

SURVIVAL AND CHANGE IN JUDGMENTS: A MODEL OF ACTIVATION AND COMPARISON

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A model of judgment maintenance and change is proposed that specifies the various processes that take place at the time of making a judgment on the basis of memory-based and online information. This model proposes that attitude maintenance and change depend on three processes: recalling a prior attitude, recalling or receiving other attitude-related information, and comparing the prior attitude with attitude-related information. Unlike prior models, the activation/comparison model assumes that all three processes can elicit attitude change and maintenance under different conditions. For instance, the mere activation of attitude-related information that is consistent with a prior attitude will favor stability, whereas activation accompanied with comparison with a prior attitude will result in polarization of the prior attitude. Furthermore, even when prior attitude accessibility will elicit attitude maintenance in the absence of comparative processes, prior attitude accessibility can accelerate comparison and therefore change when comparative cues are present. Finally, people who are motivated to compare their prior attitudes with new information should by necessity first activate their prior attitude before comparison can take place. Consequently, attitude comparison cues may induce attitude survival if subsequent processing stops at the point of attitude activation and does not proceed to the stage of attitude comparison. Comparative principles are identified and the implications of this model are discussed in relation to prior theorizing on change in attitudes and nonevaluative judgments.

I. Introduction

Social psychologists' current understanding of attitude change and maintenance faces two primary problems. One problem is fragmentation of the literature. Several bodies of research and theory identify mechanisms or thought processes that have different implications for the change and maintenance of attitudes over time. These mechanisms involve recalling a prior attitude about an object, considering online attitude-related information, and evaluating the prior attitude in light of the attitude-related information. However, past research has typically considered these processes at a molecular level, taking into account only one process at a time (for an exception, see Festinger, 1957; Festinger & Carlsmith, 1959). To our knowledge, no prior model of attitude change has attempted to explicate the complex consequences of these rather basic mechanisms for attitude change and survival.

The fragmentation of the attitude change literature contributes to a second problem. The predictions that can be made from isolated mechanisms are not the same as those that an integrative view allows. Our model emphasizes that understanding and predicting attitude change requires examination of three processes: (1) activating the prior attitude (retrieving it from memory), (2) activating information related to the prior attitude (which can be from memory or external), and (3) comparing the prior attitude with the related information (Fig. 1).¹ None of the processes in Fig. 1 is inevitable, and each process can have different implications for attitude change and maintenance. On one hand, the sole activation of either attitude change and maintenance. On the other hand, online reconstruction of an attitude based on the sole activation of attitude-inconsistent information, as well as comparison of the prior attitude with attitude-consistent or inconsistent information, should generally produce attitude change. Nevertheless, these two processes do not always occur independently of each other, and better understanding of attitude change emerges from a joint consideration of the

¹We define *attitudes* as evaluative judgments that are typically generated covertly, and may or may not be expressed to others. Both current and prior attitudes in this case represent the judgment component of attitudes, which is distinct from the representation of this judgment in memory or the representations of attitude-related information in memory (for treatments of the nature of attitude representations in memory, see Bassili & Brown, in press; Fazio, 1986; Wyer & Srull, 1989). We conceptualize *change* as a difference between a present attitude judgment about a topic and an attitudinal judgment about the same topic generated at an earlier time, even when this change results from seemingly fluid and temporary contextual factors (see e.g., Schwarz & Bohner, 2001; Tourangeau & Rasinski, 1988).

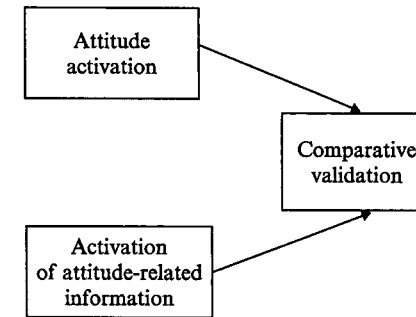


Fig. 1. Processes underlying attitude survival and change. Boxes represent processes.

two. Although the processes themselves are not counterintuitive, their joint implications elaborated in our model often contrast with prior assumptions and predictions.

Conceptualizing attitude activation and comparison as a sequential process implies that activating a prior attitude will often facilitate comparison. That is, the comparison process requires activation of both the prior attitude and attitude-related information, so spontaneous or externally induced attitude activation (step 1) will foster comparison (step 2) simply because such activation is a prerequisite for comparison. However, activation of both the prior attitude and attitude-related information does not guarantee comparison; attitude activation may not stimulate comparison if situational or individual factors discourage comparison.

Just as attitude activation facilitates comparison, comparison cues facilitate activation. When people are motivated to compare their prior attitude with attitude-related information, they may first need to activate the elements required for comparison if these elements were not already available before starting to compare. However, comparison cues do not guarantee comparison even if these cues lead to the activation of the elements required for comparison. The individual may not be sufficiently motivated or able to proceed from step 1 (activating attitudes) to step 2 (comparative validation).

An example may illustrate the need to investigate attitude activation and comparison in a concurrent fashion. For instance, considering only the activation of a prior attitude leads to the well-supported prediction that highly accessible prior attitudes survive or last longer than prior attitudes with low accessibility (Fazio, 1986). A woman who can easily recall her prior favorable attitude toward COPA airlines is more likely to sustain favorable attitudes than a person who can barely remember that "COPA"

is a Panamanian company, let alone an evaluation of the service provided by this airline. However, if attitude activation is considered in the context of comparative processes, it is easy to see how activating a prior attitude could lead to attitude change, rather than attitude maintenance. For instance, a woman who clearly remembers having a prior favorable evaluation of COPA airlines and is politely greeted by a COPA flight attendant may *reassess* the validity of her prior attitude in relation to the new information (comparative validation process). In doing this, the subjective validity of her prior attitude and the new information may increase due to the perceived fit between each cognition and prior knowledge (Wyer & Srull, 1989), her mood (Schwarz & Clore, 1983), or the sheer convenience of holding a given attitude (Festinger, 1964). Furthermore, when compared, her positive prior attitude and the new, also positive information should be mutually validating and combine to increase the positivity of the prior attitude (corroboration).

Polarization following subjective confirmation of an earlier conclusion, however, should not occur when people form a current attitude on the spot, ignoring a past attitude. For instance, the woman in our example may fail to retrieve her earlier favorable attitude toward COPA airlines at the time when she is greeted by the polite flight attendant. In this case, failure to retrieve the prior attitude should prevent the comparative validation process we described, leading to the online formation of a current attitude that is equally positive to the prior one. In conclusion, attitude survival may occur in a relatively incidental way even if the prior attitude is inaccessible, provided people consider attitude-relevant information that supports the prior attitude.

Attitude maintenance may also emerge from failed attempts to compare new information with a prior attitude. In our example, the woman who is politely greeted by the flight attendant may be asked to complete a consumer survey. In filling out the survey, she may try to recall an evaluation of the airline that she developed years ago and to integrate that attitude with the new information she gathered. However, she might become distracted in the middle of completing the survey and default to the prior attitude she recalled to perform a comparison. With such interruptions, motivation to perform a comparison will increase stability instead of change.

Because ability and motivation to think about an issue often are necessary to perform the processes in Fig. 1, our model has implications for the effects of these variables on attitude change. We argue that a prior attitude is most likely to survive when people activate the prior attitude but do not use evaluatively inconsistent information for either comparisons or online constructions. Therefore, people must have sufficient ability and motivation to retrieve the prior attitude, but not enough ability and motivation to process

relevant but inconsistent material.² Consider the influence of ability and motivation to think about an issue when the attitude-relevant information has the same evaluative implications as the prior attitude. Whereas comparison of a prior attitude with attitude-consistent information should lead to change (polarization), either recycling the old accessible attitude or forming an attitude on the go should lead to attitude survival. Thus, lower and moderate levels of processing ability and motivation should promote attitude survival more than high levels of these variables.

This chapter is organized in three sections. The next section (Section II) defines basic concepts pertinent to the model. The predictions described in Section III include an extended presentation of the potential forms of attitude change (e.g., polarization of prior attitudes, boomerang types of effects, and compromise between the prior attitude and the attitude-related information) based on the evaluative category or implication (good vs. bad) of the judgment and the relevant information, as well as the processing stages that develop (Part A of Section III). The chapter then reviews the influences of attitude activation and comparison (Part B of Section III) and the predicted effects of general processing ability and motivation on attitude change (Part C of Section III). In Section IV, we contrast the predictions of our model with prior models of attitudes, including algebraic models, such as information-integration theory (Anderson, 1974), Sherif and Hovland's (1961) social judgment theory, and more recent models of communication and persuasion.

II. Attitude Change and Survival: Preliminary Definitions

People form attitudes when they link an object to an evaluative category in the process of evaluating the object (good vs. bad, positive vs. negative; see Ajzen & Fishbein, 1980, 2001; Eagly & Chaiken, 1993; Fazio, 1986; Wyer & Srull, 1989; Zanna & Rempel, 1988). The attitude object can be a concrete target, a behavior, an abstract entity, a person, or an event (e.g., Fishbein & Ajzen, 1974). For example, individuals form evaluations of social groups

²Prior research has shown that people's ability and motivation to think about an object can induce different inferences about the validity of a given type of information (Chaiken, 1980; Petty & Cacioppo, 1986). For instance, people use their mood as information when they think about their mood to a moderate extent (Albarracín & Kumkale, 2003) but not when ability and motivation are either high or low. Moreover, individuals may correct for the influence of mood when they have high ability and motivation, resulting in reverse effects of mood on judgment (see Ottati & Isbell, 1996). These effects are orthogonal to the effects of concern in this chapter, as they affect the actual validity of the prior attitude and the attitude-related information but not the processes that guide attitude change and maintenance.

(e.g., prejudice), their own behaviors (attitude toward the behavior; Fishbein & Ajzen, 1975), their personal attributes (attitudes toward the self, including self-esteem), and other people (person impressions). Moreover, individuals form these attitudes on the basis of different types of information. For instance, Eagly and Chaiken (1993; see also Ajzen, 2001; Albarracín, 2002; Petty & Wegener, 1999) maintain that attitudes can be based on cognitive, affective, and behavioral information. A person who values health and believes that smoking poses health risks is likely to develop a negative attitude toward smoking (Fishbein & Ajzen, 1975). People who experience positive mood may favorably evaluate their lives or conclude that a political candidate is desirable (Clare & Parrott, 1994; Isbell & Wyer, 1999; Schwarz & Clore, 1983, 1996). Moreover, according to Bem (1965, 1972; Bem & McConnell, 1970), individuals often consider their past behavior and infer their attitudes from that behavior, particularly when they lack a firm prior attitude about the object being considered (for relevant evidence, see Chaiken & Baldwin, 1981). Although affective and behavioral information often gives way to attitudes, attitudes are neither affective nor behavioral in nature: They are evaluations (Eagly & Chaiken, 1993; Zanna & Rempel, 1988).

Three attitude dimensions are relevant to the model's predictions. Attitudes are first characterized by their *evaluative category* or *implication* stemming from people's classifications of objects as good or bad (e.g., Bargh, Chaiken, Govender, & Pratto, 1992). Moreover, attitudes vary in the *extremity* or the polarity of the value assigned to the evaluative category (Thurstone, 1959). For example, an individual may moderately or strongly dislike former President Clinton or may be weakly or extremely prejudiced against a societal group. Finally, people's attitudes are associated with different degrees of *confidence* or subjective certainty (see Abelson, 1988; Petty, Briñol, & Tormala, 2002). A woman may be very confident that Clinton was a good president, but decrease confidence in this attitude as a result of new information that derogates Clinton's image.³

This chapter is concerned with stability and changes in the evaluations of an object as time passes. Attitude change denotes a transformation of at least one of the aforementioned attitude dimensions over two different (and arbitrarily defined) time points. Some attitudes *change in evaluative category* or *implication*. For instance, individuals who initially favor a president may later receive information that leads them to disapprove of this president. Attitudes also *change in extremity and confidence*. For example, people with negative attitudes toward smoking may disapprove of smoking even more after making

³It is important to note that properties such as extremity and confidence are often termed *attitude strength*. We believe that conceptualizing attitude change requires understanding change in all of these dimensions.

new friends who also disapprove of smoking (attitude polarization following corroboration). As an example of change in confidence, people may become more confident in their stereotypes about a minority group if training designed to decrease stereotypes backfires (boomerang type of effect).

In contrast to attitude change, *attitude survival* (also denoted *maintenance* and *persistence*) denotes continuity in the three dimensions of evaluative category, extremity, and confidence. For example, people can automatically access their prior evaluations of political parties and maintain the same exact attitudes over many years (e.g., Fazio, 1990; Fazio, Powell, & Herr, 1983). Attitudes also survive when individuals form an attitude that is identical to a prior one on the basis of relevant information that is available online, even when they did not retrieve their prior attitude from permanent memory. As described by Bem (1965; see also Albarracín & Wyer, 2000), people may repeatedly infer an attitude on the basis of their past behavior that happens to be salient at the time (for a review of conditions that facilitate self-perception, see Eagly & Chaiken, 1993). When this behavior is the same over time, the attitude individuals generate is also likely to be stable (for discussions of how chronic accessibility of information can lead to attitudes that are identical to attitudes people formed at an earlier time, see Schwarz & Bohner, 2001; Wilson & Hodges, 1992). We will discuss these different phenomena and their facilitating conditions in the context of empirical evidence relevant to our model.

Although attitude extremity and confidence are distinct attitude dimensions, they often go hand in hand. Consider the case in which people recall a general, dichotomous categorization of an object as good or bad. For instance, people may recall that they previously thought that a war against Iraq was a bad idea. Those who become more or less confident in their category assignment should express a more or less extreme judgment, provided that there are enough verbal labels in the context of a broader judgmental scale (e.g., "very" or "slightly" bad). In the example, people who become more confident that the Iraq war is a bad idea are likely to describe the war as "very bad," whereas people who hesitate with respect to their prior judgment may characterize it as "slightly bad." However, very different effects might emerge for changes in confidence and extremity when people start with a more specific judgment, such as "very" bad on a semantic differential scale. Under those conditions, becoming more confident in one's judgment could imply reendorsing "very bad" as one's judgment rather than changing the extremity of one's attitude.

In addition to ceiling effects, implicit theories about change may further complicate the situation. If a person's initial attitude changes in valence, confidence may increase or decrease depending on the circumstances being considered. For example, a person who is initially against the Iraq war may

receive information about the advantages of the war, leading that person to manifest a neutral or even positive position. If the person focuses on his or her having changed the earlier attitude in light of more comprehensive information, his or her attitude confidence should increase as extremity decreases. In contrast, if the person focuses on his or her having changed the prior attitude, he or she may conclude that attitudes in this domain are short-lived and decrease his or her confidence in them. In sum, the model discussed in this chapter predicts changes in extremity and confidence in the case of attitude polarization, but it makes no assumptions about confidence in the case of a compromise between the prior attitude and the attitude-related information.

III. Activation/Comparison Model

The activation/comparison model stipulates that attitude maintenance and change are a function of (1) prior attitude activation, (2) activation of information related to the prior attitude, and (3) comparison between the prior attitude and the attitude-related information. According to this activation/comparison model, none of these three components is inevitable. People may activate their prior attitude without activating related information. For example, a man planning to vote in an upcoming political election may recall his prior favorable attitude toward the candidate without recalling specific information about the candidate or attending to media portrayals of the candidate. Moreover, concurrent activation of a prior attitude and information related to that attitude does not guarantee comparison between these two components. The man might read a newspaper article describing the behavior of the candidate without considering how the implications of the information in the article fit with his attitude toward the candidate. We describe the nature and predicted effects of attitude activation and information comparison on attitude change and maintenance below. Figure 2 shows the outcomes of these processes on change and survival, and Table I summarizes the model postulates.

