Structure of Attitudes:

Judgments, Memory, and Implications for Change

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Attitudes are important because they shape people's perceptions of the social and physical world and influence overt behaviors. For example, attitudes influence friendship and animosity towards others, giving and receiving help, and hiring of ethnic minority job candidates. More dramatically, attitudes are at the heart of many violent attacks, including master-minded crimes against humanity (e.g., the Holocaust and the terrorist attacks in New York City on September 11, 2001), but also, attitudes promote major philanthropic enterprises such as a current campaign to end poverty in the world.

When defined as evaluations, attitudes refer to associations between an attitude object and an evaluative category such as *good* vs. *bad* (see Albarracin, Johnson, Zanna, & Kumkale, 2005; Zanna & Rempell, 1988). The attitude object can be a concrete target, a behavior, an abstract entity, a person, or an event (Fishbein & Ajzen, 1974). For example, individuals form evaluations of social groups (e.g., prejudice), their own behaviors (attitude toward the behavior; Fishbein & Ajzen, 1975), themselves (self-esteem; Brown, 1998), and other people (person impressions: Wyer & Srull, 1989).

Attitudes have memory and judgment components (Albarracin, Johnson, Zanna, & Kumkale, 2005). The memory component involves representations of the attitude in permanent memory; the judgment component involves on-line evaluative thoughts generated about an object at a particular time and place. In this chapter, the structure of attitudes in memory is reviewed, with particular attention to implicit and explicit attitudes. In reviewing memory-structures, we first talk about the internal structure of attitudes and the relation between implicit and explicit attitudes. This section is followed by an account

of how judgments are structured by means of reasoned, associative, and configural processes, and a discussion of models depicting the relation between memory structures and judgments.

Attitude Representation in Memory

Explicit and Implicit Representations

Learning occurs when one clearly recalls having learned a particular task (explicit memory), but also when skills are acquired in subtle, difficult to recollect ways (implicit memory; Richardson-Klavehn & Bjork 1988; Roediger 1990). Using this explicit/implicit memory distinction, automatic or implicit attitudes have been contrasted with deliberate, explicit attitudes. Whereas explicit attitudes are measured with self-reported evaluations ("President Bush is *good* vs. *bad*"), implicit attitudes are measured with methods that assess the time to link the good vs. bad category with a particular object (e.g., President Bush; Greenwald, McGhee, & Schwartz, 1998; Fazio, Jackson, Dunton, & Williams, 1995; Wittenbrink, Judd, & Park, 1997). For a detailed discussion of implicit attitude measures, see Schwarz (this volume).

The implicit-measurement methods have yielded an impressive amount of evidence about attitudes, as well as generating considerable speculation about the nature of the constructs captured with these measures (see Devos, this volume). In the upcoming sections, we describe various structural aspects of attitudes and the relations between implicit and explicit attitudes.

Internal Structure of Explicit and Implicit Attitudes

Bipolarity. A common measure of explicit attitudes is the semantic differential, a seven-point scale with a negative adjective on the left end (-3) and a positive adjective on

the right end (+3). The underlying premise of this technique is that ratings of an object as *positive* have extremely high negative correlations with ratings of an object as *negative*. Some evidence suggests that this is in fact the case. For example, according to Watson and Tellegen (1985, 1999), ratings of pleasantness and unpleasantness are bipolar, leading people who report experiencing high pleasure also to report experiencing low displeasure in relation to the same object. More direct evidence comes from work conducted by Judd and Kulik (1980). Their observation that attitudes promote retention and retrieval of both consistent and inconsistent information led them to conclude that the structure of attitudes in memory is bipolar. Specifically, in their work, bipolar questions were more readily answered than unipolar ones, and information processed with bipolar questions was more easily and accurately recalled.

Ambivalence. Social psychologists have long identified attitudes entailing simultaneous positive and negative evaluations of an object (Fabrigar, MacDonald, & Wegener, 2005; also see Conner & Armitage, this volume). Ambivalence can occur because of conflict between the implications either among the various beliefs associated with an object or between the beliefs and the affect associated with an object (Ajzen, 2001). Thus, one limitation of bipolar measurement procedures is that it may mask simultaneous negativity and positivity with respect to an object.

