Attitudes, Evaluation, and Emotion Regulation

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Research and theory in the domain of attitudes and evaluation is relevant to emotion due to their many overlaps and parallels. Most fundamentally, they share at their core the concept of the valence. Attitudes encode the valence of an object: that is, goodness or badness, desirability or undesirability, pleasure or pain. Valence is similarly integral to the concept of emotion; some theories argue that all emotions, at their core, can be distilled to whether they are positive or negative (e.g., Russell, 2003; Watson & Tellegen, 1985). Its function is to guide appropriate action. In the case of attitudes, that functionality lies in their ability to provide a rapid, default assessment of an object's value; we need not constantly judge the world anew.

Yet, this tool that may even be life-saving in times of peril can also be a liability. Reflexively acting in accordance with one's feelings is not always appropriate; indeed, the feeling itself may be deemed problematic. For example, prejudiced group attitudes and evaluations may conflict with social norms or one's values, leading to reconciliatory processes of justification or suppression (Crandall, Eshleman, & O'Brien, 2002). We also argue that evaluation entails a process of affect regulation in and of itself. Even in the absence of a particular desire to change one's evaluation, regulation is occurring. Increasingly, contemporary perspectives on attitudes view evaluations as the product of dynamic processes that are shaped by the demands of the immediate situation. Relatively stable mental representations underlie the very earliest evaluative processing; however, in a way that can be viewed as fundamentally self-regulatory (e.g. Carver & Scheier, 1982), evaluations are sensitive to various goals and standards for thoughts, feelings, and behavior.

Regarding the volitional self-regulation of evaluation, it will be uncontroversial to note that people are not merely passive receivers of their psychological experiences; valence can not only be experienced but also assessed and modified. Though evaluation has some characteristics

of cued responding grounded by pre-existing structure, people do not respond to the same cue in invariably. One may generally dislike something (say, golf) but temper that affective response, or even reverse it, when the situation demands. For example, when offered the opportunity to golf with a work supervisor, one might be motivated to deemphasize the object's disliked features and emphasized its liked ones (e.g. defining golf more by its aesthetic value than, say, its early-morning tee times), or reevaluate its features (e.g. considering how golf's difficulty might constitute a virtue rather than an annoyance). Evaluations are often shaped to conform to appropriate action. As such, when considering the use of attitudes to guide behavior, the regulation of affect is important. One type of evaluative regulation entails the inhibition and reshaping of "gut reactions" of liking in accordance with their perceived appropriateness. Beyond this, we will emphasize processes within even quite rapid and spontaneous evaluations (those very gut reactions) that evidence self-regulatory flexibility in experienced object-directed affect. Relatedly, Gross and Barrett (2011) suggest the possibility that emotion generation and regulation can be considered the same process: information may be simultaneously processed as affectively relevant and informed by top-down processes that take contextual cues (e.g., situational appropriateness) into account. Similarly, Todd and colleagues (2012) have suggested that emotion can be simultaneously shaped and regulated through early attentional biases. In making this argument, we hope to highlight the potential for greater integration between the literatures on affect regulation and attitudes, which as yet have stood largely separate.

At the outset, some clarification of our usage of the terms "attitude" and "evaluation" will be useful. Some prominent definitions have defined attitudes generally: predispositions to respond positively or negatively to an object (e.g. Allport, 1935; Eagly & Chaiken, 1993), or as a constellation of affective, cognitive, and behavioral responses associated with an object (Zanna

& Rempel, 1988). In contrast, a more specific and limited definition, (Fazio, 2007), defines attitudes as associations in memory between objects and summated valenced information about those objects. This approach is the one we will take here defining attitudes as *representational*, in which attitudes signify valenced information stored in memory that have the potential to be activated. We will, however, distinguish representational attitudes from evaluation - a *process* by which valence is constructed in both bottom-up and top-down fashion. In this way, we integrate a representational definition of attitude with the approach to attitudes typically considered most antithetical to it: the constructivist approach (e.g. Schwarz & Bohner, 2001). This approach tends not to deny the existence of mental representations but chooses to deemphasize them, focusing instead on contextual factors that shape experiences of liking and disliking. In sum, we will use the term "attitude" to refer to a structural entity in memory and the term "evaluation" to refer to an appraisal process informed by an attitude that unfolds over time in a particular context. Thus, evaluation can be considered a process of affect regulation in the moment, fostering context appropriateness. Given our terminology, attitudes may also be subject to self-regulation, as when one attempts to change how much one generally likes something. We will primarily focus on the former.

It is the interplay of attitudes and evaluation that provide true functionality. A rigid retrieval system would be insensitive to context and beholden to even limited past experience. A fully constructed system would be slow, inefficient, and too unresponsive to lessons learned. Instead, we have both capabilities. The transformation of attitudes into evaluations is a form of emotion regulation in which situational factors can play a role even in immediate responses. We will argue that an attitude is a triggered affective response that is shaped into a contextually appropriate evaluation via a process of iterative reprocessing (Cunningham & Zelazo, 2007).

This updating occurs as the situation unfolds, and thus affect regulation is critical to all stages of the attitude-to-evaluation transformation—from the processes typically considered automatic to the processes that are typically considered controlled. Thus, although the effortful inhibition of evoked attitudes is a major topic, our conceptualization of regulation goes beyond this to include a variety of processes that shape adaptive responding. This broader view of emotion regulation is consistent with evolving views on self-regulation generally in which inhibition is not a *sine qua non* (e.g., Fujita, 2011).