A. PROPOSED PROCESSES

1. Activation of Prior Attitude

People activate a prior attitude if they retrieve an association between an object and a category that they previously stored in memory (see Fazio, 1986). For instance, a person may recall that a person is "good" or "bad,"

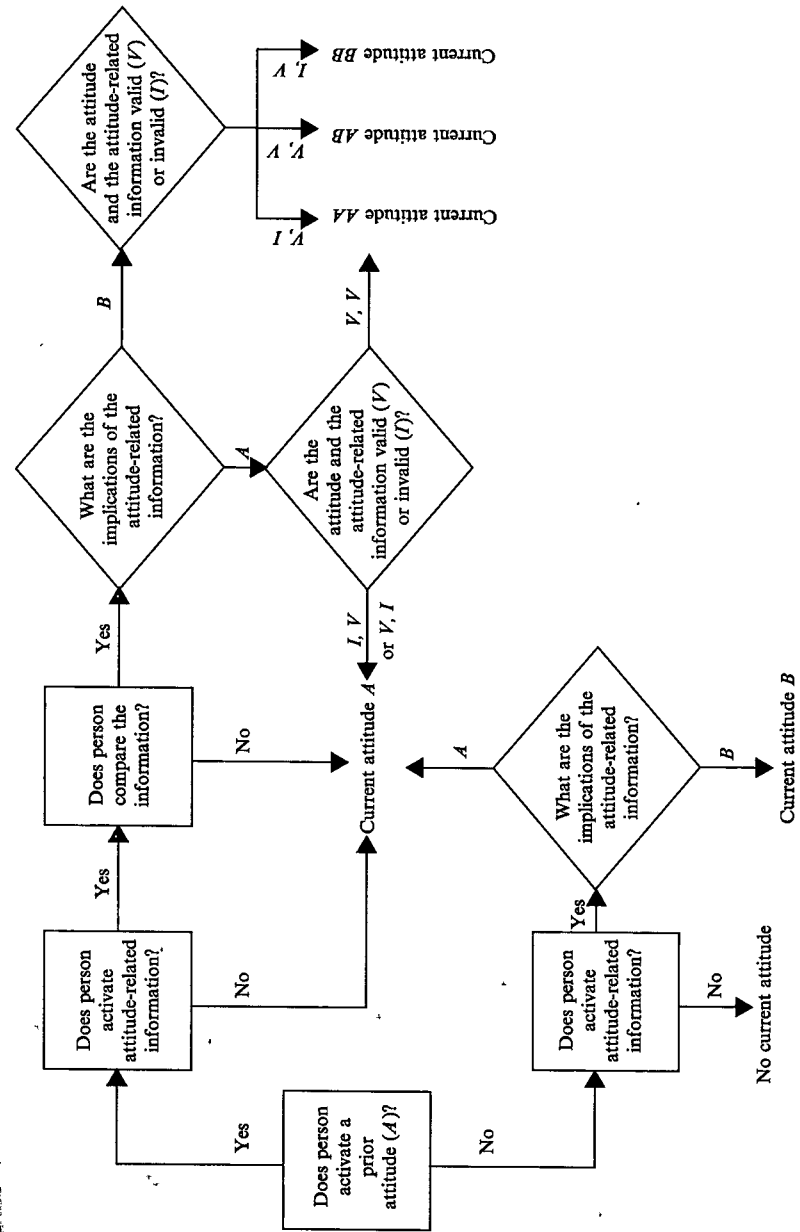


Fig. 2. Influence of processes of activation and comparison on attitudinal outcomes. Boxes indicate processes and diamonds indicate decision points. *A* and *B* represent different implications or categories (e.g., bad versus good). *V* and *I* denote subjectively valid and invalid information, respectively. *AA* and *BB* represent attitudes of the same *A* and *B* evaluation with increased confidence, extremity, or both.

TABLE I
POSTULATES ABOUT THE PROCESSES AND CONDITIONS UNDERLYING
ATTITUDE SURVIVAL AND CHANGE

Number	Postulate/principle
Independent Effects of Attitude and Attitude-Related Information on Attitude Survival and Change	
Postulate 1	<i>Attitude activation without comparison.</i> When comparison processes do not occur, attitude activation alone can lead to attitude survival.
Postulate 2	<i>Entirely online reconstruction.</i> When people do not activate a prior attitude but they activate attitude-related information, they are likely to form a new attitude on the basis of the attitude-related information. In this situation, the prior attitude survives when the attitude-related information is consistent with the prior attitude, but changes when the attitude-related information is inconsistent with the prior attitude.
Principles and Effects of Comparison on Attitude Survival and Change	
Principle 1	<i>Corroboration principle of comparison.</i> People increase the confidence and extremity of their subjectively valid prior attitudes when the evaluative implications of subjectively valid attitude-related information corroborate their prior attitudes. Correspondingly, they maintain the confidence or extremity of their prior attitudes when the prior attitudes and the attitude-related information are both evaluatively consistent but only one is valid.
Principle 2	<i>Defensive-confidence principle of comparison.</i> People increase the confidence and extremity of a given evaluation (prior attitude or evaluative implication of attitude-related information) when they perceive that evaluation as valid but invalidate the other, incongruent evaluation. In contrast, comparing a prior attitude with inconsistent but valid attitude-related information results in a compromise between the prior attitude and the attitude-related information.
Postulate 3	<i>General effects of comparison.</i> Comparative processes will generally induce attitude change. Thus, ability (e.g., use of comparative formats for presenting the information) and motivation (e.g., use of comparison instructions) to compare are likely to result in attitude change.
Reciprocal Influences of Attitude Activation and Comparison on Each Other and Their Effects on Attitude Survival and Change	
Postulate 4	<i>Effects of prior attitude activation in the presence of comparative motivation.</i> Although prior attitude activation (e.g., accessibility) will increase survival in the absence of comparative motivation (Postulate 1), attitude activation may accelerate change in the presence of such motivation.
Postulate 5	<i>Effects of comparative motivation in the absence of attitude activation.</i> Comparative motivation in the absence of attitude activation will facilitate attitude activation and stability but may be insufficient to produce comparison and the corresponding attitude change.

continues

TABLE I *continued*

Number	Postulate/principle
Effects of General Processing Ability and Motivation on Attitude Survival and Change	
Postulate 6	<i>Effects of ability and motivation in the presence of attitude-inconsistent information.</i> When attitude-relevant information conflicts with a prior attitude, high and low levels of ability and motivation to think about the issue should induce more change than moderate levels of general ability and motivation.
Postulate 7	<i>Effects of ability and motivation in the presence of attitude-consistent information.</i> When attitude-relevant information corroborates a prior attitude, high ability and motivation to think about the issue should induce more change than both moderate and low levels of general ability and motivation.

an event is "desirable" or "undesirable," or an object is "attractive" or "unattractive" (for the processes underlying categorization, see Bargh, 1994, 1997; Markman & Gentner, 2000; Medin & Coley, 1998; Smith, Fazio, & Cejka, 1996; Wyer, 1973; Wyer & Srull, 1989). Attitude retrieval from memory can occur automatically or follow the application of effortful recall strategies (see Lingle & Ostrom, 1981).⁴ For example, teachers have less difficulty retrieving their evaluations of a student currently in their class than they do retrieving their evaluations of a student in their class four years ago (for a discussion of goal-directed recall, see Koriat, 2000).

Compelling evidence indicates that activation of prior attitudes is important for attitude maintenance, specifically from studies on the attitude-behavior relation. Strong attitude-behavior correlations can be interpreted as manifestations of survival of attitudes over time. For instance, Fazio, Powell, and Williams (1989; Fazio, Chen, McDonel, & Sherman, 1982; Fazio & Williams, 1986) showed that the probability that people will use a given attitude as a basis for their future behavior is a function of the accessibility of the attitude. In this research, participants first reported their attitudes toward food products and then were allowed to take products home. As shown in Fig. 3, the correlation between participants' attitudes and their later selection of products was higher when attitudes were initially more accessible than when they were initially less accessible. That is, attitudes guided behavioral decisions to a greater extent when at the time of selecting the products, participants could quickly recall the attitudes they reported at the beginning of the experiment than when they could not.

⁴Although the model we propose can be applied to online initial attitudes, this chapter concentrates on initial attitudes that people retrieve from permanent memory.

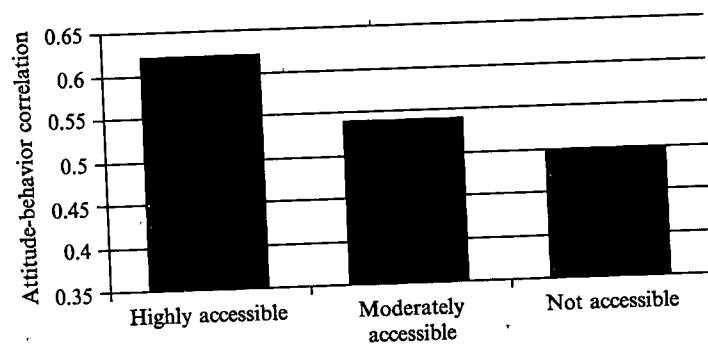


Fig. 3. Influence of attitude accessibility on the attitude-behavior relation. Numbers are correlations. Data are from Fazio, Powell, and Williams (1989).

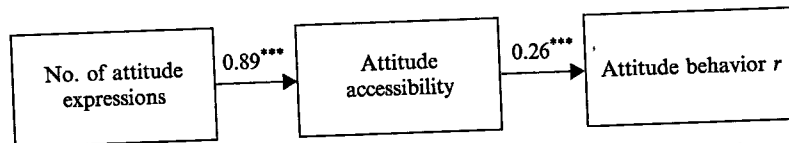


Fig. 4. Path analysis from Glasman and Albarracín's (2003) meta-analysis. The analysis is based on the within-study correlations among each of the three variables in the model. *** $p < 0.01$.

The positive effects of attitude accessibility on the attitude-behavior association were recently confirmed on a meta-analysis of the behavioral implications of newly formed attitudes. In this work, Glasman and Albarracín (2003) first obtained correlations among number of attitude expressions, measures of attitude latency, and attitude-behavior (Pearson) correlations across the different conditions within each available research report. These within-study correlations were then summarized to represent the extent to which repeating an attitude increases its accessibility and therefore its impact on behavior. Figure 4 displays a summary of the relevant path analysis, which was entirely supportive of Fazio's (1989) hypothesis. As can be seen, the effect of repeatedly expressing an attitude on the attitude-behavior relation was mediated by a facilitating effect of the speed with which the attitude was reported.

Attitude activation without comparison (Postulate 1). When comparison processes do not occur, attitude activation alone can lead to attitude survival.

2. Activation of Attitude-Related Information

People may effortfully or effortlessly access attitude-consistent or -inconsistent memories about the object, or they might consider the attitude-consistent or -inconsistent implications of external stimuli (i.e., activation

of attitude-related information). For example, during election time, people who recall their prior attitudes toward political candidates may also recall prior knowledge about the candidates (internal attitude-related information) and analyze political propaganda available in their environment (external attitude-related information). People may also consider feelings of familiarity (Krosnick, Betz, Jussim, & Lynn, 1992), the mood they experience at the time (Schwarz & Clore, 1983; see also Adaval, 2001; DeSteno, Petty, Wegener, & Rucker, 2000; Forgas, 1995; Forgas & Bower, 1987; Isbell & Wyer, 1999; Ottati & Isbell, 1996), the credibility or attractiveness of the communication source (Chaiken, 1979; Hovland & Weiss, 1951), their past behavioral decisions (see e.g., Albarracín & Wyer, 2000; Janis & King, 1954; Triandis, 1994), or the threat posed by attitude-inconsistent information (Festinger, 1957; for a proposal of modes of resolution of belief conflict, see Abelson, 1959).

Importantly, people who do not recall a prior attitude about an object can presumably construct responses online provided that they activate attitude-related information (Schwarz & Bohner, 2001; see also Bem, 1965; Fiske & Neuberg, 1990; Taylor, Fiske, Etcoff, & Ruderman, 1978). When individuals base their current attitude about an object on information that is different from the information on which they based their prior attitude, the attitude is likely to change. In contrast, people may maintain a prior attitude on the basis of online information even when they do not retrieve that attitude from memory, as long as the online information has identical implications as the prior attitude.

Entirely online reconstruction (Postulate 2). When people do not activate a prior attitude but they activate attitude-related information, they are likely to form a new attitude on the basis of the attitude-related information. In this situation, the prior attitude survives when the attitude-related information is consistent with the prior attitude, but changes when the attitude-related information is inconsistent with the prior attitude.

Although the possibility of online reconstruction leading to attitude formation and change has been hypothesized previously (Bem, 1965; Schwarz & Bohner, 2001; Sengupta, Goodstein, & Bonninger, 1997; Wyer & Albarracín, in press; Wyer & Srull, 1989), conclusive data became available only recently. In three experiments, Wallace and Albarracín (2003) induced undergraduate participants to form an initial attitude toward a proposal to institute comprehensive exams. Participants always received uniformly pro-exam information before they reported their initial exam attitude. Later, after reporting their initial attitude, participants received additional information about comprehensive exams before reporting their attitude toward the exams for a second time. The data relevant to this

analysis come from participants whose prior attitudes were difficult to access. We used individual differences in need to evaluate (Jarvis & Petty, 1996), which in an independent sample correlated negatively with attitude response latencies (lower need to evaluate = slower attitude responses), to estimate prior attitude accessibility (low need to evaluate = low attitude accessibility). In Experiments 1 and 2, the second set of information was pro-exam (consistent with the first set of information), whereas the second set of information in Experiment 3 was anti-exam (inconsistent with the first set of information). We expected that participants who were not induced to compare the second set of information with their initial attitude would recall and recycle their initial attitude when reporting their attitude again if their initial attitude was accessible (i.e., if they had high need to evaluate), but would form an online attitude based on the second information set if their initial attitude was not accessible (i.e., if they had low need to evaluate). In Experiments 1 and 2, when the second information set was consistent with the first information set, both online and memory-based outcome judgments were expected to yield the same outcome of attitude maintenance. In Experiment 3, because the second information set was inconsistent with the first information set, online judgments were expected to yield attitude change in the direction of the new information, whereas memory based judgments were expected to reflect attitude maintenance.

Scores representing attitude change from the first to the second attitude measures in Experiments 1, 2, and 3 appear in Fig. 5. As predicted, whenever need to evaluate was high, participants' attitudes survived regardless of the valence of the second set of information they received. Also as predicted, attitudes that presumably were difficult to recall survived when the second set of information was consistent with the first (second bar in panels *A* and *B*) but changed when this set conflicted with them (second bar of panel *C*).