Implications of negative and positive evaluations. Even in the absence of ambivalence, the negative and positive dimensions of attitudes have an interesting asymmetry. Specifically, compared with positive information, negative information tends to have a greater impact on attitudes and decisions (Cacioppo, Gardner, & Berntson, 1997; Fiske & Taylor, 1991; Klein, 1996; Matthews & Dietz-Uhler, 1998). People also tend to

have better memory for negative vs. positive stimulus words (Ohira et al., 1998), and the negative (vs. positive) aspects of an ambivalent attitude can have stronger effects on behavior (N. E. Miller, 1944; Cacioppo & Berntson, 1994; Cacioppo et al., 1997). Also, supporting the notion of greater sensitivity to negative than positive information, an advertising study (Yoon, 2003) revealed that respondents exposed to fictitious brands were slow to perceive the negativity of the information but were more likely to be influenced by it. In contrast, respondents exposed to real brands were quicker to perceive the negativity of the information but were less likely to be influenced by it.

Other lines of research, however, suggest that negative information has greater impact only under certain conditions. For example, messages that are framed negatively or contain negative information are more persuasive than their positive counterparts if the information is difficult to process or recipients are accuracy motivated (Ahluwalia, 2002; Block & Keller, 1995; Homer & Batra, 1994; Meyers-Levy & Maheswaren, 2004; Shiv et al., 2004). However, negative information is not always more powerful in determining attitudes. It is less effective when people have to imagine a story about a potential negative outcome (having a problem during a vacation), presumably because they construct these stories under the most favorable possible light (Adaval & Wyer, 1998). Consistent with this interpretation, the effects of negative (vs. positive) information decrease when people are motivated to process information in an even-handed fashion, but increase when people are motivated to see themselves in a positive light (Ahluwalia, 2002).

Scale. Researchers have developed a variety of scales to assess people's explicit attitudes (Fishbein & Ajzen, 1975; Krosnick, Judd & Wittenbrink 2005; Tesser, Whitaker,

Martin, & Ward, 1998). Interestingly, of more than one hundred studies of social psychological and political attitudes, 37 used 2-point scales, 7 used 3-point scales, 10 used 4-point scales, 27 used 5-point scales, 6 used 6-point scale, 21 used 7-point scales (Robinson, Shaver, & Wrightsman, 1999). Despite this diversity, dichotomous-response options appear to have advantages when it comes to understanding the scale (Krosnick et al., 2005) and may appropriately reflect the nature of the representation of evaluations in memory.

It seems unlikely that people have -3 to +3 scales stored in memory. With the exception of specific external requests to use a complex scale, or the need to compare similar objects, most judgments probably entail *good* vs. *bad* options rather than finer distinctions. Moreover, implicit evaluative associations likely link an object with representations or manifestations of visceral affect. Hence, implicit attitudes may be insensitive to variations in the evaluative intensity of the material (see Wang, 2005).

Structural Relations between Implicit and Explicit Attitudes

There are at least three possible models of the relation between implicit and explicit attitudes. The following sections address (a) a model in which the explicit and the implicit attitudes are separate (Greenwald & Banaji, 1995), (b) a model in which these two attitudes reflect different levels of processing –and censure—but are not structurally separate (Fazio, 1989), and (c) a model in which the two attitudes are separate but interact (Gawronski & Bodenhausen, 2006; Petty & Briñol, 2006).

Dissociated systems. Greenwald and Banaji (1995) defined implicit attitudes as introspectively unidentified (or inaccurately identified) traces of past experience that mediate favorable or unfavorable feeling, thought, or action toward an object. These

researchers proposed that implicit attitudes reflect unconscious evaluations of an attitude object, whereas explicit attitudes reflect conscious evaluations of an attitude object (Banaji, Lemm, & Carpenter, 2001). Unlike explicit attitudes, implicit measures reflect attitudes of which the person may not be aware, and are not subject to conscious editing on the basis of social or personal concerns. Thus, awareness and disapproval of either negative or positive associations can trigger a dissociation in which the implicit and explicit attitudes can have contradictory implications, or at least low correlations.

