important attributes.

V. Attribute importance, accessibility, and processing speed

A number of recent studies claim that meta-attitudinal measures of attitude properties such as our measure of attribute importance can differ significantly from operative measures of those same properties (see Bassili, 1996; Krosnick et al., 1993; Visser & Krosnick, 1998; see also Greenwald & Banaji, 1995 on indirect versus direct measures). Meta-attitudinal measures rely on people's perceptions of their attitudes, whereas operative measures describe the operation of the attitudes more directly, unmediated by perceptions. Some argue that operative measures of attitude properties are superior to meta-attitudinal measures (see Bassili, 1993; Bassili & Fletcher, 1991).

In order to validate our measure of attribute importance we also investigate the correspondence between our measure and several operative measures of attribute importance. We anticipate that the selection task we proposed in the previous section whereby individually important attributes are distinguished from less important attributes will be corroborated by operative measures of attribute importance. In this section we relate attribute importance to accessibility and response times for judging important versus less important attributes.

As argued above, attribute importance can be related to older work on salience and accessibility (e.g., Bruner, 1957; Krech & Crutchfield, 1948). Free elicitation methods for generating important attributes also assume that the attributes mentioned in these tasks are more accessible due to their salience or importance. We intend to show that this relation between accessibility and attribute importance also holds for attribute importance as assessed in our selection task. We assume that people are able to select the attributes that are important for their attitude. One way to validate our measure is to investigate whether the selected important attributes are also more accessible than the

non-selected remaining attributes. In a series of studies we presented respondents with a set of modal beliefs or attributes and asked them to select a subset of attributes that they considered to be important. Our measure of attribute importance would be supported by increased accessibility of these individually selected, important attributes.

This prediction is in line with theorizing about attitude importance and accessibility. Fazio, Sanbonmatsu, Powell, and Kardes (1986) argued that attitude importance is related to accessibility from memory, and a number of studies in the recent literature support this suggestion (Krosnick, 1989; Roese & Olson, 1994; see also Fazio, 1989; Boninger, Krosnick, Berent, & Fabrigar, 1995). Doll and Ajzen (1992) related the accessibility of attitudes to attitude-behavior consistency. More accessible attitudes were associated with improved attitude-behavior consistency. Their results confirm earlier findings of Fazio and colleagues (e.g., Fazio, 1990; Fazio & Williams, 1986; Fazio, Powell, & Williams, 1989). These studies all concerned the relation between attitude importance and accessibility, and doubts have been raised about whether or not the same relation exists between attribute importance and accessibility. For instance, Tourangeau and Rasinski (1988) argued that attribute importance and accessibility are not necessarily related and conclude — referring to Tversky and Kahneman's (1981) availability heuristic — that information retrieval from memory is unreliable and subject to various distortions.

As a consequence, Tourangeau and his colleagues focus on immediate context effects such as recency of use, and topical distance between the target and prime (see e.g., Tourangeau, Rasinski, & D'Andrade, 1991). Tourangeau et al. conceive of attitudes as a set of related feelings, memories, and beliefs about the attitude object, which can be represented by J. Anderson's (1983) associative network notation. Basically, such a network represents what Tourangeau and Rasinski (1988) called the static component of attitudes – the component that resides in long-term memory and serves as the basis for answering specific questions about the attitude object. Tourangeau and Rasinski acknowledge that answering questions about an attitude object may be based on existing structures. However, they also argue that the response process need not be a very

reliable one. Support for this point of view is derived from Higgins and King (1981) who stress short-term differences in accessibility, the literature on the elicitation of preferences in decision making (e.g., the literature on framing effects; Van Schie & Van der Pligt, 1995), and the survey literature (Bradburn, 1982; Hippler, Schwarz, & Sudman, 1987; Schuman & Presser, 1981) focusing on context effects on attitudinal judgment. It should be added that Tourangeau and Rasinski's primary focus is on processes of answering attitude questions in survey interviews in which interest on the part of respondents is often low, whereas time pressure is typically high. In these circumstances the response process is most likely to be carried out superficially. Not surprisingly, it seems that context effects in attitude surveys are moderated by attitude strength. For instance, Lavine, Huff, Wagner, and Sweeney (1998) found that respondents with weak attitudes exhibited larger context effects.

Unlike Tourangeau and Rasinski (1988) we focus on the long-term strength of attribute-attitude object links, and assume that important attributes are more accessible than less important attributes. Moreover, we expect response time facilitation when important attributes are judged. Important attributes entail stronger stimulus-response associations, and, hence, should be judged more quickly than less important attributes. One could also relate this prediction to theories such as those of J.R. Anderson (1987) in which reduced response time (RT) in judgments is attributed to the formation and use of content-specific attribute-behavior links. Smith, Stewart, and Buttram (1992) and Stewart, Doan, Gingrich, and Smith (1998) applied J.R. Anderson's framework to the investigation of the effects of prior impressions and stereotypes on social judgments, and their findings confirmed J.R. Anderson's theory.

We expect increased accessibility of important attributes and expect this to be relatively stable, reflecting the static component of attitudes. We also expect RT-facilitation in attitudinal judgment beyond that enabled by increased accessibility of a particular attribute due to prior exposure in the task presented to participants, and assume that this RT-facilitation is due to the long-term strength of the association between the attribute and the attitude object. This chronic accessibility of attribute-

attitude links should be reflected in judging these important, more accessible attributes. Thus, judgments of important attributes are expected to be faster than judgments of less important attributes, even when both important and less important attributes have been made accessible. In accordance with Smith et al. (1992) and J.R. Anderson (1987), we expect RT facilitation for judgments of important attributes to be the result of repeated, and hence firmer, attribute-attitude links.

Accessibility and response times in judging attributes as a function of attribute importance have rarely been investigated in the context of expectancy-value models of attitudes. One exception is a study by Ajzen, Nichols, and Driver (1995) in which the accessibility of modally salient attributes was compared with the accessibility of attributes not related to the attitude object. Ajzen et al. selected sets of 16 beliefs about the consequences of each of six leisure activities by means of free elicitation. These sets included salient and non-salient beliefs at group level (defined in terms of the frequency-of-elicitation in a pretest). They also tested the effects of response format (binary versus 5-point scale), type of belief, and belief valence. Overall, their findings revealed the predicted main effect for salience: Response times were shorter for salient than for non-salient beliefs. This applied both to the binary response in which respondents were presented with 16 statements for each attitude object and were asked to indicate whether they agreed or disagreed with each of the statements, and to the ratings on 5-point scales. It should be added that Ajzen et al. (1975) compared two relatively extreme categories: Attributes that were frequently mentioned by the participants in their study versus attributes that were hardly mentioned at all. The latter were generally seen as less relevant for the attitudinal issue at hand, and would probably not be included in the set of modally salient attributes.

Another exception is a study by Roskos-Ewoldsen and Fazio (1997). They also proposed that attribute salience or importance is related to accessibility, and that the accessibility of attributes determines their role in the formation of attitudes. In their study attribute accessibility was manipulated by frequently presenting an attribute in conjunction with the attitude object (novel objects such as a theater, a café, or a fitness

spa). Some attributes were presented five times, others only once. Their findings showed that repeated exposure to positive attributes of the attitude object led to more favorable attitudes than repeated exposure to negative attributes. In other words, they found a close relationship between the valence of the more accessible attributes and the overall attitude. Interestingly, they did not find a relationship between attribute accessibility and the perceived likelihood of the attribute being true of the attitude object. This is in accordance with our own findings showing modest correlations between attribute importance and likelihood (see section IV of this chapter). However, Roskos-Ewoldsen and Fazio did not directly assess the importance or accessibility of the various attributes, and did not measure RTs for attribute ratings and the overall attitudinal response. Next, we discuss some of our own research in which these measures were included.

In a series of studies (Van Harreveld, Van der Pligt, & De Vries, 1999a; Van Harreveld, Van der Pligt, De Vries, & Andreas 1999; Van der Pligt, Manstead, Van Harreveld, & Janssen, 1999) we presented respondents with sets of modally salient attributes related to an attitude object. These sets contained between 8 and 16 attributes and were based upon pilot research and/or existing literature. We employed our selection task to assess attribute importance. Respondents were typically asked to select 3–5 attributes out of the larger set, in order of their importance. In all studies we assessed response times for the evaluation and likelihood ratings of the complete set of attributes (on 9 or 100-point scales), and also assessed response times for a dichotomous agree–disagree judgment concerning each attribute-attitude link. The latter was measured following Fazio's (1990) recommendations, i.e., respondents were asked to keep two things in mind: “First, and above all, be accurate. Don't be in such a hurry to respond that you regret your decision. Second, whereas being accurate, try to respond as quickly as possible. So, you should try to maximize both the speed and the accuracy of your responses.” For all questions a computer recorded the response given, and the response time from presentation of a question to depression of the response key. Where the distributions of response latencies were found to be positively skewed we followed

the practice of Fazio and his associates (Fazio, Chen, McDonel, & Sherman, 1982; Powell & Fazio, 1984), and log-transformed the scores. However, for the sake of simplicity we will report statistics in terms of the original latencies.

Overall we found strong support for our prediction that selected, important attributes are associated with shorter response latencies. Table 2 summarizes the results of Van der Pligt, Manstead, Van Harreveld, and Janssen (1999). In this study respondents were presented with a series of attitudinal issues. After being introduced to the attitudinal issue, they were asked to indicate whether they agreed or disagreed with each of the attribute statements related to the issue, and RTs for these dichotomous responses were recorded. We then assessed the evaluations and likelihood scores for each attribute and asked respondents to report their overall attitude on four Likert-type scales, and also asked them to select the three most important attributes out of the total set of attributes. The findings displayed in Table 2 show that for seven of the eight attitudinal issues the average response latency for the selected important attributes was significantly shorter than the average for the non-selected attributes.