In this chapter, we review contemporary attitude theories that entail an emphasis on regulation. Following a discussion of two foundational models to most recent approaches, we will focus in detail on contemporary treatments of attitude and evaluation that illustrate the self-regulatory shaping of rapid response. We highlight the Iterative Reprocessing (IR) model (Cunningham & Zelazo, 2007), which not only addresses such processes descriptively but also provides a perspective from neuroscience regarding the underlying brain substrates of those processes. We use the IR model as a framework to address differences in theory and empirical controversy that characterize this literature.

Two Foundational Attitude Models

Models of attitudes commonly emphasize some distinction between implicit and explicit attitudes or evaluative processes. Undoubtedly, this is in large part due to the introduction of reaction-time based implicit attitude measures, such as evaluative priming (Fazio, Jackson, Dunton, & Williams, 1995) and the implicit association test (IAT; Greenwald, McGhee, & Schwarz, 1998). Researchers had long hoped to find a solution to the problem of dishonest responding to attitude measures out of social desirability concerns. These implicit measures offered the best solution to date by engaging participants in a task that might reveal attitudes

without actually calling upon participants to express them.

Interestingly, the new implicit attitude measures appear to diverge from explicit measures (self-report) particularly when self-presentational concerns are high (e.g. Fazio et al., 1995; Olson, Fazio, & Hermann, 2007), yet also diverge even when incentives to misrepresent oneself are minimal. For example, Karpinski and Hilton (2001) found null relations between IAT and self-report measures of preference for insects versus flowers and apples versus candy bars, seemingly non-controversial attitude objects. Further, it appeared that social influence (not necessarily intentional misrepresentation) was especially evident on the *implicit* measure rather than the explicit measure. That is, the IAT suggested a greater affinity for the healthy (i.e., socially valued) alternative than was evident in explicit behavior. This example highlights the findings that dissociations between implicit and explicit measures are common and are complex (for a meta-analytic review, see Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005), and that these dissociations cannot be attributed exclusively to misrepresentation on self-report measures or measurement error and lack of structural fit (Payne, Burkley, & Stokes, 2008).

Models need to account for these dissociations, and incorporating some distinction between implicit and explicit attitudes or evaluations is a common way of doing so. However, something like this distinction has been long recognized. For example, Hovland, Janis, and Kelley (1953) distinguished attitudes ("implicit responses" that are "sometimes unconscious") from opinions ("verbal answers that one covertly expresses")(cited in Petty & Briñol, 2006). The recently accumulated evidence from implicit measures can be understood as validation of the long-appreciated observation that rapid, unintentional responses (what one might call "gut reactions") can differ considerably from carefully considered evaluations. Accounting fully for the processes that distinguish them is a central issue in contemporary attitude theory and of

obvious import for self-regulation. We first discuss two influential models that have been recently built upon to explain differences between immediate and subsequent responses.

MODE Model

The acronym MODE refers to *M*otivation and *O*pportunity as *De*terminants of whether the attitude-to-behavior process is relatively spontaneous or deliberative in nature. The MODE model (Fazio, 1990; Olson & Fazio, 2009) posits a single attitude representation, and defines an attitude as the association in memory between an object and a summary evaluation thereof (see Fazio, 2007). The model is largely agnostic about the nature of attitude representation. It is readily understood in terms of a "schema plus tag" model in which summary evaluations are a special form of tag associated with an attitude object. However, it is also consistent with more recent dynamic and connectionist models if "summary" is understood to refer to distributed information in memory (Eiser, Fazio, Stafford, & Prescott, 2003). Regardless, the MODE model is primarily about when attitudes determine behavior.

The MODE model predicts whether the attitude to behavior process is relatively spontaneous or deliberative in nature. The model notes that the primary function of attitudes is to provide a rapid assessment of objects in the environment to facilitate appropriate behavior in a timely fashion. Attitudes can be activated automatically, and the likelihood of automatic attitude activation is a function of the associative strength between the attitude object and the associated evaluation (see Fazio, 2001). If there is little *motivation* for further consideration of the object, for whatever reason, or low *opportunity* (e.g. time pressure or cognitive load) to do so, attitudes should guide behavior in a spontaneous, largely automatic fashion in which they promote congruent behaviors afforded by the situation. Controlled deliberation about the attitude and behavior is likely only when the motivation *and* opportunity to do so are present. This

deliberation might lead to the alteration or rejection of an attitude and the behavior it facilitates but could also affirm it. In fact, the model suggests that affirmation is most typical because the activated attitude fosters biased processing. Alteration or rejection of the attitude depends on various factors including contextual influences on the object's utility, social influence, object reappraisal, and so on.

In summary, the MODE model posits a single attitude associated with each discrete representation of an attitude object that may be retrieved from memory, often automatically. That attitude is likely to shape subsequent judgment and behavior; however, the attitude's influence is especially likely to be direct for spontaneous behaviors. When the motivation and opportunity to deliberate are present, the attitude might be disregarded, might be adjusted for reasons including context or apparent appropriateness, or might be validated by deliberation. The MODE model's implications for emotion regulation are straightforward. It applies directly to circumstances in which one wishes to control automatic emotional responses to a particular object. The MODE model points to motivation and opportunity as broad categories encompassing many specific variables and emphasizes that any major impediment to motivation or ability drastically reduces the likelihood of deliberative regulation.