This dissociative model is undoubtedly parsimonious and has received support in studies of attitudes toward gender (Greenwald & Farnham, 2000), race, (Banaji et al., 1997; Greenwald et al., 1998), ethnicity (Greenwald et al., 1998), and age (Mellott & Greenwald, 2000). These findings may be contrasted with lack of dissociation obtained in studies of attitudes toward political candidates (Nosek, Banaji, & Greenwald, 2002) and some consumer products (Brunel, Collins, Greenwald, & Tietje, 1999; Maison, Greenwald, & Bruin, 2001). Presumably, prejudice, but not consumer attitudes, produces dissociations due to attempts at disguising spontaneous yet socially-sanctioned negative associations about minority groups.

A meta-analysis of this research (Hofmann, Gawronski, Gschwebder, Le, & Schmitt, 2005) revealed a mean r = .24 between IAT measures and self-reported attitudes. This overall low correlation is higher when individuals are likely to rely on their "gut feeling" in a particular domain (as decided by Hofmann et al.'s coders). Correspondingly, the correlation is lower when social desirability is high for a given domain than when it is not. A similar analysis of IAT data collected via the Internet also suggests that self-presentation has a small attenuating effect on the same correlation (d = .04), as does

believing that one's explicit attitudes are disapproved by one's social group (d = .24). In any case, there is no perfect relation between self-presentational concerns and dissociation, as exemplified with a .33 correlation for racial attitudes and a .37 correlation for attitudes about the seasons (i.e., winter and summer).

Separate interacting systems. It also is possible to conceive of separate yet interacting explicit and implicit attitudes. For example, Gawronski and Bodenhausen (2006) stated that implicit and explicit attitudes are the result of two different underlying mental processes: associative and propositional processes. Associative evaluations can be activated regardless of whether or not a person considers these evaluations accurate. In contrast, explicit attitudes are evaluative judgments about an attitude object that are rooted in the processes of propositional reasoning.

Importantly, Gawronski and Bodenhausen pointed out that explicit and implicit attitudes have reciprocal influences on each other. People often use automatic-affective reactions (implicit attitudes) towards an object as a basis for evaluative judgments (explicit attitudes) about the object. This influence, however, should occur if and only if the automatic affective reaction is considered valid (i.e., consistent with other propositions). There also are potential influences of evaluative judgments on implicit associations. Presumably, if new propositions make connections between an object and an evaluative category, these connections should be represented as implicit attitudes.

Continuum. Fazio and Olson (2003) have questioned the hypothesis that implicit and explicit attitudes are two different attitudes. They argued that research participants are likely unaware that their attitudes are being assessed by means of some implicit measure. However, successful concealment of the research question does not imply that

participants are unaware that they possess these attitudes. That is, people may be aware of the evaluative material in implicit measures, but they may lack the opportunity and motivation to correct for their reactions to it. The more sensitive the issue, the greater the likelihood that people will be motivated to exert an influence on overt responses to an explicit measure. In this situation, the implicit measure captures relatively raw material in memory, whereas the direct measure captures reactions altered by the opportunity and motivation to conform to a normative standard (social desirability).

Hypothesizing specific roles for motivation and opportunity leads to the prediction that when an issue is sensitive, motivation and opportunity influence what measure predicts behavior. Clearly, when motivation and opportunity are high, explicit measures should be more predictive because the more desirable associations have been deliberatively selected. Further, Fazio and Olson (2003) also predicted that implicit measures should be more predictive when motivation and opportunity are low. That is, if one cannot engage in careful correction, disguise, and/or selection of the implicit associations, the explicit measures should be direct translations of the implicit ones.

Distributed networks. A model by Bassili and Brown (2005; also see Bassili, this volume) suggests that attitudes emerge from microconceptual networks that are activated by particular context configurations. In this model, microconcepts are molecular elements of knowledge that may yield evaluations in combination with other microconcepts in the network. For example, for a person who played competitive tennis as an adolescent, tennis is represented as a collection of microconcepts having to do with the joys of winning, the disappointments of losing, traveling to tournaments, competition, discipline, pressures, fairness, and hanging out with other competitors. These prior experiences

together comprise the microconcepts by which the woman evaluates the sport of tennis.

