

## CHAPTER 14



# The Systems of Evaluation Model

## *A Dual-Systems Approach to Attitudes*

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Consider the following everyday situations. New neighbors move in next door, and despite the fact that one's interactions with them are overtly quite pleasant, one experiences an uncomfortable feeling around them that defies explanation. Or consider the couple deciding between two vacation destinations, one in a cosmopolitan setting with great restaurants and museums, and the other offering pristine, sandy beaches. After much contemplation about which one would make them happier, they choose the city, yet they would have been happier had they gone to the ocean instead. Finally, there is the dieter's dilemma, in which one has to wrestle with passing up a tempting, calorie-laden dessert in order to pursue long-range goals associated with being healthier and happier with one's appearance in the mirror. Although cases involving impression formation, judgment and decision making, and self-regulation may seem disparate, we contend that, at a process level, there are important commonalities across these situations, and that approaching attitudes from a dual-systems perspective sheds light on their similarities.

When it comes to behavior, it seems reasonable that people should gravitate toward more attractive options. In the parlance of social psychology, people should pursue the most positive attitude objects before them

and eschew the more negative ones. However, this supposition is not only contradicted by findings that attitudes often fail to predict behavior well (e.g., Fazio, 1986), but it also assumes that evaluative processes eventually converge on a singular evaluation for any object. In our chapter, we present an alternative to this latter assumption. Specifically, we outline our systems of evaluation model (SEM; McConnell, Rydell, Strain, & Mackie, 2008; Rydell & McConnell, 2006), which puts forward a dual-systems approach to attitude formation and change. The SEM posits that two dissociable systems of knowledge give rise to qualitatively different types of attitude object evaluations. In this chapter, we describe the basic tenets of the SEM, present research findings that support it, discuss the important consequences of holding discrepant implicit and explicit evaluations, and compare and contrast the SEM to other dual-systems and dual-process models of attitudes.

### THE SEM

The SEM adopts as a starting point that people possess two partially independent mental systems with distinct properties and characteristics (e.g., Kahneman, 2003; Sloman, 1996; Strack & Deutsch, 2004;

Smith & DeCoster, 2000) that differ in the knowledge each uses and in how relevant information is processed. We assume that a *rule-based system* provides evaluations of attitude objects rendered by applying logic and deductive reasoning to symbolic forms of knowledge (e.g., language, mathematical formulas) relevant to the attitude object. For instance, one could reflect on the abstract qualities of beaches (e.g., soft sand, relaxing surf sounds) and, based on a formal analysis, report having a positive attitude toward beaches. Evaluations produced by the rule-based system, referred to as *explicit evaluations*, can typically be formed and modified relatively quickly, because logic and syllogisms are responsive to one's deliberate goals and deductive reasoning processes. Because explicit evaluations are grounded in logic and symbolic representations, their assessment is typically derived from measures that rely on similar processes to complete (common language-based attitude measures; e.g., a feeling thermometer).

On the other hand, we propose that there is an *associative system* in which evaluations of attitude objects are derived from many associations that are stored in memory and based on paired occurrences involving similarity and contiguity. Evaluations evoked by the associative system, referred to as *implicit evaluations*, typically are slower to form and change, because they are based on accumulated attitude object–evaluation pairings in memory. For example, many episodes of walking on a beach and being happy lead to a relatively strong association between “beach” and “positivity” in memory. Once established, the presentation of an attitude object should evoke a spontaneous evaluation relatively automatically, without intention or any effortful thoughtful production. Because implicit evaluations are produced from associations in memory, their assessment is typically rendered by measures that gauge associative strength in memory (e.g., Implicit Association Test, IAT; Greenwald, McGee, & Schwartz, 1998).