To account for discrepancies between implicit and explicit attitudes, the MODE perspective suggests that implicit measures largely reflect automatically activated attitudes, while explicit measures capture deliberative evaluations, which may or may not reflect attitudes for the reasons described. Another way of explaining these differences is to evoke two different attitude *representations* to which the measures are differentially sensitive. The notion of an implicit attitude is often attributed to Greenwald and Banaji (1995), who wrote: "*Implicit attitudes* are introspectively unidentified (or inaccurately identified) traces of past experience

that mediate favorable or unfavorable feeling, thought, or action toward social objects" (p. 8). It was not until Wilson, Lindsey, and Schooler's (2000) dual-attitudes model, however, that a major process model of dual attitudes was articulated.

Dual-Attitudes Model

In the original conception of "implicit attitude" such attitudes were considered by definition to be unknown to the evaluator (Greenwald & Banaji, 1995). The absence of awareness is most directly the facet of automaticity (see Bargh, 1994) referred to by the term "implicit." However, the term has been used in a wide variety of ways, leading some to argue that because "implicit" *de facto* has become a catchall descriptor of (relatively) automatic processes, it should be understood as such (De Houwer & Moors, 2007). Wilson and colleagues (2000), for example, do not define implicit attitudes as characterized by unawareness. They suggested that "people are often aware, at least fleetingly, of [implicit attitudes]" (p. 105). What, then, is an implicit attitude in this model?

According to the dual-attitudes model (Wilson et al., 2000), implicit attitudes are, in a word, old (or prior). That is, when an attitude representation changes, it is not fully supplanted by a new, altered attitude. Rather, both representations can co-exist in memory. Thus, an implicit attitude is a prior, often deeply ingrained attitude. By virtue of its precedence and having been rehearsed, the implicit attitude is strongly associated with the attitude object. Thus, it will likely be automatically activated upon encountering an attitude object. Similar to the MODE model, the dual attitudes model posits that "capacity and motivation" are required to effortfully retrieve the newer, explicit attitude. Retrieval of the explicit attitude is expected to lead to its application, especially for controlled behaviors. The simultaneous activation of implicit and explicit attitudes may also demonstrate unintended influence of the implicit attitude, especially on unmonitored or

uncontrollable nonverbal responses (c.f. Dovidio, Kawakami, Johnson, Johnson, & Howard, 1997).

Wilson et al. (2000) further distinguish a typology of four kinds of implicit attitudes, which have different characteristics due to their differing origins. Briefly, an implicit attitude might arise from repression, in which an anxiety-provoking implicit attitude is expelled from consciousness and is thus implicit in the sense of being unknown. Another implicit attitude arises from motivated overriding, when an attitude is unwanted and is effortfully suppressed. It may also be the case when the process of overriding such an implicit attitude itself becomes automatized through repetition, producing automatic overriding. In this case, capacity and motivation are not actually required for the explicit rather than implicit attitude to predominate. Finally, the dual-attitudes model suggests that implicit attitudes may differ from explicit attitudes simply by virtue of having an entirely separate neurocognitive substrate (i.e., independent systems; see Lieberman, 2007 for such a view) but does not much elaborate on this possibility, which distinguishes some more recent models.

In some ways, the implications for the dual-attitudes model for emotion regulation are similar to those of the MODE model. Certainly, the necessity of motivation and ability/capacity for any sort of controlled emotion regulation is again highlighted. The different types of implicit attitudes described, however, are uniquely relevant. The case of repression, though its very existence is controversial, poses an interesting problem. In this case, one's own affective reactions to an object are anxiety-provoking, instigating defensive reactions that suppress and exclude them from consciousness. Motivated overriding essentially describes a phenomenon of successful affective regulation, but does not elaborate much about *how* this occurs especially under difficult circumstances, with the exception that automatizing a regulatory response may

occur through repetition. This is an interesting possibility in the realm of emotion regulation.

Summary of Historical Perspectives

To summarize, these models in their early incarnations posited implicit or activated attitudes that were largely unregulated. Schema-plus-tag or implicit-attitude-as-habitual-response conceptualizations of attitude share the consequence of rapid responses that are quite inflexible and context-free. Affective regulation is then possible if and only if one is motivated and able to suppress, adjust, enhance, or replace (i.e., effortfully retrieve an explicit attitude) an evaluation. However, the strong form of this view is inconsistent with findings that are indicative of self-regulatory responding even in rapid responses evident on implicit measures. For example, Lowery, Hardin, and Sinclair (2001) demonstrated that racial attitudes as measured by an IAT were sensitive to social tuning—that is, the likely attitudes of other individuals present. Increasingly, recent models address adaptive flexibility in processes occurring during the construction of an evaluation. Notably, a similar development has occurred in theorizing about stereotyping. Automatic stereotype activation was often viewed as inevitable (Bargh, 1999; Devine, 1989) and could only be overridden by controlled processes. Subsequent research in this domain suggested a much more optimistic view of flexibility and self-regulation at the earliest stages of processing (e.g. Jones & Fazio, 2010; Moskowitz, Gollwitzer, Wasel, & Schaal, 1999; Sassenberg & Moskowitz, 2005). In contemporary attitude models, we will see a greater emphasis on malleability in rapid responses. This malleability can be viewed as demonstrating the fundamentally regulatory nature of evaluation. We turn now to recent models including several variations on this theme.