With the framework above, it is relatively easy to explain the structure of explicit and implicit attitudes. According to the model, explicit and implicit attitudes share the same base of microconcepts, but differ in potentiation, which is akin to level of activation. Potentiation depends on recent and current information about the attitude object and cognitive activity in working memory. Implicit attitudes are activations under the potentiation level, which therefore preclude the involvement of deliberate processes. In contrast, explicit attitudes are activated by deliberative process facilitated by working memory.

Attitudinal Judgments

Processes Underlying Judgments and Corresponding Structures

Online judgments are formed when one considers evaluative aspects of an object either explicitly or spontaneously. Explicitly, one may open a clothing catalog with the intent of evaluating the designs. Alternatively, one may browse the catalog with the intent of selecting pictures for a child's school project and incidentally conclude that some of the designs are attractive. In the following section, we consider whether the processes are associative, reasoned, or configural.

Associative processes. Staats and Staats (1957) showed that pairing nonsense syllables with positive or negative words altered the affective response to the nonsense syllables. That is, the evaluation of the words apparently transferred to initially neutral stimuli by what is referred to as *evaluative conditioning*. In this phenomenon, the positivity of a stimulus transfers to another regardless of the order of presentation. The valenced stimulus can precede, follow, or appear at the same time as the neutral stimulus,

suggesting that mere associative processes are at stake.[i] These same processes can explain how one particular association can influence other associations as they come into working memory (see Walther & Langer, this volume).

Reasoned processes. Attitude judgments also can emerge from the application of formal reasoning**.** For example, expectancy value models have been prominently applied to describe how attitudes are derived from beliefs through the process of formal reasoning. When purchasing a car, people often form their attitudes about a particular car by determining the car's attributes and the desirability of each attribute. In this case, the judgment is determined by the evaluations of attributes or outcomes associated with the car, the strength of the car-attribute associations, and the rule used to combine these cognitions. In Fishbein and Ajzen's (1975) formulation, A_B is the attitude toward the behavior, b_i is the strength of the belief that the behavior will lead to outcome i, e_i is the evaluation of outcome i, and the sum is over all salient outcomes (see Fishbein & Ajzen, 1975; also see Ajzen & Gilbert Cote, this volume).

$$A_B = \Sigma b_i e_i \qquad [1]$$

Similarly, a conceptualization proposed by McGuire (1960, 1981) and extended by Wyer and Goldberg (1970; see also Wyer, 1974, 2003) addressed how prior beliefs can influence new beliefs and attitudes. McGuire (1960) stated that two cognitions, *A* (antecedent) and *C* (conclusion), can relate to each other by means of a syllogism of the form "*A*; if *A*, then *C*; *C*." This structure implies that the probability of *C* (e.g., "an event is good") is a function of the beliefs in the premise or antecedent, and beliefs that "if *A* is true *and* if ~*A* (Not *A*) is true, *C* is true." Further, Wyer (1970; Wyer & Goldberg, 1970) argued that *C* might be true for reasons other than those included in these premises. That

is, beliefs in these alternate reasons should also influence the probability of the conclusion ("not *A*; if not *A*, then *C")*. Hence, the belief that C is true, *P*(*C*), should be a function of the beliefs in these two mutually exclusive sets of premises, or:

$$P(C) = P(A)P(C/A) + P(\sim A)P(C/\sim A), \qquad [2]$$

where *P*(*A*) and *P*(~*A*) [= 1-*P*(*A*)] are beliefs that *A* is and is not true, respectively, and *P*(*C*/*A*) and *P*(*C*/~*A*) are conditional beliefs that *C* is true if *A* is and is not true, respectively.

A limitation of the conditional inference model described above is the use of a single premise. Although other criteria are considered, these criteria are lumped together in the value of *P*(*C*/~*A*), or the belief that the conclusion is true for reasons other than *A*. In contrast, other formulations consider multiple factors. Slovic and Lichtenstein (1971), for example, postulated that people who predict an unknown event from a set of cues are likely to combine these cues in an additive fashion. Therefore, regression procedures can be used to predict beliefs on the basis of several different pieces of information. In this case, the regression weights assigned to each piece provide an indication of its relative importance (Wiggins, Hoffman, & Taber, 1969). Nevertheless, the assumptions that underlie these linear approaches often are incorrect (Anderson, 1974, 1981; Fishbein & Ajzen, 1975; Tversky, 1969; Wiggins & Hoffman, 1968). Birnbaum and Stegner (1979), for example, found that participants' estimates of a car's value was an *average* of its blue book value and the opinion of another person, with the weight of each piece of information depending on the credibility of its source. Hence, nonlinear models are necessary to understand the influence of beliefs on attitudes.

