

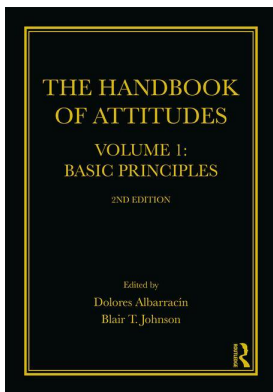
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COGNITIVE AND METACOGNITIVE PROCESSES IN ATTITUDE FORMATION AND CHANGE

Duane T. Wegener, Jason K. Clark, and Richard E. Petty

Most psychological processes involve some form of thought or feeling that influences outcomes like judgments or behaviors. Psychological processes receive a great deal of attention because hypothesized processes help to predict and explain the judgment or behavioral phenomenon and are applicable to a wide variety of specific antecedents of judgment and behavior. Furthermore, such processes often imply or explicitly outline constraints on the circumstances that might lead to that phenomenon or describe the kinds of interventions that might be effective in influencing that phenomenon. The current chapter is concerned with *cognitive processes* that underlie attitude formation and change. Cognitive processes have been at the heart of research on attitudes since the beginning (e.g., Peterson & Thurstone, 1933). But what does it mean for a process to be cognitive?

One very general approach is to note that cognitive processes deal with some form of mental representation in memory (either putting such representations in place, activating them, or using them to inform perceptions, judgments, or behavior). Since the advent of the social cognition approach, what qualifies as “cognition” has become somewhat more inclusive (with cognition melding with traditionally separate categories of psychological processes, such as motivation and emotion; see Wegener & Carlston, 2005, for discussion). Even so, the centrality of cognition to attitude formation and change remains. When the cognition is about another cognition, this is referred to as metacognition (for a review, see Petty, Briñol, Tormala, & Wegener, 2007). Thinking about one’s thoughts or attitudes would qualify as metacognition, and metacognition has gained prominence in attitudes research since the previous edition of this *Handbook* (Albarracín, Johnson, & Zanna, 2005). Thus, in addition to many traditional “primary” cognitive processes, we pay special attention in this chapter to the more recent work on metacognition.

We begin by exploring more deeply what we mean when we use the terms *attitude*, *cognition*, and *process*. We then discuss cognitive processes that have been proposed at different levels of generality. We start with what we call universal processes (i.e., processes that have been used as general descriptions of all attitude formation and change). Next, we discuss what we call component processes (i.e., more “micro” processes that are likely involved and “bundled” into many of the primary mechanisms theorists use to account for attitude formation or change). Finally, we discuss a variety of these primary mechanisms, referring to them as bounded processes because current theory tends to limit their domains of applicability or extent to which they play a role in attitude formation or change. Within each of these sections, we describe the process and we review the existing research addressing it.

Definitional Issues: Attitudes, Cognitive Processes, and Metacognitive Processes

At the outset, we deal with some definitional issues. Like most attitude researchers, we treat attitudes as overall evaluations of objects, which could be physical objects, people (including the self), policies, behaviors, and many other targets. Such evaluations are highly useful as they inform people whether to approach or avoid an object. Therefore, it would make sense for an adaptive cognitive system to represent evaluations in memory (Fazio & Olson, 2003a). However, what form such representations might take has been a matter of debate (see Fabrigar, MacDonald, & Wegener, 2005, this volume).

Following Wegener and Carlston (2005), we consider cognitive processes to “involve one or more recurrent mental events that, in concert, add to, alter, or act upon representations in memory with detectable consequences” (p. 495). Processes are thus not directly observable but constitute hypothetical mechanisms that are understood and defined largely from within the broader theories that postulate their existence. Processes can be described at varying levels of generality (just as theories can be posed at different levels of generality), and this is one reason that we organize the current discussion in terms of how general versus bounded (constrained) the processes are intended to be.

Over the years, the category of “cognitive” process has been compared with other categories such as emotional, motivational, and perceptual processes. One potential distinction between cognitive and the other categories is the central role that mental representations play in cognitive processes. Emotions, motives, and immediate perceptions need not operate on existing mental representations or even create them. However, even if each of these categories of psychological process is maintained, research and theory in recent years has given cognition a key role in each of the other categories. For example, in cognitive appraisal theories of emotion, the experienced emotion is formed based in part on the person’s assessments of how the event affects them and how they might cope with the situation (e.g., Lazarus, 1991). As a result, though we will discuss issues related to motivation and emotion in this chapter, each of these discussions will include direct links with cognitive processes feeding into or affected by those motivations or emotions.

In the early days of the social cognition movement, the definition of a cognitive approach was more tied to encoding, storage, and retrieval or to use of specific models developed in cognitive psychology. This was so much the case that many processes studied in attitude change were not considered as falling under social cognition at the time but likely would be if they had been developed later, as the social cognitive approach broadened (for a discussion, see Wegener & Petty, 2013). Most of the “cognition” in attitudes and social cognition research refers to primary cognition in which particular attributes are associated with an object or the object is related to some dimension of judgment. For example, “I like chocolate cake” would be a primary cognition that would contribute to a favorable attitude. Over the last 10–15 years especially, however, research has examined secondary cognitions, such as “I wish I didn’t like chocolate cake so much” or “I am sure I like chocolate cake” (for a review, see Petty et al., 2007). It is these secondary cognitions (or cognitions about cognitions or cognitive processes) that are labeled as *metacognition* (i.e., cognition about cognition, or thinking about thinking) and can affect the extent to which thoughts are used in judgment. Later in the chapter, we describe a burgeoning literature on metacognition in persuasion.

As components of broader theories, cognitive and metacognitive processes can be defined and described at varying levels of generality or scope. Table 7.1 lists the categories of process descriptions we discuss in this chapter along with brief descriptions of those categories. The table also lists example processes from each category that will be reviewed in the chapter. As discussed in detail by Wegener and Carlston (2005), there is no magic formula or procedure for determining equivalence or nonequivalence of processes. Various techniques must often be used as part of a “triangulation” strategy, though even triangulation on its own may not adequately address questions of how to

Table 7.1 Process Description Categories, the Nature of and Exemplars From Each Category

<i>Level of Process Description</i>	<i>Nature of the Category</i>	<i>Exemplar Processes</i>
Universal	Processes as general operations, rules or metaphors that could characterize almost any form of thought.	<ul style="list-style-type: none"> – Expectancy-value – Information integration – If-then reasoning
Bounded	Processes as varying in their applicability or impact across domains. Different processes depicted at similar levels of abstraction predominate in different circumstances or for different people (<i>here arrayed along a continuum of amount of elaboration</i>).	<p><i>LOWER-ELABORATION PROCESSES</i></p> <ul style="list-style-type: none"> – Mere association – Simple inference (<i>adding</i>) – Attribution – Use of heuristics – Balance/congruity <p><i>HIGHER-ELABORATION PROCESSES</i></p> <ul style="list-style-type: none"> – Cognitive responses – Cognitive dissonance – Metacognition (self-validation, bias correction) – Complex inference/integration/reasoning (<i>Expectancy-value, averaging</i>)
Component	Processes as having very limited responsibilities. Several (if not more) must be linked to account for even fairly simple phenomena.	<ul style="list-style-type: none"> – Knowledge/attitude activation – Categorization – Perceptual distortion – Attention – Recall/memory (for persuasive messages) – Message reception – <i>Modes of integration (adding/averaging)</i>

relate a given process to other processes. Process differentiation often comes down to clear theorizing about the mechanisms responsible for an outcome and development of tests or measures that adequately tap into the constructs of interest. For example, consider the classic debate between dissonance (Festinger, 1957) and self-perception theory (Bem, 1967). Decisions to retain both theories came from evidence supporting a necessary role for discomfort in at least some effects predicted by dissonance theory (e.g., Zanna & Cooper, 1974) along with evidence that similar effects sometimes occurred without discomfort (consistent with self-perception theory, Fazio, Zanna, & Cooper, 1977). Without a clear theoretical difference regarding the role of discomfort and without methods to adequately tap into or infer the presence of discomfort, the theoretical ambiguity would have remained (cf. Greenwald, 1975).

Each psychological theory includes processes specified at particular levels of generality, and each theory might include differing numbers of processes, depending on the goals of the theorist. At least in our reading, the majority of theorizing in attitudes research has involved some form of bounded processes. As a result, we spend much of this chapter describing bounded processes, the impact of which are related to particular types of classic or contemporary effects in the attitude formation and change literature. A general framework that has proven helpful in specifying “bounds” related to many theories of attitude change is the elaboration likelihood model (ELM; Petty & Cacioppo, 1986; Petty & Wegener, 1999; Petty & Briñol, 2012; for a similar approach, see Chaiken, Liberman, & Eagly, 1989). In particular, we use the elaboration continuum—a continuum of depth of

processing going from very low (superficial, non-effortful thought) to very high (deep, effortful thought)—to organize processes and theories of attitude change (see also Petty & Wegener, 1998a). Before organizing the literature on bounded processes, however, we begin by describing universal and component processes and by providing a more general introduction to the concept of bounded processes.

Cognitive and Metacognitive Processes

In the remainder of this chapter, we discuss cognitive and metacognitive processes that have been studied specifically with respect to attitude formation and change. Some of the processes have also received attention in other areas such as impression formation or attitude-behavior relations, but most have received primary attention in discussions of persuasion. As noted previously, different researchers have focused on processes with different levels of generality. Some theories propose mechanisms of persuasion that are very general, to the point of saying that all of attitude change results from, in essence, the same (universal) process. Other theories use (bounded) processes with more limited domains of applicability. Such process must then be supplemented by other processes to completely capture the phenomena of interest. Finally, some processes constitute even lower-level, *component* processes, many of which might come together to produce even rather simple outcomes. We begin by discussing universal process descriptions followed by the component process descriptions. Though the universal process descriptions represent particular theories of attitude change, the component processes represent only pieces of some theories or effects. The majority of the remainder of the chapter organizes and discusses the bounded process descriptions that are most common in attitude change.

Universal Process Descriptions

The greatest draw to universal process descriptions may be that they seem parsimonious. Scientists prefer to use the fewest distinctions necessary when explaining phenomena, so it should not be surprising when people prefer explanations that employ a single process rather than two or more. Most readers will already know how common it is for dual-process models in social psychology to posit relatively effortless (automatic, peripheral, heuristic) and relatively effortful (controlled, central, systematic) processes (Chaiken & Trope, 1999; Sherman, Gawronski, & Trope, 2014). Although these theories (e.g., ELM, HSM) are universal theories in that they are meant to apply to all persuasion phenomena, the processes that they refer to are bounded. In contrast, some theorists have argued that a single process can capture and account for all of this research (Kruglanski & Thompson, 1999). More generally, over the history of research in attitude change, a number of theories have relied on processes that are assumed to be virtually universal.

The Expectancy-Value Approach

A common theoretical approach in a variety of areas of social psychology has been to posit a weighting of various “values” by the extent to which the person would “expect” those values to go with the object or state being judged. In the attitude change domain, Fishbein and his colleagues would solicit salient attributes of attitude objects from one set of participants. Then, another set of participants would report their perceived likelihood of the object possessing the attribute (expectancy) and their evaluation of the attribute (value). Likelihood \times evaluation (expectancy \times value) products would be created for each attribute and summed across attributes (e.g., Fishbein & Ajzen, 1975). In a wide variety of settings, overall evaluations of attitude objects are predicted by such belief structures (e.g., Middlestadt, Fishbein, & Chan, 1993; Ottati, Fishbein, & Middlestadt, 1988), and the Theories

of Reasoned Action (Fishbein & Ajzen, 1975) and Planned Behavior (Ajzen, 1991) incorporate this general approach to this day. Such results prompted Fishbein and his colleagues to argue that all attitude change is “cognitive” (Fishbein & Middlestadt, 1995). By this, they meant that all attitude change can be captured by the appropriate expectancy \times value indices. Thus, we list expectancy-value consideration as one of the universal process descriptions in Table 7.1. However, consistent with more recent “bounded” theorizing, researchers have also suggested that combining perceptions of attribute likelihood and desirability into an overall evaluation may require cognitive effort. Consistent with this possibility, some research has demonstrated that likelihood-by-desirability products predict overall attitudes better in circumstances or for people who would be expected to put forth greater cognitive effort (e.g., Albarracín & Wyer, 2001). Thus, expectancy-value mechanisms could also be viewed as a higher-elaboration mechanism within a bounded theory of persuasion (see “Bounded” section of Table 7.1 and later discussion of combinatorial/integrative processes).