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insert Table 2 here

As predicted, these findings were generally confirmed for the likelihood ratings and evaluations of the various attributes on 9-point scales ranging from unlikely to likely, and bad to good. These ratings took place after the initial dichotomous response task, which should have made all attributes accessible. These probability and evaluative judgments generally took more time than the dichotomous responses did, but important attributes were still associated with RT facilitation beyond that due to increased accessibility of the attributes. Similar effects were obtained by Van Harreveld, Van der Pligt, De Vries, and Andreas (1999), who focused on two attitudinal issues (smoking and safe sex). In their study attributes and attitudes were rated on 100 mm lines with labeled end-points. Respondents were required to place the cursor at a position on the line that best represented their opinion. This task resulted in longer RT's than the dichotomeous responses presented in Table 2. Results revealed RT facilitation for both

probability and evaluative judgments of the various attributes after each of the attributes had been made accessible in a previous task. In these studies the attribute-related judgments consisted of probability ratings, evaluative ratings, and importance ratings (in that order). Not surprisingly, evaluative ratings were associated with slightly lower RTs than probability ratings, and importance ratings had even shorter RTs. More importantly, for all these ratings RTs for the selected important attributes were significantly faster than for the non-selected attributes, and these differences were more pronounced than those due to repeated exposure (see Figure 1). These findings can also be related to the additive nature of chronic and temporary sources of accessibility (see Bargh, Bond, Lombardi, & Tota, 1986). Bargh et al. focused on the role of temporary and long-term sources of construct accessibility in person perception and memory, and examined the joint influence of these two sources of accessibility on impression formation. In our study we found reduced RTs as a function of both chronic accessibility of attributes (due to their subjective importance) and temporary accessibility (due to frequency of exposure in the experimental task).

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insert Figure 1 here

Findings presented in Table 2 and Figure 1 thus show that selected important attributes are more accessible and are judged more quickly than the remaining non-selected attributes. In a series of additional analyses we investigated the scope of this relation between accessibility, speed of judgment, and attribute importance. More specifically, we related RTs of judging the selected attributes to their rank order, and we correlated RTs of the various attribute related judgments to their importance as assessed on a 9-point rating scale ranging from 1 (not at all important) to 9 (extremely important). First, results did not reveal a systematic relation between the rank value of the selected attributes and RTs of judging these attributes. Thus, the differences at categorical level (important versus less important attributes) were not obtained at ordinal level within the set of selected attributes. Apart from this within-subjects analysis we also did a between-subjects analysis, and investigated for each attribute

whether importance ratings were related to reduced RTs. Only two of the 30 correlations were significant. All in all these results support our proposal that attribute importance should be assessed at categorical level, rather than relying on seemingly more precise measures of attribute importance such as ranking values or simpler, but possibly less reliable measures such as ratings (see also Krosnick, 1999).

In sum, these findings confirm our prediction that more important attributes are more accessible, and that judgments about the various attributes underlying the overall attitude are made faster for individually selected, important attributes than for non-selected, less important attributes. The latter effect indicates RT facilitation beyond that enabled by increased (temporary) accessibility, as indicated by shorter RTs for important attributes even after being exposed several times to the whole set of attributes. Our point is that in the context of a particular attitudinal issue some attributes are chronically more accessible than others, and have firmer associations with the attitude object.

In one study we explicitly addressed this enduring component of the belief structure underlying attitudes. Van Harreveld, Van der Pligt, De Vries, and Andreas (1999) presented respondents with 15 attributes of cigarette smoking. As in the studies reported above, respondents were asked to select the five most important attributes out of the larger set. Judging the likelihood of these selected attributes and evaluating them took less time than judging the remaining attributes. One week later respondents returned to the laboratory to participate in the second part of the study. This follow-up study was announced as part two of the study on cigarette smoking, and entailed two tasks. The first was a lexical decision-making task in which respondents were presented with a total of 90 words and were asked to determine (as quickly as possible) whether each of these words was a proper or non-existent Dutch word. In order to obtain maximum speed during this task, respondents were asked to keep their hands near the response keys throughout the task. Each word was visible on the screen until the “yes” or “no” button was pressed on the keyboard. A few seconds after participants pushed the button, the next word appeared on the screen. Of the 90 presented words, 66 were

existing words in Dutch. This set of 66 included words that referred to the 15 attributes included in the first part of the study (e.g., smelly, heart-disease, relaxation, unhealthy, addictive, concentration, fitness, social facilitation). The sequence in which the words were presented was randomized. Response latencies were assessed and corrected for word length (number of characters) and frequency of usage. Response latencies were significantly lower for the individually selected important attributes than for the remaining non-selected attributes of smoking cigarettes. Thus, one week after the first session, important attributes of smoking were still more accessible than less important attributes. Respondents were also asked to list a maximum of three attributes of smoking presented in part 1 of the study, in the order in which they came to mind. Although the literature on the impact of attitudes on memory is inconclusive (Eagly, Chen, Chaiken, & Shaw-Barns, 1999), we expected enhanced recall for individually important attributes, and our results indeed revealed better memory for individually important attributes than for less important ones. Both findings confirm the expected chronic accessibility of important attributes associated with the attitudinal issue.

Some of our studies also allowed us to test another assumption of our approach. As argued earlier, we focus on relatively important attitudes, and assume a bottom-up process, as opposed to automatic activation of the overall attitude. Thus, we assume that attitudes are structures in long-term memory, and that answering attitude questions is likely to involve processes such as activating the relevant attributes, and integrating this information into an overall attitudinal judgment. Generally it is regarded as unlikely that respondents retrieve some or all of their beliefs on an issue. Some research emphasizes automatic activation of overall attitudes without much deliberation (e.g., Fazio, 1990; Bargh, Chaiken, Govender, & Pratto 1992), whereas other studies assume that the retrieval process is likely to yield a sample of pertinent beliefs, the sampling being primarily determined by immediate situational cues (e.g., Tourangeau & Rasinski, 1988). Basically, this literature on the constructionist nature of attitudes (e.g., Strack & Martin, 1987; Tourangeau, 1984, 1987; Tourangeau & Rasinski, 1988; Tourangeau, Rasinski & D'Andrade, 1991; Wilson & Hodges, 1992; Zaller & Feldman, 1992)

assumes that when an evaluative attitudinal response is required, people retrieve relevant information and integrate it to form a coherent evaluative judgment. This retrieval process is seen as unreliable and largely determined by contextual cues. In other words, expressions of attitudes are often assumed either to be a function of automatic processes, or to be based on biased retrieval of relevant attributes in which situational factors such as question wording and/or the context provided by preceding questions guide the retrieval process.

Both our approach stressing the enduring elements of attitudes and the literature in which doubts are expressed about whether attitudes consist of stable, enduring evaluative responses share one important assumption, namely that it is not overall attitudinal judgments that are stored in memory, but rather features of the attitude-object (i.e., attributes and feelings associated with the object). Thus, overall attitudinal responses are assumed to be generated by a computational process rather than a direct retrieval process. This computational process underlying attitudinal responses may be influenced both by the external context and by internal, introspective processes. We focus on the latter and expect the overall attitudinal response to take longer than the response to specific beliefs and feelings underlying the attitudinal response. Van Harreveld, Van der Pligt, De Vries, and Andreas (1999) assessed response times for overall attitudinal judgments on a set of Likert-type items (e.g., favorable–unfavorable, good–bad) both before and after assessing judgments on the various attributes underlying the overall attitude. Thus after respondents rated the various beliefs in terms of their likelihood and valence, and selected the beliefs or attributes they considered the most important determinants of their attitude, they were again asked to indicate their overall attitude on the set of Likert-type items. Van Harreveld et al. compared the speed of the overall attitudinal response with the speed of judgment of the various attributes underlying the overall attitude.

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insert Figure 2 here

The direct overall attitude measure took significantly longer than the attribute-related ratings, irrespective of whether it was assessed before or after rating the attributes in terms of their likelihood and value. Assessing the overall attitude measure took significantly less time after having judged all attributes than before judging these attributes, but RTs for this overall measure were still slower than for judging the various attributes. It should be noted that the questions concerning the evaluation of the attributes and the likelihood that they were associated with the attitude object were generally considerably longer than the questions with which we assessed the direct attitude score (four semantic differential scales preceded by the sentence "My attitude toward issue/object is …"). Thus, despite the fact that the target stimulus was shorter, and took less reading time than the typical belief item, response latencies were significantly longer for the overall attitudinal response even when the latter was assessed after having judged all attributes (see Figure 2). Not surprisingly, these differences were even more pronounced when comparing the response latencies of the overall attitudinal response with those of individually selected, important attributes. Similar findings were obtained for other attitudinal issues such as safe sex and the introduction of English as the language of instruction in Dutch universities, with RTs for the overall attitudinal judgment being significantly longer than for judgments of the attributes (Van Harreveld, Van der Pligt, & De Vries, 1999b). Our results are therefore consistent with the notion of a bottom-up process in which attributes are combined and integrated to form an overall attitude judgment.

The study by Van Harreveld, Van der Pligt, De Vries and Andreas (1999) also allowed us to investigate the moderating role of attitude strength. In accordance with Fazio (1989, 1990) we classified attitudes as relatively strong or weak on the basis of RTs for the direct attitude score at time 1. Additional analyses on the basis of a median split on these RTs allowed us to investigate whether the substantial differences between attribute ratings and attitude ratings (see Figure 2) were moderated by attitude strength. Results of these analyses showed that RTs for both attribute and attitude ratings were shorter for strong than for weak attitudes. However, for both groups RTs were faster for

attribute ratings than for attitude ratings. Both groups thus seemed to rely on a bottom-up, computational construction of the overall attitude. This difference was, however, much more pronounced in those with weak attitudes than in those with strong attitudes. Figure 3 shows the overall mean RT for the 45 attribute ratings (15 attributes rated in terms of their likelihood, evaluation, and importance) and for the set of four Likert-type items used to assess the overall attitude. As can be seen , the increased difference between RTs among attribute and attitude ratings for those with a weak attitude was mainly due to increased RTs for the overall attitudinal response; i.e., those with a weak attitude needed slightly more time to judge the various attributes and considerably more time to integrate these attributes into an overall attitude, as compared with participants who had a strong attitude.

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insert Figure 3 here

These additional analyses therefore suggest a bottom-up process for both strong and weak attitude holders, but also indicate that attitude strength moderates the difference between attribute and attitude ratings. If people with strong attitudes rely to a lesser extent on bottom-up processing, one would expect a stronger relation between RTs for attribute judgments and the overall attitudinal response for those with weak attitudes, simply because attitudes can be "computed" faster when attributes are judged faster. Table 3 shows the correlations for the two groups and these confirm our predictions: Correlations between attribute ratings and attitude ratings were non-significant (.14) or modest (.38 and .39) for the strong attitude group, and (significantly) stronger for respondents with a weak attitude (.68, .60, and .75 respectively).