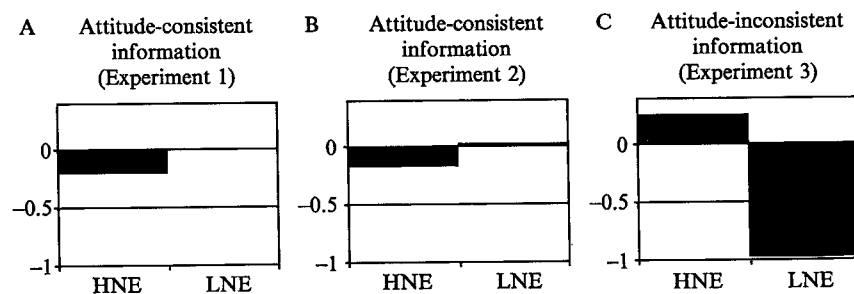


Fig. 5. Attitude change as a function of need to evaluate and consistency of the attitude-related information with the prior attitude. Data calculated from Wallace and Albarracín (2003; Experiments 1 and 3; no activation/no comparison conditions).

These findings thus indicate that retrieving the prior attitude or constructing it online for the second time led to the same result when the new information confirmed the old (panels *A* and *B*). However, difficult to access prior attitudes changed (become more negative) when the second information set contradicted the first (panel *C*).

Wallace and Albarracín's (2003) Experiment 3 is particularly helpful in clarifying the moderating role of attitude accessibility in attitude survival and change. In addition to measuring need to evaluate, this study also assessed initial attitude accessibility more directly by measuring initial attitude response latencies (speedy attitude judgments were interpreted as an indicator of subsequent accessibility). Furthermore, Experiment 3 manipulated prior attitude accessibility by reminding half of participants of their initial attitude judgment (i.e., simply flashing their earlier numerical response to an attitude item) before they read the second information set. We expected that participants with low attitude accessibility would show negative attitude change as a result of forming attitudes online based on the second (negative) information set, whereas those who spontaneously activated or were induced to activate their prior attitudes would maintain their initial attitude. Figure 6 represents conditions in which the researchers did and did not remind participants of the initial attitudes, as well as the likelihood of spontaneously retrieving the prior attitude (high accessibility = low response latency). As the figure clearly shows, the attitude

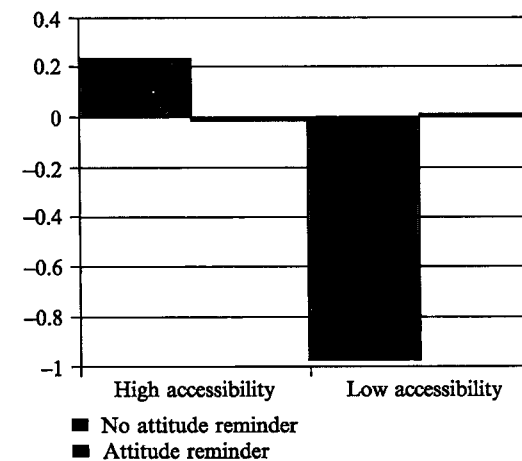


Fig. 6. Attitude change as a function of accessibility of prior attitudes and presence or absence of an attitude reminder. Data calculated from Wallace and Albarracín (2003; Experiment 3; no comparison conditions).

reminder reestablished attitude stability when the prior attitudes were not spontaneously accessible (fourth versus third bars). When attitudes were highly accessible initially, however, the reminder had no effect (second versus first bars).

3. Comparative Validation of Prior Attitudes and Attitude-Related Information

People validate their attitudes by applying "if-then" types of rules (Kruglanski, Thomson, & Spiegel, 1999; Smith, 1994; Thomson, Kruglanski, & Spiegel, 2000; Wyer & Srull, 1989), in which the premise consists of a validation criterion and the conclusion asserts the validity or invalidity of the evaluation under consideration. We refer to *validity* in a broad sense, including both logical and factual validity (logical and referential criteria), as well as the functionality or convenience of accepting a given conclusion (pragmatic criterion). If people conclude that a valid criterion supports their prior attitude or the implication of the attitude-related information, they are likely to judge that this particular evaluation is valid (McGuire, 1960; Wyer, 1974). Consider individuals who encounter a communicator who has the explicit intent of changing their attitudes. These individuals are likely to establish the validity of their activated prior attitude and that of the advocacy with reference to their chronic goals of preserving personal freedom and self-esteem (Baumeister, 1997; Brown, 1993; Kunda, 1987, 1990). If the recipients have attitudes that conflict with the message advocacy, these recipients are likely to perceive the counterattitudinal message as a threat to their freedom and may in turn respond with reactance (Brehm, 1966). Consequently, they are likely to conclude that their prior attitudes are more valid than the attitude-related information.⁵ Correspondingly, if people conclude that invalid criteria support their prior attitudes or the implications of the attitude-related information, they are likely to conclude that the evaluation is invalid. For instance, recipients of a persuasive message can judge the validity of the information they examine by applying cognitive heuristics (Chaiken, 1980; Chen & Chaiken, 1999; Kahneman, Slovic, & Tversky, 1982). Recipients who believe that expert sources are more frequently correct than nonexperts should be less persuaded when the source of the message lacks expertise than when it does not (Chaiken, 1980; see also, Hovland, Janis, & Kelley, 1953; Raven, 1965). Experiencing negative affect also can prompt the rejection of a persuasive communication (e.g.,

⁵Our model does not exclude "hot" processes, but instead assumes that minimizing negative affect is an important criterion for judgment.

Albarracín & Kumkale, 2003). Regardless of the subjective criterion used in validation, people's validation of information permits them to associate attitudes with an assessment of confidence (see Haddock, Rothman, & Schwarz, 1996; Haddock, Rothman, Reber, & Schwarz, 1999; Kruglanski, 1989; Nelson, Kruglanski, & Jost, 1998).

Of particular interest, people who consider their prior attitudes in light of other information must weigh their prior attitude and the attitude-related information (see Anderson, 1974, 1981). These weights imply that individuals decide whether their prior attitudes and the attitude-related information are each subjectively valid or invalid. Sometimes individuals who activate a current attitude may validate their prior attitudes and attitude-related information in an effortless fashion when activation occurs. For example, individuals may assess the validity of information in an automatic way and validate all information by default before they proceed to question it more carefully (Gilbert, 1991; for a theory that accounts for these findings, see Wyer & Radvansky, 1999). At other times people may effortfully validate information on the basis of multiple criteria or on the basis of criteria that are relatively demanding of cognitive resources. For instance, whereas a default imputation of validity to a written statement may be performed automatically (Gilbert, 1991), deciding whether a persuasive message conflicts with one's prior knowledge about the topic is a more cognitively demanding task (e.g., Petty & Cacioppo, 1986). Independent of the efficiency of validation processes, we use the term *comparative validation* to refer to the *joint, relative* assessment of the validity of attitude-related information and prior attitudes. Two principles are proposed as driving the outcomes of comparative validation (see Fig. 2 and Table II), one concerning corroboration and the other defensive confidence.

a. Corroboration Principle. Consider the situation in which people compare a prior attitude with attitude-related information of identical evaluative implications. In our model, the *corroboration principle* implies that the corroboration between the prior attitude and the attitude-related information should increase confidence in the validity of both elements (Treadwell & Nelson, 1996) and may increase the extremity of the prior attitude. This principle also implies that attitude-consistent but subjectively invalid information should not produce this confirmation or the resulting polarization.

Corroboration principle of comparison. People increase the confidence and extremity of their subjectively-valid prior attitudes when the evaluative implications of subjectively valid attitude-related information corroborate their prior attitudes. Correspondingly, they maintain the confidence

TABLE II
PREDICTIONS ABOUT ATTITUDE-CHANGE OUTCOMES FROM DIFFERENT MODELS

Model and validity of the prior attitude and the attitude-related information	Consistency of prior attitude and attitude-related information	
	Evaluatively consistent	Evaluatively inconsistent
Activation/comparison model		
Both valid	AA	AB
Only one valid	A	AA/BB
Additive integration model		
Both valid	AA	AB
Only one valid	A	A/B
Averaging integration model		
Both valid	A	AB
Only one valid	A	A/B
Social judgment theory		
Both valid	A/AA	AB/BB/AA
Only one valid	A/AA	AB/BB/AA

A and *B* represent different implications or categories (e.g., bad versus good). *AA* and *BB* represent attitudes of the same *A* and *B* evaluation with increased confidence, extremity, or both.

and extremity of their prior attitudes when the prior attitudes and the attitude-related information are both evaluatively consistent but only one is valid.

i. Increase in confidence and extremity of the activated prior attitude. People who receive information that supports their earlier attitude are likely to become more confident and extreme in their position, provided that they perceive the two elements as valid (Treadwell & Nelson, 1996). For example, one's prior attitude toward a political candidate may agree with the attitude of one's close friends. As a result of this attitude-confirming comparison, one may view one's attitude as "twice as valid" and increase its extremity and confidence.

Several studies support the polarization effects of corroboration. For example, female participants who evaluate pictures of male models increase the confidence and extremity of their evaluations of the models when their ratings are corroborated by other raters (Baron, Hoppe, Kao, & Brunzman, 1996). Further, corroborating evidence appears to derive not only from

external sources but also from internal ones that become active when people spontaneously think about an issue. Tesser (1978) argued that merely thinking about an issue results in attitude polarization because people normally produce ideas that are consistent with their prior attitudes. Moreover, people who are more knowledgeable about an issue appear to produce more thoughts in line with their attitudes than people who have little knowledge about the issue. Consistent with this possibility, Tesser and Leone (1977) found that when men and women reflected about football plays and women's fashion, polarization was greater when men thought about football and women thought about fashion than in the other two conditions. Presumably, polarization occurs because people have knowledge that is consistent with their prior attitudes, and this knowledge serves to increase the subjective validity of the attitude.

There is also considerable research on the factors that may prevent corroborating evidence from increasing the confidence and extremity of an earlier attitude. For instance, belief confidence increases when one receives information from a source that is dissimilar from (rather than similar to) oneself (Goethals & Nelson, 1973). Similarly, receiving new information about a person's traits changes attitudes to a greater extent when the new traits do not imply traits that were considered beforehand (Kaplan, 1971; for a more precise treatment of novelty, see Wyer, 1970). However, individuals do not change their attitudes when the later information is redundant with the prior information. To this extent, information that is highly redundant with the bases for the prior attitude may not be compared with that attitude beyond establishing the redundancy. After all, engaging in comparative validation implies having distinct pieces of information to compare.

Wallace and Albarracín (2003) provided important evidence that comparative processes are essential to induce polarization of prior attitudes. In Experiments 1 and 2 of their series, participants received a first persuasive message advocating comprehensive exams, followed by another that contained new arguments but also supported comprehensive exams. Attitudes were measured after the presentation of each message. In Experiment 1, activation and comparison were elicited by presenting the first message that served as a basis for the first attitude at the time of presenting the second message. In Experiment 2, the comparison manipulation entailed explicit instructions to compare the implications of the second message with participants' attitudes based on the first message. The data from each experiment appear in Fig. 7. As the figure shows, attitudes polarized when participants were induced to compare the new message with their earlier attitude but showed greater stability when no comparison induction was in place. Attitude confidence followed the pattern of attitude extremity, suggesting that these two factors are similarly influenced by corroboration.

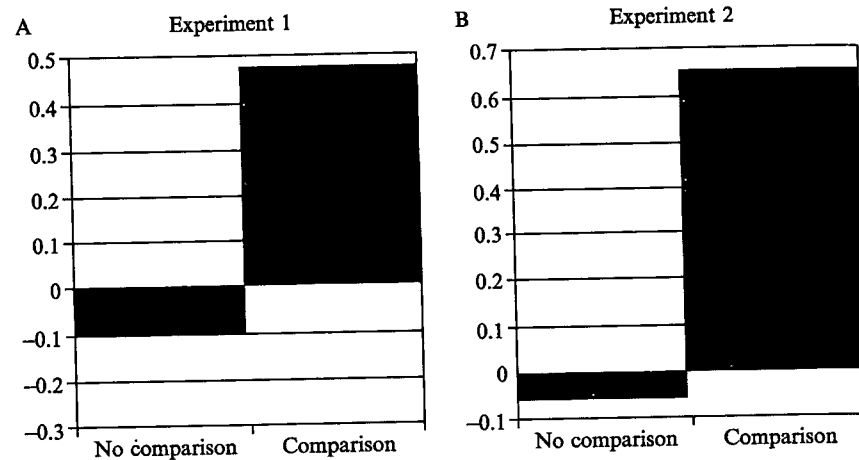


Fig. 7. Attitude polarization as a function of comparison manipulation. Data calculated from Wallace and Albarracín (2003; Experiments 1 and 2). In Experiment 1, the Y axis represents Time 2 attitudes adjusted for Time 1 attitudes.

ii. Survival of prior attitude. The corroboration principle predicts no polarization when either (but not both) the prior attitude or the attitude-related information is valid and the implications of the information are consistent (see Fig. 2 and Table II). Students who consider their writing abilities strong may receive compliments on their writing from a fellow student who is particularly weak at writing. In this situation, students may discount their peer's feedback as invalid and form an attitude that is no more (or less) confident than their activated prior attitude. Similarly, one may recall that one was once a Democrat without recalling the reasons for that affiliation. Unable to find arguments in support of this prior attitude, one may conclude that one's earlier favorable attitude toward the Democratic party was invalid. Nevertheless, if one has recently learned that Democrats support beneficial social policies, one may use this attitude-related information as a basis for a current attitude that is identical to the prior one, even though one has discounted the prior attitude. Both of these examples suggest that in the course of analyzing the activated prior attitude along with other, attitude-confirming information, people may conclude that one of the two elements is invalid. Under these conditions, the category, confidence, and extremity of the current attitude and the initial attitude should be the same.

b. Defensive Confidence Principle. The other validation principle applies to situations in which people compare a prior attitude and evaluatively inconsistent attitude-related information. In this case, people are likely to hold more confident and even extreme attitudes after counterarguing valid

information of conflicting implications than before they consider any attitude-related information (Albarracín & Mitchell, in press; McGuire, 1964; McGuire & Papageorgis, 1961; Tormala & Petty, 2002). Our model's *defensive confidence principle* asserts that when people consider the validity of two conflicting pieces of information, they establish the validity of each piece on the basis of perceived defensive success. Thus, people may more strongly endorse evaluations they have successfully defended from challenge than evaluations that did not undergo such defense. The associated polarization in either the prior attitude or the implications of the attitude-related information, however, should not occur when the prior attitudes and the attitude-related information are both subjectively valid. Instead, these situations should stimulate a compromise between the prior attitude and the attitude-related information.

Defensive-confidence principle of comparison. People increase the confidence and extremity of a given evaluation (prior attitude or evaluative implication of attitude-related information) when they perceive that evaluation as valid but invalidate the other, incongruent evaluation. In contrast, comparing a prior attitude with inconsistent but valid attitude-related information results in a compromise between the prior attitude and the attitude-related information.

i. Polarization of confidence in and extremity of the activated prior attitude. People are likely to increase their confidence in their prior attitude when they consider the prior *A* attitude valid and the *B* attitude-related information invalid. That is, people who trust their prior attitude after (and despite) having confronted attitude-conflicting information may endorse their prior position more strongly than before exposure to that information. In this situation, the presence of the conflicting attitude-related information elicits a "boomerang" effect, leading to greater confidence or extremity of *A* (i.e., attitude *AA*) after the invalidation of *B* than before consideration of *B* (see Albarracín, Cohen, & Kumkale, 2003; McGuire, 1964; Sherif & Hovland, 1961; Tormala & Petty, 2002).