Information Integration

Information integration theory (Anderson, 1971) took an approach similar to the expectancy-value model’s product of likelihood and desirability for each attribute. Information integration theory posited that salient pieces of information are weighted by their importance in arriving at an overall attitude. However, whereas the expectancy-value approach added likelihood \times desirability products, information integration theory posited an averaging process. That is, a person’s final attitude would be a weighted average of the person’s initial evaluation and any new information (or thoughts in reaction to the message; Anderson, 1981). In this approach, factors such as source credibility could be treated as influencing the weights of information provided by the source (Birnbaum, Wong, & Wong, 1976).

Though some theorists still treat information integration (averaging) as a universal process, research has also suggested that different modes of integration can occur across different situations. For example, Betsch, Kaufmann, Lindow, Plessner, and Hoffmann (2006) found averaging effects when people were asked to intentionally evaluate stock shares but found adding effects when people were not asked to evaluate the stocks (but did so unintentionally and perhaps automatically). Thus, one could consider traditional information integration (averaging) as more likely under higher-elaboration settings (see “Bounded” section of Table 7.1). Because one must add or average some content and some forms of input—such as likelihood \times desirability products—require more effort to construct, one might consider adding versus averaging as component processes that supplement additional mechanisms (see “Component” section of Table 7.1).

Probabilistic/Syllogistic/If-Then Reasoning

Formal rules of logic have long been discussed as a basis for understanding attitudes and beliefs. For instance, a positive evaluation of exercise could follow from the premise that exercise leads to longer life together with the premise that longer life is desirable (e.g., McGuire, 1960; Wyer, 1974). Of course, not all people would hold similar beliefs linking exercise to long life, and people might even differ in the extent to which long life is viewed as desirable. In addition, other premises linking exercise to hard work and characterizing hard work as unpleasant could reduce people’s favorability toward exercise. When many premises relate to the same attitudinal conclusion, the belief system is said to have extensive horizontal structure (McGuire, 1981). Though this example parallels aspects of the expectancy-value approach, the premises in a syllogism need not address an attribute of the attitude object and its desirability. The probabilistic approach also goes beyond expectancy-value in that the probability of a conclusion depends on (a) the probability that the two premises are true, (b) the probability of the conclusion given that the two premises are true, (c) the probability that the two

premises are not true, and (d) the probability of the conclusion given that the premises are not true (for equations and comparisons of the McGuire and Wyer approaches, see Eagly & Chaiken, 1993).

The probabilistical approach is quite flexible in that it can be used to conceptualize the impact of heuristics (such as “the source is an expert” and “experts can be trusted,” “therefore, I trust the message,” Chaiken, 1987) or message-based persuasion (Eagly & Chaiken, 1993; McGuire, 1981). One interesting notion from the probabilistical approach concerns indirect change. That is, because a premise or conclusion can become a premise for other syllogisms, changes in one element of the system can result in changes in other, unmentioned attitudes (for a recent example, see Blankenship, Wegener, & Murray, 2012; for a review and additional theory, see Glaser, Dickel, Liersch, Rees, Süßenbach, & Bohner, 2015; Wyer & Albarracín, 2005).

Building on the probabilistical approach, Kruglanski and Thompson (1999) characterized all of attitude change as reflecting “if-then reasoning.” This “unimodel” view adopted concepts from more “bounded” theories to treat attitude change as sometimes reflecting relatively thoughtful processes and sometimes relatively nonthoughtful processes. However, Kruglanski and Thompson (1999) characterized such differences in terms of different amounts of the same hypothesis-testing process. This contrasts from theories proposing “bounded” processes (discussed later) that would entertain different underlying mechanisms both within particular levels of amount of processing and across different levels of processing. One potential benefit of describing processes at this high level of generality might be to highlight commonalities across many phenomena. For example, beyond persuasion, the unimodel has been applied to attribution (Chun, Spiegel, & Kruglanski, 2002) and a wide variety of judgmental phenomena (Erb, Kruglanski, Chun, Pierro, Mannetti, & Spiegel, 2003). Yet, if that broad description requires use of concepts from more bounded approaches in order to accord with the data, the benefits may be more apparent than real (see Wegener & Carlston, 2005; Wegener & Claypool, 1999).

Role of Universal Processes in Persuasion Theorizing

Over the last 30 years, the majority of theorizing about attitude change has used bounded processes. Some principles connected to the universal processes have clearly been useful (e.g., indirect attitude change). However, perhaps by their very nature, the universal process models have tended to be more descriptive than explanatory. One could measure expectancy-value components and tie changes to likelihood (e.g., Wegener, Petty, & Klein, 1994) or desirability (Johnson, Smith-McLallen, Killea, & Levin, 2004). Yet, predictions about which components had more impact or when each was more important or questions about which sources, messages, or conditions would lead to greater persuasion generally came from complementary theorizing. Similarly, the information integration approach described changes in weights of particular information, but it was relatively silent regarding a priori determinants of the weights (for additional discussion, see Eagly & Chaiken, 1984).

The unimodel has been touted as more parsimonious than dual- or multi-process models, because two or more processes are replaced by different amounts of a single process in accounting for phenomena (Kruglanski & Thompson, 1999). Yet, the simple notion of if-then reasoning does not make any more predictions than the expectancy-value or information integration approaches. The unimodel retained its single-process framing only by adding moderators that were adapted (and renamed) from the dual- and multi-process theories. For example, whereas the ELM would suggest that higher levels of motivation and ability to put effort into evaluating an attitude object would lead to greater impact of assessments of *central merits* of the attitude object (Petty & Cacioppo, 1986), the unimodel suggests that greater effort in processing increases the impact of information with greater *relevance to the (evaluative) conclusion* (Pierro, Mannetti, Kruglanski, & Sleeth-Keppler, 2004; cf. Darke, Chaiken, Bohner, Einwiller, Erb, & Hazelwood, 1998). To us at least, it seems that central merits of an object are, by definition, more relevant to the evaluative conclusion (see Wegener &

Claypool, 1999). As a result, much of the apparent parsimony in the unimodel is parsimony only in labels or descriptions rather than in the explanation *per se*.

A common criterion for evaluating theories concerns the generative potential of the theory compared with prior theories. To be sure, when the dual- and multi-process theories of persuasion were developed, they generated many novel predictions about traditional persuasion variables such as distraction (Petty, Wells, & Brock, 1976) and involvement (Petty & Cacioppo, 1979). To date, it is harder to make the case that theories positing a universal process do more than describe what has happened in a given persuasion setting or repackage the predictions that would have followed from the same variables that were developed using dual- or multi-process perspectives. Ultimately, when constructing theories of attitude change, researchers must decide which distinctions are important (see Petty, Wheeler, & Bizer, 1999). Renaming a variable studied elsewhere under another name can even restrict progress by producing unrecognized redundancy; see Wegener & Carlston, 2005, for additional discussion).

Component Process Descriptions

Many specific cognitive processes associated with encoding, storage, and retrieval in memory could be considered as components of the bounded (or universal) processes. Some of these processes played key roles in early theories of attitude change that were focused on memory for a persuasive message, and some of these processes continue to receive research attention in their own right.

Activation of Attitudes/Knowledge

The concepts of construct activation and accessibility have long been central to research conducted under the social cognition (Bruner, 1957; Higgins, 1996) and judgment and decision-making (Kahneman, 2003) labels. In the attitudes domain, more research links attitude accessibility to attitude-behavior consistency than to attitude change (for reviews, see Fazio, 1995; Fazio & Olson, 2003a). The work on attitude-behavior consistency suggests that accessible attitudes can remain more stable over time than inaccessible attitudes (Fabrigar, Wegener, & MacDonald, 2010; cf. Zanna, Fazio, & Ross, 1994). One reason for persistence over time may be that accessible attitudes are more likely than inaccessible attitudes to resist change when faced with social influence (Bassili, 1996). Recent research suggests that this is one reason why general action goals can increase resistance to change. That is, when expecting to receive a persuasive message on a topic, activating a general action goal leads to activation of the related attitude, which then reduces message-consistent attitude change (Albarracín & Handley, 2011).

Attitude activation could contribute to a number of the bounded processes described later. For instance, peoples' own accessible attitudes might be used as "cues" or in "heuristics" to accept or reject a persuasive message (Wegener, Petty, Smoak, & Fabrigar, 2004). Accessible attitudes also more powerfully bias the processing of attitude-relevant information (Houston & Fazio, 1989; Schuette & Fazio, 1995). Accessible attitudes could also influence universal processes, such as receiving greater weight in information integration, or other component processes, such as more powerfully directing selective attention (Roskos-Ewoldsen & Fazio, 1992b). Finally, as discussed later in the chapter, pre-message attitude accessibility can also influence the amount of elaboration one undertakes when receiving a persuasive message (and such effects can be moderated by the discrepancy between that pre-message attitude and the position taken by the message; Clark & Wegener, 2013).

Popular measures of working knowledge also seem likely to reflect the amount of accessible or recently activated object-relevant knowledge rather than the total amount available in memory (Fabrigar et al., 2005; this volume). In some ways, activated knowledge may serve similar roles to those played by accessible attitudes. For example, accessible/recently activated knowledge could bias information processing by influencing interpretations of new information or combining with it

(e.g., to increase the weight given to new information that is consistent with accessible knowledge). Activated knowledge could also feed into perceptions of the extent of one's knowledge. One type of metacognition may be whether one's perception or judgment is well-formed and has a strong (rather than weak) basis, so perceptions of high levels of knowledge could increase faith in one's current attitude or judgment (cf. Petty et al., 2007). Knowledge accessibility could also influence the ease with which information is retrieved or generated, which can also affect the ease and fluency with which evaluations are made (Wyer & Albarracín, 2005). Experiences of ease or fluency can serve as additional potent metacognitions that determine the extent to which the content of the generated thoughts is used to formulate related judgments (e.g., Tormala, Petty, & Briñol, 2002; see later discussion of metacognition).

Categorization and Perceptual Distortions

Categorization is a fundamental cognitive process intertwined with issues of activation (Lingle, Altom, & Medin, 1984; Macrae & Bodenhausen, 2000). Many social objects can be categorized in multiple ways, and individuals tend to focus on those categories that have been used most frequently or recently (Higgins, Bargh, & Lombardi, 1985) and those that are associated with the most accessible attitudes (Smith, Fazio, & Cejka, 1996). Once an attitude object has been categorized along one dimension (e.g., race) other alternatives (e.g., gender) are actually inhibited, making perceivers less aware of the attributes (and, presumably, the attitudes) associated with the unused category (Macrae, Bodenhausen, & Milne, 1995). Once an object has been categorized, it also becomes associated with attitudes linked to that category, even if the attributes associated with the category are no longer salient (Castelli, Zogmaister, Smith, & Arcuri, 2004).