<center>*Contemporary Attitude Models*</center>

Associative-Propositional Evaluation (APE) Model

Probably the most influential contemporary approach to attitudes and evaluation is the associative-propositional evaluation (APE) model. Originally, the APE model was introduced to explain the complex literature on the impact of interventions that form or change attitudes on implicit and explicit measures (Gawronski & Bodenhausen, 2006). Since then, it has been broadened to address attitudes and evaluation more generally (see Gawronski & Bodenhausen, 2011). The APE describes two interactive but distinct types of processes that underlie evaluation: associative and propositional processes.[1] *Associative* processes activations of associated representations from memory. This activation is presumed to follow the principles of contiguity and similarity; contiguity refers to the spatiotemporal proximity of stimuli that determines the structure of memory, whereas similarity refers to the fit between encountered objects and mental representations. *Propositional* processes involve the validation of information activated by associative processes. Unlike associative processes, propositional processes entail subjective assessments of truth values (i.e., veridicality of information). They are posited to operate according to principles of logical consistency, though in the sense of perceived coherence rather than formal logic per se. Associative processes are argued to underlie implicit evaluations, and propositional processes are argued to underlie explicit evaluations. Thus, if implicit evaluations are perceived as valid, they will be used for explicit evaluations; if they are not, they are modified.

The APE suggests that, following connectionist models of associative memory, information associated with a given attitude object is distributed across a network of weighted connections. The activation of a given piece of information associated with an object is typically probabilistic, in a manner that maximizes the likelihood of the most relevant information being activated, which can be viewed as regulatory. The particularities of the input stimulus as well as

incidentally active information due to recency of use will determine which subset of associations are activated. This allows for different implicit evaluations as a function of context, consistent with malleability often observed on implicit attitude measures (e.g. Barden, Maddux, Petty, & Brewer, 2004). These implicit evaluations provide the grist for propositional processing. If the propositional implications of an implicit evaluation are inconsistent with other salient propositions, an aversive state of cognitive dissonance is evoked. Cognitive dissonance, induced by the simultaneous activation of conflicting information, is an aversive state of arousal that motivates efforts to alleviate it (Festinger, 1957). Various methods of restoring balance and consistency have long been recognized, such as rejecting one of the propositions or introducing another proposition that reconciles or trivializes the apparent conflict.

Importantly, associative and propositional processes are argued to be interactive. In addition to the bottom-up processes in which activated associations determine the kinds of propositions that are evoked, there are also top-down processes that create or activate further associations (see Gawronski & Bodenhausen, 2011 for detail). The APE is useful for explaining the highly varied patterns of results that have been observed when implicit and explicit measures follow manipulations meant to form or change attitudes. Earlier models, particularly those that emphasize the stability of implicit evaluations (e.g. Wilson et al., 2000), have trouble explaining circumstances in which implicit measures are more sensitive to manipulation than explicit measures (e.g. Gawronski & LeBel, 2008; Karpinski & Hilton, 2001). The APE, in contrast, can explain when information will recruit associative versus propositional processes.

Some types of interventions are likely to have direct effects on associative processes (Gawronski & Bodenhausen, 2011). For example, evaluative conditioning, a phenomenon by which an attitude toward an object forms or changes due to its co-occurrence with one or more

valenced objects, is likely to have these types of direct associative effects (for reviews, see De Houwer, Thomas, & Baeyens, 2001 ; Jones, Olson, & Fazio, 2010). The repeated pairing of objects occurring during conditioning procedures facilitates association formation and strengthening for obvious reasons. Other types of interventions are likely to have direct effects on propositional processes. Inductions of cognitive inconsistency (e.g. Gawronski & Strack, 2004) impact propositional processes directly, but may leave relevant associations intact. Events might also directly influence both associative and propositional processes. For example, a persuasive message could change the propositions that are considered with and also create a new associations in memory.

Finally, events might directly influence one process and indirectly influence the other. Any change in associative structure can potentially influence the propositions that are generated and assessed, the path taken to reduce cognitive dissonance, and so forth. The propositions an individual considers can create or change the associative strength of associations, even in the absence of external stimulation. A fuller account of the details of the APE (see Gawronski & Bodenhausen, 2006; 2011) is beyond the scope of this paper, but it should be noted that the APE offers many specific hypotheses about the eliciting circumstances and processes underlying patterns of attitude change evident on implicit and explicit measures.

One issue addressed by the APE that has interesting implications for affect regulation concerns negation. The act of negating a proposition may be insufficient to change the relevant associative structure in memory. Indeed, though negation may influence propositional processes in a straightforward manner (i.e., processing consistent with the negated proposition), the act of negation may have ironic effects at the associative level due to the co-activation of elements (e.g., Deutsch, Gawronski, & Strack, 2006). For example, telling oneself, "I am not afraid of

giving a speech," may have some immediate positive consequences due to its consciously processed implication. However, this also risks increasing the (automatic) association in memory between fear and public speaking merely because of their simultaneous activation. Gawronski and Bodenhausen (2011) suggest that the overall success of regulating future affective reactions depends on whether unwanted propositions are negated ("I'm not afraid of public speaking") or preferable propositions are affirmed ("public speaking is fun"), implying that affirmation works better than negation for emotion regulation.[3] For example, a study in which stereotypic associates were negated led to *increased* automatic stereotype activation and, significantly for the question of affect regulation, increased bias on an evaluative priming task (Gawronski et al., 2008). Gawronski and Bodenhausen (2011) suggested that such ironic effects may bear some responsibility for the general superiority in emotion regulation (Gross, 1998) of an affirmative strategy of reappraisal as opposed to a negative strategy of suppression. However, other work suggests that generating or encountering negations may have positive influences on affect regulation. For example, Herbert and colleagues (2011; see also Mauss et al., 2006) examined startle eyeblink responses to pleasant and unpleasant nouns that had or had not been negated. They found (with ample processing time) on-line effects of negation consistent with the logical meaning: reduced startle response to negated unpleasant words and increased response to negated pleasant words. Thus, the role of negation in affect regulation remains controversial.