One example of this form of change comes from McGuire and Papageorgis's (1961; McGuire, 1964) research on beliefs that are deeply held but weakly supported (i.e., "truism;" e.g., brushing one's teeth frequently is beneficial). In this research, participants received a communication that contained arguments attacking a truism after having defended the truism from a mild attack or after receiving no such communication. Findings indicated that participants who received an attack after being immunized by the earlier although mild attack were better able to maintain their belief in the truism than people who were not previously inoculated. One interpretation of this finding is that realizing that one's prior attitude has survived attack

strengthens one's confidence in that attitude (McGuire, 1964; Tormala & Petty, 2002).⁶

Recent research by Tormala and Petty (2002) is also relevant to the defensive-confidence principle. In one of their studies, participants in experimental conditions were asked to resist messages that were described as strong or weak. (Participants in control conditions received no information about the strength of the communication.) Findings indicated that participants had equally extreme attitudes regardless of the supposed strength of the message they resisted. However, participants were more certain about their attitudes after resisting an ostensibly strong message than after both resisting an ostensibly weak message and after resisting arguments of undetermined normative strength. Tormala and Petty concluded that people interpret their personal success in protecting their attitudes from a strong attack as evidence of the correctness of their attitude (thus increasing attitude certainty).

ii. Increase in confidence in and extremity of the current attitude beyond the attitude-related information. When people compare their activated prior attitudes with conflicting, attitude-related information and judge the attitude-related information as the only valid element, their current attitudes will be in line with the attitude-related information. Moreover, individuals in these situations are likely to form more confident and extreme attitudes than their attitudes would have been if they had based them solely on the attitude-related information (see defensive confidence principle). This form of polarization is hypothesized to occur when people compare their prior attitude with attitude-related information and conclude that only the attitude-related

⁶Our model assumes that people may polarize their prior attitudes either by receiving valid supporting information or by refuting inconsistent information. However, McGuire and Papageorgis (1961) demonstrated that receiving refutational defenses increases resistance to future persuasion to a greater extent than simply receiving information that supports one's attitude, although receiving supportive arguments is better than receiving no arguments at all. In the context of our model, it may be that people engage in more comparison when the information they receive disagrees with their attitudes, and so polarization may in fact be more frequent when the attitude-related information is inconsistent with the prior attitude. However, given the same degree of comparison, our model predicts polarization regardless of the direction of the information. Unfortunately, McGuire's (1964) research did not clarify the processes that induce resistance following the reception of attitude refutation. Most likely, as he argued, participants in his research became more confident in their defensive abilities when they gained practice refuting counterarguments, thus being able to counterargue more effortfully the next time their attitudes come under attack. Alternatively, practice with refutation may increase the salience of potential criteria (e.g., formal principles) for the invalidity of a message. Once accessible, these criteria may well guide the estimation of (in) validity of any incoming message (for a treatment of the importance of accessible concepts, see Higgins, 1996; Srull & Wyer, 1979).

information is valid. Presumably, people who invalidate their prior attitude in light of valid attitude-related information are likely to perceive that the information was strong enough to defeat the prior attitude, a conclusion that may strengthen the confidence and extremity of the current attitude.

Consider the case of incoming freshmen who are prejudiced against African Americans but learn that the group to which they aspire to belong despises racism. In those situations, students may judge both pieces of information vis-à-vis their current goal to be accepted by the ingroup. Consequently, they may judge the ingroup's opinion to be valid and the prior attitude to be invalid. In comparing their assessments of each element, however, students may conclude that the ingroup opinion ought to be particularly sound to convince them despite their prior attitudes. As a result, they may endorse an egalitarian position that is more confident and extreme (*BB*) than the one produced by contact with the aspiration group in the absence of prior conflicting attitudes (for a related analysis, see Aronson & Mills, 1959).

Recent evidence is also illustrative of this outcome. Rucker and Petty (2004) presented participants with a strong ad promoting a pharmaceutical product and instructed some of these participants either to list negative thoughts (for an introduction to the technique to induce biased thoughts, see Killeya & Johnson, 1998) or to simply list their thoughts about the message. Presumably, participants who listed only negative thoughts attempted to resist the communication to a greater extent than those who were free to list positive, negative, and neutral thoughts. Findings indicated that participants were persuaded regardless of what thoughts they listed, probably because the ad was difficult to refute. However, participants who attempted to resist the message (and failed) were more confident in their favorable attitude toward the product than those who did not make an effort to resist persuasion. Although the researchers examined attitude formation rather than change, these data suggest that failure to invalidate attitude-inconsistent information often reassures individuals of the validity of the information. To this extent, one may become more convinced of a counter-attitudinal advocacy than one would be if one had no prior position on the topic being considered.

iii. Compromise between prior attitude and attitude-related information. People who activate both a subjectively valid prior attitude and subjectively valid attitude-related information with conflicting implications are likely to develop a current attitude that falls somewhere between a position based solely on the activated prior attitude and one based solely on the attitude-related information (see Fig. 2). In these situations, people should present a current attitude that is less extreme than at least one of the two elements. (As we have previously explained, this reduction in extremity may or may not be accompanied by a change in evaluative implications or confidence.)

Change from a prior attitude to a position that lies between the prior attitude and the implications of other information about the object is probably the most frequent and straightforward outcome of attempts to persuade an audience. Demonstrating the outcome, however, requires estimating the effect of a given set of information when people have a prior attitude that conflicts with that information and comparing this effect with the impact of the same information when people had no prior attitude on the topic. As an illustration, consider the influence of the persuasive arguments and the credibility of the source contained in communications used to test the sleeper effect (for a meta-analysis, see Kumkale & Albarracín, 2004). A meta-analysis of the influence of each type of information was conducted for studies in which the audience possessed prior attitudes and for studies using novel, experimental issues. If communication recipients frequently reach a compromise between their prior attitudes and the implications of the information contained in the communication, the effect of the arguments and the source should be weaker when participants have a (conflicting) prior attitude than when they do not. The effect of the arguments was estimated by subtracting attitudes when participants did not receive a message from attitudes after participants received the message; the effect of the source credibility was estimated by subtracting attitudes when the source lacked credibility from attitudes when the source was credible. As shown in Fig. 8, both of these effects were stronger when participants had no prior attitudes on the topic, implying that (as few would doubt) participants with

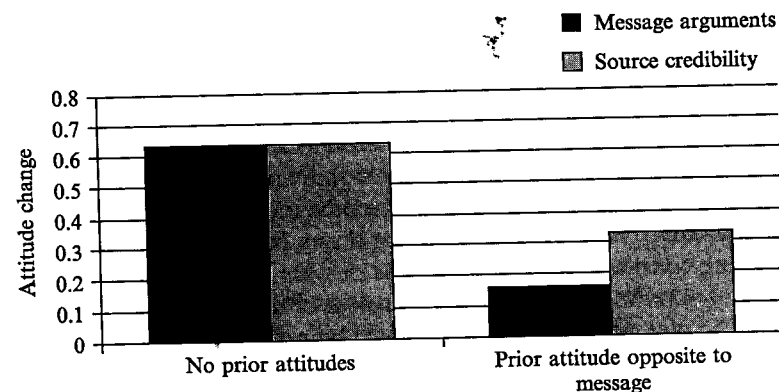


Fig. 8. The influence of the message arguments and the credibility of the source in a meta-analysis of the sleeper effect. Message effects are mean weighted d s, calculated by subtracting attitudes in control conditions from attitudes immediately after the message was presented. Source effects are mean weighted d s, calculated by subtracting attitudes immediately after the message when the source was not credible from the same measure when the source was credible. Data reanalyzed from Kumkale and Albarracín's (2004) data.

prior attitudes combined them with the new information and reached an intermediate position in that fashion.

iv. Corollary of comparison influences on attitude change. Activating attitude-related information is likely to stimulate attitude change when people engage in comparative validation processes. As shown in Table II, of the four different outcomes of comparison predicted by the activation/comparison model, one entails changes in the valence and/or extremity of prior attitudes (compromise, which may involve attenuation or polarization relative to the extremity of the prior attitude), one entails changes in the valence and extremity of prior attitudes (polarization beyond the sole implications of attitude-related information), and one involves modifications in extremity without changes in valence (polarization beyond the extremity prior attitudes). Thus, comparing activated attitude-related information with one's prior attitudes leads to a hypothetical .75 probability of change based on the application of the corroboration and defensive confidence principles (assuming that each of these four outcomes is equally likely). Comparison only results in attitude survival when neither the corroboration nor the defensive confidence principles are applicable. That is, comparison leads to maintenance of prior attitudes when the attitude-related information is of the same valence as the prior attitude but its low subjective validity prevents it from corroborating a prior attitude, or when the prior attitude is currently judged invalid, thus failing to corroborate subjectively valid attitude-related information.

General effects of comparison (Postulate 3). Comparative processes will generally induce attitude change. Thus, ability (e.g., use of comparative formats for presenting the information) and motivation (e.g., use of comparison instructions) to compare are likely to result in attitude change.

Evidence about the effects of attitude comparison comes from findings that the reception of comparable information across different time points elicits attitude change in response to information that counters a prior attitude. Consistent with this possibility, Fabrigar and Petty (1999; Experiment 1) found that participants who initially formed an attitude toward a beverage on the basis of its taste (affective attitude basis) were more likely to change this attitude when they later smelled the product (affective persuasion) than when they later read information about the effects of temperature on beverage taste (cognitive persuasion). Similarly, participants who initially read that the product yielded a desirable taste (cognitive attitude basis) changed their attitudes to a greater extent when they read about the effects of temperature on taste than when they smelled the product. Figure 9 presents the mean postexperiment attitudes (which represent change in line

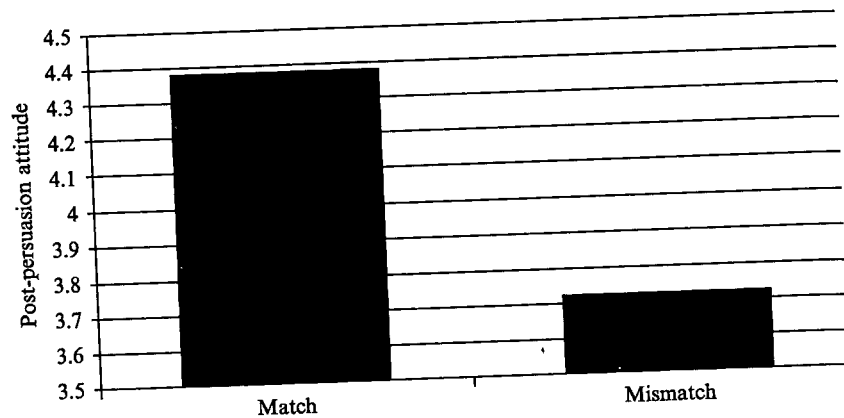


Fig. 9. Influence of match of attitude and persuasion basis (*match*: both affective or both cognitive; *mismatch*: one cognitive, the other affective) on attitude change. Data calculated from Fabrigar and Petty (1999).

with the second message assuming similar attitudes at baseline) when the attitude basis and the persuasion strategy matched and mismatched. These results suggest that a criterion that can be applied to validate the prior attitude and the attitude-related information can increase ability to compare the two elements and consequently, attitude change.

Consistent with the idea that information comparability increases attitude change, people appear to change their prior attitudes to a greater extent when they confront information that is at the same level of abstraction as the information that served as a basis for that judgment. Pham and Muthukrishnan (2002; Experiment 1) presented participants with an initial specific persuasive message and then with a second, general or specific countermesssage that challenged the claims of the first one. The mean amount of change in line with the second message (attitudes at Time 2 subtracted from attitudes at Time 1) as a function of match versus mismatch in the two messages appears in Fig. 10. Their findings suggest that participants changed their attitudes to a greater extent when they received the specific challenge, which matched the initial ad, relative to when they received the general challenge, which did not match the first ad.

The research by Pham and Muthukrishnan (2002) presents a case in which people compare their prior attitude with attitude-related information and realize that the same validation criterion applies to both elements (bottom-up comparison). Other times, however, people may have a standard of comparison in mind and search for information to which the standard applies (top-down comparison). Arguably, because activating the standard at the outset

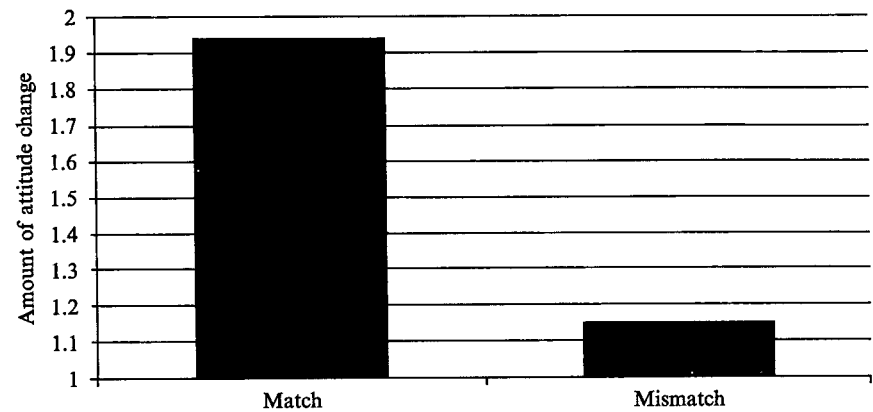


Fig. 10. Influence of match of initial and later persuasion (*match*: both specific; *mismatch*: initial was specific but later was abstract) on attitude change. Data calculated from Pham and Muthukrishnan (2002; Experiment 1).

increases the probability of activating prior attitudes and attitude-related information that are both associated with the standard (alignable; Markman & Medin, 1995), top-down comparison of conflicting elements should lead to greater attitude change than analyzing information in a bottom-up fashion. Thus, people who think about their prior attitudes in ways that induce comparative validation with attitude-related information should be more likely to change their prior attitudes than people who use noncomparative procedures.

Evidence that top-down comparison can increase attitude change was provided by Muthukrishnan, Pham, and Mungalé's (1999; see also Muthukrishnan, Pham, & Mungalé, 2001) research on the effect of two ads presented sequentially. The first ad promoted a product from a target brand; the second ad either highlighted the superiority of a competitor brand relative to the target brand (comparative format) or simply presented arguments in support of the competitor brand (noncomparative format). The results from this experiment indicated that participants who received the second ad in the comparative format became more negative toward the target brand than those who received the counter ad in a noncomparative format. The researchers provided additional evidence that the comparative format induced greater processing of the second ad. They presented another group of participants with comparative and noncomparative ads that contained either five or two arguments against a target brand, after having presented a first ad promoting the target brand. Overall, participants' attitudes toward the target became more negative when the

comparative ad presented more arguments than when it did not. However, the number of arguments contained in the second ad did not influence attitudes toward the target brand when the second ad promoted the competitor brand using the noncomparative format. Essentially, comparative formats stimulated greater consideration of the available information (comparison) and consequently more attitude change than formats that prevented attitude comparison.

An even more direct manipulation of comparative validation on attitude change in line with information that challenges prior attitudes was implemented by Wallace and Albarracín (2003). In their third experiment, participants received two persuasive arguments advocating the institution of comprehensive exams at the university and reported their attitudes for the first time. Following a filler task, participants received two new arguments that were antagonistic toward comprehensive exams. Some of the participants were instructed to compare the new arguments with their attitudes toward the issue formed on the basis of the first message (comparison induction); other participants did not receive this instruction (no comparison induction). The findings when participants' initial attitudes were highly accessible confirmed our predictions (Fig. 11). That is, participants who received comparison instructions changed their prior attitudes, becoming more negative toward the policy than they were immediately after the first message. In contrast, participants who received no comparison instructions showed no significant attitude change. Furthermore, whereas attitude confidence and extremity covaried when attitude change followed corroboration, in Experiment 3 attitude confidence did not change as a function of the comparison manipulation.