Attitudes themselves can also lead people to categorize evaluative statements as “for them” or “against them.” For example, consistent with social judgment theory (Sherif & Hovland, 1961), evaluative statements that are relatively close to one's own attitude are assimilated to one's own view (i.e., viewed as more similar to one's view than they actually are), whereas evaluative statements farther from one's own attitude are contrasted away from one's own view (i.e., viewed as more dissimilar to one's view than they actually are; Sherif & Sherif, 1967). In social judgment theory, perceptions of the message as relatively unbiased were supposed to increase the impact of messages as discrepancy increased within one's “latitude of acceptance,” whereas perceptions of the message as relatively biased were supposed to decrease the impact of messages as discrepancy increased within one's “latitude of rejection.” The proposed curvilinear effects of message discrepancy were found in some studies (e.g., Bochner & Insko, 1966), but evidence for the role of latitudes of acceptance/rejection or the related message perceptions has been illusive (Eagly & Telaak, 1972).

Categorization and perceptual distortions could influence many of the thoughtful and non-thoughtful processes discussed later in the chapter. For example, when different categorizations call up different stored evaluations, the evaluations could be used as simple (nonthoughtful) “cues” to accept or reject a persuasive message (Wegener et al., 2004). Distortions in perceptions of the message position could also influence such nonthoughtful acceptance or rejection. When thinking (elaborating) more thoroughly about an object, categorization of the object could determine which information is brought to bear on the evaluation and which information is viewed as informative about the object. Perceptual distortions might also influence interpretations of the information as message recipients are generating cognitive responses integrating multiple pieces of information and evaluative knowledge into an overall evaluation.

Attention

From very early on in the development of persuasion theory, researchers assumed that learning the message and remembering it over time were important for the long-term impact of the message

(Hovland, Janis, & Kelley, 1953). That is, they assumed that people had to attend to the message, comprehend its meaning, yield to the message (accept it as true), and retain the message content. Thus, attention was the most basic first step leading to memory of the message content (see Sherman, 1987, for discussion of attention as a core cognitive process related to message-based attitude change).

Attention could also combine with attitudes to influence memory. In studies of the attitude congeniality effect in memory, for example, the recipient of the information could pay more attention to attitude-consistent information than to attitude-inconsistent information (at least such efforts were consistent with early dissonance-based predictions, see Frey, 1986). Perhaps especially in studies that externally control the pace of the information, there may be little room for attention differences, and congeniality effects in memory have been relatively small and inconsistent (Eagly, Chen, Chaiken, & Shaw-Barnes, 1999). One important aspect of attention not generally considered in early persuasion theorizing is that attention need not be “positive” attention. As an example, attitude-inconsistent information can be memorable precisely because people pay attention in the process of countering (Cacioppo & Petty, 1979; Eagly, Kulesa, Brannon, Shaw, & Hutson-Comeaux, 2000).

When information seekers can choose to pay attention to attitude-consistent versus inconsistent information, selective preference for attitude-congenial information depends on a number of factors (Hart, Albarracín, Eagly, Brechan, Lindberg, & Merrill, 2009; Smith, Fabrigar, & Norris, 2008). Preferences for attitude-consistent information are stronger when the person must be selective because of limited time to process information and when they are preparing for attitude expression (Smith, Fabrigar, Powell, & Estrada, 2007). Attitude-consistent exposure can also be greater when the person’s attitude is strong rather than weak (Brannon, Tagler, & Eagly, 2007). There are limits on these effects, however. For some kinds of weak attitudes, such as ambivalence or doubt, the experience of the weakness can itself be uncomfortable. In such settings, when available information seems capable of strengthening the attitude, people actually tend to seek more attitude-supportive information when attitudes are weak (held with doubt or ambivalence) rather than strong (held with certainty or without ambivalence; Sawicki et al., 2011; Sawicki et al., 2013). Part of the reason for such effects may be that a strong attitude makes the person believe that they can adequately defend against counterattitudinal information, thereby making them more willing to expose themselves to it (Albarracín & Mitchell, 2004). Additional factors come into play when selective exposure occurs after a decision is made as opposed to during an initial decision. For example, Fischer and Greitemeyer (2010) presented an integrated model of defense versus accuracy motivation, with defense (e.g., of a prior decision) increasing attitude-consistent exposure and accuracy sometimes reducing attitude-consistent exposure (when related to the decision-making context) and sometimes increasing attitude-consistent exposure (when related to the information search context).

Recall/Memory (for Persuasive Messages)

Though the Hovland group assumed that message impact relied on memory for message arguments, the data were less than encouraging. A number of message-based persuasion studies produced weak (near-zero) correlations between message memory and attitudes or changes in attitudes over time that failed to mirror changes in memory (e.g., Insko, 1964; Miller & Campbell, 1959; Watts & McGuire, 1964). There might have been many reasons, but perhaps the most recognized is that a pure learning model does not account for individuals’ unique evaluations of information in the message. Two people could remember a piece of information, but one might find the argument very compelling whereas the other finds the same argument laughable (see Petty, Ostrom, & Brock, 1981). Indeed, correlations between memory and attitudes are stronger when weighting the recalled information by the person’s evaluation of the information (Chattopadhyay & Alba, 1988).

The Hovland group assumed that memory would follow high levels of attention. Yet, paradoxically, research has shown that, if anything, memory for message arguments predicts attitudes better when initial attention to the message (and processing of it) is low rather than high (e.g., Haugtvedt & Petty, 1992; Mackie & Asuncion, 1990). This could happen if people do not initially evaluate the attitude object but, when later asked to report an attitude, they make memory-based judgments (Hastie & Park, 1986). One might be tempted to assume that high levels of elaboration equate to online judgments and low levels of elaboration equate with memory-based judgments. It may be natural to engage in online evaluation when motivated to process attitude-relevant information such as when individuals are high in their need to evaluate (Jarvis & Petty, 1996; see Tormala & Petty, 2001). Yet, when initially unmotivated or unable to process and people later make memory-based judgments, they might evaluate that information in thoughtful or nonthoughtful ways (such as using the amount of information recalled as a “cue” to how much information supports the advocated position; cf. Petty & Cacioppo, 1984).

Message Reception

McGuire (1968) divided the processes from the Hovland et al. (1953) message-learning approach into reception (including attention, comprehension, and, to some extent, retention) and yielding. McGuire further suggested that some persuasion variables might primarily influence reception, whereas others might influence yielding (and sometimes might affect the two mechanisms in opposite directions). For instance, as message recipient intelligence increases, ability to receive the message might improve, but the recipient might also be less willing to yield to the message (e.g., because they hold their pre-message opinions with confidence). In such cases, a moderate level of recipient intelligence should lead to the greatest persuasion (the compensation principle, McGuire, 1968). A meta-analysis of studies examining recipient self-esteem supported the hypothesized curvilinear pattern for self-esteem, but a parallel analysis only showed a negative relation between intelligence and persuasion (Rhodes & Wood, 1992). According to the reception/yielding perspective (McGuire, 1968), this pattern could occur if the studies did not include message recipients with low enough levels of intelligence or because the messages in the studies were simple enough that reception was generally high and yielding became the primary determinant of persuasion (see also Briñol & Petty, 2005, this volume).

Bounded Process Descriptions

Most process descriptions in attitude change implicate processes that are broader than the component processes (and may involve more than one component process) but that operate in a more restricted domain than claimed by the universal processes. Like dissonance and self-perception, different bounded processes are generally described as having different antecedents and are expected to have at least some nonoverlapping consequences (in terms of judgment, thought, or behavior).

One distinction that runs through many of the bounded processes relates to the categories of associative versus propositional processes (for models built on this distinction, see Gawronski & Bodenhausen, 2006; Strack & Deutsch, 2004; similar distinctions have also been addressed by postulating different association-based and rule-based memory systems; e.g., Rydell & McConnell, 2006; Smith & DeCoster, 2000). As discussed later in the chapter, these and related distinctions have been key to conceptualizing independent influences on implicit versus explicit measures of attitudes. In general, *associative* processes work through feature similarity and spatiotemporal contiguity to determine which mental contents are activated when, for example, an attitude object is encountered. In contrast, *propositional* processes involve assessments of the validity of activated mental contents (often using cognitive consistency principles in such assessments).

Because what is activated can determine the consistency of considered contents and assessments of validity can include selective activation and consideration of attitude-related knowledge, the two types of process can influence one another in addition to working independently (see Gawronski & Bodenhausen, 2014). Thus, in many settings, the processes at work involve both associative and propositional mechanisms. This approach has a number of interesting implications, such as suggesting that expectancy-violating counterattitudinal experiences enhance attention to incidental features of the environment and integrating those experiences into the representation of the attitude object (Gawronski, Rydell, Vervliet, & De Houwer, 2010). As a result, those counterattitudinal experiences affect implicit measures of evaluation only in the environmental contexts where those experiences occurred; in contrast, initial attitude-consistent experiences affect implicit measures of evaluation across contexts (see Gawronski & Cesario, 2013). Also, negating a proposition repeatedly can ironically enhance the associative link between the object and the (negated) evaluative information, leading to dissociations between implicitly and explicitly measured evaluations (e.g., Deutsch, Gawronski, & Strack, 2006; unless the negations are more meaningful and affect automatic prejudice in proposition-consistent directions; Johnson, Kopp, & Petty, in press). As discussed by Gawronski and Bodenhausen (2014), the distinction between associative and propositional processes can be related to, but is not synonymous with, distinctions such as automatic versus controlled processing.

Another dimension is related to both the associative/propositional categorization and the automatic/controlled distinction but cross-cuts both to some degree. That dimension is the amount of elaboration involved in the process of forming or changing the attitude (for previous uses of elaboration to organize persuasion processes, see Petty & Wegener, 1998a; Wegener & Carlston, 2005). Following the ELM approach to persuasion (Petty & Cacioppo, 1986), people want to hold correct (reasonable, defensible) attitudes but are not always equally motivated or able to put cognitive effort into seeking those correct attitudes. Therefore, motivation and ability to think carefully about attitude-relevant information are key determinants of the kinds of processes engaged in attitude change.

As mentioned earlier, initial ELM research suggested that, with sufficiently high levels of ability to think, higher levels of motivation (e.g., because of higher levels of personal relevance or involvement) increased the impact of argument quality on resulting attitudes (e.g., Petty & Cacioppo, 1979; Petty, Cacioppo, & Goldman, 1981). Similarly, with sufficiently high levels of motivation, restrictions in ability to think (e.g., because of distraction) reduced the impact of argument quality on resulting attitudes (Petty et al., 1976). Such results suggest that motivation and ability serve as prerequisites for more effortful and extensive cognitive processes that take into account the merits of the arguments provided in support of the message advocacy (see Petty & Cacioppo, 1986; Petty & Wegener, 1999, for additional discussion). In fact, over the years, many moderators of attitude change effects have been interpreted in terms of how they affect motivation and/or ability to process object-relevant information (see Petty & Briñol, 2012; Petty & Wegener, 1998a; Johnson et al., 2005). For example, effects of recipient mood on message processing have been attributed to influences on ability (Mackie & Worth, 1989) or motivation to process (e.g., Bless, Bohner, Schwarz, & Strack, 1990; Wegener, Petty, & Smith, 1995). A variety of types of “matches” between message recipient characteristics and message characteristics increase message processing. Some of these are directly analogous to personal relevance because they involve priming a trait or stereotype and then providing a message that matches aspects of the trait or group (Wheeler, DeMarree, & Petty, 2008). Other matches link an aspect of the person to their preferences or foci, such as matches between likely attitude functions (e.g., based on recipients’ level of self-monitoring) and message content (Petty & Wegener, 1998b); recipient self-guides and message content (Evans & Petty, 2003); and even message recipients’ level of need for cognition and preferences to engage with simple versus complex material (See, Petty, & Evans, 2009). Also, surprising combinations of source characteristics (Ziegler, Diehl, & Ruther, 2002) or inconsistency between recipient’s mood-based expectancies

and source characteristics (Ziegler, 2010; Ziegler & Diehl, 2011) can enhance message processing. These effects have generally been explained using motivational accounts, though some types of matching effects could involve a match with the type of knowledge people possess about the attitude object (which could influence ability to elaborate).