In the previous example, the rule-based system and the associative system led to the expression of positive attitudes toward beaches even though the underlying knowledge used by each system was quite different. And often, evaluations produced by the rule-based system and by the associative sys-

tem are similar because one's repeated associations with an attitude object and one's abstract knowledge about it are relatively consonant. However, because the underlying knowledge and how that information is processed can differ between the rule-based and associative systems of evaluations, striking differences in the output of these systems may result. Sometimes these evaluative discrepancies are manufactured in the laboratory (e.g., using subliminal priming) to establish and evaluate the potential independence of these systems (e.g., Rydell, McConnell, & Mackie, 2008; Rydell, McConnell, Mackie, & Strain, 2006). However, there are many real-world circumstances in which meaningful asymmetries between implicit and explicit evaluations exist (e.g., Hofmann, Rauch, & Gawronski, 2007; Jellison, McConnell, & Gabriel, 2004). These discrepancies can be even more consequential, because research (e.g., Dovidio, Kawakami, & Gaertner, 2002; Rydell & McConnell, 2006) indicates that different behavioral outcomes are related to one's explicit evaluations (e.g., deliberate, strategic actions) and to one's implicit evaluations (e.g., spontaneous actions, nonverbal displays).

## SUPPORT FOR THE SEM

Although one's implicit and explicit evaluations may often be of the same valence, laboratory experiments can produce dissociations between evaluations derived from the rule-based and associative systems to document the different processes underlying them. Because the associative system of evaluation is based on the accrual of many pairings between an attitude object and appraisals over time, the speed with which implicit evaluations form and change will typically be slower than the speed with which explicit evaluations form and change. Although some manipulations, such as imagining counterstereotypical exemplars or altering the context around the attitude object, may affect the expression of associative knowledge (see Blair, 2002), we contend that, all things being equal, evaluations produced by the associative system are slower to develop and change than attitudes generated by the rule-based system. This prediction has been borne out in a number of empirical studies.

For example, Rydell and McConnell (2006, Experiment 2) had participants form an impression about a novel target individual named Bob by reading 200 descriptions of his behavior. For the first 100 statements, the valence implied by the statements suggested that Bob either performed only desirable actions or performed only undesirable actions in order that participants form positive or negative initial impressions of Bob, respectively. Next, an additional 100 statements describing Bob were neutral in valence (i.e., did not imply positivity or negativity), mildly counterattitudinal (i.e., 20 of the opposite valence connoted by the first 100 statements followed by 80 neutral statements), or completely counterattitudinal (i.e., all 100 statements were of the opposite valence implied by the first 100 statements). After exposure to all 200 statements, participants offered explicit evaluations of Bob (liking scales, feeling thermometers, and semantic differentials) and implicit evaluations of Bob (using an IAT). Not surprisingly, both explicit and implicit evaluations of Bob reflected the valence of the initial 100 statements in the neutral condition. However, the signature of attitude change between explicit and implicit measures was quite different when the second 100 statements provided counterattitudinal information. Encountering just 20 counterattitudinal items in the mildly counterattitudinal condition resulted in a strong shift in explicit evaluations of Bob, away from the valence connoted in the initial 100 statements, but did not significantly alter implicit evaluations of Bob. Eventually, implicit evaluations did significantly shift toward the direction of the new information, but only when participants were exposed to 100 counterattitudinal statements (but the additional 80 counterattitudinal statements had very little impact on explicit evaluations of Bob). Overall, change in explicit evaluations revealed an asymptotic signature (i.e., fast change in response to initial counterattitudinal information but then very little change following extreme amounts of it), whereas change in implicit evaluations showed a linear signature (i.e., change was proportional to the amount of counterattitudinal information presented). As anticipated by the SEM, explicit evaluations changed quickly