Configural or structural processes. In many instances, neither summative

nor averaging models (see Anderson, 1959; Fishbein & Ajzen, 1975) may be applicable. Kahneman and Tversky (1982) provide strong evidence that people's estimates of the conjunction of two features (e.g., the likelihood that a woman is a feminist bank-teller) are not predictable from their estimates of each feature (i.e., being a feminist or being a bank teller) considered in isolation. In these instances, people appear to process the information configurally rather than construing the implications of each piece of information separately (see Wyer & Carlston, 1979). One possible configural or structural arrangement relates to *good form*, in the spirit of Gestalt psychology. For example, information that is easier to process often is associated with positive affective reactions. Hence, harmoniously organized information is likely to produce more positive attitudes than disorganized information. Consistent with this hypothesis, Simmons and Nelson (2006) found that people were less confident in predicting the winning of their favorite team over the underdog when the game information was presented in poor, difficult-to-read (vs. easy-to-read) font, which reduced fluency and positive affect (Werth & Strack, 2003).

Another configural process relates to the organization of information in a *familiar form*. As research on mere exposure shows, neutral information gains in favorability with its mere presentation (Zajonc, 1968; see Bornstein, 1989, for a review). For example, Law, Schimmack, and Braun (2003) presented brief video sketches containing one of two brands of food products to a group of participants. One week later, despite their lack of recall or recognition of the presentation, participants liked the previously-presented brands better than the unpresented ones.

A third type of configural process is *syntactic parsing, or the arrangement of*

stimuli using propositional structures (e.g., a subject-action pair). Judgments emerge from temporally-organized information stored in working memory. As stimuli flow through working memory in a particular sequence, the order of stimuli can determine judgments. For example, linguistic propositions may emerge when the order of relatively random material in working memory is syntactically compatible with a given proposition (Chomsky, 1959). Noguchi, Albarracín, and Fischler (2006) investigated the formation of intentions based on implicit propositions formed from random environmental inputs. They reasoned that people could form intentions on the basis of the mere succession of certain words presented in a given behavioral context. In this study, participants who previously played a prisoner's dilemma game (the behavioral context) engaged in a word-detection task. The word-detection task, introduced as a filler while awaiting the scores of the game, required participants to press a key when words began with certain letters (e.g., *A* or *N*). In a series of trials, two sets of words comprised the experimental manipulation. The manipulated words were synonyms of either "act" or "nice." In one condition, participants were exposed to the "act" words (e.g., "play"), followed by "nice" words (e.g., "fair"). In the other condition, participants were exposed to the same words in the opposite order ("nice" - "act").

After the word-detection manipulation, participants played another prisoner's dilemma game. The prediction was that the implicit proposition "act"- "nice" might motivate participants to cooperate because the order suggests a command. In contrast, the implicit proposition "nice"- "act" could be perceived as a compliment. As a result, "nice"-"act" may suggest that participants had already been nice in the prior game. In turn, this assessment may reduce the perceived need to be nice on a future game.

Supporting these expectations, the "act"-"nice" sequence increased cooperativeness from the first to the second game. Correspondingly, the "nice"-"act" sequence decreased cooperativeness from the first to the second game. Importantly, these findings were produced with the combination of words; they were not the result of a recency effect in the "be" - "nice" sequence.

Meta-cognitive processes. Human meta-cognitive capacity allows individuals first to form attitude judgments, then form judgments about those judgments (see Jost, Kruglanski, & Nelson, 1998). These types of processes form multilayered judgments in which each judgment is the object of another judgment. For example, analyses of meta-cognitive principles have been applied to attitude confidence, defined as a subjective sense of certainty or validity regarding one's attitudes (see Tormala, this volume). In this case, the object of the attitude is the attitude itself, and the meta-cognitive judgment of attitude confidence entails a judgment about one's attitude. Attitude confidence is higher when one has been repeatedly exposed to the source of the attitude (e.g., an advertisement, Berger & Mitchell, 1989), when one experiences positive affect (Werth & Strack, 2003), and when beliefs and attitudes are univalent rather than complex (Jonas et al., 1997; Prislin, Wood, & Pool, 1998). Attitude confidence has several notable consequences, including using the particular attitude as a basis for later behaviors (Berger, 1999; Fazio, Zanna & Cooper,1978; Albarracin, Wallace, & Glasman, 2004), and increasing the attitude's resistance to change (Babad et al., 1987; Krosnick & Abelson, 1992; Swann et al., 1988).