The APE model suggests that the interplay of associative and propositional processes underlie evaluation. It is sometimes misunderstood as a dual-system or dual-representation model but it is explicitly not (Gawronski & Bodenhausen, 2011, p. 104-105). The APE model argues that all information is stored in the form of associations and that there is not a separate store for propositions, thus rejecting the possibility of dual representations. The APE model does

not explicitly endorse or reject a dual-system approach, which emphasizes separate mental

systems (i.e. neurocognitive substrates).[4] Some researchers believe that the sometimes stark

dissociations between implicit and explicit evaluations that have been observed are best

explained by their origination from separate systems. We turn now to a recent model of dual

systems to explore this idea in greater detail.

The Systems of Evaluation Model (SEM)

The Systems of Evaluation Model (SEM) describes an *associative system* that produces

implicit evaluations and a *rule-based system* that produces explicit evaluations (McConnell &

Rydell, in press; Rydell & McConnell, 2006). It builds on prior dual-system models of cognition,

particularly Sloman's (1996) model of fast- and slow-learning systems of reasoning. These

partially independent systems operate in parallel and differ in the type of knowledge they use and

the operations conducted on that knowledge. The associative system reflects associations

governed by principles or similarity and contiguity, whereas the rule-based system operates on

symbolic representations (e.g., language) that are subjected to operations of logic and deductive

reasoning. Because implicit measures tend to reflect construct activation and explicit measures

tend to reflect symbolic reasoning, the measures differ in their sensitivity to the output of the two

systems. This suggests that the primary distinction between these systems is similar to the APE

model. However, a major difference is that the SEM emphasizes distinctive characteristics of the

two systems that lead to differential rates of change. The SEM suggests that the explicit system

is faster, while the implicit system is slower, both to form and to change attitudes. Explicit

evaluations "can be formed and modified relatively quickly because logic and syllogism are

responsive to one's deliberate goals and deductive reasoning processes," whereas implicit

evaluations "typically are slower to form and change because they are based on accumulated

attitude object-evaluation pairings in memory" (McConnell & Rydell, in press). In this way, the SEM bears some resemblance to the earlier dual-attitudes model of Wilson and colleagues (2000), insofar as an implicit attitude tends to be distinguished by stability. However, the SEM does not posit separate stores for "old" and "new" attitudes, nor does it require attitude change to be necessary to produce separate evaluations. Though sometimes implicit measures are quite labile, this can be reconciled with the SEM by noting that this often appears to be due to a different subset of associations being activated from memory that influence an implicit measure, among other reasons, rather than a rapid change in particular associative representations.

The SEM is supported by research demonstrating strong dissociations between implicit and explicit measures consistent with a dual-systems view. For example, Rydell and McConnell (2006, Experiment 2) presented participants with a series of behaviors performed by a target individual. Presenting a large number of positive or negative behaviors established positive or negative attitudes, respectively, that were evident on both implicit and explicit measures. This was followed by a series of counterattitudinal behaviors. When 100 initial behaviors were followed by 20 conflicting behaviors (i.e., positive followed by negative, or vice versa), explicit attitude measures showed considerable sensitivity to new information while implicit measures were largely unaffected by it. When 100 counterattitudinal behaviors followed the initial 100, both types of measures reflected the new information. This is interpreted as consistent with the presence of a slow-learning associative system and fast rule-based system. In other work supportive of the SEM, a series of subliminal primes were paired with target individuals (Rydell, McConnell, Mackie, & Strain, 2008). Because repeated subliminal priming might produce the gradual association of affect with an attitude object, it would be expected to influence the associative system. Moreover, by virtue of being subliminal, such a manipulation would provide

grist for the rule-based system. However, the rule-based system should be especially sensitive to consciously accessible information, as evidenced by influences on explicit measures. Results in line with these hypotheses were obtained: across several studies, implicit attitudes formed and changed in response to subliminal primes, and explicit attitudes formed and changed in response to consciously accessible information.

An interesting aspect of the SEM with wide implications for affect regulation is the study of the consequences of discrepancy between implicit and explicit evaluations. One consequence of implicit-explicit discrepancy involves the extent of information processing. It has been suggested that these discrepancies lead to increased information processing (e.g., Petty, Tormala, Briñol, & Jarvis, 2006). Moreover, recent work has suggested that this may be due to the arousal of cognitive dissonance caused by the conflicting outputs of the two systems (Rydell, McConnell, & Mackie, 2008). Seeking out information to resolve the discrepancy is a major route to dissonance reduction. However, the source of these aversive feelings can be mysterious to those experiencing them, and consequently, the feelings might be misattributed to inappropriate sources). Specifically, negative arousal caused by attitude formation with valence inconsistent information led participants to report lower subjective well-being (Rydell & Durso, 2012). Thus, the SEM suggests that when the systems of evaluation produce discrepant evaluations, negative affect and affective regulation tend to follow. Another relevant consequence of implicit-explicit discrepancy involves affective forecasting. It has also been suggested that thoughtful affective forecasting relies on explicit evaluations of objects, ignoring implicit evaluations (McConnell, Dunn, Austin, & Rawn, 2011). Consistent with this idea, implicit but not explicit attitudes predicted error in affective forecasting when considering future enjoyment of foods.