as participants integrated new information about Bob into their on-line impressions of him (see McConnell, Sherman, & Hamilton, 1994), whereas implicit evaluations required a considerable amount of counterattitudinal information to produce change, because the associative system more closely reflects the totality of information associated with the attitude object (see also Rydell, McConnell, Strain, Claypool, & Hugenberg, 2007). If appraisals produced by the rule-based system reflect deliberation, then providing participants with explicit processing goals should affect perceivers' explicit evaluations more than their implicit evaluations, which should not be strongly influenced by processing goals. To test this prediction, Rydell and McConnell (2006, Experiment 3) had participants form impressions using "the Bob paradigm" previously described (e.g., 100 initial statements about Bob, followed by 100 additional items that were neutral, mildly counterattitudinal, or completely counterattitudinal) and complete the same measures of explicit and implicit evaluations of Bob. In addition, participants were given explicit processing goals either to rely on their first impressions of Bob (the default manner in which impressions of individuals are made; see McConnell et al., 1994) or not to rely on their first impressions. When participants were instructed to rely on their first impressions, the data for explicit and implicit evaluations of Bob replicated the previous study: Changes in explicit evaluations revealed the asymptotic signature, whereas changes in implicit evaluations revealed the linear signature described earlier. However, when participants were instructed not to rely on first impressions, their explicit evaluations of Bob showed a more linear rather than asymptotic trend (i.e., the additional 80 counterattitudinal items in the completely counterattitudinal condition slowly eroded participants' initial explicit evaluation of Bob), yet their implicit evaluations of Bob were not affected by the instructions to rely or not rely on their first impressions. Thus, providing participants with information-processing goals changed the nature of explicit evaluations but did not have any impact on implicit evaluations. From the SEM perspective, this is expected because explicit goals should affect the sys-

tem of evaluation that is responsive to logic and reasoning (i.e., the rule-based system of evaluation) but should be less consequential for evaluations derived from paired associations in memory (i.e., the associative system of evaluation).

Although differential speed of change and differential responsiveness to deliberate processing goals between the two systems of evaluation are anticipated outcomes in the SEM, it is also assumed that each system of evaluation is sensitive to different forms of information. Each system could potentially draw upon all the information about the attitude object that is stored in memory to render an evaluation, but the SEM assumes that each system is sensitive to and therefore more likely to use different types of information, at least when multiple forms of information are available. For example, associative knowledge that is not available to conscious deliberation should affect implicit evaluations but not affect explicit evaluations as strongly. To test this prediction, Rydell et al. (2008) had participants form impressions in "the Bob paradigm." On each trial, a positive or negative word (e.g., *love*, *hate*) presented subliminally to participants was immediately replaced by an image of Bob's face on the computer monitor. Next, a sentence was presented that characterized one of Bob's behaviors. Thus, participants were exposed to information in a 2 (subliminal prime valence: positive vs. negative)  $\times$  2 (descriptive sentence valence: positive vs. negative) between-subjects design. Afterwards, participants provided their explicit and implicit evaluations of Bob. In short, implicit evaluations of Bob reflected the valence of the subliminal primes (i.e., more positive when the subliminal primes were positive, more negative when the subliminal primes were negative), whereas explicit evaluations of Bob reflected the valence implied by the statements (i.e., more positive following positive behavioral descriptions, more negative following negative behavioral descriptions). As predicted by the SEM, each system of evaluation was more influenced by information attuned to the form of knowledge underlying the rule-based (i.e., behavioral sentences) and associative (i.e., subliminal primes) systems of evaluation, reflecting the potential for these systems of evaluation

to be completely dissociable (see Rydell et al., 2006, for additional evidence).

Admittedly, it may be unusual for an individual to receive forms of information that are completely at odds with each other (e.g., very positive behavioral descriptions and very negative subliminal cues). Although demonstrations such as these are important to test the hypothesized processes underlying explicit and implicit evaluations, one might conclude that such cases are extremely rare. However, we contend that there are probably a number of circumstances in which such evaluative dissociations naturally exist. Consider the conditions under which one is forming an impression of novel individuals such as new neighbors. Initial conversations with one's new neighbors might reveal a wealth of positive information about them (e.g., they tell positive stories about their families or hobbies). These verbal descriptions are probably important pieces of information for developing positive explicit evaluations of them. Yet what if other information about them was not verbal in nature, such as their being a member of a group associated with a pejorative stigma (e.g., they are obese). From the perspective of the SEM, one's explicit evaluations of these neighbors should be very positive (based on the positivity conveyed in their stories about themselves), but one's implicit evaluations of them might be very negative (based on the strength of association between obesity and negativity) when such a cue is irrelevant for one's deliberate information-processing goals.