In addition to studying attitude confidence, researchers have examined confidence in the beliefs or evaluations that underlie a particular attitude toward an object. According

to Petty et al. (2002), people's confidence in the validity of their thoughts about an object, and the valence of these thoughts influence attitudes. That is, when positive thoughts dominate responses to a communication, increasing confidence in those thoughts makes attitudes toward the message topic more favorable. In contrast, when negative thoughts dominate responses, increasing confidence makes attitudes toward the message topic less favorable.

Another meta-cognitive aspect examined in past research is the perceived strength of the persuasive attack. In a series of studies, Tormala and his collaborators (see Tormala, this volume) demonstrated that participants were more certain about their attitudes after resisting an ostensibly strong message than after resisting an ostensibly weak message or after resisting arguments of undetermined normative strength. The authors 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).

Conventional strength, however, is not the only judgment people make of their attitudes. How intuitive a judgment is, for example, can influence attitude confidence (Simmons & Nelson, 2006). Moreover, judgments based on what is subjectively defined as "intuitive" can last longer than judgments based on what is subjectively defined as "reasoned." Presumably, these intuitions are not questioned, or cognitive resources are recruited to bolster them. Both of these processes can explain the durability of intuitions.

Models of the Relation Between Memory Representations and Judgments

Up to now, we considered the structure of attitudes in memory and also the structure of judgments as formed on line without clarifying how memory and online aspects relate to each other. In the following sections, we discuss models that emphasize memory-based influences on judgments, models that assume exclusively on-line influences, and models that consider both memory-based and online influences.

Representational Models of Attitudes

Memory as the Primary Basis for Judgments

Fazio (1986, 1990, 1995; Fazio & Towles-Schwen, 1999) has stated that attitudes are represented in memory as summary evaluations associated with the attitude object. Although the object-evaluation associations are supposedly integrated into broader representational networks, the model concentrates on the strength of the association between an evaluation and an attitude object. Attitudes are thought to fall on a continuum defined on one end by representations of attitude objects that are not associated with a summary evaluation (i.e., *non-attitudes*, see Converse, 1964, 1974), and on the other end, by representations of attitude objects that are strongly associated with a summary evaluation.

According to this model, attitude accessibility is determined by the strength of the association between an attitude object and its evaluation. When the object-evaluation link is strong, the attitude is highly accessible and exposure to the attitude object will activate the prior evaluation. This automatic process is important because activated evaluations can guide thought and behavior in the presence of the attitude object (Fazio, Powell, & Herr, 1983; also see Ajzen, this volume). For example, highly accessible attitudes exert strong influences on behavior (Fazio, 1990) and can bias perceptions of attitude objects

(Fazio, Ledbetter, & Towles-Schwen, 2000). To this extent, information about an object is likely to have a different impact depending on whether or not people possess a prior accessible attitude. Fazio's model, however, does not describe how specific representations are incorporated with other information at the time of making an evaluative judgment.

Models of Rigid Implicit Attitudes

Another example of emphasis on memory-based processes is the assumption that implicit attitudes do not change. Although this assumption later changed, implicit attitudes were initially believed to be difficult to change because they are formed gradually though experiences and learning (see Devos, this volume; Gregg, 2000; Smith & DeCoster, 1999). For example, counterattitudinal information that reliably changes explicit attitudes does not affect implicit attitudes (Gawronski & Strack, 2003; Gregg et al., 2006); McDell, Banaji, & Cooper, 2004). In the area of racial attitudes, White participants directly instructed not to show a bias while performing an Implicit Association Test persisted in showing it (Kim, 2003). Other research suggests that changes that are apparent in explicit attitudes are not observed in implicit ones. In particular, a rise in explicit self-esteem from older to newer generations of East Asian immigrants to the United States is not accompanied by a rise in implicit self-esteem (Hetts et al., 1999), nor are there cross-generational differences in implicit attitudes toward age (young vs. old) and academic disciplines (math vs. arts) (Nosek, Banaji, & Greenwald, 2002). These findings all support the possibility that implicit attitudes can be stable).