To more specifically contextualize the notion of *elaboration* in comparison with related mechanisms, elaboration goes beyond memorization of object-related information to connect such information to existing knowledge structures (see Fabrigar, MacDonald, & Wegener, this volume). Though terms like “scrutiny” or “effortful processing” are generally used as synonyms, elaboration perhaps best captures the range of mental activities. The notion of elaboration built directly off of the notions of depth of processing and elaboration from cognitive psychology (Craik & Lockhart, 1972; Craik & Tulving, 1975) and might be considered as similar to notions of relational processing in social cognition (Carlston & Smith, 1996). Elaboration is also related to but not synonymous with controlled (Schneider & Shiffrin, 1977) or intentional processing (Uleman, 1999). People might very well intentionally engage in elaboration, and elaboration may often involve controlled processing, but people could also specifically (intentionally) choose to adopt a low-elaboration process (e.g., if they are unmotivated or lack ability to elaborate), and high levels of elaboration could involve automatic activation of existing attitudes or related knowledge. Thus, at least some portions of elaborative processes may involve automatic or unintentional components; see also Wegener & Petty, 2013). As discussed in more detail later in the chapter, some discussions of “implicit processes” focus on the automaticity of a process. As such, even high levels of elaboration could thus involve some implicit components. However, other discussions of implicit processes focus on lack of awareness. In that regard, elaboration is typically aimed at explicitly evaluating the attitude object. That does not mean that people would necessarily be aware of every step in their efforts to evaluate the object, but the resultant attitude is likely to be open to awareness. As characterized by Petty and Cacioppo (1986), elaboration of persuasive messages includes attention to presented information, attempts to access external (message) and internal (knowledge) information related to the attitude object, scrutiny of and inferences about attitude-relevant arguments in light of other available information including background knowledge and relevant standards of comparison (see also Albarracín, Wallace, & Glasman, 2004), drawing conclusions about merits of the attitude object, and derivation of an overall evaluation that combines the outputs of these efforts. As discussed throughout the remainder of this chapter, the literature on elaboration has identified many variables in the persuasion setting or message recipient that can affect the person’s motivation or ability to think about the persuasive message.

Elaboration has played a central role in persuasion theorizing, in part, because elaboration is connected to the overall “strength” of the resulting attitude (see also Fabrigar et al., this volume). That is, attitudes based on high-elaboration processes persist longer over time (e.g., Petty, Haugtvedt, & Smith, 1995; see also Blankenship, Wegener, Petty, Detweiler-Bedell, & Macy, 2008); better resist opposing persuasive messages (e.g., Blankenship & Wegener, 2008; Haugtvedt & Petty, 1992; Haugtvedt & Wegener, 1994; Shestowsky, Wegener, & Fabrigar, 1998); and better predict future behavior and intentions (e.g., Cacioppo, Petty, Kao, & Rodriguez, 1986; Petty, Cacioppo, & Schumann, 1983).

Using the Elaboration Continuum to Organize Bounded Processes

Quantitative and Qualitative Distinctions

Theories using bounded processes have made both quantitative and qualitative distinctions among those processes. For example, the elaboration continuum directly addresses a *quantitative* dimension (“amount of processing”). A social perceiver could evaluate an object with minimal elaboration by

simply considering one piece of information about the object. If that piece of information is the first received, such a mechanism might lead to low-thought primacy effects (see Petty, Tormala, Hawkins, & Wegener, 2001). As noted earlier, though, motivation or ability could also be so low that no information is evaluated carefully until after the entire message is encountered and a (surprise) attitude question is posed (e.g., Mackie & Asuncion, 1990). Evaluating only one piece of information might be more effortful or less effortful than using a stored heuristic, but it is certainly less effortful than evaluating more pieces of information each in a similar fashion. Other potential quantitative differences could involve equal effort in evaluating each piece of available information but less effort given to each piece in one condition than in another condition. Alternatively, one could put less effort into integrating the pieces of information into an overall evaluation in one condition than in another.

Within any particular level of thinking, however, a theory like the ELM also allows for *qualitative* distinctions (this is why the ELM is most appropriately considered as a multi-process theory rather than a dual-process theory). In essence, these qualitative distinctions are among different mental operations. For example, in mathematics, long division and geometry problems might be similar in overall requisite effort (as long as one has the knowledge to undertake either). Yet, the different kinds of problems involve somewhat different cognitive manipulations and operations. As discussed in the following sections, among persuasion processes, various forms of conditioning, effects of cognitive (im)balance, and self-perception might all fall toward the low end of an elaboration continuum, but one can also readily distinguish among different cognitive mechanisms involved in each. On some level, the utility of a given distinction comes down to whether or not it allows one to predict people's future thoughts, judgments, or behaviors. If it does, it may not matter in any practical way whether the distinction was quantitative or qualitative (Ajzen, 1999). Debates over whether a given process distinction in attitude change is quantitative or qualitative have arisen only recently and have principally contrasted universal versus bounded process descriptions. Regardless of whether one agrees that persuasion processes can be usefully conceived as qualitatively distinct, there is general agreement that persuasion processes can be usefully arrayed along the (quantitative) elaboration continuum.

Relatively Low-Elaboration Processes

A number of processes are conceived as influencing attitudes without the necessity of deep or effortful thinking. These processes can operate when motivation or ability to think is low. Some of the mechanisms falling at the lowest level of elaboration involve creation of "mere associations" between the attitude object and some other positive or negative cognitive element. Other relatively low-thought processes might involve simple inferences about the attitude object even on the basis of information relatively unrelated to the central qualities of the object.

MERE ASSOCIATION

Classical Conditioning In attitudinal studies of classical conditioning, the attitude object is presented repeatedly just before other positively or negatively valenced stimuli. For example, Staats and Staats (1958) used unfamiliar nationalities or disembodied names as conditioned stimuli (CSs). The nationalities or names were evaluated more positively if their presentation was consistently followed by positive rather than negative words (i.e., the unconditioned stimuli, US). Some researchers have expressed concerns that classical conditioning might only occur when participants recognize that the CS was consistently followed by stimuli of a particular valence (e.g., Lovibond & Shanks, 2002; see also Kruglanski & Stroebe, 2005) and when participants believe

that the experimenter expects them to respond in ways consistent with the valenced stimuli (Page, 1974). To the extent that classical conditioning involves learning that the CS signals the approach of positive or negative stimuli, criticisms of contingency awareness may be, in part, offering the classical conditioning mechanism as if it were an alternative explanation. Alternatively, participants might realize the contingency after the conditioning occurs rather than before (cf. Staats, Minke, Martin, & Higa, 1972). More generally, one could view the criticism more as a suggestion that classical conditioning involves a (simple) inferential process rather than a purely associative one. At a minimum, however, existing data suggest that classical conditioning is not merely due to demand awareness per se. That is, classical conditioning effects have been found when the experimenter has changed and responses are made in a new, unrelated context (e.g., Berkowitz & Knurek, 1969; Zanna, Kiesler, & Pilkonis, 1970). Classical conditioning has also been shown to influence responses that are difficult to control. For example, classical conditioning has influenced Implicit Association Test assessments of evaluations (Olson & Fazio, 2001). Also, when measuring speed of response to a target word after exposure to an evaluative “priming” stimulus, prior classical conditioning of the priming stimulus—and the consistency or inconsistency of the conditioning with other evaluative information—influenced the speed of response to the target (e.g., Petty, Tormala, Briñol, & Jarvis, 2006).

Evaluative Conditioning In classical conditioning, the CS is encountered prior to the US (so the CS “signals” the upcoming US). However, some conditioning also occurs when signal learning is less likely (e.g., because the CS follows the US, as in studies of affective priming, Krosnick, Betz, Jussim, & Lynn, 1992; Murphy & Zajonc, 1993) or when the US and CS are encountered at the same time (for a review, see Hofmann, De Houwer, Perugini, Baeyens, & Crombez, 2010). US and CS are encountered together in many settings, including embodied evaluations (such as when flexor vs. extensor movements, Priester, Cacioppo, & Petty, 1996, or facial expressions serve as the US, Strack, Martin, & Stepper, 1988) or conditioning between the self as a US and an object as the CS (Perugini, Zogmaister, Richetin, Prestwich, & Hurling, 2013, as in endowment or mere ownership effects; Gawronski, Bodenhausen, & Becker, 2007). These more general effects of USs on CS evaluations are typically referred to as evaluative conditioning.

The major debate in this literature is over how to best conceptualize evaluative conditioning effects. Various theories suggest that the conditioning results from an association in memory between the CS and US or from misattribution of reactions to the US as coming from the CS (e.g., Jones, Fazio, & Olson, 2009). Effects consistent with such approaches include evaluative conditioning in the absence of contingency awareness (e.g., Walther & Nagengast, 2006) or when the US or CS are subliminal (e.g., De Houwer, Hendrickx, & Baeyens, 1997). Other researchers suggest that evaluative conditioning stems from the acquisition of propositional knowledge about the relation between the CS and US (e.g., Mitchell, De Houwer, & Lovibond, 2009). Evidence consistent with this type of approach includes influences of memory for CS-US pairs on evaluative conditioning (e.g., Gast & Kattner, 2016). Alternatively, evaluative conditioning could result from stimulus-stimulus or stimulus-response associations in some settings but by propositional knowledge in others (e.g., Gawronski & Bodenhausen, 2014, see also Gast, Gawronski, & De Houwer, 2012; Jones, Olson, & Fazio, 2010). Our own tendencies to conceptualize outcomes as potentially reached through different mechanisms in different settings would suggest to us that a multi-process approach to evaluative conditioning is most likely to be fruitful in the long term.

Consistent with the idea that classical and evaluative conditioning generally require little effortful elaboration, these forms of conditioning have greater impact on targets initially associated with weak or nonexistent evaluations (e.g., pronounceable nonwords) rather than existing neutral evaluations (e.g., neutral words; e.g., Priester et al., 1996; see also Cacioppo, Marshall-Goodell, Tassinari, & Petty, 1992).

Operant Conditioning Rewarding or punishing initial evaluations can enhance or reduce those evaluative tendencies. For example, in an early study, Hildum and Brown (1956) had telephone interviewers respond positively to either favorable or unfavorable responses students made toward university policies. The responses by the interviewer increased the frequency of whichever type of response had been rewarded. Addressing potential “demand” interpretations like those leveled at classical conditioning studies, similar verbal “rewards” also resulted in more favorable or unfavorable attitude reports (whichever was rewarded) after a week-long delay and in an unrelated context (Insko, 1965). Straightforward application of this technique requires that there be initial favorable or unfavorable responses to be rewarded. If wanting to create more favorable responses in the absence of favorability, one might attempt to “shape” behaviors by first rewarding less negative responses but gradually requiring more positive responses for additional rewards. In any case, the rewards have to be effective. In the phone interviewing paradigm, for example, the interviewer has to be likable for verbal responses (e.g., “good”) to effectively reward the research participant (e.g., Insko & Cialdini, 1969). Theoretically, the rewards could take many forms though these interpersonal rewards make the operant conditioning studies very similar to interpersonal balance (Heider, 1946; see later discussion of “Inferential Approaches—Balance”).

Over the years, theorists have debated whether operant and classical conditioning are, in essence, the same (e.g., see Donahoe & Vegas, 2004). For the current purposes, each might represent associations between an attitude object and a valenced object or event. Yet, operationally, studies of classical and operant conditioning generally start with different types of attitude objects. Classical and evaluative conditioning generally start with an object toward which few or no valenced associations exist. In comparison, operant conditioning typically begins with an object toward which there are existing associations so those evaluative responses can be rewarded and enhanced (or punished and reduced). Nonetheless, the various forms of conditioning could share key underlying mechanisms.