This possibility was assessed in several studies by McConnell et al. (2008), who used a modified Bob paradigm that presented descriptions conveying that Bob performed positive or negative actions, along with an image of Bob's face. In some cases, Bob was a relatively thin, White man. In other cases (in different experiments), Bob was an obese man or an African American man. In cases where Bob was thin and white, implicit evaluations of him reflected the valence implied by his behaviors. However, when Bob was portrayed as obese or African American, implicit evaluations of him were negative even when his behaviors indicated that he performed nothing but positive actions. In short, the strong associa-

tion between social group membership cues (e.g., weight, race) and negativity led to the formation of implicit evaluations of Bob that reflected group-based stigmas rather than his actions.

To explore this effect further, McConnell et al. (2008, Experiment 2) used the same paradigm but presented behaviors about a woman (Bobbie) who was presented as average in physical attractiveness, as physically unattractive, or as very physically attractive. When Bobbie was average in attractiveness, implicit evaluations of her reflected the valence of her actions. However, when she was portrayed as physically unattractive, implicit evaluations of her were negative even when she performed nothing but positive actions (replicating the effect observed with obesity and with African Americans). But most important, when Bobbie was very physically attractive, implicit evaluations of her were very positive even when her actions were exclusively negative in valence. Thus, when associated with a group membership cue strongly associated with valence (negative or positive), implicit evaluations were strongly influenced by this associative cue and not the actions described about the target individual. These results strongly support the dissociable systems outlined by the SEM.

If appraisals produced by the associative system reflect the accrual of evaluations over time, while assessments rendered from the rule-based system of evaluation are responsive to logic and deliberation, we might expect to see interesting asymmetries in how one's implicit and explicit evaluations predict one's *own* past behaviors. In one study that examined this possibility, Jellison et al. (2004) examined how gay men's implicit and explicit evaluations of sexual orientation predicted their past experiences. Specifically, they had men who identified as being primarily homosexual provide explicit reports of sexual orientation attitudes (using common paper-and-pencil measures of attitudes toward homosexuality) and implicit attitude measures toward sexual orientation (using a sexual orientation IAT). In addition, these men provided reports about their past personal experiences, including the frequency with which they had positive, gay-affirming experiences in their lives (e.g., attending gay-supportive religious services,

subscribing to publications that cater to the gay community) and the extent to which they had disclosed their homosexuality to others (e.g., family members, coworkers). Jellison et al. anticipated that gay men's implicit sexual orientation evaluations would be a better predictor of their *frequency* of past positive gay experiences (presumably, many gay-affirming experiences would result in more positivity being associated with their sexual orientation in memory) but that gay men's explicit evaluations would be a better predictor of the extent to which they had disclosed their sexual orientation to others ("coming out" to others reflects a strategic, deliberate choice that results from a thoughtful analysis of the consequences of disclosing one's sexual orientation to others). Indeed, this is exactly what they found. The frequency of involvement in gay-affirming activities was uniquely predicted by gay men's implicit evaluations (i.e., having more positive past experiences was related to relatively more positive implicit evaluations of homosexuality), whereas disclosure of one's sexual orientation to others was uniquely predicted by gay men's explicit evaluations (i.e., more "coming out" was related to more positive explicit evaluations of homosexuality). Thus, Jellison et al. provided evidence that distinct forms of past experiences are related to one's implicit (e.g., frequency of past experiences) and explicit (e.g., strategic, deliberate actions) evaluations, which is in line with the expectations of the SEM (see Sinclair, Dunn, & Lowery, 2005, for similar findings regarding children's implicit racial prejudice and their parents' level of prejudice).