Meta-Cognitive Model (MCM)

Petty and colleagues' Meta-Cognitive Model (MCM; Petty, 2006; Petty, Tormala, Briñol, & Jarvis, 2006; Petty, Briñol, & DeMarree, 2007). The MCM has elements of most of the other models we have discussed. It focuses on how attitudes might be stored in memory, with particular emphasis on meta-cognitive perceptions of the validity of responses. Moreover, the MCM draws on research arguing that the neural substrates of positive and negative valence are distinct (e.g., Cacioppo, Gardner, & Berntson, 1997), suggesting that separate positive and negative evaluations of an object might be represented in memory.

According to the MCM, though many attitudes are predominantly univalent, it is not uncommon for an object to be associated with both positive and negative summary evaluations. Whether the positive or negative attitude associated with an object is activated depends on associative strength, recency of prior positive and negative experiences, and whether the current context is a better fit with the positive or negative association. Reflecting on these attitudes can lead them to become associated with a tag, marking them as either valid or invalid. The associated confidence indicator serves as a signal to utilize or disregard the attitude with minimal reflection required. However, the MCM notes that validity tags also vary in their associative strength to the evaluation and vary in accessibility, meaning that sometimes it may not be retrieved from memory when the attitude object is. Often, attitudes marked with an invalidity tag are prior assessments that have been changed, but still may exert an influence (Petty et al., 2006). The MCM concurs with the APE in the assumption that the default response to association activation is acceptance, the presumption of validity (see also Gilbert, 1991). Therefore, it tends to matter more when an *in*validity tag is not retrieved, in which case a rejected evaluation is likely to influence judgment and behavior. The MCM distinguishes between explicit

ambivalence, in which both positive and negative evaluations are associated with validity tags, and implicit ambivalence, in which one association is validated and the other is not. Explicit ambivalence is perceived as subjectively conflicting when it is experienced, but implicit ambivalence is not, due to the conscious rejection of either the positive or negative evaluation. In sum, the MCM suggests that the creation and retrieval of validity tags serve a self-regulatory function by marking which associations are (in)appropriate for guiding action. Unlike the other models discussed, The MCM can particularly be seen as clearly concerning the regulation of attitudes per se. Validity tags concern the associative network of an attitude and the adaptive change of more regulation of relatively generalized responses that can guide later action. Though all models concern the regulation of attitudes insofar as the process of evaluation not only recruits but also changes attitudes in memory, the MCM is particularly useful for considering how attitude structure changes over time.

The Iterative Reprocessing Model and Dynamism

Our final contemporary perspective emphasizes dynamism in evaluation and regulation. Dynamism refers to the notion that mental representations are constantly evolving states in which partial representations are cascading, competing, and interactive. The dynamical approach to processing (e.g., Spivey, 2007) has been applied to multiple social psychological concepts including categorization (Freeman, Ambady, & Rule, 2008), stereotyping (Freeman & Ambady, 2009), and evaluation (Wojnowicz, Ferguson, Dale, & Spivey, 2009). Wojnowicz and colleagues (2009) argue that explicit evaluations are "merely the end result of a complex, non-linear, time-dependent process of multiple less-explicit attitudes competing with one another over hundreds of milliseconds" (p. 1428). In early processing, multiple patterns of activity are evoked that are partially consistent with various evaluations. Over time, a "continuous accrual of information

causes the distributed pattern to "dynamically 'sharpen' into a confident (selected) interpretation, forcing other, partially activated, competing alternative[s]… to gradually die out" (p. 1429), an idea consistent with the connectionist modeling notion of an "attractor state" (e.g. Conrey & Smith, 2007). Selection is spurred by a cyclical processing loop between higher-order integrative brain regions and lower-level informational sources in which the former enact representation competition that promotes or inhibits alternatives. Wojnowicz and colleagues (2009) drew on research on racial attitudes (e.g., Fazio et al., 1995) suggesting that negative partial evaluations of Black targets would be common early in participants' processing streams but would be subsumed by more positive evaluations due to the motivation to control prejudice. They anticipated that the dynamic evolution of an evaluation would be evident in subtle behavioral traces as participants moved a cursor to associate "Black" with "Like" or "Dislike." Their theory specifically predicted a curvature in trajectory towards the eventually unchosen alternative ("Dislike") when expressing liking for the target "Black" that would not be evident when the target was "White." This is what they observed.

The IR model (Cunningham & Zelazo, 2007) considers such dynamism central in regulating evaluative responses. As noted, the terms 'attitude' and 'evaluation' are often used interchangeably, butwe believe that it is useful to refer to them as qualitatively different. Whereas an attitude is a relatively stable set of representations of a stimulus, an evaluation reflects one's current appraisal of the stimulus. Evaluative processes transform attitudes into evaluations. In other words, to generate an evaluation, one uses pre-existing attitudes to retrieve useful affective information about a stimulus, but the evaluation also takes into consideration information about the environment and context, as well as current goals (see Figure 1). Further, because information is distributed, not all aspects of the attitude are activated; as such, only the

currently active aspects of attitude can shape an evaluation. Critically, because active representations shape perception and construal of a situation, and because categories and construals shape which attitude aspects are foregrounded and made more active, stimuli initiate an iterative sequence of evaluative processes (the evaluative cycle) through which the stimuli are interpreted and reinterpreted in light of an increasingly rich set of contextually meaningful representations. Such a view blurs the traditional distinctions found in dual-system or dual-process models of attitudes and attitude regulation. Indeed, although evaluations that are based on few iterations of the evaluative cycle may be thought to be relatively automatic or implicit, they can be shaped by higher-order processes before they are ever encountered (Cunningham, Van Bavel, Arbuckle, Packer, & Waggoner, 2012; Todd et al., 2012). Further, although evaluations that are based on additional iterations may become more integrated, they do not necessarily require or use new representations to generate ongoing evaluations.