Mere Exposure When novel objects are repeatedly encountered, they are often evaluated more favorably (e.g., Zajonc, 1968a) even if people cannot say whether or not they have previously seen or heard the objects (Kunst-Wilson & Zajonc, 1980). Bornstein and D’Agostino (1994) explained such mere exposure effects as due to increases in perceptual fluency (Jacoby, Kelley, Brown, & Jasechko, 1989) that can be attributed to liking of the object (but might also be attributed to other stimulus dimensions, Mandler, Nakamura, & Shebo Van Zandt, 1987—even disliking if the stimulus is already negatively valenced, Klinger & Greenwald, 1994). When fluency can be attributed to previous exposure rather than liking, perceptions are “corrected,” and mere exposure effects are reduced. Consistent with this idea, mere exposure effects are diminished when people are told that the stimuli have been repeatedly presented (Bornstein & D’Agostino, 1994) or when stimulus exposures are for longer periods of time (Bornstein & D’Agostino, 1992). If an experience of fluency is itself rather neutral but it becomes positive when attributed to liking, then one might consider the mechanism as similar to inferential or attributional processes (see later discussions). Another approach that might be considered more associative is to argue that perceptual fluency is directly experienced as positive affect. For example, Winkielman and Cacioppo’s (2001) hedonic fluency model suggests that easy processing of a stimulus results in a brief experience of positive affect. Manipulations of ease of processing (e.g., by preceding a stimulus with a brief contour prime) are associated with physiological markers of positive affect (such as electrical activity in the zygomaticus region; Winkielman & Cacioppo, 2001; see also Harmon-Jones & Allen, 2001). If the fluent object is accompanied by positive affect, one could consider mere exposure effects to be similar to evaluative conditioning effects.

Regardless of whether one thinks of mere exposure effects as associative or inferential, there is little reason to consider the effects as requiring more than minimal thought about the attitude object. Mere exposure effects are strongest when the exposures are very brief (Bornstein, 1989) or

even subliminal (Bornstein & D'Agostino, 1992) and when motivation to process available information is minimal (e.g., with low rather than high evaluation apprehension; Kruglanski, Freund, & Bar-Tal, 1996). Just because thinking about the origin of fluency can diminish effects of previous exposures, that does not mean that effects of fluency are themselves thoughtful (cf., Kruglanski & Stroebe, 2005). Rather, effort put toward judgmental correction can be present or absent regardless of whether the initial (biasing) effect required high or low levels of thinking (Petty, Wegener, & White, 1998; Wegener & Petty, 1997).

A recent meta-analysis of mere exposure effects supported many patterns predicted by these previous models, such as stronger effects of exposure for very brief (< 15ms) exposures than for longer exposures and an inverted U-shaped impact of exposure frequency on evaluations (Montoya, Horton, Vevea, Citkowicz, & Lauber, 2017). However, a number of patterns also seemed less consistent with existing models. For example, the inverted U-shaped pattern was just as strong (or stronger) for very brief (possibly subliminal, < 15ms) exposure stimuli, which seems somewhat inconsistent with attributions or corrections stemming from explicit recognition of previously encountered stimuli or with boredom stemming from over-exposure. Based on the meta-analytic results, Montoya et al. (2017) advanced a representation-matching model suggesting that a specific form of habituation (via learning, such that later exposures better match a representation of the object in memory) is responsible for downturns in mere exposure effects beyond a certain number of exposures.

INFERENTIAL APPROACHES

The previous section described processes that might do little more than directly connect the attitude object to some evaluation or feeling. Sometimes, however, people briefly consider a piece of information and use it as a simple means to determine the appropriateness of a positive or negative attitude. More specifically, people may do this as a way to forego the time or effort involved in more extensive processing of attitude-relevant information.

Attribution One common setting for inference involves explanations for one's behavior (i.e., attributions). When another person takes an attitudinal position, people generally attribute that action to the person holding that position (Jones & Harris, 1967) though less so when the person seems less confident in that position (Blankenship & Craig, 2007). Bem (1967) suggested that when people do not have well-formed attitudes they might infer them from their own behavior and the circumstances surrounding it (much as external perceivers infer a target person's attitude from his or her behavior in a particular context). For some time, self-perception theory was considered as an alternative explanation for dissonance effects (Bem, 1967; see Greenwald, 1975). Yet, self-perception could not account for the role of physiological discomfort in dissonance effects (e.g., Zanna & Cooper, 1974).

Self-perception effects appear most when people are unlikely to think carefully about object-relevant information. That is, the tendency to infer one's attitudes from past behavior is more likely when people are distracted while inferring their attitudes (Albarracín & Wyer, 2000); when people possess little knowledge about the attitude object (Wood, 1982); and when people regard the attitude object as unimportant rather than important (Taylor, 1975). Self-perception effects may also be more likely when behavior is proattitudinal rather than counterattitudinal (Fazio et al., 1977), where proattitudinal information is often processed less thoroughly than counterattitudinal information (e.g., Cacioppo & Petty, 1979; Edwards & Smith, 1996; though this pattern can also be reversed given the appropriate circumstances, see later discussion of motives accompanying message discrepancy).

Though self-perception effects might often occur in conditions encouraging relatively low levels of elaboration, attribution can occur in many settings. Some attributions likely influence how

thoroughly people will process attitude-relevant information. For example, when a source speaks against his or her own self-interest, recipients of that message might infer that the source is honest and the message is true (Eagly, Chaiken, & Wood, 1981). Such attributions could decrease the need for message scrutiny (Wood & Eagly, 1981), especially if the message recipient is disposed toward looking for reasons to forego effortful thinking (Priester & Petty, 1995). Attributions can also serve as key elaborations that occur when thinking carefully about the meaning of one's attitudes. For example, attributions of a behavior to reward can undermine long-standing intrinsic interest in that behavior (Lepper, Greene, & Nisbett, 1973). Ironically, this suggests that one way to decrease agreement with an idea may be to repeatedly reward the person for expressing that view and later remove the reward (Scott & Yalch, 1978).

Use of Heuristics Many inferences involve well-learned decision rules or “heuristics” (Chaiken, 1987). For example, when a person lacks ability or motivation to think carefully about a persuasive message, the person might use how they feel at the time as part of a “how do I feel about it?” heuristic (Schwarz & Clore, 1983). Use of this type of heuristic relies on an underlying attribution process in that one's current feelings (even those from an incidental source) are (mis)attributed to the attitude object. The key that renders something a “heuristic” is that, with misattribution only, it is sufficient for inferences to be made online, whereas heuristics are presumed to be stored in memory and retrieved when activated by the situation (Chaiken, 1987). Though the same judgment effects might often be consistent with either association or heuristic mechanisms, it should in principle be possible to distinguish between these processes. For example, certain kinds of mere association might take place even when the attitude object is encountered only subliminally, whereas inferences about liking of the object should only be instigated by conscious awareness of the object. Proposed heuristics for persuasion have included various source characteristics (Chaiken, 1980) and mere number of arguments (Petty & Cacioppo, 1984; Tormala, Petty, & Briñol, 2002). Heuristics have not only been linked to changes in initial attitudes, but also attitude strength (i.e., the extent to which an attitude is consequential; see Petty & Krosnick, 1995). For example, a *thoughtfulness* heuristic has been proposed to link perceptions of amount of elaboration to certainty in one's attitude and its impact on behavior (Barden & Petty, 2008).

Similar to mere association processes, however, use of heuristics need not require much motivation or ability to think. Consistent with a number of proposed heuristics, message sources that are attractive or likable, expert, similar to the message recipient, or numerous can influence attitudes more when the message recipient lacks motivation (e.g., because the topic is low in personal relevance; e.g., Chaiken, 1980; Petty, Cacioppo, & Goldman, 1981) or ability to elaborate (e.g., because the person lacks knowledge; e.g., Wood & Kallgren, 1988; Wood, Kallgren, & Preisler, 1985) or because the person is distracted during message presentation (e.g., Kiesler & Mathog, 1968; see also Petty & Wegener, 1998a). Heuristics are also expected to be most influential when they are accessible or salient to message recipients (Chaiken, 1987; e.g., Pallak, 1983; Roskos-Ewoldsen & Fazio, 1992a) unless the feature in the heuristic is viewed as biasing and salience of the heuristic leads to bias correction (e.g., Kang & Herr, 2006; Petty et al., 1998). Heuristic-based inferences can be quite simple, but more complex inferences can be made (e.g., about multiple pieces of attitude-relevant information). These more “elaborative” inferences are discussed later in the section on “Relatively High-Elaboration Processes—Combinatorial/Integrative Processes.”

Balance People often learn that an admired person supports a particular position, endorses a particular product, etc. In such situations, use of a source-related heuristic (e.g., experts can be trusted) can lead to outcomes that parallel predictions made by balance theory (Heider, 1946) or congruity theory (Osgood & Tannenbaum, 1955). Both of these theories are cognitive consistency theories, so they put a motivational twist on the “colder” inference processes involved with straightforward use

of heuristics. When the self, a group to which one belongs, and a valenced attribute or evaluation constitute the three elements in a balance triad, this has been referred to as a balanced identity design (Greenwald, Banaji, Rudman, Farnham, Nosek, & Mellott, 2002). As balance theory would predict, people's self and group evaluations cohere to the extent that the person identifies with that group.

Cognitive consistency theories make their predictions based partly on Gestalt principles that cognitive representations should gravitate toward "good forms" (e.g., balance or congruity) and partly on the notion that inconsistency is uncomfortable. In interpersonal settings, inconsistency could come from agreeing with a person one dislikes or from disagreeing with a person one likes. Because interpersonal "balance" or "congruity" feels better, people prefer to agree with liked others and disagree with disliked others. Evidence does suggest that it is uncomfortable to agree with disliked others and especially to disagree with liked others (Jordan, 1953; Priester & Petty, 2001), but the role of discomfort has been explored more fully in the context of dissonance theory (see later discussion in the section on "Relatively High-Elaboration Processes—Cognitive Dissonance"; Olson & Stone, 2005). Relatedly, evidence also suggests that attitudes change more when a disagreeable assertion comes from a liked rather than disliked communicator and that, consistent with congruity predictions, exposure to a persuasive communication results in changes in attitudes toward both the advocacy and the source (e.g., Osgood & Tannenbaum, 1955; Tannenbaum, 1966).

Balance and congruity processes might be reasonably characterized as reflecting a relatively low level of elaboration, because neither requires effortful consideration of the qualities of the attitude object per se (Petty & Wegener, 1998a). Yet, determination of whether a triad is balanced or congruent involves assessing three pieces of information (i.e., attitude toward the other person, the other person's attitude toward the attitude object, and one's own attitude toward the attitude object). Considering all three might require greater cognitive effort than considering only one's liking of the other person ("attraction") or considering only the agreement between one's own attitude and that of the other toward the attitude object ("agreement," Zajonc, 1968b; see Cacioppo & Petty, 1981).

Relatively High-Elaboration Processes

Over the years, a number of persuasion processes have been proposed that reflect relatively high levels of cognitive effort and elaboration. Indeed, the expectancy-value process that we outlined earlier is one such mechanism, but there are others. Different high-elaboration processes might focus on particular aspects of elaboration. For example, some proposed processes focus on inferences, others on use of background knowledge, and still others on the ways multiple pieces of information might be combined into an overall evaluation.

COMBINATORIAL/INTEGRATIVE PROCESSES

We noted earlier that one could describe simple inferences as a syllogism in which two pieces of information form premises that suggest a conclusion. Of course, syllogistic reasoning could also be more complex (consistent with quantitative distinctions embodied in the elaboration continuum). For example, people are more likely to go beyond the presented information and make inferences about omitted information when they are more knowledgeable or more motivated to process attitude-relevant information (Kardes, 1994). In syllogistic terms, these inferences would expand the number of syllogisms that determine the evaluative conclusion (i.e., the horizontal structure of the attitude; McGuire, 1981).