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insert Table 3 here

In sum, our results show that, contrary to the suggestion made by Tourangeau and Rasinski (1988), important attributes are more accessible than less important attributes, that judging these attributes requires less processing time, and that they are recalled

more accurately. Moreover, judging (important and less important) attributes is associated with shorter RTs than is the overall attitudinal response, suggesting a computational construction of the overall attitude as opposed to a direct retrieval. This applied to both strong and weak attitudes; for both groups attributes were judged faster than was the overall attitude, but this difference was more pronounced for respondents with weak attitudes. Weak attitudes were associated with substantially longer RTs for the overall attitude, indicating that information integration in order to derive one's overall attitude was more "cumbersome" and more time-consuming for those with weak attitudes. Thus a limited number of attributes or beliefs seems to constitute a frame of reference within which the attitude object is evaluated, and these attributes are presumed to be the prime determinants of the attitude and subsequent behavior. Knowledge of other possible attributes may be present or available, but it is less accessible, and less likely to be used in the construction of an attitudinal judgment (cf. Higgins, 1996).

VI. Attribute importance and the prediction of attitudes and behavior

In the previous two sections we showed (a) that attribute importance can be measured by asking participants to select a subset of individually important attributes out of the larger set of modal attributes; and (b) that individually selected important attributes are more accessible in memory, and that judging these attributes takes less time than does judging non-selected attributes of the modal set. In the present section we focus on another operative measure of attribute importance, i.e., the predictive power of a composite attribute-based attitude measure based on individually selected, important attributes versus that of non-selected less important attributes. We expect important attributes to be more predictive of overall attitudes and behavior than less important attributes. The predictive power of important attributes is compared with a composite measure based on a larger set of modal, but non-selected attributes. As argued in section IV of this chapter, we opt for an unweighted composite score based on

a limited subset of attributes. Integrating these considerations into an overall judgment requires less information processing than is usually assumed to be the case in expectancy-value approaches. A second way to achieve a composite attitudinal measure that is more in accordance with the notion of limited information processing capabilities would be to simplify the operations presumed by SEU theory and expectancy-value approaches such as those of Fishbein and Ajzen. As argued in section II, the multiplicative rule that is central to these approaches is quite complex and people find it difficult to apply the rule, even after receiving a full explanation (e.g., Slovic, 1974). We first focus on attribute importance and the way it reduces the amount of information that needs to be processed. Then we will turn to the issue of using simpler decision rules than the multiplicative rule presumed by SEU theory and expectancy-value approaches to attitudes.

Predicting attitudes and behavior

We have used the attribute selection task described above in a series of studies. In all cases attitudes were decomposed into a modal set of attributes and respondents were required to select a subset of individually important attributes. In all these studies we employed an expectancy-value framework and compared (a) the correlations between a composite attitude score based on selected important attributes and a direct measure of attitudes and behavior or behavioral intentions, with (b) the correlation between the remaining attributes of the modal set and a direct measure of attitudes, and behavior or behavioral intentions. Generally, the modal set consisted of between 10 and 18 attributes, and respondents were required to select between three and five of these. In some studies respondents were free to select as many (important) attributes as they wished.

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insert Table 4 here

Table 4 summarizes the results of 10 studies in which selected and non-selected attribute-based measures of attitude were correlated with a direct attitude measure and/or behavior. The studies shown in this table embrace a wide range of attitudinal

issues, including smoking cigarettes, practicing safe sex, teaching in English (as opposed to Dutch), organ donation, student selection, and nuclear energy. The results exhibit a very stable pattern. In all cases correlations were significantly higher for the selected important attributes than for the remaining attributes. Composite scores based on the remaining attributes showed either modest correlations or did not correlate at all with attitudes and/or behavior.

As can be seen in Table 4, it is not unusual for composite scores based on the remaining, non-selected attributes to be uncorrelated or negatively correlated with attitudes or behavior. Moreover, in several studies the composite score based on important attributes was more predictive than the score based on the total set of modal salient beliefs or attributes (including the selected important attributes). For instance, Van der Pligt and De Vries (1998b) reported a correlation of .37 between the composite score based on all attributes and behavior, significantly lower than the .52 for the composite score based on selected attributes reported in Table 4. Similar findings were obtained by Van der Pligt, De Vries, and Van Harreveld (1999b). It should be added that these significant differences were generally obtained for the correlations with behavioral intentions or behavior, and not for the correlations with the direct attitude score. The latter correlations hardly differed for the composite scores based on selected attributes versus scores based on all attributes. Thus, including all beliefs can dilute the measure of attitudes, reduce the sensitivity of the belief-based attitude measure, and obscure differences between attitudinal groups. Nisbett, Zukier and Lemley (1981) used the term 'dilution' to refer to the fact that nondiagnostic information may weaken the implications of diagnostic information. In the present context we propose that the inclusion of less relevant attributes for a given individual or group can weaken the predictive power of attribute-based measures of attitude.

In some of these studies it was also possible to derive a composite score based on all b x e values weighted by their importance as assessed on a direct rating measure, with scores ranging from 1 (not at all important) to 9 (extremely important). These scores did not reveal higher correlations with attitudes and behavioral intentions than

the unweighted composite score based on the smaller subset of selected attributes. All in all, these findings support the use of a simple measure of importance to derive composite attitude scores based on a limited number of individually selected attributes.

Sensitivity of composite measures based on important versus less important attributes

Another way to illustrate the diluting effects of including too many modally salient, but individually less important attributes, is to compare the composite score for groups with different attitudes and/or behavioral preferences. In a series of studies Van der Pligt and colleagues (Van der Pligt & De Vries, 1998b; Van der Pligt, De Vries, & Van Harreveld, 1999b; Van Harreveld, Van der Pligt, & De Vries, 1999a) compared attitudinal differences between smokers and non-smokers with respect to scores based on important attributes for each group: non-selected, less important attributes, and the complete set of modal salient beliefs or attributes. Figure 4 summarizes some of these findings, and shows clear-cut differences between the two behavioral groups when comparing them in terms of a composite attitude score based on their selected subset of important attributes. Although we also found significant differences in the composite scores based on the modal set of attributes, these were less pronounced. Moreover, these differences disappeared altogether when comparing the two groups in terms of the remaining, non-selected attributes. For instance, the b x e scores for the important attributes in Study 1 were –11.55 (smokers), and –33.95 (non-smokers). The b x e scores could range from –36 (negative) to +36 (positive), and scores for the two groups indicate a much more negative utility or b x e score for the non-smokers than for the smokers. When comparing the two groups on the overall b x e score, these differences were far less pronounced (–4.80 and –8.29, respectively), and they disappeared entirely when focusing on the 12 remaining attributes (–3.30 vs. –2.90). Similar findings were obtained for other attitudinal issues.

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insert Figure 4 here

Simplifying decision rules and expectancy-value models

In this section we briefly compare different ways of combining attribute related judgments (their probability, evaluation, and importance) in terms of their predictive value. A number of researchers have argued that one needs only to assess the evaluative component of elicited important or salient attributes, and suggested that one should ignore the probability component on the grounds that scores on this component tend to be quite high (see e.g., Bell, Esses & Maio, 1996; Cronen & Conville, 1975; Eagly & Chaiken, 1993; Eagly, Mladinic & Otto, 1994). Others (e.g., Eiser & Van der Pligt, 1979; Van der Pligt, Van der Linden, & Ester, 1982) dichotimized the evaluation of the various attributes (+1 or –1) and multiplied these values by the obtained probability scores. In other words, they assumed that the evaluation of the selected attributes would be relatively extreme, and focused on the assessment of the perceived probability of the selected attributes. Hom and Hulin (1981) found that the strength of the correlation between the summed b x e score and a direct attitude score was not different when one took only account of the sign of the e-score.

Van der Pligt, De Vries, and Van Harreveld (1999b) also tested the predictive power of a composite attitude score based on evaluations of the selected important attributes only, versus a score based on their evaluation multiplied by their likelihood. As shown in Table 3, the score based on the selected, important attributes correlated .56 with smoking status, and .65 with the direct attitude score. A composite attitude score based only on the evaluative score of the selected attributes correlated .58 with smoking status, and .64 with the direct attitude score. Thus, limiting the attitudinal measure to the subjective value (or evaluation) of selected, important attributes resulted in an attitude score that was as predictive as the score based on the product of evaluative and likelihood scores. On the other hand, the predictive value of an attitude measure based on the evaluative score of all attributes correlated only .34 with smoking status, and .39 with the direct attitude score. Both these correlations are significantly lower than those just mentioned. In sum, the evaluative score of individually selected attributes resulted in an attitude measure that was as predictive as the b x e score of the selected attributes,

and that composite scores based only on the evaluation of all attributes resulted in lower correlations. Contrary to Bell et al. (1996), weighting the e scores by importance did not improve the predictive value of the composite score. Correlations with behavior and direct attitude were .58 and .64, respectively. Van der Pligt et al. (1999b) conclude that the most efficient attribute-based measures of attitude in terms of predictive power are the unweighted b x e score based on a limited subset of selected attributes, followed by the summed evaluation (e) of these selected attributes. By comparison with the traditional b x e measure based on all modal attributes, both measures are more efficient, they are equally predictive of attitudes, and are often more predictive of behavior. The suggestion made in the literature that one could limit the attitudinal measure to the evaluative ratings of important attributes is also supported by our data. It should be added, however, that this is only the case for individually selected, important attributes.

One could argue that the most efficient way to derive a composite attribute-based attitude measure would be to combine our selection task with a simple measure assessing the evaluation of the selected attributes. This composite score does not rely on the (difficult) multiplicative rule assumed by expectancy-value models of attitudes combining probability and evaluation ratings. However, we have two reasons for preferring a solution in which both the likelihood and valence of attributes are assessed. First, the valence of attributes is usually assessed in general terms and reflects the evaluation of (sometimes) general values such as good health, fairness, equity, social relations, and so on. Second, assessing both the likelihood and evaluation of important versus less important attributes makes it easier to explain the difference between attitudinal groups. For instance, they might agree on the valence of specific attributes, but disagree about the firmness of the link between the attribute and the attitude object. Assessing both the likelihood and evaluation of the modal set of attributes, in combination with our selection task for assessing attribute importance, is likely to be more informative than simply assessing the evaluation of attributes in combination with our selection task. In the following section we discuss this issue in more detail.