Models Emphasizing Online Information

In contrast to traditional representational models of attitudes, constructionist models emphasize that judgments derive from whatever information happens to be accessible at the time. The weak form of Schwarz and Bohner's (2001) model implies that memory-based evaluative information about an attitude object plays a role in current judgments, but this role is not necessarily more important than that of external inputs. The strong form of this argument implies that evaluative judgments are exclusively guided by information present in the external context (Schwarz & Bohner, 2001). For example, individuals may use momentarily-experienced affective reactions (e.g., Schwarz & Clore, 1983) or physiological arousal (e.g., Valins, 1966; Wells & Petty, 1980) to determine their evaluations of objects. They may do this without ever bothering to retrieve a previously stored prior attitude about these objects. In this strong version, even when a prior judgment serves as a basis for a subsequent judgment, the judgment is still constructed anew – it is just constructed using old information from memory.

Online use of information as a basis for judgments can be effectively modeled with an inclusion/exclusion model (see Schwarz, this volume). For example, Stapel and Schwarz (1998) drew participants' attention either to Colin Powell's (a highly popular military leader at the time) decision to join the Republican Party or his decision to reject an offer to run as a presidential candidate for the Republican Party. Subsequent evaluations of the party were more favorable when participants had thought of Powell joining rather than rejecting a party offer. Presumably, including Powel into the evaluation led to assimilating the party to the highly popular leader. In contrast, distancing Powell from the party led to contrasting the party from him.

Models Integrating Memory Representations and Online Information

Social Judgment Theory

According to social judgment theory (Sherif & Hovland, 1961; Eiser, 1973; Eiser & Mower White, 1974; for an excellent review, see Eagly & Chaiken, 1993), attitude change is the result of a perceptual process. When the position of the communication appears close to recipients' attitudes, people become closer to the position advocated in the communication by "assimilating" their own attitude to the advocacy. In contrast, when the communication is subjectively distant from their attitudes, there is a "contrast" effect, or perception that one's attitude is more discrepant from the communication than it actually is. In these situations, people resist change, occasionally even changing in opposition to the communication.

Several other predictions of social judgment theory concern the conditions leading to contrast versus assimilation. A chief assumption is that attitude change is a function of the range of positions a person accepts and rejects. When the message position falls within this latitude of acceptance, people assimilate this position to their attitudes. When the position falls within the latitude of rejection, people contrast their attitudes with that position. Furthermore, topics that are highly involving shrink the latitudes of acceptance and expand the latitudes of rejection. The assumption that heightened involvement increases resistance to change has not received consistent support (for reviews, see Eagly & Chaiken, 1993; Johnson, Maio, & Smith-McLallen, 2005).

Information Integration Theory

Anderson (1974) was one of the first researchers to statistically model the effects of prior attitudes and new information. According to his (1959, 1974) *information-*

integration theory, if a person receives *n* items of information, the response (*R*) to the set of items (*s*, *i*...*n*) is given by:

$$R = w_0 s_0 + w_1 s_1 + w_2 s_2 + \ldots + w_n s_n, \quad [1]$$

where w_i are the weights and s_i are the scale values of each item. Based on the assumption that information is normally combined by averaging rather than adding, the sum of the weights is typically set to 1. Supporting the averaging model, Birnbaum and Stegner (1979) found that estimates of a car's value were an average of information from the Blue Book and the opinion of another person, each weighted by the credibility of each source of information. However, Fishbein and Ajzen (1975) 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 (set-size effect), the averaging model needs to assume an initial moderate attitude to account for the set-size effect (Anderson, 1981).

The Activation and Comparison Model

Albarracin, Glasman, and Wallace (2004) also attempted to conceptualize the role of memory representations and online information in producing evaluative judgments. They proposed an activation and comparison model in which attitude change depends on three processes: (a) activating the prior attitude (retrieving it from memory), (b) activating information related to the prior attitude (which can come from memory or an external source), and (c) comparing the prior attitude with the related information. People presumably can activate their prior attitudes as well as information relevant to those attitudes.