Given the iterative nature of the model, evaluations are proposed to be the dynamic result of an integrated set of distributed processes, each of which responds to and resolves specific computational problems (see Cunningham & Johnson, 2007). Evaluation is an emergent property of multiple processes that unfold over time. Critically, the model proposes that there is a common set of processes that are consistently involved in generating current evaluations that are shaped by both bottom-up and top-down influences. Thus, evaluative processes are part of an iterative cycle: with every iteration, the current evaluation of a stimulus is adjusted in light of additional contextual and motivational information in order to create an updated evaluation. Information is continually passed back from relatively higher-order to relatively lower-order processes and the evaluation is recalculated. This "reseeding" of information allows for the foregrounding of relevant (and backgrounding of irrelevant) attitude representations and

contextual information in order to develop incorporate current goals and standards, and allows for the regulation of an evaluation response to come into line with situational or motivational constraints. At each iteration, the current evaluation serves as input for ongoing evaluative processing; as such, earlier evaluations are likely to bias subsequent evaluative processing by influencing attention, information seeking, stimulus construal, and so forth. Importantly, while conscious deliberation exerts an influence on evaluative processing, information about the valence and arousal value of a stimulus continues to be represented in subcortical structures.

To understand when people are more likely to generate complex evaluations, the IR model proposes that two competing motivational drives influence the extent of evaluative processing. First, a drive to minimize the discrepancy between one's evaluation and the hedonic environment (i.e., to minimize error) increases reflective processing during evaluation. Second, a drive to minimize processing demands decreases in reflective processing during evaluation. These opposing drives create a dynamic tension that can help individuals to strike a delicate balance between an initial "gut" response and evaluations that are more nuanced, but not computationally overwhelming. The influence of these competing motivations likely varies as a function of situational demands, current goals, and individual differences in processing style.

Thus, unlike models that propose a stark difference between automatic and controlled processes, the IR Model suggests a continuum from relatively automatic to controlled evaluative processes that can operate on a set of representations. At the early stages of processing, the strongest weights associated with an attitude give rise to a specific pattern of activation, and result in quick and automatic evaluations. However, with more iterations and the potential for reflective processing in areas of the brain responsible for higher processing (such as prefrontal cortex), evaluations are shaped by a dynamic interaction of several bottom-up and top-down

processes. This interaction allows for the foregrounding and backgrounding of particular patterns of activation in accordance with current contexts and goals. Evaluations based on additional iterations are generally more reflective. As individuals engage in reflective reprocessing, they are able to formulate more complex, nuanced representations of a stimulus (e.g., allowing a stimulus to be understood in terms of multiple conflicting dimensions of evaluation). This hierarchical approach, which views reflection as a matter of degree, is consistent with contemporary characterizations of prefrontal cortical function (Bunge & Zelazo, 2006).

Yet, although it is possible to draw parallel's between standard dual-process models and the IR model, the nature of the relationship between what can be considered automatic and controlled differs in important ways. The IR model proposes that what is typically considered more controlled or reflective processing in dual-process models merely biases which representations remain active and the complexity of the evaluation that is possible given this set of active representations. Thus, the biasing of representations can come prior to processing any given stimulus allowing for automatic regulation – the initial representation, categorization, and evaluation of an object can be modified at the earliest levels of processing. Indeed, attention to one category (race) or another (age) for stimuli that can be multiply categorized lead to greater affective priming to the focal category (Gawronski et al., 2010). That is, foregrounding one category or the other changed the initial evaluation as measured by affective priming.

Linking the literatures on Attitudes, Evaluation, and Emotion Regulation

In this chapter, we suggest that the processes by which attitudes are transformed into evaluations may be more dynamic that previously considered. As such, the classical distinctions between automatic/implicit and controlled/explicit processes may need to be modified to articulate the dynamic and iterative nature of evaluative processes. In doing so, many parallels

with the literature on affect and its regulation are noted. For example, to the extent that evaluations are constantly updated, and regulation (defined as biasing representations) exists throughout the process, this suggests that the ways that we shape affect will be important for what types of representations are active, and how we use them to generate appropriate evaluations. For example, the processes of appraisal and re-appraisal will be essential for determining the meaning of object in a situation, and determining its value. To the extent that one is a successful dieter, by re-apprising a donut as an efficient calorie delivery system rather than a tasty snack, the nature of active representations will be more negative, and a more negative evaluation will be constructed. This process is central to emotion regulation, as changing the value of the goal state or the experienced outcome is the most effective means to feeling better (e.g., I didn't actually want that donut, because it is bad for me). Further, attitudes and their transformation into information are essential for all stages of emotion regulation, from situation selection (one can use attitudes to determine whether a situation is likely to be good or bad), to attention deployment (attitudes guide attention, Roskos-Ewoldsen & Fazio, 1992). Attitudes provide the expectations for a stimulus, and this information is critical to guide responses to lead to good outcomes and more positive emotions.