VII. Attribute importance, attitude structure, and attitude change

In the previous section we reviewed a number of studies showing that composite attitude-scores based on selected, subjectively important attributes are generally more predictive of directly assessed attitudes, behavioral intentions and/or behavioral practice than are composite scores based on non-selected attributes. Moreover, these composite scores based on selected attributes can also be more predictive than composite scores based on all presented attributes. Not surprisingly, composite scores based on important attributes were also more sensitive in detecting differences between groups with opposing attitudes and/or behavioral preferences.

In the present section we focus on the added value of assessing attribute importance when investigating the structure of attitudes of groups with opposing attitudes. If opposing groups differ systematically with respect to the kinds of attribute they regard as important, this information could improve our insight into the "how" and "why" of attitudinal differences between these groups, especially when they differ either not at all or only marginally with respect to the perceived likelihood and evaluation of these attributes. This is exactly what we have found in a number of studies. For instance, in a study on protective sexual behavior, Van der Pligt, De Vries, and Van Harreveld (1999b) found that people with safe versus less safe behavioral practices differed only marginally in the perceived likelihood and evaluation of hedonic attributes associated with condom use, such as reduced pleasure and sensitivity; however, the risky respondents more often selected these attributes as being important. More than ten times as many respondents from the higher risk group selected the attribute reduces sensitivity, and nearly twice as many respondents from this group selected decreases pleasure as one of the three most important attributes. Thus, including a simple measure of belief importance helped to provide a better picture of how different groups perceived the pros and cons of condom use. Sometimes groups do

not differ in their beliefs about (sets of) attributes of condom use, but do differ in the importance assigned to these attributes.

Van der Pligt et al. (1999b) obtained similar findings when investigating the attitudinal structure of smokers and non-smokers. They found clear differences between smokers and non-smokers with respect to the mean b x e scores for various attributes from a total set of 15. Smokers tended to give more extreme utility ratings to the positive consequences of smoking, whereas non-smokers tended to give more extreme utility ratings of the negative consequences. However, these differences were more pronounced when considering attributes selected as important. Smokers tended to select the more hedonic, short-term consequences (reduces nervousness, helps one to relax, fosters social interaction), whereas non-smokers emphasized the long-term health consequences (is addictive, is bad for one's health) and possible detrimental effects for others (causes discomfort to others, is smelly). Moreover, the task of selecting the most important attributes of smoking provides additional information about how the two groups (smokers versus non-smokers) approached the issue. Smokers not only rated the negative attributes of smoking less extremely; they also found these attributes less important than the non-smokers did. Not surprisingly, they found the immediate positive consequences of smoking more important than non-smokers did. More interestingly, on some attributes the two groups did not differ in terms of their b x e score, but did differ significantly in terms of the importance attached to the attribute. For instance, smokers and non-smokers had similar b x e scores for attributes such as reduces nervousness and helps to conceal one's unease, but smokers found these attributes significantly more important than did non-smokers. Overall, the smokers acknowledged the adverse consequences for their health, but a significantly larger percentage of this group selected positive consequences of smoking, such as the relaxing properties and the social aspects of smoking, as important attributes. These findings suggest that in trying to change the attitudes of smokers, one should not limit oneself to providing information about the seriousness of long-term consequences. Both smokers and non-smokers regard these possible consequences as serious. It would be

better to try to change the importance smokers attach to these consequences and/or to confront them with their emphasis on short-term as opposed to longer-term consequences. Moreover, it should be helpful to stress that some of the short-term benefits can also be achieved in other ways. A prerequisite of behavioral change is that people reassess the risk-benefit ratio of certain practices. This implies that they should appreciate their vulnerability and the seriousness of the consequences if they do not change their behavior. Attempts to change this risk-benefit ratio should not only address the likelihood of adverse consequences of existing habits and behavioral practices. They should also stress the importance of these adverse consequences, along with the fact that the perceived benefits of risky practices can also be achieved in other ways.

Research on expectancy-value approaches to attitudes and behavior generally emphasizes the importance of message content in changing attitudes and behavior (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1981). According to Fishbein and Ajzen (1981) arguments play a crucial role in attitude change processes, and these arguments should pertain to the important attributes underlying the attitude one wants to change. This can be achieved in a variety of ways. One could attempt to change the perceived likelihood of existing beliefs or attributes associated with the attitude object (Fishbein, Ajzen, & McArdle, 1980). One could also increase the importance or accessibility of new or existing beliefs about the object (Roskos-Ewoldsen & Fazio, 1997; Sanbonmatsu & Fazio, 1990). The latter strategy is most likely to be successful when the individual has not yet formed an attitude about the object. When applying this strategy to existing attitudes it is essential to motivate the individual to reconsider his/her attitude, and to design information that increases the importance and accessibility of some specific attributes. Our main point is that assessing attribute importance increases the number of strategies one can use in persuading people to change their attitudes and behavior.

In sum, assessing attribute importance can help to provide more insight into the structure of attitudes and tell us which aspects of a behavior are regarded as salient or important. Our simple procedure for assessing the subjective importance of beliefs

results in an adequate assessment of attitudes and behavior, and could help us to understand the underlying decision making processes of specific subgroups. In applied areas such as health psychology, it could also help to tailor health education interventions. Too often intervention programs appear to be based upon the frame of reference of those who are already convinced of the value of the recommended behavior. Assessing the perceived likelihood, evaluation, and importance of possible consequences makes it possible to determine whether the primary aim of an intervention programme should be to change beliefs about the likelihood of specific consequences, the evaluation of these consequences, or their accessibility and perceived importance. Applied research and practice could therefore benefit from the improved insight into the frame of reference of individuals or groups when judging behavioral alternatives with different implications for one's health.

VIII. Attribute importance and attitude ambivalence

Research on the relation between ambivalence and attitude strength has focused on the moderating effects of attitude ambivalence on attitude-intention consistency and attitude-behavior consistency. Some have argued that ambivalent attitudes should lead to reduced attitude-intention and/or attitude-behavior consistency. There is some evidence supporting this view (e.g., Conner, Sparks, Povey, James, & Shepherd, 1996; Moore, 1973, 1980; Sparks, Hedderly, & Shepherd, 1992). Jonas, Diehl and Brömer (1997), on the other hand, found that ambivalent attitudes were more consistently related to behavioral intentions than were non-ambivalent attitudes. In this section we focus on the impact of attitude ambivalence on information integration.

One of the implications of our conception of attitudes as a bottom-up process is that the integration of attributes in order to “compute” one’s overall attitude should take more time for ambivalent attitudes than for non-ambivalent attitudes, because the former are based on a mix of evaluatively inconsistent attributes. The primary aim of the present section is to demonstrate that information integration takes more time for ambivalent attitudes. We will also show that our measure of attribute importance can be

used to derive a measure of attitude ambivalence. First, we present a brief history of research on attitude ambivalence, followed by an overview of the various measures used to assess such ambivalence. This will provide a context for our own measure of attitude ambivalence based on our selection task of important attributes. We propose an attribute-based measure of attitude ambivalence and compare this measure with other measures of attitude ambivalence. Finally, we turn to the impact of attitude ambivalence on RTs associated with providing an overall attitudinal response, and test our prediction that ambivalence should not affect RTs for judging individual attributes but should affect RTs of the overall attitudinal response. We expect the latter to take more time for respondents who hold ambivalent attitudes. Attitude ambivalence thus provides another opportunity to test our assumption that attitudes are based on a "computational" process in which various attributes are combined to form an overall attitudinal response.

Attitude ambivalence is often related to the distinction between a one- versus two-dimensional conception of the evaluative, attitudinal response. Lewin (1951) was one of the first researchers to refer to a state of tension within a system when there are opposing forces that produce conflict, as when equally strong positive and negative forces are encountered. He was referring to social psychological processes in general. Research on approach-avoidance conflicts (e.g., Miller, 1959) also focused on more general psychological processes. Most of this work stressed the importance of conflicts that arise when the pursuit of one goal might interfere with the attainment of another. This framework is of relevance to decision-making, and some have applied it to post-decisional processes that are motivated by the need to reduce dissonance (Festinger, 1957; Wicklund & Brehm, 1976). Although potentially relevant, the literature on goal conflicts has not been related to attitude ambivalence (see e.g., Srull & Wyer, 1986).

Over the past decades a number of researchers discussed ambivalence in the context of attitudes, and also addressed measurement issues. Scott (1966, 1968) was the first to discuss ambivalence in the context of attitudes. As argued by Thompson, Zanna, and Griffin (1995), one of the reasons for the limited impact of Scott's introduction of the concept of attitude ambivalence may have been the then prevailing measurement

strategy. Generally, attitudes were measured using bipolar semantic differentials on which respondents were required to report their attitude. Unfortunately this measurement technique provides only limited opportunities for expressing ambivalent attitudes. Kaplan (1972) made a significant contribution to clarifying the concept of attitude ambivalence by stressing the need to distinguish between attitudinal indifference and ambivalence. The former arises from a lack of experience and/or involvement, whereas the latter reflects the holding of both positive and negative evaluations of the attitude object. Like Kaplan we focus on the latter form of attitude ambivalence. Kaplan also attempted to develop a procedure for assessing positive and negative evaluations separately. The procedure proposed by Kaplan had a clear impact on later developments in the measurement of attitudinal ambivalence. In order to collect positive and negative evaluations, Kaplan split semantic differential scales at the neutral point and asked respondents to indicate how positively and how negatively they evaluated the attitude object. This resulted in a measurement in which respondents were asked to consider only the positive (or negative) attributes of an attitude object and to ignore the negative (or positive) attributes. This seems to be quite a task, and one might wonder whether people are capable of ignoring specific attributes with the opposite valence of those that they are asked to judge, especially when explicitly asked to do so. Research by Wegner (1989, 1992) on thought suppression suggests that this might be difficult to achieve. Moreover, it is unclear whether the opposite evaluation that one is asked to ignore serves as an anchor (leading to contrast), or whether respondents are likely to assimilate their evaluative judgment to the position on the evaluative dimension they are asked to ignore. Thompson et al. (1995) are nevertheless relatively optimistic about this issue, and report only modest correlations between positive and negative scales.