Consider the case in which both prior attitudes and new information from a persuasive message (e.g., a political ad) are activated. If one recognizes the message information as being the basis for the prior attitude (redundancy), one may simply select the prior attitude that summarized the information. However, if the retrieved information is new, one may attempt to integrate this information. Integrating this information may entail assigning equal weights by default. Then, both the prior attitude and the new information will be combined through simple average (Anderson, 1974). Alternatively, comparison may ensue (see Muthukrishnan, Pham, & Mungale, 1999, 2001; Pham & Muthukrishnan, 2002). Then, both perceptual comparison as well as comparative validation may determine how the information will be integrated. Perceptually, the new information may appear more invalid when juxtaposed to prior confident attitudes than it would appear alone (Sherif, 1964; a perceptual effect). In addition, people may reason that if the new information appears valid even when it is discrepant with one's prior attitudes, this attitude may be more valid when juxtaposed to the attitude than alone (an inferential or comparative validation process). That is, the weights of the prior attitude and the new information may become interdependent.

These observations suggest that there are lower-level, perceptual types of comparative processes as well as inferential forms of comparative validation. Either form of comparison can involve a number of elements. One may simply wish to compare one's prior attitude with a current attitude to determine if the attitude has changed. Or one may compare the direction or validity of the prior information with the direction or validity of the current information. Importantly, these comparisons may be performed very quickly or may require more time. When they require time, the ability to activate the prior

attitude quickly increases the chance of comparative processes that modify the weights of the information. Thus, although in many conditions quick recall of the prior attitudes increases stability (Fazio, 1989), by facilitating comparison high prior-attitude activation can also produce *change*.

Models of Malleable Implicit Attitudes

Several recent studies have suggested that implicit attitudes are more flexible than previously thought (Blair & Banaji, 1996; Blair, Ma, & Lenton, 2000). For example, Dasgupta and Greenwald (2001) found that White participants exposed to favorable exemplars of Black Americans and unfavorable exemplars of White Americans showed weaker implicit pro-White preferences than did control participants. In addition, levels of automatic racial prejudice decrease with casual social encounters with members of the target group (Lowery et al., 2001), suggesting that implicit attitudes are fairly malleable.

The above findings of malleability of implicit attitudes greatly interested social psychologists, producing a sizable literature (see Devos, this volume). Reviews of this research by Dasgupta and Greenwald (2001), Blair (2002), and Bassili and Brown (2005) have identified various conditions in which online information affects implicit attitudes. These conditions include self- and social motives to appear fair *(*Kinder & Sanders, 1996; Schuman, Steeh, Bobo, & Krysan, 1997; Sinclair & Kunda, 1999); cognitive strategies such as invoking an image that counters an implicit attitude (Blair & Banaji, 1996); attention to an attitude object (e.g., a social category;. Macrae, Bodenhausen, Milne, Thorn, & Castelli, 1997; Mitchell, Nosek, & Banaji, 2001); *context reminders of the attitude object (*Macrae et al.,1995, Wittenbrink, Judd, & Park, 2001); and the fit of an external object with the attitude object (Livingston & Brewer, 2002; Macrae, Mitchell, &

Pendry, 2002).

The Potentiated Recruitment Framework

As previously mentioned, models inspired by connectionism (see Smith, 1996) offer an alternative means to account for the influences of both enduring attitudes and the evaluative implications of momentarily accessible information. By explicating the sources of variability in the potentiation of attitudes (e.g., context, goals), this framework integrates prior attitude representations with online information.

Final Comments

"Attitude structure" encompasses rich and diverse themes including how attitude-relevant memories are structured, how judgments are constructed, and whether and how the memory and judgment components interact to produce new judgments. For a while, the study of attitude structure involved simply the literature on explicit attitudes, but the last decade has allowed for new and exciting developments in the area of implicit attitudes. We hope that the next decade will bring further integration of our understanding of explicit and implicit attitudes, and that social psychology will continue to be at the forefront of this important theorizing.

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Authors Notes

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Footnotes

[i] By contrast, classical conditioning requires that the valenced (conditioned) stimulus be followed by the unconditioned stimulus, thus ensuring that the conditioned stimulus will signal the unconditioned one.