The expectancy-value, information integration, and probabilistic approaches discussed earlier provided somewhat different views of how people combine information or reactions into an overall evaluation. However, each view somehow incorporates perceptions of the desirability of each object attribute and the likelihood that the object possesses each attribute. Thus, from many

views, one could change attitudes by influencing perceptions of desirability or likelihood (Petty & Wegener, 1991). When creating “strong” versus “weak” persuasive messages (Petty & Cacioppo, 1986), researchers have generally manipulated the desirability of the described attributes of the attitude object (see Johnson, Smith-McLallen, Killea, & Levin, 2004). Even so, at least some changes in attitudes appear driven by shifts in the perceived attribute likelihood (DeSteno, Petty, Rucker, Wegener, & Braverman, 2004; Wegener, Petty, & Klein, 1994).

If combining perceptions of attribute likelihood and desirability into an overall evaluation takes effort, then variation in perceived likelihood and desirability should have the greatest impact on attitudes when perceivers are sufficiently motivated and able to process attitude-relevant information. In fact, likelihood-by-desirability products predict overall attitudes better when people are higher in topic relevant knowledge (see Albarracín & Wyer, 2001; Lutz, 1977). Also, at least some effects of mood or emotion through perceived event likelihood (DeSteno et al., 2004; Wegener et al., 1994) are stronger when message recipients are relatively high in need for cognition (i.e., when they enjoy effortful thought; Cacioppo & Petty, 1982).

COGNITIVE RESPONSES

Responding to Messages The concept of *cognitive response* (Greenwald, 1968) could include all manner of thoughts about an attitude object or persuasive setting, including thoughts not germane to the attitude object such as source derogations. With the advent of the ELM, however, distinctions were made between thoughts about “central merits” of attitude objects (i.e., thoughts directly relevant to the qualities of the object) versus thoughts toward more “peripheral” aspects of a persuasive attempt (such as liking the music in an ad, when the advertised product has nothing to do with music). In contemporary research, cognitive response indices have been used to assess the level of elaboration, so the term “cognitive response” is often limited to object- or issue-relevant thoughts (see Wegener, Downing, Krosnick, & Petty, 1995; see also Albarracín, 2002). Such indices often consist of a difference in the number of positive versus negative thoughts, divided by the total number of thoughts (Wegener et al., 1995).

A number of patterns support a role for cognitive responses influencing rather than merely justifying attitudes (see Petty, Wegener, Fabrigar, Priester, & Cacioppo, 1993, for a review; see also Albarracín & Wyer, 2001). The patterns include (a) manipulations of thought favorability creating parallel valence of attitudes when motivated and able to elaborate (e.g., Cacioppo & Petty, 1979; Johnson et al., 2004); (b) thought favorability correlating with attitudes more highly when motivation or ability to process is high rather than low (e.g., Chaiken, 1980; Petty & Cacioppo, 1979); and (c) thoughts serving as mediators between independent variables and attitudes (e.g., Clark, Evans, & Wegener, 2011; see also Petty, Wegener et al., 1993).

When There Is No Message Self-generated arguments can often be more persuasive to the person who generated them than to recipients of those same arguments (Janis & King, 1954). It could be that the person generating the message focuses on thoughts supporting the advocated position, whereas recipients consider both reasons to support and oppose the position (Greenwald, 1969). It could also be that the person finds his or her own arguments to be superior in some way (e.g., more original or valid) than the arguments of others (Greenwald & Albert, 1968). If the generated arguments are generally strong (compelling), differential persuasion could also be due to people thinking more about the topic when they are generating rather than receiving messages. Participants in self-generation studies generally receive some direction (such as the position to take and a rough outline of points they could make). In some settings, people are also given a goal such as persuading themselves or others. In one set of studies, self-persuasion was greater when people generated

counterattitudinal messages aimed at persuading themselves rather than persuading others or when they generated a proattitudinal message aimed at persuading others rather than themselves (Briñol, McCaslin, & Petty, 2012). These effects stemmed from the differential effort perceived as necessary and actually exerted in trying to produce persuasion under these conditions.

In other research, participants are given no guidance and are simply asked to think about an issue. These studies generally show that people express more extreme attitudes after such “mere thought” (see Tesser, 1978). Extremity primarily results when people start with a clear, unambivalent attitude and when they are committed to their attitude (e.g., Liberman & Chaiken, 1991; Millar & Tesser, 1986; Tesser & Leone, 1977). As time to think increases, attitude polarization also increases to a point, beyond which depolarization occurs (Clarkson, Tormala, & Leone, 2011). When asked to think for the optimal amount of time, attitude polarization can be accounted for by generation of attitude-consistent thoughts and by increased confidence in those thoughts (Clarkson et al., 2011). When pre-thought attitudes are unclear or inconsistent, mere thought leads to depolarization rather than polarization (see Tesser, Martin, & Mendolia, 1995). When asked to think too long, depolarization occurs because of difficulty generating attitude-consistent thoughts (Clarkson et al., 2011). Also, fear of invalidity can increase reflection on attitude-inconsistent thoughts, leading to depolarization (Clarkson, Valente, Leone, & Tormala, 2013).

Objectivity and Bias in Thinking Many motivation or ability factors “objectively” increase or decrease message recipients’ amount of processing without favoring certain types of thoughts over others. For example, distraction disrupts whatever thoughts would otherwise come to mind, regardless of whether they generally favor or oppose the message advocacy (Petty et al., 1976). From the standpoint of the ELM, motivation is relatively objective if the person’s goal is to seek a “correct” attitude, whatever it might be (Petty & Cacioppo, 1986). In contrast, motivated biases (e.g., the need to adopt a specific position, Webster & Kruglanski, 1994) push people toward a particular preferred outcome, as when people take positions that help them to view themselves positively (Fein & Spencer, 1997), to reassert their freedom (Brehm, 1966), or to identify with admired others (Lavine & Snyder, 1996). When people elaborate, motivation could influence the thoughts that come to mind or the attention given to particular features of the attitude object. Biases in processing are more likely when available information is mixed or ambiguous and open to alternative interpretations (Chaiken & Maheswaran, 1994).

One challenge in documenting motivated bias is in clearly distinguishing biased processing from objective processing. For example, people often judge potential interaction partners more positively than people they will not meet (Berscheid, Graziano, Monson, & Dermer, 1976). Some researchers explain such effects by noting that outcome dependency (a motive to have a smooth interaction with the person) can motivate the perceiver to view the target favorably (e.g., Klein & Kunda, 1992). However, other researchers note that outcome dependency can increase the depth of processing of target information (e.g., Neuberg & Fiske, 1987). The difficulty is that mere increases in processing of positive information can increase positivity of evaluations (Petty & Cacioppo, 1979). Thus, one cannot really claim motivated bias without examining whether mere increases in processing were at work. One way to distinguish between these patterns, however, is to manipulate the relative favorability of information available about the target person. Clark and Wegener (2008) manipulated the valence of information available about an interaction partner. Expecting to meet the person (outcome dependency) led to more favorable judgments of the target when positive information was available about the target person, but only because objective processing had increased (which led to less favorable judgments when the target information was unfavorable). In contrast, when substantial awards were available for a smooth interaction with the target, processing of target-related information was positively biased, leading to more favorable judgments of the target regardless of the favorability of target information.

Even when bias occurs, motivation is not the only possible reason. People can also have knowledge-based (ability) biases (Petty & Cacioppo, 1986). For example, when generally healthy people receive an unfavorable medical test result, they are more likely to question the validity of the test than when they receive a more favorable test result (Ditto & Lopez, 1992). This could be because of wanting to view themselves as healthy, but it could also be that their knowledge was mostly pointing toward viewing themselves as healthy, making unfavorable health results seem less likely to be correct (for purely knowledge-based reasons). Because existing knowledge can differentially fit available information or knowledge can be different for self versus others (a common comparison in studies of motivated reasoning), many biases are ambiguous regarding whether they were due to motivational or ability (knowledge-based) reasons. This is one reason that some of the strongest evidence for motivated reasoning continues to come from research on cognitive dissonance (where knowledge can be equated across experimental conditions that shift motivations; cf. Kunda, 1990).

COGNITIVE DISSONANCE

Festinger (1957) developed a very general theory dealing with inconsistent (dissonant) cognitions. Two cognitions are dissonant if one cognition would imply the opposite of the other. Dissonance (inconsistency) was regarded as creating an unpleasant drive state that would create pressure to reduce that state. As reviewed by Olson and Stone (2005), an amazing number of revisions and reinterpretations of dissonance have appeared over the years, and dissonance-related theorizing has been used to make predictions about post-choice shifts in evaluation (Brehm, 1956), attitude changes after attitude-inconsistent action (Aronson & Carlsmith, 1963; Festinger & Carlsmith, 1959), effort justification (Aronson & Mills, 1959), hypocrisy (Stone & Fernandez, 2008), and many more (see Olson & Stone, 2005, for a more thorough review).

Because dissonance is often produced by a behavior conflicting with a belief or evaluation, and behavior is often difficult to “undo” (see Steele, 1988), attitude or belief change is often the result. Dissonance can also be reduced through other means such as adding consonant cognitions (i.e., thoughts that make the dissonant action or belief make sense) or regarding one or both of the dissonant cognitions as less important (i.e., by “trivializing” the cognition or action; Abelson, 1959). Trivialization has been used to explain why affirming a valued aspect of the self can decrease dissonance (Simon, Greenberg, & Brehm, 1995; cf. Steele, 1988).

Because dissonance reduction often involves (biased) cognitive activity aimed at changing one of the dissonant cognitions, cognitive dissonance has often been viewed as involving substantial amounts of cognitive effort (cf. biased scanning of outcomes of one’s past behaviors; e.g., Albarracín & Wyer, 2000; Albarracín & McNatt, 2005). Evidence consistent with such an approach includes persistence of dissonance effects over time (e.g., Freedman, 1965; Higgins, Rhodewalt, & Zanna, 1979; Sénémeaud & Somat, 2009—insofar as elaboration helps to create stable attitudes) and impact of dissonance through propositional more so than association-based processes (Gawronski & Strack, 2004). Alternatively, Lieberman, Ochsner, Gilbert, and Schacter (2001) suggested that dissonance need not even rely on explicit memory, as research participants with anterograde amnesia showed dissonance effects. The discrepancy between these results could have many explanations. It could be that dissonance involves conscious thought but the strength of dissonance effects differs across paradigms, as Gawronski and Strack (2004) were examining the counterattitudinal essay paradigm, whereas Lieberman et al. (2001) were examining the free-choice paradigm (which has been criticized as not necessarily involving post-choice shifts in evaluation, let alone dissonance; Chen & Risen, 2010). Even if dissonance does drive some spreading of alternatives in the free-choice paradigm, it could be that alternative mechanisms (such as associative self-anchoring, Gawronski et al., 2007) might not require the same level of conscious thought. These and related research questions should receive additional research attention.

One of the most far-reaching attempts to bring disparate perspectives on dissonance together into a single overarching framework is the self-standards approach developed by Stone and Cooper (2001). This model suggests that people compare the outcomes of their behaviors to relevant standards. When they compare to a normative standard, dissonance follows the aversive consequences approach (Cooper & Fazio, 1984). That is, dissonance follows from realizing that one is responsible for the aversive consequences of one's actions (e.g., Voisin & Fointiat, 2013). Because normative standards apply to all people within the group for which the norm is relevant, the person's level of self-esteem is not expected to influence the level of dissonance aroused (Stone & Cooper, 2003). If, instead, the person compares his or her behavior to personal standards, then the person's self-view should matter. If the person has high self-esteem (and likely high expectations for his/her behavior), then dissonance is greater for people with high self-esteem (Stone & Cooper, 2003; cf. Aronson, 1969). Once dissonance is aroused, if self-relevant thoughts remind the person of their important values or other areas of life in which they view themselves favorably (i.e., a self-affirmation), those positive self-views can reduce dissonance (Steele, 1988; for additional reviews of dissonance theories, see Harmon-Jones, Armstrong, & Olson, this volume; Olson & Stone, 2005).