Kaplan (1972) also proposed a measure of attitude ambivalence based on his procedure in which respondents are presented with two distinct unipolar scales. More formally, ambivalence = $\underline{A}_p + |\underline{A}_n| - |\underline{A}_p + \underline{A}_n|$. In this formula $\underline{A}_p$ and $\underline{A}_n$ denote the positive and negative attitude components. Katz and Hass (1988) proposed a similar

measure, based on the similarity and the extremity of an individual's position on the positive and negative attitudinal components. Their view corresponds with that of Kaplan and is also based on the assumption that ambivalence implies that a person tends to have equally strong positive and negative evaluations of the attitude object. They do, however, propose a different way of measuring attitude ambivalence (see also Hass, Katz, Rizzo, Bailey, & Eisenstadt, 1991). In their view the product of the positive and negative component is more influenced by the extremity of, and the similarity between, the two components.

Both Kaplan's (1972) approach and that of Katz and Hass (1988) share a problem: Holding constant the less extreme component of the two, the difference between the more extreme and the less extreme component does not decrease the ambivalence score. In Kaplan's solution a person with a score of 2 on the positive component and a score of 2 on the negative component will have the same ambivalence score as a person with the same score on the positive component and a score of 6 on the negative component. As argued by Thompson et al. (1995), this counterintuitive outcome of Kaplan's measure is exacerbated by the formula proposed by Hass et al. (1991). Thompson et al. propose assessing attitudinal ambivalence by subtracting the absolute difference of the positive (P) and negative (N) components from the average of the two components. Expressed as a formula, this becomes $(P + N)/ 2 - |P - N|$.

In a series of studies Thompson et al. obtained support for the validity of their measure, which they call the "Griffin measure." The attribute selection task we described earlier can provide an attribute-based measure of attitudinal ambivalence. We propose to base the positivity (P) and negativity (N) scores on the number of positive and negative attributes selected among the set of most important attributes. More formally we propose a measure of ambivalence that can be expressed as $(N_p + N_n)/ 2 - |N_p - N_n|$, where N_p refers to the number of selected positive attributes of the attitude object, and N_n to the number of selected negative attributes. In our view attitude ambivalence is primarily a function of the presence of inconsistent and important attributes.

Attitudinal ambivalence has also been related to a direct, self-report measure of ambivalence, generally showing modest but significant correlations in the .30 to .40 range (Thompson et al., 1995). As shown by Van Harreveld, Van der Pligt, and De Vries (1999b), our ambivalence measure performs as well as the Griffin measure and shows either similar or slightly better correlations with self-reported ambivalence. Interestingly, our measure did well both with and without restrictions on the number of attributes respondents could select among their subset of important attributes. In a first study respondents were free to select as many attributes as they thought necessary out of a larger set of 15 attributes. In a second study we compared restricted selection (a maximum of five) with unrestricted selection, and found no differences between the two conditions. In a third study we allowed respondents to select five attributes. Selecting a maximum of five attributes affects the range of our ambivalence measure (minimum is –2.5, maximum +1.5). Notwithstanding the restricted range of our measure, the results again confirmed our predictions (Van Harreveld, Van der Pligt, & De Vries, 1999b).

Because the ambivalence of attitudes is primarily determined by evaluative inconsistency of attributes associated with the attitudinal issue, Thompson et al. (1995) do not necessarily expect attitude ambivalence to be related to properties of attitude strength such as accessibility, importance, and commitment. One can hold ambivalent attitudes about important and unimportant issues, as well as to issues to which one is or is not committed. In their view decreased accessibility of the overall attitude is likely to be the result of the presence of two or more highly accessible and contradictory attributes. More recently, McGregor, Newby-Clark, and Zanna (1999) found support for this view and concluded that for individuals to experience a great deal of ambivalence their congitions should not only be inconsistent but also need to be simultaneously accessible. In accordance with this view we would expect increased RTs for the overall attitude response due to the increased effort needed to integrate evaluatively inconsistent cognitions. Bargh, Chaiken, Govender, and Pratto (1992) also argued that attitude ambivalence involves response competition between the positive and negative attitude component. They expected the latency in an attitudinal assessment task to be

greater for more ambivalent attitudes. Bargh et al. followed Kaplan (1972) by defining ambivalence in terms of low consistency of evaluation: Ambivalent attitudes are expected to have rather strong links in memory to both good and bad evaluations. Bargh et al. (1992) expected that it would take ambivalent respondents longer to report their attitude because of response competition. Interestingly, this suggests a bottom-up process as opposed to direct retrieval of the attitudinal response. Their respondents were required to choose between a positive or negative evaluation. This forced choice implies that one of the activated responses must be made and the other inhibited (see e.g., Logan, 1980; Shallice, 1972). Suppressing a competing response requires attention and processing time (Katz, 1981), and should slow response times. Bargh et al. (1992) measured response latencies when attitudes were assessed on separate unipolar scales for positive and negative feelings toward the attitude object, each on 4-point scales ranging from not at all to extremely. Their findings confirmed their expectations in that response times were slower for more ambivalent attitudes. As noted above, Bargh et al.'s explanation is based on the time and effort associated with suppressing evaluatively inconsistent feelings. We follow a slightly different line of reasoning and argue that information integration takes more time for inconsistent than for consistent attributes. For this reason we assessed response latencies for the direct attitude score, as well as for evaluative and likelihood ratings of the attributes underlying the attitudes.

In sum, ambivalence is a function of the presence of contradictory, or evaluatively inconsistent attributes and is – at least conceptually – independent of most other attitude strength variables. Moreover, we do not expect differences between respondents with high versus low ambivalent attitudes in terms of the accessibility of important attributes, or in processing speed when judging the likelihood and evaluation of selected important attributes. We do expect, however, that integrating information (attributes) to derive an overall attitude takes more time for respondents with ambivalent attitudes than it does for those with less ambivalent attitudes. Generally, integrating inconsistent information takes more time than does integrating consistent, converging information. This finding has been repeatedly found in research on person perception and research on

stereotyping (e.g., Rojahn and Pettigrew, 1992). Other research has shown that inconsistent information is generally studied longer than is consistent information (e.g., Belmore, 1987; Hemsley & Marmurek, 1982). We therefore do not expect differences in RTs between ambivalent and non-ambivalent attitude holders when judging the various attributes; however, we do expect non-ambivalent attitude holders to be faster when integrating the various attributes to derive an overall evaluative attitudinal response.

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insert Table 5 here

To test this we (Van Harreveld, Van der Pligt, & Andreas, 1999; Van Harreveld, Van der Pligt, & De Vries, 1999b) compared RTs for a direct attitude measure (the average RT on four semantic differentials) with that for the various attributes (the average response time for likelihood and evaluative ratings for the set of attributes). Results confirmed our predictions, and are summarized in Table 5. In three domains we found reduced processing speed for the overall attitude measure as compared to processing speed for rating the various attributes in terms of their likelihood and evaluation, providing further support for our view that attitudes are the result of a bottom-up process in which various attributes are combined to form an overall attitudinal response. More importantly, RTs associated with the overall attitudinal response were significantly longer for ambivalent than for non-ambivalent respondents. This difference was not obtained for the RTs associated with judging the attributes in terms of their valence or likelihood.

IX Summary and conclusion

We have focused on the belief or attribute structure underlying attitudes and proposed a simple idiographic measure of attribute importance. We validated our simple meta-attitudinal measure of attribute importance with two sets of operative measures of attribute importance: Accessibility of important versus less important attributes and RTs

associated with judging these two categories of attributes; and the ability of important versus less important attributes to predict directly assessed attitudes, behavioral intentions and behavior. Next, we addressed the benefits of incorporating our measure into expectancy value approaches to attitudes and attitude-behavior consistency. These benefits are that a composite attitude score based on individually important attributes is better able to detect differences between attitude groups, and provides more insight into the structure of their attitudes and the implications for attitude change strategies. Finally, we showed that our measure can also be used to assess attitude ambivalence. We now summarize our findings and discuss implications for research on attitudes and attitude change.

Attribute importance can be measured

Research during the past several decades has resulted in a variety of ways of assessing attribute importance. These methods vary in the type of data they require (at categorical, ordinal, interval, or even ratio level), the complexity of the task presented to respondents, and the amount of time it takes to generate all the needed responses. Unfortunately, response format has a considerable impact on the elicited attribute weights, as indicated by research on attitudes and decision-making (e.g., Borcherding, Schmeer, & Weber, 1995; Doyle, Green, & Bottomley, 1997; Jaccard & Sheng, 1984; Jaccard, Brinberg, & Ackerman, 1986). Both practical and theoretical reasons play a role in determining which method to use. It is therefore essential to find a solution that takes all these factors (complexity, time, and meta-cognitive abilities) into account. We decided against complex methods such as the swing-weight method and the allocation of points to all presented attributes. These tasks are difficult, time consuming, and are likely to exceed meta-cognitive abilities. Simpler methods are easier for respondents and also result in more reliable assessments of attribute weights. In a series of studies (Van der Pligt et al., 1999a) we compared the allocation of points to individually selected important attributes, direct rating of both selected and the whole set of attributes, rank-based approximate weights, and an equal weights solution in which the

subset of individually selected, important attributes received equal weights. Our results confirm previous findings that response format has a profound impact on elicited weights or scores of attribute importance. Moreover, most of the methods resulted in more differentiated weights than those obtained when regressing each b x e value of selected important weights on the overall attitude score. These objective, statistically derived weights were more in accordance with an equal weights solution for the selected subset of individually selected, important attributes. We therefore opted for the use of a method requiring respondents to select a subset of individually important attributes. Our method of assessing attribute importance has four basic characteristics. First, it is an idiographic as opposed to a nomothetic measure of attribute importance, i.e., it assesses attribute importance at individual (as opposed to group) level; second, it relies on a simple categorical judgment, in that an attribute is important or not; third, from a practical point of view, the measure does not take much time; and fourth, the measure relies on introspection and is a meta-attitudinal measure of one of the components of attitude, i.e., attribute importance.