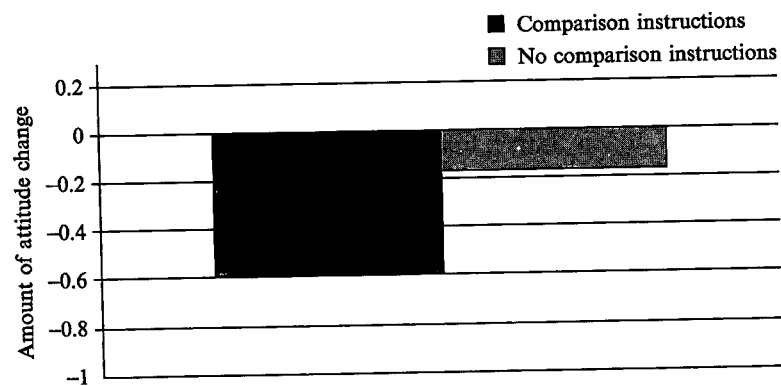


Fig. 11. Effects of attitude reminder and comparison instructions on attitude change for participants with easy to access prior attitudes. Data calculated from Wallace and Albarracín (2003; Experiment 3).

B. RECIPROCAL INFLUENCES ON ATTITUDE ACTIVATION AND COMPARATIVE MOTIVATION: EFFECTS ON ATTITUDE SURVIVAL AND CHANGE

Other models have assumed that people maintain their prior attitudes when they activate these attitudes with relative ease (Fazio, 1989). Moreover, it has been assumed that people change their attitudes when the nature of the information facilitates comparison with a prior attitude (for an example of suggestive findings, see Pham & Muthukrishnan, 2002). Our model, however, establishes the boundary conditions for these predictions, highlighting situations under which attitude activation and comparison inducements each increase attitude change and survival.

1. When Attitude Activation Can Induce Attitude Change

Like Fazio (1989; see also Fazio, Ledbetter, & Towles-Schwen, 2000), our model highlights that activating prior attitudes frequently perpetuates these attitudes. However, because attitude activation is a prerequisite for attitude comparison, the attitude activation should mostly facilitate attitude maintenance (i.e., no attenuation or polarization) when no comparison motivation exists. Clearly, attitude activation ought to increase survival when there is no other information with which the attitude could be compared. In addition, attitude activation should increase survival when there is other information in memory or in the environment but people are unlikely to spontaneously compare that information with the prior attitude. In contrast, when people are motivated to compare their prior attitudes with attitude-related information, increases in attitude activation will only accelerate comparison, thus increasing attitude change.

Effects of prior attitude activation in the presence of comparative motivation (Postulate 4). Although prior attitude activation (e.g., accessibility) will increase survival in the absence of comparative motivation (Postulate 1), attitude activation may accelerate change in the presence of such motivation.

Two experiments by Wallace and Albarracín (2003) support the nonintuitive conclusion that greater prior attitude activation can facilitate comparison and, consequently, attitude change. The researchers first presented participants with a message advocating the institution of comprehensive exams. Participants then reported their attitude for the first time. After a delay, they received a second message that either supported (Experiment 2) or opposed the exams (Experiment 3). Before reading the message, half of the participants were instructed to compare their reactions to the second

message, whereas the other half received no such instructions. Orthogonal to the comparison manipulation, half of the participants received a reminder of the attitudes they reported previously, whereas the other half did not. If prior attitude activation accelerates change in the presence of cues leading to comparative validation (comparison conditions) of those prior attitudes, then the reminder manipulation should increase change relative to lack of a reminder when participants' prior attitudes are not initially easy to access (participants with low accessible prior attitudes).

The data reported by Wallace and Albarracín (2003) are consistent with these predictions. Figure 12 shows the results of Experiment 2, in which easy and difficult to access prior attitudes were inferred from self-reported need to evaluate. Figure 13 shows the results of Experiment 3, in which attitude accessibility was inferred from prior attitude latencies (Fig. 13). As shown in these figures, participants with accessible prior attitudes (i.e., those with high need to evaluate or low prior attitude response latencies) changed their prior attitudes when they received the comparison instructions regardless of whether they also received the attitude reminder. In contrast, when participants had relatively inaccessible attitudes, the attitude reminder facilitated attitude change when participants were also instructed to compare their

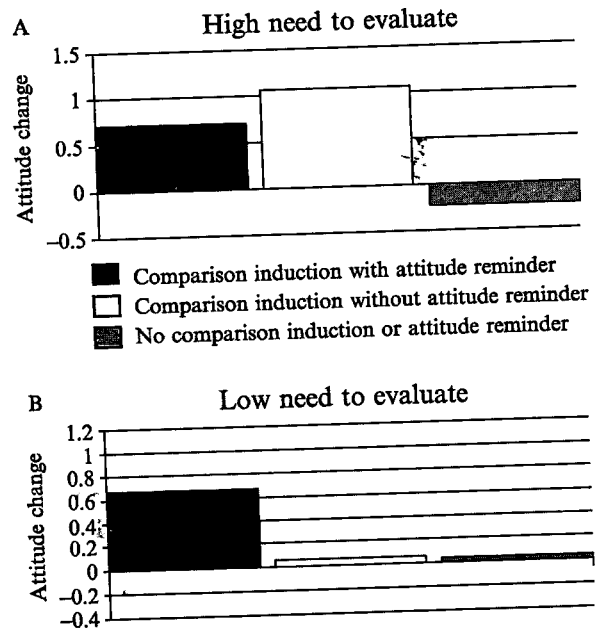


Fig. 12. Effects of level of need to evaluate, attitude reminder, and comparison instructions on attitude change. Data were calculated from Wallace and Albarracín (2003; Experiment 2).

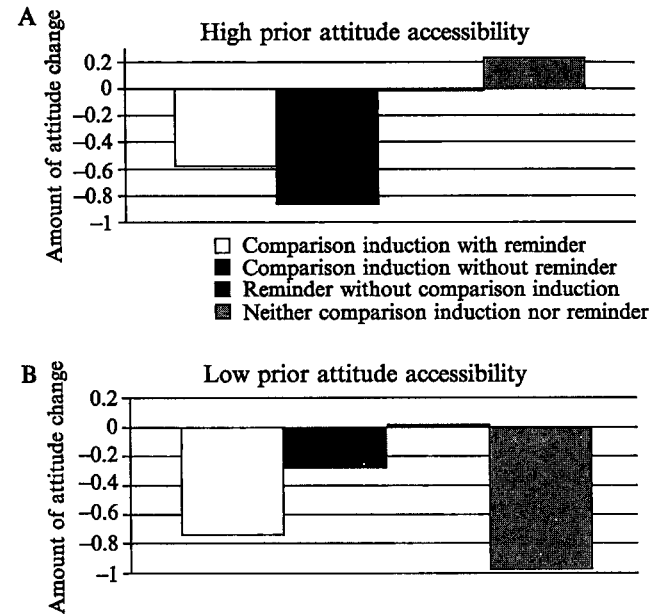


Fig. 13. Effects of spontaneous prior attitude accessibility, attitude reminder, and comparison instructions on attitude change. Data calculated from Wallace and Albarracín (2003; Experiment 3).

prior attitudes with the new message. In Experiment 2, the actual change observed consisted of prior attitude polarization because the old and new messages were consistent. In Experiment 3, attitudes change was negative because the implications of the new message conflicted with those of the old, pro-exam message. Like those of Fazio (1989), these findings show that highly accessible attitudes impede the online formation of new inconsistent attitudes. Nevertheless, when people are motivated to compare their prior attitudes with new information, the findings of Wallace and Albarracín (2003) confirm our prediction that having a highly accessible prior attitude can serve to promote attitude change.

2. When Comparative Motivation Can Induce Attitude Survival

We have reviewed research showing that inductions to compare prior attitudes with other information (e.g., persuasive message) increase the probability of change when prior attitudes are accessible. However, in contrast to prior hypotheses that comparability increases attitude change (e.g., Fabrigar & Petty, 1999; Muthukrishnan, Pham, & Mungalé, 1999; see

also Muthukrishnan, Pham, & Mungalé, 2001), the model in Fig. 1 also implies that attempts to engage in comparative validation will trigger a retrieval of the prior attitude to make the comparison possible. Therefore, it seems plausible that being motivated to compare a prior attitude with other information could initiate the process of recruiting a prior attitude, but the process could nevertheless stop at the point of the attitude retrieval. If such an interruption occurred, comparison would lead to attitude survival rather than change.

Effects of comparative motivation in the absence of attitude activation (Postulate 5). Comparative motivation in the absence of attitude activation will facilitate attitude activation and stability but may be insufficient to produce comparison and the corresponding attitude change.

As shown in Fig. 1, people need to activate an attitude to compare this attitude with other information. Suppose that people are induced to compare a new persuasive message with their prior attitude but had not previously retrieved that attitude. In this situation, the comparison motivation elicited by the experimental induction should promote the activation of the prior attitude, a process that necessarily precedes the process of attitude comparison. However, the comparison motivation may only be sufficient to inspire the first step of attitude activation, but not the second step of comparative validation. In this case, people should simply readopt the attitude they were encouraged to recall. In sum, if the two-stage process is interrupted after the attitude-activation stage but before the comparison stage, the comparison motivation will increase attitude survival rather than change. Because having to activate *and* compare one's attitudes is presumably more effortful and time consuming than simply activating a prior attitude, people may quit halfway unless their motivation and ability to compare are very strong.

The evidence presented in Fig. 13 (Wallace & Albarracín, 2003) is consistent with the possibility that comparison inductions may sometimes provoke activation and survival of a prior attitude. Participants with relatively low prior attitude accessibility who did not receive an attitude reminder showed high negative attitude change when they did not receive a comparison inducement, suggesting that they formed attitudes online on the basis of the second message alone. However, when participants with hard to access prior attitudes received the comparison inducement, their subsequent attitudes were relatively similar to their initial attitudes, which suggests that the comparison inducement may have led to attitude activation but the sequence of information processing stopped short of the comparison stage needed for attitude change.

If a given comparison inducement is sufficient to provoke the activation of the prior attitude but falls short of inducing actual comparison, an even stronger comparison inducement might achieve both. Relevant to this prediction are data on attitude change among participants who previously received information that a product was either positive or negative (Muthukrishnan, 2003). After reporting their attitude for the first time, participants received an ad that challenged the consumer information they received previously. The ad was presented in either a comparative or a noncomparative format and contained information that concerned either the same or different dimensions as the first information set. Thus, these four combinations of format and dimension alignability provide three levels of comparison induction, namely (1) high (both comparative format and same dimensions), (2) moderate (either comparative format or same dimensions), and (3) low (neither comparative format or same dimensions). One would expect that if prior attitudes are difficult to access, the moderate comparison induction might be sufficient to instill attitude activation but not comparison, leading to maintenance of the recalled attitude. In contrast, the highest comparison induction might successfully promote attitude comparison as well as activation when initial attitudes are difficult to recall.

To examine Muthukrishnan (2003) data in light of our predictions, one must rely on their finding that negative initial attitudes were more difficult to access than positive initial attitudes. Given this difference in attitude accessibility, the moderate level of comparison induction may only increase activation and maintenance of initially negative attitudes, but elicit comparison and change of positive (and spontaneously active) prior attitudes. However, a stronger inducement may be successful at producing comparison and therefore change regardless of the accessibility of prior attitudes. As can be seen from Fig. 14, these predictions received support. On the one hand, when prior attitudes were easier to access, participants were able to recall and maintain them more when the comparison induction was low than when it was moderate or high. Moreover, participants with easier to access prior attitudes changed these attitudes more when the comparison inducement was either moderate or high, presumably because having an attitude "close to the surface" increased their likelihood of comparing these attitudes with the new information when motivated to do so. On the other hand, participants with difficult to access attitudes changed their attitudes the most when the comparison induction was either low or high. When the induction was weak, participants were probably forced to form an attitude online, managing to do so on the basis of information that contradicted their prior attitudes. When the induction was moderate, participants were more likely to recall a prior attitude, but the induction was not always strong enough to promote comparison. As expected, however, the strongest induction

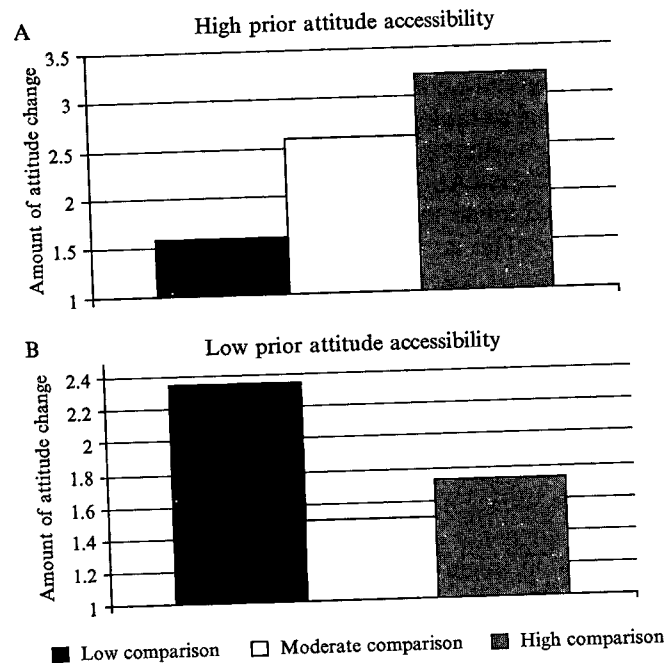


Fig. 14. Effects of different levels of comparison inductions as a function of the spontaneous accessibility of the prior attitude. Data calculated from Muthukrishnan (2003). Panels *A* and *B* include participants with positive and negative initial attitudes, respectively.

succeeded at inducing both activation and comparison and therefore elicited greater attitude change than the moderate comparison induction.

3. Summary

Different studies address the possibility that people maintain their prior attitudes when they activate these attitudes (Postulate 1). For instance, Fazio, Powell, and Williams (1989) demonstrated that accessible attitudes are more predictive of future behavior than attitudes that people recall with less ease. Our model complements these prior findings in suggesting that accessibility can facilitate change when the right conditions are met. Specifically, attitudes that people access spontaneously or as a result of an external reminder increase the probability of change in response to comparison inductions, presumably because the accessibility of the prior attitude accelerates comparative processes (Postulate 4). In contrast, the presence of comparative cues when prior attitudes are not easily accessible facilitates attitude activation and therefore maintenance but can be insufficient to

achieve comparison and therefore change (Postulate 5). In achieving this understanding, our model provides new insights concerning the use of comparative persuasion formats, which previously were assumed to always increase attitude change (Muthukrishnan, Pham, & Mungalé, 1999, 2001; Pham & Muthukrishnan, 2002).

C. IMPLICATIONS FOR THE INFLUENCE OF GENERAL ABILITY AND MOTIVATION ON ATTITUDE CHANGE AND MAINTENANCE

Two conceptualizations of attitudes have addressed the influence of processing ability and motivation to think about an issue on attitude change. McGuire (1968) and Wyer (1974) proposed that a (counterattitudinal) communication has an impact when recipients of a persuasive message receive but do not counterargue the message. Consequently, situational or personal variables (e.g., intelligence, concentration) that simultaneously increase reception and counterarguing should elicit most message impact when they are moderate than when they are either high or low.