METACOGNITION

The prior sections have dealt with factors that impact a person's primary thoughts. As noted earlier, however, people can also have thoughts about their thoughts—or metacognitions (Briñol & DeMarree, 2012; Jost, Kruglanski, & Nelson, 1998). Clearly, metacognition can influence peoples' beliefs and actions. For instance, perceptions of one's own psychological functioning can influence whether a word is perceived as familiar enough to judge it as previously seen (Strack & Förster, 1998). Perceptions that one knows an unretrievable word can make people spend additional time searching their memory for the word (Costermans, Lories, & Ansay, 1992), and perceptions of one's ability in cognitive tasks can influence intellectual performance (Bandura, 1995). Relatively simple forms of metacognition might exist (e.g., perceptions of what created familiarity in mere exposure studies), but some metacognitive effects likely depend on relatively high levels of thought. That is, to the extent that metacognition involves thinking about the appropriateness or perceived validity of one's thoughts, metacognition seems more likely to occur when people are already motivated and able to think in the first place (see Briñol & Petty, 2009; Petty et al., 2007). We discuss two areas in which metacognition has played an important role in persuasion.

Self-Validation Perhaps the most fundamental role for metacognition in attitude change is when people think about the validity or desirability of their thoughts. Considerable research supports the self-validation hypothesis that the more people see their thoughts as accurate (cognitive validation) or liked (affective validation) the more these thoughts are used in forming attitudes (Petty & Briñol, 2015). The self-validation notion goes beyond the cognitive response notion that the number and valence of one's thoughts matters when thinking is high. That is, what people think about their thoughts also matters. In the initial self-validation research, both measuring and manipulating confidence in people's thoughts enhanced the ability of thoughts to predict attitudes (Petty, Briñol, & Tormala, 2002). In one study, for instance, college students read strong or weak arguments (to create primarily positive or negative thoughts) about a proposed comprehensive exam policy at their university and then they listed their thoughts about the proposal. Following the thought-listing, the students were asked to write about a past time in which they felt confident or doubtful. Consistent with the self-validation logic, the valence of the thoughts listed had a larger impact on attitudes for individuals who had thought of times when they were confident than for individuals who considered times they were doubtful. The notion is that the confidence from the memory task would be

misattributed to confidence in one's thoughts, and indeed, measured thought confidence mediated the impact of the induction on attitudes.

Since this initial research, many variables have been shown to affect thought use by affecting the perceived validity of one's thoughts. For example, participants use their thoughts more when they write their thoughts with their dominant rather than nondominant hand (Briñol & Petty, 2003) and when, after thought generation, they are induced to feel happy rather than sad (Briñol, Petty, & Barden, 2007; Petty & Briñol, 2015), to sit up straight rather than slumped in their chairs (Briñol, Petty, & Wagner, 2009), or to feel powerful rather than powerless (Briñol, Petty, Valle, Rucker, & Becerra, 2007). The source of a persuasive message can also influence thought validation (Briñol, Tormala, & Petty, 2004) with a source that matches the function of the attitude (e.g., an expert for high self-monitors) validating both favorable and unfavorable thoughts when learning the source of the message following the message (see Evans & Clark, 2012). When the validating factor is more closely related to the content of the thoughts, however, such as source expertise validating previous perceptions that the source is competent, then source-based validation can depend on the content of the thoughts—only validating thoughts that are consistent with the validating source information (Clark, Wegener, Sawicki, Petty, & Briñol, 2013).

Notably, the self-validation hypothesis provided a new mechanism by which previously studied variables can affect the extent of attitude change. For example, initial research showed that nodding one's head while listening to a message could increase persuasion over shaking (Wells & Petty, 1980). Originally, this effect was attributed either to a self-perception or a biased processing mechanism. However, subsequent research showed that nodding one's head can enhance confidence in one's thoughts, leading to more persuasion if thoughts are favorable but to less persuasion if thoughts are unfavorable (Briñol & Petty, 2003). In another example, initial work on the ease of retrieval effect showed that generating few thoughts in favor of a position could lead to more persuasion than generating many thoughts favoring the position if the latter task was perceived to be more difficult (Schwarz, Bless, Strack, Klumpp, Rittenauer-Schatka, & Simons, 1991). Originally, this effect was attributed to the availability heuristic (Tversky & Kahneman, 1973) but subsequent research showed that people had more confidence in their thoughts when generation was easy rather than difficult (Tormala et al., 2002, 2007). Through this self-validation mechanism, ease of retrieval of favorable thoughts can produce more persuasion, but ease of retrieval of negative thoughts can lead to less persuasion.

The most recent phase of self-validation work has turned to the implications of treating one's thoughts as material objects. For example, after being asked to write positive or negative thoughts on a piece of paper, participants were told to either throw the paper in the trash, keep the paper in their pocket or purse, or, in a control condition, simply leave the paper on the table (Briñol, Gascó, Petty, & Horcajo, 2013). Individuals who tossed the physical manifestation of their thoughts away used their thoughts less than controls in forming their attitudes, whereas individuals who kept their thoughts with them used their thoughts more than controls. Subsequent research has shown that the presumed meaning of one's actions makes a critical difference. For example, if placing one's thoughts in one's pocket is done to "protect" the thoughts, the thoughts are used more than if the same action is thought to be done to "hide" the thoughts (Briñol, Petty, & Belding, 2017).

In sum, the available research indicates that thought confidence plays a causal role in determining whether attitudes are based on the thoughts people produce about an attitude object. Consistent with the argument that metacognition often requires relatively high levels of motivation and ability, thought confidence has been shown to matter most for people who report high levels of thinking about the attitude object (Petty et al., 2002). Self-validation also depends on confidence being salient during or after thought generation rather than prior to it. If confidence is made salient prior to thinking, it can affect the extent of elaboration (e.g., Briñol, Petty, Gallardo, & DeMarree, 2007; Clark & Wegener, 2013).

Bias Correction When people view an attitude, belief, or judgment as biased, they might try to avoid or correct for that bias. In such cases, the perceptions of bias would generally qualify as a metacognition (i.e., a secondary cognition; Petty et al., 2007). Perceptions of bias might be accompanied by additional metacognitions, such as viewing the attitude, belief, or judgment as unwanted, or inappropriate. In some cases, this might be because the perceived origin of the thought is illegitimate. Research on bias correction started by examining biases created by concept priming and categorization and suggested that people correct by partialling or subtracting reactions that were attributed to the prime or category rather than the target (e.g., Martin, Seta, & Crelia, 1990; Schwarz & Bless, 1992; for a review, see Bless & Schwarz, 2010).

Alternatively, efforts at bias correction could be guided by perceivers' beliefs or theories about the bias affecting one's assessments of the target (for reviews, see Chien, Wegener, Petty & Hsiao, 2014; Petty & Wegener, 1993; Wegener & Petty, 1997; Wilson & Brekke, 1994). The flexible correction model suggests that corrections are guided by perceptions or beliefs about bias and are most likely to occur when people are motivated and able to engage in the correction (Wegener & Petty, 1997). Evidence consistent with theory-guided correction includes corrections occurring when relevant theories of bias exist but not when they do not exist (e.g., Szesny & Kühnen, 2004), corrected judgments being predicted by individuals' theories of bias (Wegener & Petty, 1995), and manipulated theories of bias influencing corrected judgments (McCaslin, Petty, & Wegener, 2010). Motivation to think (a precursor to metacognition) and awareness of bias (which could create a motivation to correct per se) have also been tied to bias correction (e.g., Chien & Hsiao, 2015; DeSteno, Petty, Wegener, & Rucker, 2000; Isbell & Wyer, 1999; Martin et al., 1990). Effort aimed at correction is potentially separable from motivation to elaborate per se, as reductions in the impact of peripheral "cues" like source attractiveness with high levels of elaboration do not seem to be because of efforts to avoid source influence per se (see Petty et al., 1998; cf. Kang & Herr, 2006).

Corrections are aimed at serving perceivers' judgment goals (Wegener & Petty, 1997), which can include not only accuracy motives, but also self-enhancement (McCaslin et al., 2010) or procedural justice or following the law (Fleming, Wegener, & Petty, 1999). Accordingly, corrections have been observed in a variety of settings and for many different types of bias (see Chien et al., 2014, for a recent review). Outside the persuasion domain per se, corrections have been shown for effects of traditional versus egalitarian gender-role beliefs (Khan, Dang, & Mack, 2014), for socioeconomic status (SES)-related stereotypes (Wegener, Clark, & Petty, 2006), for implications of behavior in attribution (Gawronski, 2004), and for background contrast effects in choice (Priester, Dholakia, & Fleming, 2004). In the persuasion domain, aside from corrections for source (endorser) attractiveness (Chien & Hsiao, 2015; Kang & Herr, 2006) and source likeability (Petty et al., 1998), message recipients have also been shown to avoid expectation-congruent judgments when they hold naïve theories that persuasive messages will produce expectation-consistent outcomes (Handley, Albarracín, Brown, Li, Kumkale, & Kumkale, 2009).

Corrections often require greater cognitive effort than lack of corrections, though the overall effort in corrections could differ across people, targets, and situations (see Wegener & Petty, 1997; for potential non-effortful or even automatic corrections, see Glaser & Banaji, 1999; Maddux, Barden, Brewer, & Petty, 2005; Moskowitz, Gollwitzer, Wasel, & Schaal, 1999). There is much potential for future research regarding effort expended in producing the initial bias and in the correction. In some cases, biases occur under both high- and low-processing settings, but higher levels of processing facilitate corrections (e.g., Chien & Hsiao, 2015). In others, a more thoughtful bias decreases the likelihood of later correction (e.g., Schul & Burnstein, 1985; Wegener et al., 2006). With a strong indication that correction is necessary, short-term corrections can sometimes leave biases intact to reappear later (as in the sleeper effect in persuasion; Albarracín, Kumkale, & Poyner-Del Vento, 2017; Kumkale & Albarracín, 2004). Just as consequences of

elaboration for the ongoing strength of attitudes has received a great deal of attention in recent years, consequences of elaboration for correction (and the strength of corrected judgments) could receive similar attention.

Message Discrepancy and Amount of Elaboration

By and large, the processes discussed thus far have been assumed to operate across different positions of persuasive messages (e.g., relatively agreeable—proattitudinal—and relatively disagreeable—counterattitudinal). However, the relative discrepancy between the message position and the recipient's attitude has also been postulated to matter. For many years, counterattitudinal messages were thought to motivate people to process more deeply than proattitudinal messages—perhaps because counterattitudinal messages represent more of a threat (e.g., Cacioppo & Petty, 1979; Edwards & Smith, 1996) or because it is more surprising to encounter a counterattitudinal message (especially when the message recipient is in a positive mood, Ziegler, 2013, or the message represents a majority position, which implies that the message recipient is in the minority, Baker & Petty, 1994). Yet, in many situations, message recipients might engage in greater elaboration of pro- rather than counterattitudinal messages (e.g., Baker & Petty, 1994; Clark, Wegener, & Fabrigar, 2008b; Wegener et al., 1995).

By focusing on the different motives that guide the processing of agreeable and disagreeable information, the discrepancy motives model (DMM; Clark & Wegener, 2013) offers a general framework for organizing and understanding many of these seemingly conflicting findings. The DMM specifies that the processing of counter- and proattitudinal information is often driven by different motives. When an advocacy is counterattitudinal, the amount of careful scrutiny that recipients pay to the message may be a function of their degree of motivation to defend their views on the issue (i.e., defense motives). However, when a message is proattitudinal, the extent to which people process the communication should be driven more by a desire to strengthen or bolster one's current views (i.e., bolstering motives) rather than to defend them against an attack.