We assume that people are capable of introspecting which attributes out of a larger set are important for their own attitude. The implication is that we are more optimistic about the quality of introspection than Nisbett and Wilson (1977). It should be added that the kind of introspection that we rely on is of a relatively simple nature. We acknowledge that more detailed assessments of the relative weights of attributes might be beyond the capabilities of the average respondent. Nisbett and Wilson (1977) provide a series of demonstrations of the ignorance of the causal factors that influence (changes in one's) behavior, preference and choice. For example, their participants were unaware that the learning of the word pair "ocean-moon" increased their probability of naming "Tide" when asked to name a detergent.

There are at least three reasons for adopting a less stringent attitude toward meta-attitudinal measures. First, the ignorance that is associated with cognition need not apply to higher-level central processes. If asked why we chose the particular words in the previous sentence, we are unlikely to be able to give an accurate answer, given that

we are unaware of the exact processes underlying the construction of the sentence. However, if asked why (or how) we decided to buy a particular computer, most of us would be able to refer to the attributes that determined our choice. Second, it may well be the case that we are unaware of the precise numerical weights that we allocate to the various attributes underlying our attitude or choice. It seems unlikely, however, that people are incapable of distinguishing between important and less important attributes that determined their choice or attitude (see also Dawes, 1979). A third reason for taking meta-attitudinal measures seriously is that whether or not people's beliefs about their cognitive processes are accurate, these beliefs still form the basis of their attitudes, decision making and behavior. Our research confirms this view. A composite measure of attitude based on important attributes is more closely related to overall attitudes and behavior than a measure based on non-selected, less important attributes.

In our view people are consciously aware of at least some of the processes that determine their more important attitudes and choices. These entail more controlled information-processing at a relatively high level, and concern attitudes and behaviors that are relatively important and have clear consequences for the individual. We therefore argue for a more prominent role for meta-attitudinal measures of attitude structure; more specifically, we believe that our measure of attribute importance can serve a useful function in the study of attitude structure.

Important attributes are more predictive and more accessible than less important attributes

In this chapter we summarized evidence from a number of studies showing that selected, subjectively important attributes are more predictive of attitudes than are non-selected attributes in the modal set. Moreover, our composite measure based on important attributes was often more closely related to behavioral intentions and behavior than a measure based on all presented attributes (including the individually selected, important attributes). The latter finding suggests that less important attributes can dilute the predictive validity of the composite attitudinal measure. A comparison of various attribute weighting methods led to the conclusion that a solution in which these

selected attributes receive equal weights is as predictive of attitudes and behavior as a solution in which approximate weights are derived from the rank values of the selected attributes. More complicated methods such as the allocation of points to the selected attributes and rating selected attributes or even all attributes in terms of their importance also failed to improve the predictive power of a simple composite score based on our categorical measure of attribute importance. Moreover, the obtained objective weights based on regression analysis confirm our solution.

Important attributes were also more accessible and were judged faster than the remaining attributes. The latter finding further corroborates our method of assessing attribute importance. Our findings from the more elaborate judgment tasks reveal RT facilitation over and above that created by increased accessibility. After all attributes had been made accessible, respondents' judgments of subjectively important attributes were still faster than those of non-selected, less important attributes. Our findings also provide support for Fazio's (1990) notion that repeated expression of attitudes increases their accessibility: Repeated judgments of overall attitudes generally resulted in faster responses. We found similar effects of temporary sources of accessibility on judgments of the various attributes underlying the attitude. All in all, our evidence also confirms the additive nature of chronic and temporary sources of attribute accessibility (Bargh et al., 1986). It is worth noting that the effects of temporary sources of accessibility of attributes (due to repeated judgments) were less pronounced than the effects due to chronic sources of attribute accessibility (due to their subjective importance).

Interestingly, the results of one of the experiments reported above show both RT facilitation and RT inhibition as a function of attribute importance: Findings reported by Van Harreveld et al. (1999b) show faster responses in a lexical decision-making task for important attributes than for less important attributes, and slower RTs for the latter category than for control words incorporated in the total stimulus set. This can be related to research on the facilitatory and inhibitory effects of stereotype activation on trait accessibility (Dijksterhuis & Van Knippenberg, 1996). Further research is needed to confirm these facilitatory and inhibitory effects, and to assess the possible role of

mediators, such as commitment to one's attitude, attitude extremity, and the threatening nature of dissonant and (often) less important attributes.

Top-down versus bottom-up conceptualizations of attitudes

After a period in which researchers tended to focus on controlled information processing and to develop and test models that were relatively optimistic about human information processing capabilities (Ajzen, 1985, 1991; N.H. Anderson, 1971, 1981; Fishbein & Ajzen, 1975), attitude research now tends to focus on automaticity, and possible antecedents and consequences of the accessibility of the overall attitudinal response (Bargh, 1989; Bargh et al., 1992; Fazio, 1986, 1989, 1990). Fazio (1986) has described his MODE model as an alternative to the expectancy-value models of Fishbein and Ajzen. As argued by Eagly and Chaiken (1993), Fazio (1986) is incorrect in regarding these models as assuming that an individual "considers the attitude in a deliberate reasoning process to arrive at a behavioral decision" (p.237). In Eagly and Chaiken's view Ajzen and Fishbein focused on the role of deliberate or controlled information processing in attitude formation and did not necessarily presume that people think about all these consequences at each opportunity, engaging in a complete subjective cost-benefit analysis to recompute their attitude. It should be added, however, that Fishbein and Ajzen have not always been clear about the extent to which information-processing takes place before expressing existing attitudes. For instance, Ajzen (1996) summarized the theory of planned behavior as stipulating "that when confronted with the need to decide on a course of action, people consider the likely consequences of available alternatives…" (p. 387). Moreover, the way in which attitudes are decomposed and assessed in research based on expectancy-value models carries the implication that attitudes are based on elaborate computations.

Regardless of what Fishbein and Ajzen intended, it seems highly likely that a full-blown computational analysis of all available attitude-relevant information only takes place when individuals are confronted with new and/or important attitude objects or behavioral choices. Equally, it seems very likely that the processing of attitude-relevant information is only completely automatic when the individual is confronted with very

familiar, unimportant, or even trivial attitude objects or behavioral choices. We would like to argue for more theory and research between these two extremes, focusing on processes underlying the expression of existing (non-trivial) attitudes. These processes are likely to be based on relatively simple computational rules according to which information is integrated, and the amount of information (i.e., number of attributes) is also likely to be modest.

Our results show that RTs associated with judging the various attributes (irrespective of their subjective importance) are much shorter than RTs for the overall attitudinal response. This difference was obtained irrespective of whether the overall attitudinal response was given before or after judging the various attributes. These findings suggest that some information integration takes place in order to derive one's overall attitudinal response. We thus favor a 'computational' approach to attitudes, in which attitudes are based on the retrieval of relevant attributes, as opposed to direct retrieval of the overall evaluative response. We emphasize that information integration processes underlying the overall attitude are simple and based on a limited number of personally relevant attributes. In other words, our assumptions concerning the information-processing capabilities of people are more modest than those that prevailed at the start of the cognitive revolution.

Attitude structure, stability, and attitude change

Another conclusion we would like to draw can also been seen as an attempt to restore some balance in social psychological research. Older attitude research focused on the mechanisms people use to preserve their existing attitudes. This research examined biased information search, biased interpretations of new (counter-attitudinal) information, and so on (McGuire, 1985). Applied research on attitude change is often confronted with considerable resistance to attitude change, and similar observations have been made in behavioral domains in which values and/or habits play an important role, such as health behavior, traffic behavior and political attitudes (e.g., Sears, 1983). Research on stereotypes also suggests that attitudes about groups or individuals are difficult to change (Rothbart, 1981; Rothbart & Park, 1986).

This is in sharp contrast with attitudinal processes that have been the focus of research over the past 15 years. Research on context effects in attitudinal judgment, and research on the effects of introspecting about one's attitude toward an attitude object suggest that attitudes are relatively unstable. This research on context effects adopts a constructionist view of attitudes, in which the focus is on how an attitudinal response is influenced by providing a specific judgmental context (Schwarz & Strack, 1991; Tourangeau & Rasinski, 1988). Research by Wilson and colleagues (Wilson & Dunn, 1986; Wilson, Dunn, Bybee, Hyman, & Rotundo, 1984; Wilson, Dunn, Kraft, & Lyle, 1989) suggests that the simple request to consider the reasons why one holds an attitude immediately before one expresses the attitude activates different attributes and feelings than would be normally accessible. This biased set of attributes and feelings affects the attitudinal response and can also result in a poor attitude-behavior relationship.

These lines of research imply that expressed attitudes have low reliability and that they are only marginally related to behavior. We take a different view on this issue, and argue that attitudes can be related to quite stable attribute structures. Although we agree with the emphasis placed on the computational aspects of attitudes, we believe that the attributes used in computations made to derive one's overall attitude are more stable than is assumed to be the case in the two lines of research just mentioned. One reason for this difference may be that in our research we tend to focus on attitudes to behaviors or issues that can have consequences for the individual (smoking, safe-sex, educational preference, blood donation, and so on). Most research on context effects on expressed attitudes has tended to focus on issues that are less involving for respondents, and/or on contexts in which respondents have to reply under time pressure. Low involvement and time pressure increase the likelihood of limited and superficial information processing and are therefore likely to enhance context effects. Tourangeau and Rasinski (1988) more or less acknowledge this point. Fazio (1986) also maintained that with weak and poorly articulated attitudes, behavior is often controlled by features of the attitude object that happen to be salient (see also Fazio, Powell, & Williams, 1989). Similarly, the work of Wilson and his colleagues tends to focus on non-consequential attitudes or

attitudes with trivial consequences for the individual, such as the selection of a soft drink in a cafeteria. Moreover, subsequent research by Wilson, Dunn, Kraft, and Lisle (1989) showed that the effects of analyzing reasons on attitude change and on attitude-behavior correspondence were largely confined to participants who were not very knowledgeable about the attitude object. More recently, Zanna (1993) made a similar point and noted that research in the persuasion literature has tended to employ attitude topics for which participants had rather weak attitudes.