Another model that has dealt with the impact of processing ability and motivation is the elaboration likelihood model. Incorporating Craik and Lockhart's (1973) views on memory, Petty and Cacioppo (1986) assumed that attitudes formed on the basis of a thorough analysis of information are easier to recall than attitudes based on the use of simple cues to persuasion. Arguably then, attitudes that are more accessible in memory should last longer than less accessible attitudes (Fazio, 1989). Furthermore, because careful analysis of information is only possible when individuals are highly motivated and able to think about the information, Petty and Cacioppo predicted that increases in general ability and motivation should stimulate attitude maintenance.

One difference between our model and the models of McGuire (1968) and Petty and Cacioppo (1986) is our consideration of both attitude comparison *and* activation. McGuire's (1964) model implicitly assumes that prior attitudes are readily available for counterarguing the communication, a premise that is not always true. Similarly, Petty and Cacioppo (1986) presumed that easily accessible attitudes produce attitude stability without taking into account the influence of attitude accessibility on comparison processes and the associated attitude change. However, when both attitude activation and comparison are considered, the predictions about the role of general ability and motivation differ from the earlier conceptualizations. We describe these predictions below, in relation to the processing of information that either supports or contradicts prior attitudes.

1. *Evidence About the Effects of General Processing Ability and Motivation on Change in Response to Attitude-Inconsistent Information*

The evidence reviewed in the previous section has important implications for predictions of attitude survival and change when the attitude-related information contradicts prior attitudes. One such critical situation occurs when an external persuasive message *attacks* a previously held attitude, which has been examined under the general level of attitude resistance (see Zanna, 1993). Our model suggests that in this case, attitude survival should be most likely when ability and motivation but insufficiently high to induce sufficiently high to induce attitude activation but insufficiently high to induce attitude comparison. We propose that people are most likely to maintain their attitudes when they have moderate ability and motivation to think about the issues at hand, but they are most likely to change their attitudes when they have either low or high ability or motivation to think about a topic.

Effects of general ability and motivation in the presence of attitude-inconsistent information (Postulate 6). When attitude-relevant information conflicts with a prior attitude, high and low levels of ability and motivation to think about the issue should induce more change than moderate levels of general ability and motivation.

Important evidence in support of Postulate 6 comes from Gilbert and Hixon's (1991) research on stereotypical judgments. According to these researchers, individuals require ability to both activate a stereotype and to not apply it in a given situation. If this prediction is plausible, distracting people from activating a stereotype in relation to a person and distracting people from applying the stereotype for judgment should both decrease the probability that individuals will generate stereotypic responses. To make their case, Gilbert and Hixon (1991; Experiment 2) presented participants with a videotape in which the experimenter flashed cards with words for participants to complete. The experimenter was Asian- or European-American, and some of the words could be completed in ways consistent or inconsistent with the Asian-American stereotype (e.g., S_Y = SHY or SPY). Some participants were instructed to recall digits while they saw the videotape of the experimenter flashing cards (busy during activation phase), whereas others were not (not busy during activation phase). In addition, after viewing the video, participants heard an audio recording ostensibly containing the experimenter's description of daily life events she experienced and were instructed to form an impression of the experimenter. Half of the participants used a hand clicker to count the number of times the letter T

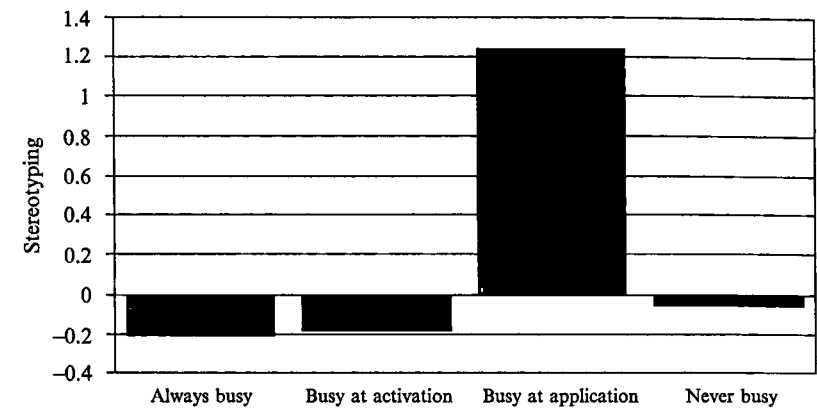


Fig. 15. Influence of early and late cognitive busyness on stereotyping. Data from Gilbert and Hixon (1991; Experiment 2).

appeared on the screen during the presentation of the audio recording (busy during application phase); the other half of the participants did not perform this visual task and simply looked at a black computer screen (not busy during application phase).

The results from Gilbert and Hixon's (1991) Experiment 2 appear in Fig. 15, which presents degree of stereotypic judgments for each experimental condition. (Degree of stereotyping was calculated by subtracting perceptions that the experimenter had stereotypic Asian traits when the experimenter was Caucasian from perceptions that the experimenter had stereotypic Asian traits when the experimenter was Asian.) As shown, only participants who could concentrate at the time of activating the stereotype but were busy at the time of applying the stereotype used the Asian stereotype as a basis for their impression of the experimenter. In contrast, participants who were distracted at the time of stereotype activation did not stereotype the experimenter, presumably because the distraction manipulation prevented them from initially activating the stereotype. Participants who were not distracted at any time did not stereotype the experimenter either, presumably because they activated the stereotype but were careful to use individualized information. Although this research did not measure judgment change, it implies that over multiple judgment occasions, people should be most likely to rely on a past stereotype when they are sufficiently able to activate the stereotype but unable to compare it with other information, such as target-individuating material or goals to make egalitarian social judgments.

Research on persuasion also provides support for the nonmonotonic prediction of change in response to attitude-inconsistent information.

Albarracín (2002) provided participants with either a persuasive message or behavior feedback. Some participants received a strong persuasive message that advocated the institution of comprehensive exams at the university. A different group of participants received feedback that outside of awareness, they had supported the institution of comprehensive exams at the university. All participants reported their attitudes immediately after receiving the information (immediate follow-up) and then a week later (delayed follow-up), thus allowing for an estimation of change over time. They also reported the degree to which the comprehensive exams were relevant to them personally, a measure used as an indicant of motivation to think about them personally, a measure used as an indicant of motivation to think about comprehensive exams. In addition, some participants were asked questions that contradicted the messages, allowing for analysis of change when attitude-inconsistent information is available.

It is first important to examine whether the relevance of the information influenced the initial scrutiny of the information as reflected in attitudes measured immediately after receiving the information. Findings indicated that immediately after receiving the message, participants were more favorable toward the policy when they received information in support of the policy than when they received information attacking the policy ($M_{diff} = 2.06$). Moreover, consistent with Petty and Cacioppo's (1986) predictions, the difference in the impact of the information direction was significantly greater when the topic was more rather than less relevant to participants ($M_{diff} = -0.73, 2.91, \text{ and } 3.99$ for low, moderate, and high relevance, respectively). That is, participants were more likely to form initial attitudes on the basis of the information they received when the issue was more relevant (higher motivation) rather than less relevant (lower motivation). In other words, the relation between relevance and attitude formation was linear.

In contrast to models that are interested in the role of ability and motivation at the time people first receive a persuasive communication, our model has implications for the role of these factors at later points of time.⁷ Specifically, Postulate 6 suggests that after individuals form and store an initial attitude, they are more likely to maintain this attitude when they are moderately able or motivated to think about the issue than when their ability and motivation are very high or very low. This hypothesis implies that *change* (not first-time formation) in participants' attitudes from the immediate to

⁷Clearly, the level of ability and motivation at the time of first forming an attitude toward an object may not be the same as the level of ability and motivation at the time of reevaluating the object. Thus, temporary distractions at the time of forming an attitude may not be present later, when one reconsiders the object. However, the chronic personal relevance of an issue or the need for cognition of an individual (see Petty & Cacioppo, 1986) may be relatively stable over time, and so research on the influence of these factors on initial attitude formation can illuminate processes that occur at the time of reevaluating the object.

TABLE III
ATTITUDE CHANGE IN RESPONSE TO ATTITUDE CONSISTENT AND INCONSISTENT
ATTITUDE AS A FUNCTION OF MOTIVATION AND ABILITY

Measure	Motivation or ability level		
	Low	Moderate	High
Attitude inconsistent	-0.92 ^{a,*}	0.43 ^b	-2.03 ^{a,*}
Attitude consistent	-0.75 ^a	-0.21 ^a	1.15 ^{b,*}

The evidence on attitude-consistent information comes from a study by Albarracín (2002). The evidence on attitude-inconsistent information comes from a study by Wallace and Albarracín (2003). Motivation and ability were trichotomized to achieve approximately equal number of participants in each level. Different alphabet letter superscripts indicate statistically significant differences across change scores within each study.

*Change significantly different from a zero standard.

the delayed follow-up should be greater when the issue is low or high in relevance (high vs. low motivation) than when the issue is moderately relevant (moderate motivation). The first row of Table III presents change scores from participants' attitudes at the immediate and delayed follow-ups as a function of reported motivation to think about the issue. As shown, a nonmonotonic relation existed between motivation to think about the topic and the change in participants' attitudes toward that topic. That is, participants were more likely to maintain their initial postmessage attitudes when they were moderately motivated to think about comprehensive exams than when their motivation was either high or low (Postulate 6).

2. Effects of Processing Ability and Motivation on Change in Response to Attitude-Consistent Information

Consider what happens when attitude-relevant information corroborates a prior attitude. When this occurs, lower levels of ability and motivation to think about an issue should induce an online construction of an attitude that is similar to the prior attitude. Moderate levels of processing ability and motivation should also facilitate attitude maintenance because these moderate levels are likely to induce the activation and use of the prior attitude without inducing comparative validation. The effects of low and moderate ability and motivation to think about an issue, however, should differ from the effects associated with high levels of these variables. Presumably, high general ability and motivation should increase comparison-based attitude

polarization when the attitude-relevant information corroborates the prior attitude.

Effects of ability and motivation in the presence of attitude-consistent information (Postulate 7). When attitude-relevant information corroborates a prior attitude, high ability and motivation to think about the issue should induce more change than both moderate and low levels of general ability and motivation.

We examined the viability of the predicted step-shaped effect of motivation to think about an issue when new consistent information is contained in a persuasive communication. For this purpose, we reanalyzed Wallace and Albarracín's (2003) control conditions of Experiment 1 using the level of the topic personal relevance and the reported processing effort as a predictor. The analysis involved averaging participants' reports that the message was personally relevant and that they thought about it (processing ability and motivation), and calculating difference scores to represent change from the pretest to the posttest. As shown in the second row of Table III, attitudes were more stable when participants had low and moderate processing ability and motivation, but changed in line with the second message (polarization of initially positive attitudes) in conditions of high processing ability and motivation.⁸

3. Summary

Postulate 6 states that when other things are equal, attitude change should be greatest when people have information that questions their prior attitudes and possess either low or high ability and motivation to think about an issue. Correspondingly, attitude change in these situations should be smallest when individuals have moderate ability and motivation to think about the issue. Research by Gilbert and Hixon (1991; but see Devine, 1989) is consistent with this possibility. Their work specifically suggests that people are most likely to perpetuate stereotypes when distraction prevents them from ignoring (not applying) the stereotype but does not prevent them from initially activating the stereotype. In contrast, people use information other than stereotypes from memory when distraction disrupts both stereotype activation and application and when distraction disrupts neither process. Similar conclusions can be drawn from data reported by Albarracín (2002), which showed that reported processing motivation has a nonmonotonic influence

⁸These analyses could not be conducted in Experiment 2 of the series because the pretests and posttests were on different scales, nor could they then be conducted in Experiment 3 due to the low number of subjects in the condition without attitude reminder and comparison instructions.

on attitude change over time when attitude-inconsistent information is available. In this research, recipients of information were more likely to maintain the attitudes they formed initially when the issue was moderately relevant to them than when it was either highly relevant or highly irrelevant. Presumably, recipients of moderately relevant information activated their attitudes but did not compare them with other, attitude-inconsistent information. In contrast, recipients of irrelevant material formed attitudes online (they neither activated nor compared their initial attitudes with attitude related information), and recipients of highly relevant information activated their attitudes but changed them as a result of comparison processes.

Finally, the predictions from our model are supported by data from Wallace and Albarracín's (2003) research. The control data from the first experiment of that series showed that when people possess attitude-confirming information, low and moderate processing ability and motivation result in attitude maintenance. That is, people can reconstruct the prior attitude on the basis of the new consistent information or simply retrieve and use their past judgment. Change, however, appears to occur when people have high ability and motivation to consider the issue. In these situations, comparing a prior positive attitude with equally valid but new positive attitude increases corroboration and polarization beyond the extremity of the prior attitude.

IV. Conclusion

The proposed model is the first to generate predictions concerning how the activation of prior attitudes, the activation of attitude-related information, and the comparison of the attitude with the other information jointly determine the change and maintenance of prior attitudes, and how conditions that influence these processes jointly determine attitude survival. In providing this understanding, the model has benefited from a large amount of past and contemporary work on attitude change. For instance, the favorable effects of attitude accessibility on attitude maintenance were proposed and verified by Fazio (1989). Moreover, Schwarz and Bohner (2001), Wilson and Hodges (1992), and Wyer and Srull (1989) called attention to how online constructions can lead to attitude stability, a phenomenon that our model also considers. Despite the important contributions of these researchers, none of them specified how activating a prior attitude can lead to change or how motivation to compare a prior attitude with other information can lead to attitude stability. Nor can prior models predict the

different forms of attitude change we propose, or the hypothesized shape of the function when one attempts to predict attitude change from indicants of ability and motivation to think about an issue.

Because the activation of alternative information can result from retrieval of material from memory and reception of external information, our model's predictions apply equally to persistence of judgments in light of internal information and survival of these judgments in light of external pressures (i.e., persistence and resistance, see Petty & Krosnick, 1995). This aspect of our model is important because as Zanna (1993) nicely characterized it, most research on persuasion represents attempts to convince message recipients of rather trivial issues as opposed to producing change, with respect to hard to change attitudes, about real issues. As our model suggests, a prior attitude about an issue can dramatically alter the impact of a persuasive message depending on whether or not recipients can recall that attitude and whether that activation promotes attitude change or resistance to persuasion.

A. INTEGRATION OF MEMORY-BASED AND CONSTRUAL PROCESSES

According to Schwarz and Bohner (2001), individuals generally form attitudes online solely on the basis of information that is available at the time, without retrieving an attitude from permanent memory. For example, individuals may use the affective reactions they momentarily experience to determine their responses to objects they encounter without bothering to recall a prior attitude about these objects (Schwarz & Clore, 1983), or they may consider the anchors of a scale in a survey to establish the prior frequency of a given behavior they have performed instead of recalling their past behavior (Schwarz, 1994). Like Schwarz and Bohner's formulation, our model implies that online information is critical and often leads to attitude survival over time.