The findings of many previous investigations offer convergent support for this conceptualization. For example, various properties of the premessage attitudes that recipients hold and different characteristics of communicators have been found to interact with message position to determine the amount of elaboration. Strikingly, opposite effects on processing are routinely observed across these moderating variables. For example, evidence indicates that relatively weak premessage attitudes (e.g., those held with high levels of ambivalence, low levels of accessibility, and low levels of certainty) trigger increased processing of proattitudinal messages because such messages would help people bolster their initially weak attitude (e.g., Clark, Wegener, & Fabrigar, 2008a, 2008b; Maio, Bell, & Esses, 1996; see Clark & Wegener, 2013). Similarly, other studies suggest that ineffective, inexperienced, or minority sources enhance processing of proattitudinal messages again because these conditions would foster the need to bolster one's view (Baker & Petty, 1994; Clark & Wegener, 2009; Clark, Wegener, Habashi, & Evans, 2012). In sharp contrast, relatively strong premessage attitudes (held without ambivalence, with high levels of accessibility, and high levels of certainty) and effective, expert, or majority sources increase elaboration of counter- rather than proattitudinal messages because such messages pose a greater threat against which people with strong attitudes feel capable of defending (Baker & Petty, 1994; Clark & Wegener, 2009; Clark, Wegener, & Fabrigar, 2008a, 2008b; Clark et al., 2012). Thus, it seems likely that the discrepancy between recipients' premessage attitudes and the position taken by the message may influence the likelihood of attitudes being influenced by the wide variety of relatively low- versus high-elaboration processes discussed in this chapter.

Content, Processes, and Measures: Implicit or Explicit?

Discussions of implicit processes abound in social psychology (see Gawronski & Payne, 2014, for reviews), and attitudes research is one of the hotbeds for such discussions. Many of the processes discussed in this chapter are likely to be at least partly implicit in one way or another. However, the difficulty with such discussions is that there are both different uses of the term “implicit” and different facets of a process that could be implicit (cf. Wegener & Petty, 1998). Different roots of implicit social cognition have led to rather different emphases and even different definitions of what it means for a process (or measure) to be implicit (Payne & Gawronski, 2014). One common approach to defining the term “implicit,” grew out of the distinction between automatic and controlled processes and mostly equates implicitness with automaticity. This work emphasized automatic activation of mental content upon encountering of a target object, and little concern was given to the issue of consciousness or lack thereof. In such work, the key questions concerned whether a measure picks up on automatically activated content and on whether a process is undertaken spontaneously or without intention. A prototypic example of such work would be Fazio’s research on automatic attitude activation and its role in racial prejudice (e.g., Fazio, 1995; Fazio, Jackson, Dunton, & Williams, 1995). From this automaticity-oriented approach, there is no necessary reason to assume that automatically activated evaluations lie outside awareness. In fact, at least some key measures in this tradition ask people for direct evaluations and use the speed of response as an index of associative strength (see Fazio, 1995).

Building off of the literature on implicit memory (Banaji, 2001), a second tradition focused more on the distinction between conscious and unconscious processing (equated with explicit and implicit processes). Research emblematic of this tradition includes development of the Implicit Association Test (Greenwald, McGhee, & Schwartz, 1998) and testing of hypotheses relating such “implicit attitudes” to judgments of related objects (as in the balanced identity design, Greenwald et al., 2002). For researchers coming from this tradition, implicitness largely means lack of awareness. In general, by default people depicting something as implicit may well intend to depict an unawareness of that thing. Without being explicit about their intent, however, such statements can be confusing. Consider, for example, when a researcher uses a measure like an IAT (developed by researchers equating implicitness with lack of awareness) but thinks of the measure not as tapping into attitudes of which people are unaware, but rather as tapping into attitudes that are automatically activated upon encountering the attitude object. In many cases, it would be helpful for researchers to be specific about what brand of implicitness they are assuming and, ideally, what types of validity evidence support that conceptualization of the measures and mechanisms at work (at least when the claims of the work include claims about implicitness).

In their iconic review, Greenwald and Banaji (1995) called for the development of implicit measures in order to study implicit social cognition. In many ways, they were using implicitness as lack of awareness, but this was only true of particular parts of the studies they reviewed. For instance, many of the reviewed studies used explicit measures (such as direct evaluations of the target object). The effects themselves were identified as implicit because the influence of the stimulus input could not be identified (cf. Nisbett & Wilson, 1977), sometimes because people might not even be aware of the stimuli creating the effects (e.g., in some mere exposure paradigms, Bornstein & D’Agostino, 1992; or affective priming paradigms, Krosnick et al., 1992). Even when clearly focusing on lack of awareness of a process, however, that lack of awareness seems different from saying that people lack awareness of the attitude itself. Importantly, there are likely many situations in which people are quite aware of their attitudes but not aware of what influenced those attitudes or how.

To us at least, people are likely to have varying degrees of conscious awareness of stimuli, processes, and outcomes (e.g., attitudes). Yet, it is important to be specific about whether one is applying the “implicit/explicit” distinction to measures (Fazio & Olson, 2003b), to processes (Gawronski &

Payne, 2014), or to the attitude construct itself (e.g., Wilson, Lindsey, & Schooler, 2000, in part, because any one of these need not imply the others; see also Dulany, 1997; Payne & Gawronski, 2014; Petty, Fazio, & Briñol, 2009). In some cases, people may be unaware of the eliciting stimulus or stimuli; in others, people might be aware of the stimuli but fail to recognize their effects on related judgments or behavior; in yet others, people might not even be aware of the outcomes (as in when a memory or perception has been changed, but direct measures of those memories or perceptions do not pick up on them; see also Wegener & Carlston, 2005). Because of the possible lack of correspondence between measures and processes, both cognitive theorists in the realm of implicit memory (Roediger, 2003) and researchers of implicit social cognition (De Houwer, Teige-Mocigemba, Spruyt, & Moors, 2009) have advocated adoption of the traditional attitude measurement labels of indirect versus direct measures (e.g., see Petty & Cacioppo, 1981) rather than implicit and explicit measures per se (see also Wegener & Carlston, 2005). Contributing to the reluctance to equate implicit measurement with implicit attitudes per se is evidence suggesting that people can be consciously aware of implicitly assessed attitudes (e.g., Gawronski, Hofmann, & Wilbur, 2006; Hahn, Judd, Hirsh, & Blair, 2014).

Most of the attitudinal processes discussed in this chapter are likely to operate outside of awareness at least some of the time. People may often fail to realize that they have integrated the available attitude-relevant information in a particular way (with particular weights) or that they relied on a particular heuristic. Similarly, they seem unlikely to realize the influences of many factors on the amount of elaboration in which they engaged (such as their current feeling state or the discrepancy between their current attitude and the position of the message). This lack of awareness of specific cognitive processes or causes is basically the “lack of knowing” discussed by Nisbett and Wilson (1977). Even processes that began as intentional and conscious (including, perhaps, some forms of elaborative analysis or metacognition) might, with practice, ultimately achieve some degree of automaticity, such that they later take place spontaneously, without intention, and outside awareness (see Wegener & Petty, 1997; Wegener & Carlston, 2005, for additional discussion). When this happens, changes in automaticity, in awareness, or both might change the kinds of consequences those processes have. Such questions await future research, but in conducting that research, progress will be aided by specificity on the part of researchers regarding what is treated as implicit (the measure, the process, or the attitude) and why.

Summary, Future Directions, and Conclusions

We have attempted to review the extensive literature on cognitive and metacognitive attitudinal processes on several different levels. Our emphasis was on bounded processes, as we perceive the majority of attitude change mechanisms as falling into that category (even if the boundaries were not proposed when the theory was originally developed). Though a number of specific distinctions could be made among processes, we find utility in organizing processes according to their rough placement on an elaboration continuum. This is partly because key frameworks for understanding attitude formation, attitude change, and attitude consequences, such as the ELM, incorporate such a dimension.

It could well be, however, that additional specific dimensions of attitude change processes, alone or in conjunction with the elaboration continuum, might prove theoretically useful. For example, consider the unintentional/intentional distinction. It could be that some low-elaboration processes operate quite spontaneously and without intention (such as familiarity-based or representation-matching effects of mere exposure). It could be that other low-elaboration processes are taken on more intentionally as a way to simplify processing and still come to a reasonable (and defensible) view of an attitude object. In some cases, at least, siding with an expert might fall into this category. It could also be that the same overall effect, such as agreeing with an expert, might occur for

different reasons—some unintentional, like mere association of the object with the positive features of the source, and others intentional, like inferring that the object is likely positive if the expert source favors it as a means to forego effortful processing of object-relevant information. Perhaps future research will identify influences of such intentionality, and perhaps effects of intentionality would differ depending on whether they occur under particular levels of elaboration or some other common process continuum (e.g., associative vs. propositional).

Some processes have also been developed as “universal” processes potentially capable of playing a role in virtually any attitude formation or change. We find such process descriptions to be limited in their ability to make specific predictions unless they are accompanied by moderating factors that place limits on their operation (thereby making them more bounded in practice if not in name). Of course, a variety of lower-level “component” processes have also been examined, with a number of such processes potentially contributing to any particular bounded or universal process. Similar to the previous comments about cross-cutting dimensions of process distinctions, it could be that operation of a specific component process might have different implications depending on whether that process occurs under different levels of elaboration, intentionality, etc. To some degree, current conceptualizations probably include such reasoning, even if not explicitly. For example, if one recalls the source of a message when it is time to evaluate the attitude object, the effects of that source memory should depend on whether the person is motivated to elaborate on available information about central merits of the object or is looking for processing shortcuts because either motivation or ability is lacking.

Many parts of the reviewed literature have been developing for some time, and a number of the basic phenomena are well-established (such as the existence of conditioning effects, influences of mere exposure, and links between elaboration and consequences of attitudes, such as resistance to change). Even when the basic form of the effect has been consistent and predictable, however, there is often still room for disagreements regarding process-level explanations and the limits of those processes (e.g., compare propositional explanations for evaluative conditioning with multi-process explanations, Gawronski & Bodenhausen, 2014, or consider the role of habituation in mere exposure effects; cf. Montoya et al., 2017).

As reviewed in this chapter, however, there are also a number of newer literatures where a variety of questions have not yet been examined. Consider, for example, the literature on metacognition. Studies of metacognition from the standpoint of self-validation theory have been consistent in linking metacognition to higher levels of elaboration when the object of the metacognition is one’s recently generated thoughts. Yet, such links may depend to some degree on the type of target for the metacognition. When the target is thoughts, it may be that high levels of elaboration are needed (because one has to be actively thinking for those thoughts to become objects of metacognitions). When the object is a previously established attitude or judgment, however, it could be that at least some facets of metacognition could occur much less thoughtfully. If so, it would be interesting to examine whether strength-related consequences follow the level of elaboration involved (with the evaluative outcomes of more thoughtful mechanisms having stronger consequences) or the pattern of the metacognition itself (such as higher confidence or liking of the primary cognition creating stronger impact of that primary cognition, regardless of the level of elaboration). Of course, it is also possible that the level of elaboration involved in a metacognition will help to determine the extent to which the metacognition itself has consequences, such as persistence over time or resistance to change.

Finally, it seems likely that future work will examine how the consequences of attitudes that have served as the defining features of strong attitudes (i.e., persistence of the attitude over time, resistance of the attitude to change, and impact of the attitude on thinking and behavior; Krosnick & Petty, 1995) unfold in relation to one another. Impact on behavior often depends crucially on persistence and resistance (see Fabrigar et al., 2010). Yet, it may be different facets of an attitude that facilitate persistence in the absence of attack, create resistance when an attack is encountered, or determine

whether an action will be consistent with the attitude. However, the potential distinctions across these common consequences have been understudied. There are some very practical reasons for this. Most of the relevant research has examined a single outcome such as persistence over time or resistance to change. But links among the outcomes require examination of two or more of the outcomes in the same study. There is no shortage of open questions, and we look forward to the continuing developments of both cognitive and metacognitive mechanisms for attitude formation and change as well as their connections to the consequences of the resulting attitudes.

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