If attitude structures are relatively stable, one should be systematic and persistent in attempting to change (elements of) this structure in order to change attitudes and behavioral preferences. We argue that assessing attribute importance should help to tailor attitude change programs. Fishbein and Ajzen also argued that expectancy-value models of attitudes have clear implications for persuasion (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1981). Not surprisingly, their application of expectancy-value principles emphasizes the importance of message content in producing changes in beliefs, and consequently attitudes, behavioral intentions and behavior. This approach has been quite popular and generally confirms the expectation that changes in beliefs (especially the probability component) can lead to corresponding changes in attitudes (see, e.g., Fishbein, Ajzen, & McArdle, 1980; Olson & Zanna, 1987). As argued by Eagly and Chaiken (1993), there is far less evidence showing that changing attribute evaluations leads to changes in overall attitudes. One reason is that changing attribute evaluations is much more difficult than changing the perceived likelihood of positive or negative attributes associated with the attitude object. Attribute evaluations are often related to more central values and norms and are likely to be more stable than attribute-attitude links.

Our approach offers an additional strategy. For Fishbein and Ajzen (1981), arguments play a key role in determining persuasion, and these arguments need to be selected with care. In their view, these arguments should pertain to the primary attributes underlying the attitude the influencer wants to change. Our argument is that the influencer should be aware of the prime determinants of attitudes at individual or

group level. Thus, persuasion strategies that emphasize message content should not only address the probability and evaluation of attributes or possible consequences of behavioral action, but also the subjective importance of these attributes. Explicitly considering the subjective importance of attributes opens up alternative strategies to foster behavioral change. These could be based on questioning the perceived importance of attributes for a specific target group, or on attempting to increase the importance of attributes that are presently not considered important. Such a strategy broadens the scope of opportunities for persuasion in research on applied issues such as health behavior. Given the fact that changes in the perceived likelihood of adverse health consequences have a limited impact on attitudes (Van der Pligt, 1998), and given the fact that evaluations of the possible adverse consequences of behavioral practices often hardly vary between attitude groups, it may well be more efficient to focus on changing the perceived importance of certain attributes. Our research on smoking illustrates this point and reveals that smokers do not necessarily deny the likelihood of adverse health consequences or evaluate these consequences less negatively; they simply find them less important. Moreover, they focus on positive attributes of smoking that are totally ignored in most persuasion strategies.

Attribute importance and attitude ambivalence

Our measure of attribute importance can be used to assess a number of features that are studied under the general rubric "attitude strength." First, if respondents were only to select attributes that are consonant with their overall attitude we would obviously be dealing with stronger (less ambivalent) attitudes. As we showed, these attributes are not only more closely related to overall attitudes and behavior, but are also more accessible. A one-sided selection of attributes thus gives a good indication of strength, and consequently of attitude ambivalence. Our measure of attribute ambivalence is similar to the Griffin measure, but can be more easily assessed and is also more reliably related to other indices, such as the time needed to integrate evaluatively incongruent attributes into an overall attitudinal judgment.

Our results show slower RTs for the overall attitudinal response when the set of selected attributes consists of attributes that support both sides of the attitudinal continuum. More ambivalent respondents generally took longer to express (or construct) their overall attitude than less ambivalent respondents did, whereas the two groups did not differ in the RTs associated with judging the various attributes underlying their overall attitude. These findings are in accordance with results obtained in related fields, such as person perception and stereotyping, showing that integrating evaluatively inconsistent information takes more time than integrating consistent information (Belmore, 1987; Hemsley & Marmurek, 1982; Rojahn & Pettigrew, 1992). These findings therefore support our conception of attitudes as a bottom-up process in which attributes are combined to arrive at an overall attitudinal response.

Our measure of attribute importance can also be related to ambivalence due to affective-cognitive inconsistency. If the modal set of attributes contains beliefs and feelings associated with the attitude object, the relative frequency with which beliefs and feelings figure in the set of selected attributes, in combination with their respective valences, can give a simple indication of affective-cognitive consistency. As argued above, our measure of attribute importance is not taxing for the respondent, and we expect that it will be possible to use the measure to make reliable assessments of the relative weight of affect versus cognition at the individual level.

Concluding remark

Our primary objective in this chapter has been to argue that the scope of attitudinal research should be broadened and that more attention should be paid to the cognitive processes underlying relatively important attitudes. In studying these cognitive processes the best solution seems to be to focus on relatively simple cognitive operations that rely on limited amounts of information. In our view, assessing attribute importance could help to decompose attitudes into a set of attributes that can easily be integrated into an overall attitudinal judgment. The information integration presumed by our approach is more in line with the known limitations of on-line human information processing. We would like to emphasize the need for more research on attitudes

between the two extremes of automatic attitudinal processes, in which attitudes are conceived as the result of no conscious thought at all, versus controlled information processing approaches, in which it is assumed that people make a complete cost-benefit analysis of each attitudinal or behavioral decision. In our view, broadening the scope of attitudinal research also implies adopting a view that is more open to the possible benefits of meta-attitudinal measures of attitudes. We do not share the general distrust of such measures, and believe that meta-attitudinal measures of components such as attribute importance are useful and can help to improve our insight in attitude structure and attitude change processes. In sum, we believe that attitude research should also address more important attitudes, pay more attention to the (simple) controlled information processes underlying such attitudes, and study these attitudes using both process-related and meta-attitudinal measures.

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Table 1.

Correlations of Weighted and Unweighted Attribute-Based Scores with Attitude and Behavior.

method of weighting	Attitude	Behavior
(1) Equal weights (EW)	0.687	0.586
(2) Rank-sum weights (RS)	0.668	0.577
(3) Reciprocal of ranks (RR)	0.665	0.573
(4) Rank-order centroid weights (ROC)	0.649	0.566
(5) Elicited weights by point allocation (PA)	0.683	0.552
(6) Direct rating selected attributes	0.697	0.593
(7) Direct rating all attributes	0.670	0.465

Note. Methods 2–4 are techniques to derive precise numerical weights from rank values. The methods vary in the steepness of the distribution of weights. Direct rating (6) refers to a b x e x i (importance) score for the three selected attributes. Direct rating (7) refers to a composite score based on the b x e x i scores of all attributes in the modal set. Adapted from Van der Pligt, De Vries and Van Harreveld (1999a).

Table 2.

Reaction Times for Important versus Less Important Attributions (Dichotomous Task)

Attitudinal issue	Important attributes	Remaining attributes
Abortion	2.169	2.179
Blood donation	1.165	1.979**
Use of softdrugs	1.708	2.065**
Genetic modification	1.524	2.287**
Bill Clinton	1.634	1.814**
Wim Kok	1.263	1.615**
Frits Bolkestein	1.674	1.862*
Patrick Kluivert	1.024	1.839*

Note. Wim Kok is the present prime minister of the Netherlands. Frits Bolkestein is a right-wing liberal politician, and Patrick Kluivert a national soccer player who has been accused of negligence (causing a serious traffic accident) and rape.

* p<.05, **p<.001. Adapted from Van der Pligt, Manstead, Van Harreveld, & Janssen, 1999.

Table 3.

Correlations between (logtransformed) RTs of Attribute Ratings and RTs of Overall Attitude as a Function of Attitude Strength

	(1)	(2)	(3)	(4)
1. Overall attitude rating	(–)	.68**	.60**	.75**
2. Attribute likelihood	.14	(–)	.78**	.72**
3. Attribute evaluation	.38*	.53**	(–)	.78**
4. Attribute importance	.38*	.48**	.35*	(–)

Note. Correlations for weak attitude holders (N=37) are above the diagonal; those for strong attitude holders (N=39) are below the diagonal.

* p<.05, **p<.01.

Table 4.

Correlations between Composite Scores based on Selected, Important versus Unselected Attributes, and Direct Attitudes and Behavioral Intentions.

Study (issue)	Correlation with attitude	Correlation with behavior/intention
• Eiser & Van der Pligt (1979) (nuclear power)		
- selected attributes (5)	.86	–
- non-selected attributes (6)	.44	–
• Budd (1986) (smoking cigarettes)		
- selected attributes (5)	.62	–
- non-selected attributes (13)	.07	–
• Van der Pligt & De Vries (1998) (smoking cigarettes)		
- selected attributes (3)	.63	.52
- non-selected attributes (12)	.15	.06
• Van der Pligt, De Vries, Van Harreveld, & Andreas (1999)		
Study 1 (safe sex)		
- selected attributes (3)	–	.33
- non-selected attributes (7)	–	.19
Study 2 (smoking cigarettes)		
- selected attributes (3-5)	.65	.56
- non-selected attributes (10-12)	–.01	–.15
• Van Harreveld, Van der Pligt & De Vries (1999b)		
Study 1 (English as language of instruction)		
- selected attributes[a)]	.66	.71
- non-selected attributes	–.08	–.11
Study 2 (smoking cigarettes)		
- selected attributes (5)	.70	.47
- non-selected attributes (10)	–.08	.06
Study 3 (safe sex)		
- selected attributes (5)	.49	.50
- non-selected attributes (10)	.27	.04
• Van Harreveld, Van der Pligt,3 & De Vries (1999c)		
Study 1 (organ donation)		
- selected attributes[a)]	.46	.45
- non-selected attributes	.16	.13
Study 2 (student selection)		
- selected attributes (5)	.51	–
- non-selected attributes (11)	–.27	–

Note. In each pair, correlations differed at $p < .05$. Numbers in parentheses refer to the number of (non)selected attributes. [a)] Studies in which participants were free to select as many (important) attributes as they liked.

Table 5.

Reaction Time as a Function of Attitude Ambivalence.

Issue ambivalence	Attribute evaluation	Attribute likelihood	Direct attitude
• Gen food			
low	3.40	4.13	5.29
high	3.40	4.37	4.79
• Smoking			
low	3.71	3.40	6.48
high	3.70	3.56	6.08
• English as language of instruction			
low	4.04	5.24	8.68
high	4.23	5.44	7.17

Note. Differences between attitude ratings and attribute ratings were more pronounced for ambivalent attitude holders.

Adapted from Van Harreveld, Van der Pligt, De Vries, Wenneker, and Verhue (2000).