Unlike Schwarz and Bohner's (2001) views, however, our conceptualization allows for predictions of the conditions in which people form attitudes on the basis of both online and memory-based information. For instance, our conceptualization predicts that people will construct and reconstruct their attitudes online when their ability or motivation to think about the information is either very low or very high. In contrast, people may retrieve and use a prior attitude when they have moderate ability and motivation to recall their prior attitude but not enough to compare that attitude with attitude-related information. Explicating the conditions for online attitude formation and for retrieval of a prior attitude appears fundamental for understanding attitude change.

Furthermore, our model makes predictions that may permit researchers to distinguish memory-based and online attitudes in some conditions. All things equal, when people form a new attitude based on online information, they are likely to have a current attitude that is as confident and extreme as a prior attitude they simply retrieve (Postulate 2). However, when people form a new attitude based on online information and on a prior attitude (comparison process), they may develop an attitude that is less or more confident and extreme than if they had only retrieved their prior attitude or if their attitude was formed entirely online (i.e., Principles 1 and 2; see Table II). For example, individuals may conclude that their prior belief in the benefits of tax paying is even stronger when they learn new, subjectively valid information indicating that taxes fund desirable social programs (corroboration principle). They may also find taxes more desirable if they maintain their point of view despite new evidence of government mismanagement of tax dollars (defensive-confidence principle). In contrast to these outcomes, people who manifest identical attitudes at different time points may be construing attitudes online on the basis of chronically accessible information, as Schwarz and Bohner (2001) proposed. These competing predictions about the extremity and confidence of partly online/partially memory-based attitudes versus purely memory-based or online attitudes may help to resolve the memory-based versus construal debate in the future.

Finally, whether or not using a prior attitudinal response implies construction is probably a matter of semantics (Wyer & Albarracín, *in press*). All goal-directed judgments imply the selection of an informational basis as well as a response generation: In this sense, all judgments are "reconstructions." However, the key problem appears to be whether individuals ever use prior relevant judgments from memory, or whether they ignore those judgments and instead construct new ones on the basis of more specific information about the object that is available at the time. Our research in no way implies that people do not use their prior attitude to construct the new attitudinal response. Nevertheless, it identifies the conditions in which the use of a prior attitude versus other information is more likely.

B. DIFFERENCES FROM POSSIBLE PREDICTIONS ABOUT FORMS OF CHANGE IN OTHER MODELS OF ATTITUDE CHANGE

¹To summarize, two principles may underlie comparative processes, producing outcomes that no other prior model can simultaneously predict. A relative consideration of these predictions is possible from Table II,

organized according to hypotheses derived from the activation/comparison model, the additive and averaging models of information-integration theory, and social judgment theory.

According to Anderson's *information-integration theory*, if a person receives n items of information, the response (R) to the set of items ($s, i \dots n$) is given by:

$$R = w_0s_0 + w_1s_1 + w_2s_2 + \dots + w_ns_n \quad (1)$$

where w_i are the weights and s_i are the scale values of each item. Because Anderson (1959, 1974) has argued that averaging rather than adding best represents the way in which people combine information, the sum of the weights is typically set to 1. However, Fishbein and Ajzen (1975) have argued that an additive model is more plausible. The main source of controversy between the additive and averaging models is their ability to account for the set size effect. Whereas additive models naturally account for increases in extremity as new elements of the same value are incorporated, the averaging model needs to assume an initial moderate attitude to account for the set-size effect (Anderson, 1981).

Regardless of whether Anderson's (1974) model involves additive or averaging combination rules, his model differs from our formulation in that Anderson's functional measurement assumes constant weights ($c, i \dots n$) regardless of the values being combined. This linear assumption is not the case in our model, which suggests that the implications and validity of the individual pieces of information mutually drive the validation of each element (corroboration and defensive-confidence principles). Both versions of information-integration theory thus make predictions that present differences from our model. As shown in the table, the additive model can predict polarization through corroboration, compromise between the prior attitude and the attitude-related information, and survival. However, the additive model does not predict the necessary update in weights that would predict polarization beyond the extremity of the attitude-related information via the defensive-confidence principle. Similarly, the averaging model effectively accommodates attitude compromise and survival, but it cannot account for any case of polarization beyond the extremity of either the prior attitude or the attitude-related information.

Social judgment theory undoubtedly comes to mind when one thinks of comparative processes, because it was proposed to understand attitude change as opposed to mere formation. However, Sherif and Hovland (1961) only took into account perceptions of the evaluative direction of information, under the premise that people map their prior attitudes onto the perceived extremity of the attitude-related information (Sherif & Hovland, 1961; but see Eiser, 1973; Eiser & Mower White, 1974; for an

excellent review, see Eagly & Chaiken, 1993). When the position of the communication is close to the recipients' attitude, people "assimilate" their own attitude to the advocacy and thus become closer to the position advocated in the communication. In contrast, when the communication is subjectively distant from their attitudes, a "contrast" effect or perception exists that one's attitude is more discrepant from the communication than it actually is.

Because social judgment theory does not specify the role of the perceived validity of either one's prior attitude or of attitude-relevant information, the predictions for evaluatively consistent and inconsistent cases should be the same regardless of whether both elements are valid. Generally, more assimilation, leading to greater survival, should be observed when the information is evaluatively consistent with and similarly extreme to the prior attitude. Similarly, attenuation or polarization could be observed when the attitude-related information and the prior attitude are perceived as consistent yet the attitude-related information is perceived as less or more extreme than the prior attitude. In contrast, when the attitude-related information is evaluatively inconsistent with the prior attitude, boomerang or compromise types of effects emerge depending on the perceived distance between the two positions. In the context of our model, these perceptual effects undoubtedly could occur over and above the comparative validation outcomes we propose. However, it is also clear that the predictions of the activation/comparison model are unique with respect to the comparative outcomes it postulates.⁹

C. RECIPROCAL INFLUENCES OF ATTITUDE ACTIVATION AND COMPARISON

Our model incorporates Fazio's (1989) hypothesis that highly accessible attitudes are activated by the mere presence of the attitude object.¹⁰ The more times people evaluate an object, the faster they can make decisions

⁹Models based on Bayes' theorem are also relevant to the analysis of the way in which people validate information. According to these models and our model, judgments are updated in a relatively fluid fashion as people encounter new information that is relevant to those judgments. However, applications of prior probabilistic models are silent to the processes that might elicit attitude change under different conditions, or the mechanisms that elicit attitude activation and comparison.

¹⁰Bargh, Chaiken, Govender, and Pratto (1993; see also Bargh, Chaiken, Raymond, & Hymes, 1996; Chen & Bargh, 1999) stated that any attitude, regardless of its strength and accessibility, is automatically activated in the presence of the attitude object. However, it is presently unclear whether the data that led to this conclusion reflected attitude activation or the mere activation of a good-bad concept (see Wyer, 2003).

about the favorableness of the object, and the more automatic the decision becomes. Therefore, highly accessible prior attitudes should guide final attitudes by reducing the need to consider alternative information (see Fazio, Ledbetter, & Towles-Schwen, 2000). However, our model further specifies the applicability of this hypothesis by pointing to situations in which highly accessible attitudes facilitate change.

The facilitating effects of attitude accessibility on attitude change emerge from considering that in order to compare a prior attitude with attitude-related information, an individual should first retrieve that prior attitude from memory. As a result, when activating the prior attitude is easy (prior attitudes are highly accessible), people should reach the comparative validation stage more rapidly than they do when they struggle to recall their prior attitudes (see Figs. 12 and 13). Consistent with this prediction, participants who could spontaneously activate their prior attitudes changed their prior attitudes when they received comparison instructions regardless of whether they also received an attitude reminder. However, when prior attitude accessibility was low and participants received comparison instructions, the attitude reminder increased attitude change, whereas its absence resulted in attitude maintenance.

Important evidence about the role of attitude comparison in attitude change comes from findings that the reception of comparable information across different time points elicits attitude change (Muthukrishnan, Pham, & Mungalé, 1999, 2001; Pham & Muthukrishnan, 2002). What makes our proposal unique, however, is that in addition to predicting effects of comparison on attitude change, it highlights the need to consider both activation and comparison to understand attitude change. To this extent, it is incorrect to assume that only comparison triggers change, when, in fact, no comparison without activation can also trigger change. Wallace and Albarracín (2003; Experiment 3) documented that when people do not activate their prior attitudes, they are likely to use whatever information is available at the time. Consequently, they change as much if not more than individuals who both activate and compare their prior attitudes if the available information is not consistent with their prior attitude.

Our model also specifies situations in which comparative motivation can facilitate the activation and maintenance of prior attitudes without triggering comparison. When prior attitudes are not easy to recall, having the goal of comparing the prior attitude with the new information will first elicit the recall of the prior attitude. In the process, however, people may decide to simply use that prior attitude and give up on their attempts to compare it with other information. As shown in Fig. 13, when prior attitudes are low in accessibility, either the comparison instructions or the attitude reminder produces attitude survival. Apparently, very strong comparison

inducements are necessary to successfully induce attitude comparison and change when prior attitudes are difficult to recall (see Fig. 14).

D. THE INFLUENCES OF PROCESSING ABILITY AND MOTIVATION

Various models of persuasion have noted that the extent to which individuals process information in an elaborative fashion has important implications for the outcomes of persuasion. Several decades ago, Petty and Cacioppo (1986) and Chaiken (1980) proposed that people who have sufficient ability or motivation to elaboratively think about a communication are much more discriminating of argument quality and become persuaded only when they receive strong arguments. In contrast, people who lack ability or motivation often use peripheral cues as a basis for their attitudes or are more influenced by heuristics if these heuristics are accessible at the time (Chaiken, 1980). These findings have relevance for our model, both with respect to the definition of elaborative processes and with respect to the role of processing ability and motivation to think about an issue in attitude change.

1. General Definitions of Elaboration and Precise Determination of Cognitive Processes

Despite the valuable contributions of prior models of persuasion, more recent considerations of processing in persuasion have highlighted that a more detailed understanding of what takes place might be necessary (Albarracín, 2002). For instance, Albarracín and Wyer (2001) demonstrated that when people can concentrate at the time they receive a persuasive message, they first form beliefs about the arguments and later base their attitudes on those beliefs. When people are distracted, however, they form attitudes on the basis of irrelevant affective reactions they experience at the time and later rationalize those attitudes by reporting beliefs that are consistent with those attitudes. Further, Albarracín and Kumkale (2003) demonstrated that a global consideration of elaboration is insufficient to uncover the effects of affect as information in persuasion. They proposed that using affect as information entails identifying the source of affect and then deciding whether that affect is relevant to the judgment to be made. Consequently, when people experience irrelevant affect at the time they receive a message, moderate increases in ability and motivation to think about their affect increase the use of affect as information because they allow individuals to pay attention to their affective reactions (identification

stage) but prevent them from realizing that the affect is irrelevant (discounting stage). However, increases in ability and motivation beyond that point reduce the influence of affect altogether because they disrupt affect identification as well as discounting. These findings suggest that *elaboration* is a useful broad label for a variety of cognitive activities, but that understanding these activities is indispensable to accurately predict persuasion outcomes.

The present model has similar implications for the study of the effects of elaboration on attitude change and maintenance. Activation and comparison are both forms of elaboration, just as is the case with affect identification and discounting. However, these distinct forms of elaboration predict very different outcomes. As shown in Fig. 13, activation with comparison, as well as lack of activation and comparison, can induce more attitude change than activation alone, an effect that mere depth of processing cannot explain. Moreover, elaboration should induce greater attitude change to the extent that it induces comparison, but should induce greater stability when the elaboration consists of activating a prior attitude. Consequently, the consideration of the specific processes involved in elaborative processing, as well as ability and motivation to perform each specific process, should provide greater predictive power than merely accounting for elaboration.

Consider also the possibility that attitude activation and comparison can be orthogonal to general ability and motivation, which are often used as indexes of elaboration. One may be able to induce activation and comparison even under conditions of relatively low ability and motivation. In such situations, comparative processing might be relatively peripheral and have an effect only when easier to process information is alignable. For instance, one may introduce a highly credible source the first time and a noncredible communicator the second time. Just as was the case with the presentation of persuasive arguments, comparison instructions along with either high prior attitude accessibility or an attitude reminder should induce change after the second message. The only difference would be that change in this case might be initiated by the comparative application of a heuristic such as "experts know better" (Chaiken, 1980).

2. Hypothetical Roles of Ability and Motivation to Think About an Issue

The activation/comparison model also specifies the levels of general processing ability and motivation under which people are most likely to transform or maintain their prior attitudes. When disconfirming information is activated, people with moderate ability and motivation to think about the issue should be more likely to maintain their prior attitudes than people with either high or low ability and motivation. When attitude-confirming

information is activated, however, people with low and moderate ability to think about the issue should both maintain prior attitudes because they reconstruct their attitudes online or use the prior judgment. In contrast, people with high processing ability and motivation should change their prior attitudes to a greater extent. In brief, our model predicts an inverted-U function for attitude-inconsistent information and a step function for attitude-consistent material.

These predictions, which are supported by the findings presented in Table III, slightly differ from those made by Petty and Cacioppo's (1986) elaboration likelihood model. According to their model, a persuasive communication can stimulate recipients to generate issue-relevant thoughts and to change attitudes in line with these thoughts (central processing). However, when people do not have the ability and motivation to think about the issues discussed in the message, they may still use cues (e.g., number of arguments, their past behavior, or the affect they experience at the time) that can help them to make a decision without having to think about the issues at hand with any depth (peripheral processing; see Petty & Cacioppo, 1986). Petty and Cacioppo further hypothesized that centrally processed attitudes are likely to be more lasting and resistant to change than peripherally formed ones (see also Craik & Lockhart, 1972; for reviews, see Brown & Craik, 2000; Petty, Haugtvedt, & Smith, 1995). For instance, people who are high in need for cognition or care about the issues discussed in a communication should maintain their message-based attitudes more than people who have low chronic ability and motivation to think about an issue.

Consistent with the predictions of the elaboration likelihood model with respect to attitude maintenance, Petty, Haugtvedt, Heesacker, and Cacioppo (1995) found that the initial impact of the strength of the arguments contained in a persuasive communication persisted more when participants received a highly relevant message than when they received an irrelevant communication. These findings may, at first sight, appear inconsistent with our predictions and findings. However, nonlinear effects can go undetected unless one carefully examines the pattern of observations or has specific predictions of nonlinear effects. Therefore, it is possible that a combination of low and moderate levels of personal relevance (rather than low levels) could have driven the decreased persistence observed by Petty et al. (1995) in that study. Future research should elucidate these ambiguities.

Our predictions also differ from a model proposed by McGuire (1960) and later formalized by Wyer (1974). According to McGuire (1968), the probability that a communication will influence its recipients is a multiplicative function of (1) the likelihood of receiving and comprehending the

message and (2) the cognitive elaboration that follows reception and comprehension. If the communication is counterattitudinal, this elaboration should predominantly involve counterarguing, which allows the model to be stated as:

$$P(I) = P(R)[1 - P(CA)] \quad (2)$$

where $P(I)$ is the probability that the communication has an influence, $P(R)$ is the probability of the message being received and comprehended, and $P(CA)$ is the probability of the recipients effectively counterarguing the communication (Wyer, 1974). Because reception and counterargument exert antagonistic effects on the influence of the message, situational and individual differences that promote both reception and counterarguing (e.g., intelligence) should foster greater persuasion when they are moderate than when they are either high or low.