Conclusion

We hope the reader will find conceptual parallels within the models reviewed and emotion regulation. Many of the automatic influences of goals and standards on automatic evaluation and the means and eliciting circumstances of effortful self-regulation of attitudes and evaluation are likely relevant to the regulation of emotion. Unfortunately, these literatures have as yet seen little integration despite their potential to inform one another. For example, attitude theory has often neglected the role of arousal, which has been integral to the study of emotion.

We will end with a final note on the applicability of models of evaluation for emotion regulation. Although typically studied in isolation from one another, the processes involved in attitudes are highly overlapping with those involved in emotion regulation. Indeed, as suggested in this chapter, the critical question concerning how one converts attitudes (stored representations about the world) into current evaluations (temporary affective experiences that can be used to drive thoughts and behavior) can be viewed fundamentally as a regulatory process in which an evoked affective response is shaped to reflect the exigencies of the moment.

This view goes beyond more traditional notions of regulation which typically involve the inhibition or alteration of an automatic response, dependent upon conscious will and ability. We argue that the translation of representation (attitude) to experience (evaluation) involves regulation, as active representations are shaped and reshaped across multiple levels of organization. At lower levels, the perceptual system helps to regulate what stimuli to attend and what stimuli to ignore by biasing attention, while at higher levels, the more reflective regulatory systems make use of similar foregrounding and backgrounding processes. As such, the ability to effectively regulate one's emotions has been linked to the ways in which these lower- and higher-order processes interact (Lee, Heller, van Reekum, Nelson, & Davidson, 2012). Critically, the ability to flexibly reinterpret or reconstrue incoming information – or cognitive flexibility (Scott, 1962) – is an essential feature of these models and may be vital for emotion regulation. Although dynamic perspectives on attitudes are only beginning to receive attention, it is our hope that these perspectives will be influential in guiding future research beyond the scope of attitudes alone. After all, these models are, at their core, models of cognitive processing, and as such are relevant to and overlap with many domains, emotion regulation included.

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Footnotes

1. This basic distinction between associative and propositional processes is shared with Strack and Deutsch's (2004) reflexive-impulsive model (RIM), which in turn drew from multiple earlier dual-process theories (see Smith & DeCoster, 2000, for a review). However, the APE model is focused on evaluation per se, whereas the RIM is explicitly a model of behavior.

2. It should be noted that some negations are familiar ("no way") and/or very easily reversed ("not good") such that their appropriate meaning may be encoded even when cognitive resources are strained (e.g., Mayo, Schul, & Burnstein, 2004), rendering ironic effects unlikely in these cases.

3. However, the authors express skepticism that a strong dual-system approach is consistent with emerging evidence from neuroscience.
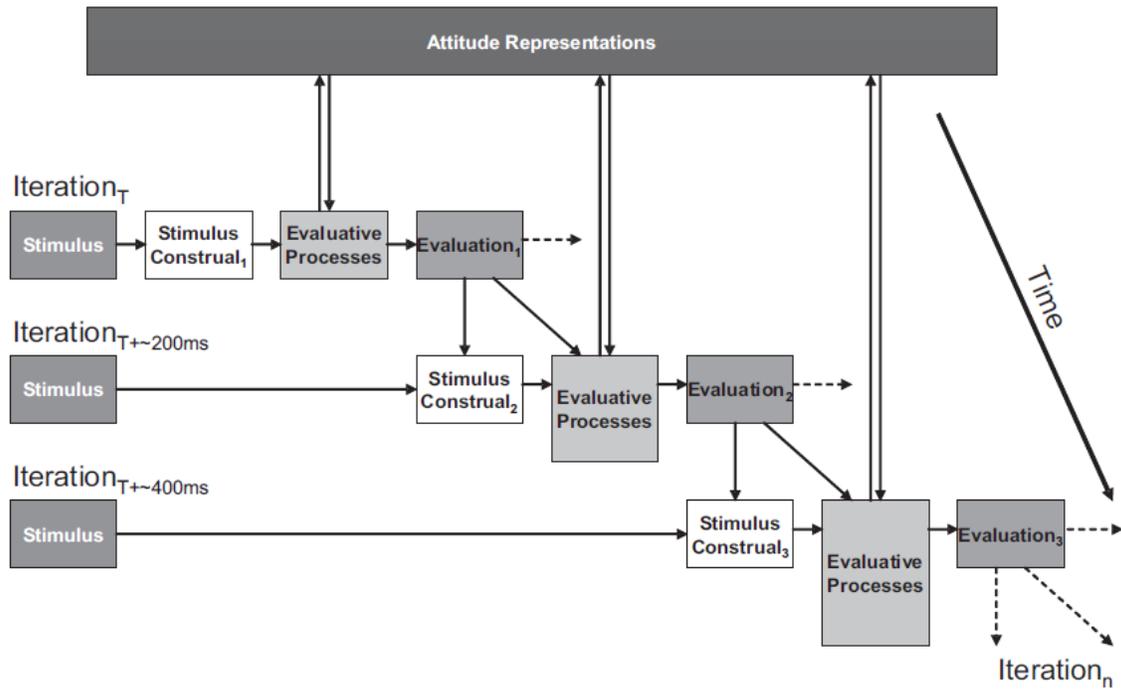
Figure 1

Figure 1 Caption: The Iterative Reprocessing model. Figure appears in Cunningham, Zelazo, Packer and Van Bavel (2007).