Figure Caption

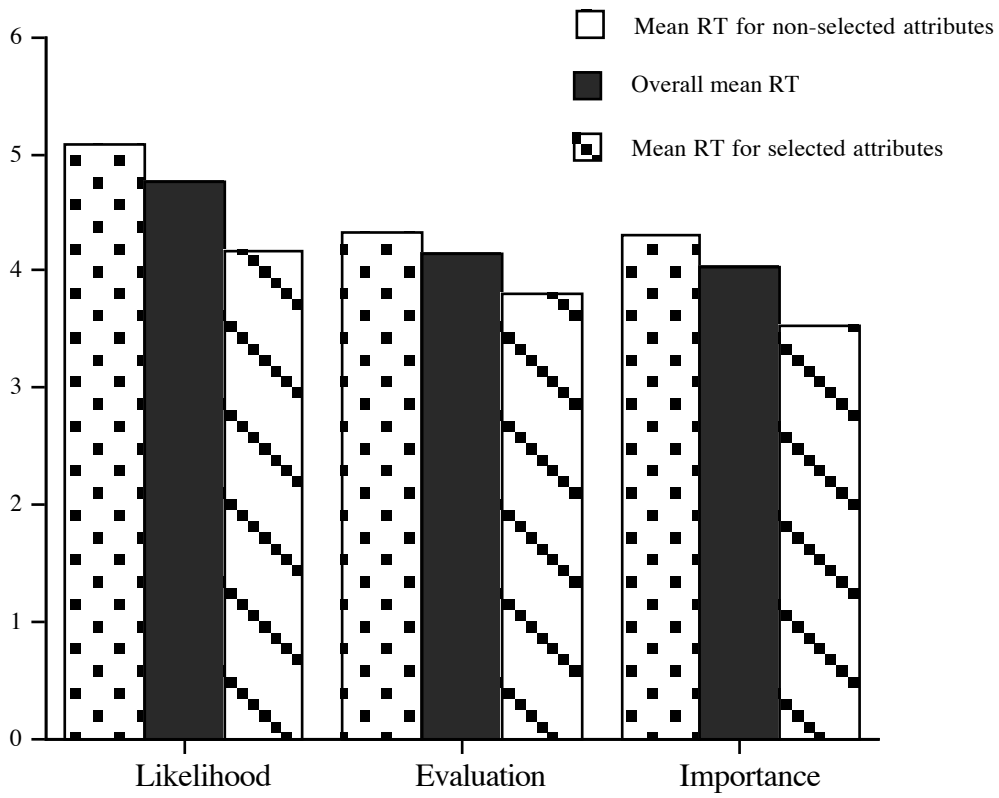
Figure 1. Response times as a function of attribute importance and repeated exposure to attributes.

Figure 2. Response times for attribute ratings and direct attitude assessed before and after rating the attributes.

Figure 3. Response times for attribute and attitude ratings as a function of attitude strenght.

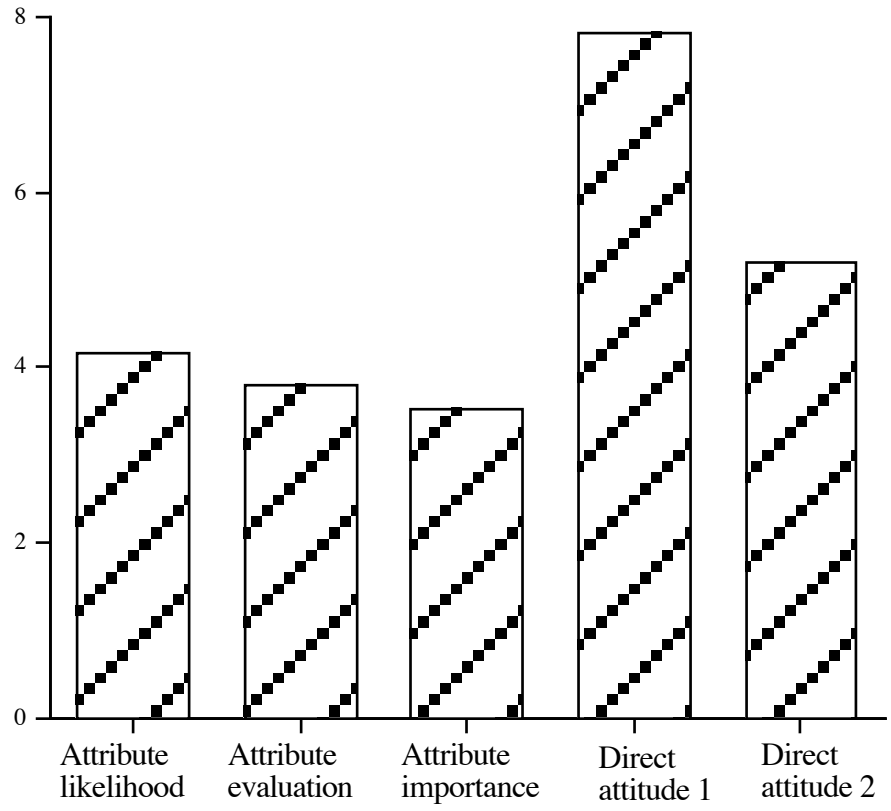
Figure 4. Differences between smokers' and non-smokers' composite attitude scores based on selected versus non-selected attributes.

Figure 1.



Note. Likelihood ratings were assessed first, followed by evaluative and importance ratings. Adapted from Van Harreveld, Van der Pligt, De Vries, and Andreas, 1999.

Figure 2.



Note. Direct attitude 1 refers to attitude assessed before rating the attributes, Direct attitude 2 to attitude assessed after rating the attributes. Scores are averaged over the 15 attributes or the four semantic differential scales (Direct attitudes 1 and 2). Adapted from Van Harreveld, Van der Pligt, De Vries, and Andreas, 1999.

Figure 3.

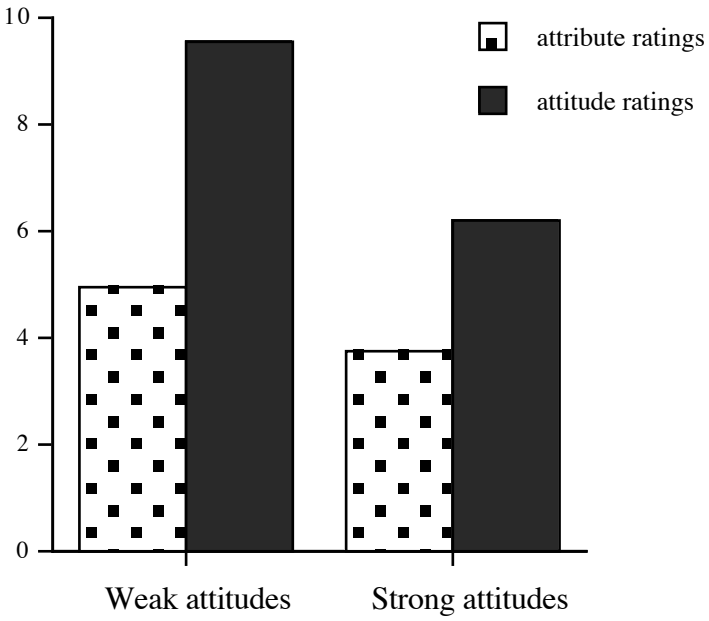
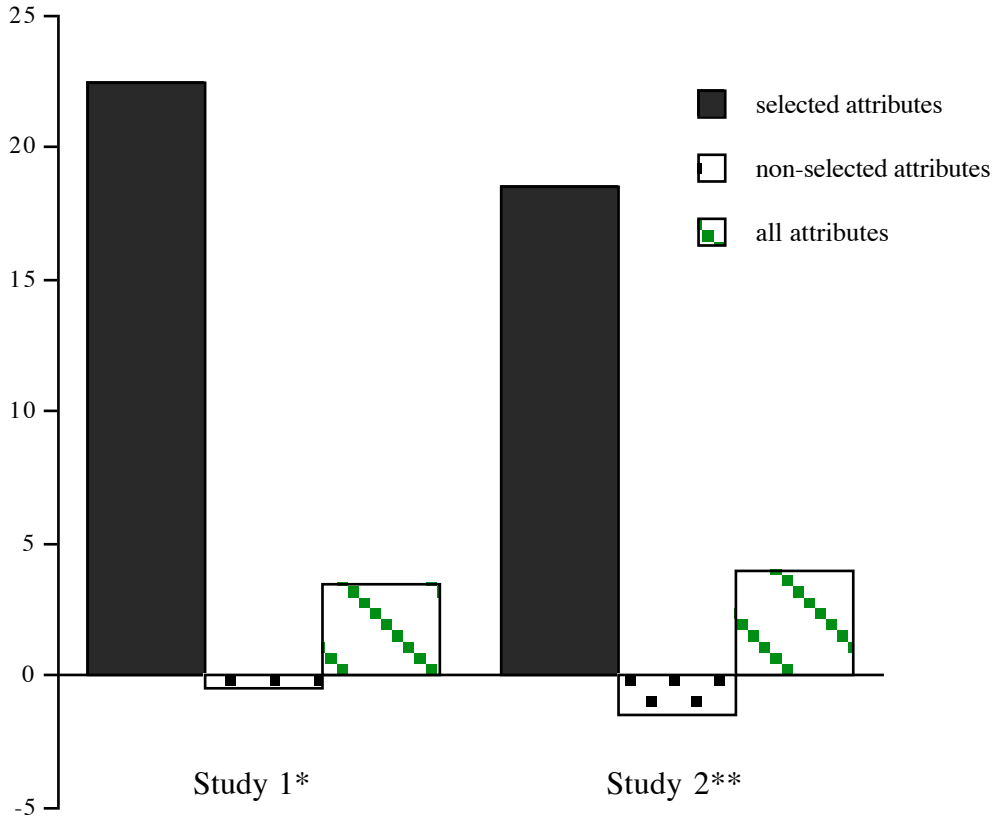

10
8
6
4
2
0
attribute ratings
attitude ratings
Weak attitudes
Strong attitudes

Figure 4.



Note. A positive score means that differences were in the predicted direction with smokers having higher b x e scores for smoking than non-smokers, a negative score means that differences were in the opposite direction.

*Adapted from Van der Pligt and De Vries (1998).

**Adapted from Van der Pligt, De Vries, Van Harreveld, and Andreas (1999).