Like our model, the model shared by McGuire (1968) and Wyer (1974) implies that processing ability and motivation have nonmonotonic effects on attitude stability. The difference is that whereas their model suggests a U-shaped effect, our model predicts an inverted-U effect. The discrepancy between the two models stems from differences in focus. Whereas McGuire and Wyer's predictions imply that prior attitudes and knowledge are available for counterargument, our model focuses on differences in the accessibility and activation of these prior attitudes. Thus, McGuire and Wyer's predictions should be viable when prior attitudes are in fact highly accessible, and differences in processing ability and motivation can only alter attention to the communication and counterarguing. However, an inverted U should better represent the pattern of attitude change when prior attitudes vary in accessibility, allowing variations in ability and motivation to modify attitude activation.

E. IMPLICATIONS FOR RELATED TOPICS IN SOCIAL PSYCHOLOGY

1. Generalizability to Nonevaluative Judgments

Because the problem of judgment change has been primarily addressed in the area of attitudes, our chapter applied the principles of our model to the domain of evaluative judgments. However, the proposed principles also readily apply to probabilistic judgments. For instance, people may believe that members of certain social groups are lazy simply because they belong to that group. As a result, stereotype changes entail movements from beliefs that the category implies the trait to beliefs that the category does not imply

the trait. Other than the differences in the type of category used in evaluative and probabilistic judgments, the structure of these two types of judgments is isomorphic (see Wyer, 1974; Wyer & Albarracín, in press). Therefore, activating prior probabilistic judgments and comparing them with belief-relevant information should have the same consequences we outlined in relation to attitude change (see Table I). Future research on beliefs may uncover evidence about the applicability of the model postulates to such probabilistic social judgments.

2. Implications for the Role of Attitude Confidence

In discussing our model, we considered changes in attitude extremity and confidence that evolve over time. We argued that attitude change can be reflected in changes in the extremity of a prior attitude, its certainty, or both. Attitudes that become more or less polarized should change in both extremity and confidence, whereas attitudes that change in line with attitude-inconsistent information should not necessarily change in confidence. In describing prior research in support of our model, we discussed Wallace and Albarracín's (2003) finding that attitudes that become more extreme following corroboration by consistent information are also reported as more certain attitudes. However, people who compare a prior attitude with new, inconsistent information often reach a compromise between the two positions without altering their initial attitude confidence.

The possibility that attitude confidence and extremity are inextricably linked was first raised by Wyer (1973). He assumed that evaluative category ratings are subjective expected values of the distribution of beliefs that an object belongs to various evaluative categories (e.g., good, very good, bad). Furthermore, attitude certainty is a reflection of the dispersion of this distribution, with greater variance resulting in less confidence. One aspect on which Wyer (1973) did not elaborate is what happens to attitude confidence when new information elements are acquired. If the variance of a distribution is the sum of the squared deviations of each observation from the mean divided by the number (N) of observations, then confidence should be an inverse function of the deviations from the mean and a direct function of N . Because adding new consistent elements guarantees an increase in N without increases in the deviation from the mean, the acquisition of new information should lead to concomitant increases in attitude confidence. However, the relation between the incorporating inconsistent elements cannot be specified unless one knows the exact number of elements being included and the exact deviation of these elements with respect to the mean of the distribution. If the N and the sum of squared deviations increase

similarly as new elements are added, the inclusion of new inconsistent elements should not produce changes in confidence. These exact predictions were supported by Wallace and Albarracín (2003).

Even when Wyer's (1973) model can effectively account for the relation between attitude extremity and confidence, people may sometimes be more willing to express changes in confidence rather than changes in extremity. Motives to achieve consistency and to avoid the appearance that one lacks serious opinions often promote attempts to side with the judgment one reported previously (Festinger, 1957). However, manifesting changes in certainty may strike a balance between a motive to be truthful and a motive to preserve a self-image, suggesting that confidence changes may be easier to detect than extremity changes (for an example of change in confidence without change in extremity, see Tormala & Petty, 2002). These motives may be further complicated by ceiling effects that are often present in attitude research (see Cook & Campbell, 1979).

Further attempts to elucidate whether attitude change is reflected in extremity and confidence should be oriented by the theoretical significance of these distinctions instead of the presence or absence of effects on either or both confidence and extremity. For instance, Fazio and Zanna (1978a,b) reported that confident attitudes last longer, evidence that is sometimes taken as incontrovertible proof that attitude confidence is key for understanding attitude change. However, reasoning suggests that greater confidence should elicit stability not because of confidence itself, but because of differences in the knowledge associated with the attitude. People are generally more confident when the available information about the object adequately aligns with prior attitudes. Because the consistency of the attitude-related information and the prior attitude is undoubtedly responsible for attitude stability (see Figure 5), attitude confidence is a convenient proxy for understanding the true processes underlying stability.

Similarly, attitude confidence is presumed to play an important role in resistance to persuasion. However, the actual evidence in support of this supposition is rather tenuous. For instance, McGuire (1964) showed that merely increasing confidence in one's attitude by providing attitude-supporting evidence is less effective than immunizing individuals to potential threats to their attitudes. But even confidence that one can effectively counterargue challenges to one's attitudes can have ironic effects, leading people to confront material that ultimately defeats one's attitudes (Albarracín & Mitchell, *in press*). To this extent, focusing on individual differences, including attitude confidence, is unlikely to promote a clear understanding of attitude change without an effective explication of the cognitive and motivational processes at stake.

F. APPLIED AND POLICY IMPLICATIONS

In our illustrations of the activation/comparison model, we relied largely on laboratory research that allows for precise controls of the processes that occur. However, the implications of our model for applications in the real world are readily apparent. For example, HIV prevention programs such as those implemented at the time people obtain an HIV test often involve messages that directly counter the client's beliefs (for a review, see Albarracín *et al.*, 2003). For example, because many people refuse to use condoms because of the associated physical discomfort, campaigns try to "eroticize" condoms to make them appealing to reluctant audiences (see Albarracín *et al.*, 2000). This strategy can certainly trigger comparison of the prior belief with the campaign's counterargument, resulting in the successful outcomes persuaders expect. However, when such prior beliefs are not highly accessible in memory, the attempt to induce the comparison may only trigger the activation and maintenance of the earlier belief, thus decreasing the effectiveness of the campaign. In this context, our model suggests that practitioners must establish whether their campaigns will elicit activation of a prior attitude with or without comparison before they can ensure effectiveness for their programs.

G. OTHER REMARKS

1. Consideration of Attitude Dissolution Processes

Until this point, our discussion has implied that attitude change and maintenance processes always result in an outcome attitude of one form or another. However, attitudes sometimes simply dissolve altogether. Individuals should use their prior attitudes and attitude-related information as a basis for judgment provided that at least one of the two elements is valid, but when individuals consider both the prior attitude and the attitude-related information invalid, they should generate no current judgment (for a related analysis, see Converse, 1964, 1970). In the case of political attitudes, for example, one may remember that one was a Democrat but be unable to recall solid arguments for this affiliation. If one later receives a Democratic ad one considers biased, neither the new information nor the earlier attitude may have enough subjective validity to inform a current attitude. Under those conditions, people are likely to delay judgment until they gather further information about the object they need to evaluate (e.g., Chaiken, 1980). This situation should yield an outcome that we term *attitude dissolution*.

Conflicting information is also likely to lead to attitude dissolution when people conclude that neither their prior attitude nor the attitude-related information they activated is valid. In such a circumstance, individuals may delay judgment indefinitely until they can overcome their indecision through the consideration of further information. For instance, politicians and citizens often strive to reduce prejudice and stereotypes toward minority groups. They may attempt to improve the social climate for ethnic minorities by increasing social acceptance and positive intergroup attitudes. One may wish to change stereotypes that African-Americans are lazy and unintelligent or that Asian-Americans are hard-working and intelligent. The ideal change, however, is different for prejudice and stereotypes. Reducing prejudice implies decreasing negative evaluations, whereas reducing stereotyping implies suspending judgment about the characteristics of stereotyped group members and concluding that no two members of the group are alike. In this regard, our model highlights that people are likely to dissolve a prior stereotype when they compare their prior stereotypes with alternative information and conclude that both are invalid. For example, individuals may conclude that they cannot make a general inference about the traits of a target group after they analyze conflicting stereotypes about that group that are prevalent across different cultures.

Our model can seamlessly accommodate attitude dissolution processes without altering our predictions about the effects of activation, comparison, ability, and motivation (Fig. 16). For the sake of simplicity and because attitude dissolution has received virtually no attention in the past, we chose not to review dissolution outcomes in detail in this chapter. The lack of past research on attitude dissolution is not surprising, because researchers currently lack the methodologies to adequately assess a person's lack of attitude. For instance, the use of "don't know" responses has often been criticized as generating conditions for survey recipients to "satisfice" rather than provide what researchers consider meaningful responses (Krosnick, 2002; Schuman & Presser, 1981). In any case, the adequacy of using these types of options or of asking participants whether they have an opinion seems essential to better elucidate attitude-relevant processes. As the stereotyping example suggests, interventions to get recipients to suspend judgments about social groups and adequate measures of these particular changes may be essential in combating subtle and overt intergroup conflict.

2. Biases in Activation and Comparison

The elaboration likelihood model (Petty & Cacioppo, 1986) and the heuristic systematic model (Chaiken, 1980) both assume that people process information in either objective or biased ways. For example,

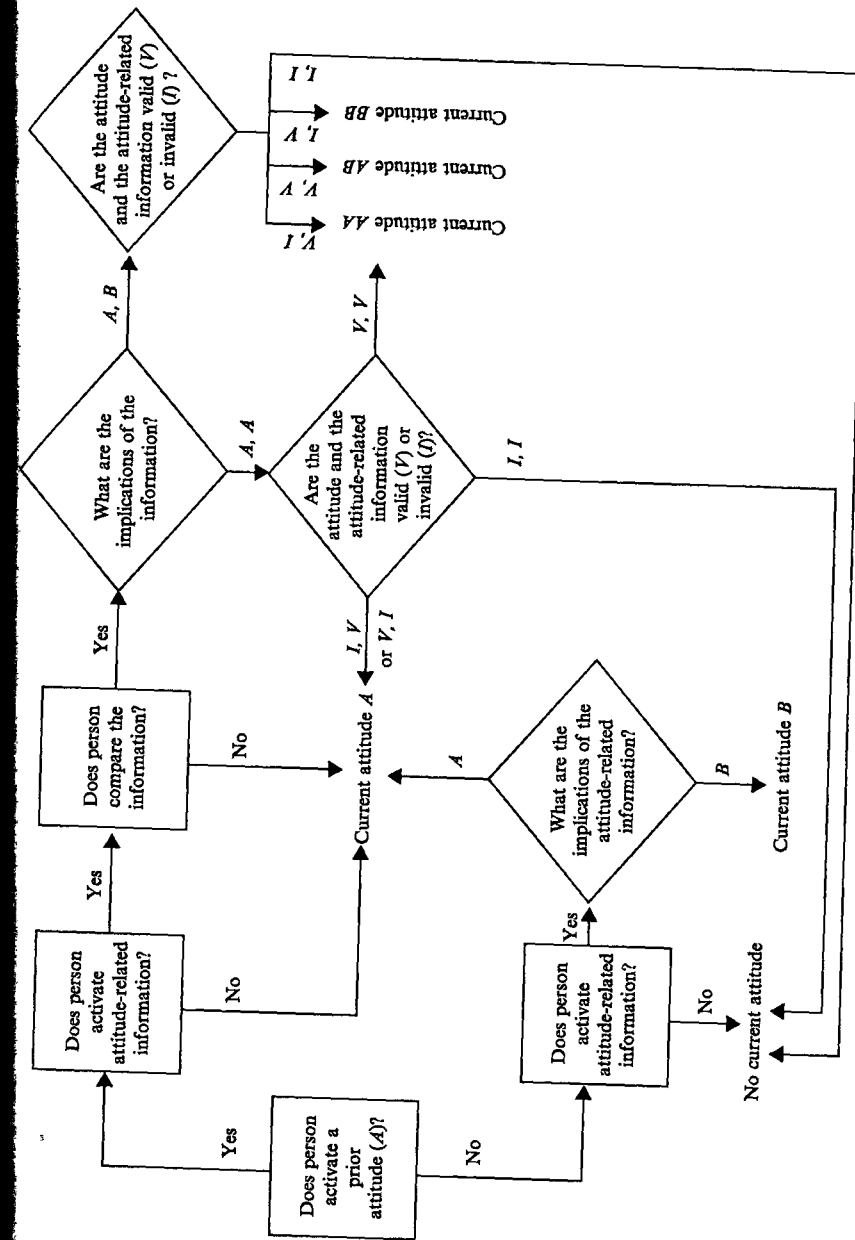


Fig. 16. Influence of processes of activation and comparison on attitudinal outcomes, including attitude dissolution. Boxes indicate processes and diamonds indicate decision points. *A* and *B* represent different implications or categories (e.g., bad versus good). *V* and *I* denote subjectively valid and invalid information, respectively. *AA* and *BB* represent attitudes of the same *A* and *B* evaluation with increased confidence, extremity, or both.

objective processing entails being persuaded by strong factual information contained in a communication but remaining unconvinced by weak arguments. Alternatively, people may interpret the arguments contained in a communication as less supportive of a given point of view when they are in a bad mood than when they feel happy, a phenomenon that reflects an affective bias. In our model, validation is an entirely subjective process. The selection of an affective heuristic (a formal criterion) leads to a bias of affect, whereas the use of referential criteria can lead to more objective assessments if and only if the referents from prior knowledge are objectively correct.

3. Limitations

For some time, the literature on attitude change has lacked a comprehensive interpretation of the mechanisms underlying judgment survival and change. The model we presented is an attempt to fill this gap. Nevertheless, important areas of our knowledge on attitude change remain outside the model. One such area was highlighted by Wilson, Lindsey, and Schooler (2000), who argued that an attitude that changes does not perish. In fact, when people change a prior attitude, the prior attitude can persist at the implicit level and reemerge under some conditions. Because our model does not concern storage processes, readers should consult Wilson *et al.*'s work for a treatment of how different attitudes can coexist in memory (but see Fazio & Olson, 2003).

In presenting our conceptualization of attitude survival, we considered the possibility that people can activate up to two cognitive elements (i.e., the prior attitude and attitude-relevant information) at a time. Without a doubt, however, individuals spend their lives in environments with large amounts of information. As a result, they must often make decisions after considering multiple elements that have the potential to guide their future attitudes. The presence of multiple prior attitudes or multiple pieces of attitude-relevant information should have important implications for the processes we postulate. For instance, if one retrieves multiple pieces of information, comparing each piece with each other may not be cost effective. In this situation, people may arbitrarily select whatever piece is most salient at the time and operate as if they had a single piece of available information. Alternatively, the prospect of performing so many comparisons may be so daunting that people may reendorse a prior attitude they happen to recall, or parcel the information out in more or less simplified ways. Future research should address the processes elicited by information of greater complexity than we examined.

4. Closing Comment

Many studies have investigated the predictors and consequences of attitude survival and change. As a result of these studies, researchers now have a decent understanding of parts of the many different processes that govern the evolution of attitudes over time. Unfortunately, the existing attitude change literature has lacked comprehensive, theoretical integration, which is not surprising considering the difficulties inherent in achieving such integration. In view of this situation, enhanced integration and theoretical development in attitude research is a worthwhile goal given the important societal consequences of attitude survival and change. Our integrative model makes new predictions that have the potential to guide the development of programs to improve judgments and behaviors that are important for individuals in society. We hope that our model will stimulate such efforts in the future.

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