To summarize, a number of studies support important distinctions between rule-based and associative systems of evaluation. Measures of attitudes derived from these systems of evaluations can show striking differences and asymmetries. For example, explicit measures of attitudes that capture the rule-based system of evaluation can change very quickly to new information and are affected by explicit processing goals that guide one's impression formation objectives (Rydell & McConnell, 2006; Rydell et al., 2007). Implicit measures of attitudes that capture the associative system of evaluation, on the other hand, change more slowly and are unaffected by explicit processing goals

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(Rydell & McConnell, 2006; Rydell et al., 2007), and are strongly influenced by cues involving group membership–valence associations (McConnell et al., 2008) and by cues that are subliminal in nature (Rydell et al., 2006). Finally, there is good evidence that the frequency of past experiences that can produce strong associations between attitude objects and evaluations in memory is uniquely related to one’s implicit evaluations, whereas past actions involving the strategic performance of behaviors are uniquely predicted by one’s explicit evaluations (Jellison et al., 2004). These strong dissociations seem best accounted for by a framework that views attitudes as the product of two discrete systems of evaluation.

### CONSEQUENCES OF INCONSISTENT IMPLICIT AND EXPLICIT EVALUATIONS

The previous findings reveal that a number of conditions, either in the laboratory or in everyday life, can result in people holding different attitudes derived from the rule-based and associative systems of evaluation. When systems of evaluation are in conflict, what are the consequences? Below we outline a number of significant outcomes, including inconsistencies in behavior, felt ambivalence (negative arousal), affective forecasting errors, and difficulty in successful goal attainment. These effects can be quite far-reaching, and they underscore the value of considering how different attitudes can result from distinct systems of evaluation.

One of the most well documented outcomes of holding inconsistent implicit and explicit evaluations is observing divergent behaviors. In the domain of interracial interactions, there is considerable evidence that people’s implicit racial prejudice (i.e., attitudes toward outgroup members, as indexed by association-based measures) uniquely predicts participants’ nonverbal behaviors toward minority group members (e.g., McConnell & Leibold, 2001). Although explicit measures of attitudes can predict behavioral outcomes, implicit measures of attitudes, such as racial IATs, predict intergroup behaviors better than explicit measures of attitudes in contexts in which social sensitivity concerns are considerable (for a

meta-analysis, see Greenwald, Poehlman, Uhlmann, & Banaji, 2009). Yet there is evidence that even with novel individual targets (instead of social group targets in which political correctness pressures may exist), implicit measures of attitudes can uniquely predict many subtle nonverbal behaviors that explicit measures cannot. For example, Rydell and McConnell (2006, Experiment 4) induced different explicit and implicit evaluations of a novel person using “the Bob paradigm.” Afterwards, participants were told that they were going to interact with Bob in a different room in a “get acquainted” interaction. First, they reported on how much they would want to have social contact with Bob. Next, they moved to a different room to meet Bob, but upon arriving, only Bob’s bookbag was there, and the experimenter suggested that Bob must have stepped out for a moment. Participants then grabbed a chair from against the wall and positioned it for the forthcoming interaction, which never took place. From these actions, two indices of behavior were computed: desire for future interaction (greater reported desire is an indicator of more positive behavior) and seating distance (less distance between Bob’s bookbag and the chair positioned by the participant is an indicator of more positive behavior). Participants’ greater desire for future interaction was uniquely predicted by participants’ explicit evaluations being more positive toward Bob, and closer seating distance was uniquely predicted by participants’ more positive implicit evaluations toward Bob. Thus, when interacting with a novel individual, participants’ rule-based evaluations uniquely predicted a deliberate behavior (i.e., desire for future contact) and their associative evaluations uniquely predicted a spontaneous behavior (i.e., seating distance).

Because holding inconsistent beliefs can be aversive and arousing (e.g., Festinger, 1957), one might wonder whether holding inconsistent implicit and explicit evaluations might trigger felt ambivalence (or diffuse negative arousal caused by inconsistent evaluations of an attitude object but not attributed to that object, which is sometimes called *implicit ambivalence*). Indeed, there is suggestive evidence that this might be the case. Briñol, Petty, and Wheeler (2006) found that participants with greater discrepancies

in explicit and implicit self-beliefs (e.g., one's own shyness) processed persuasive messages related to the domain of the discrepancy more extensively. Although Briñol et al. did not assess felt ambivalence in their study, greater attentional deployment in the service of making sense of one's discrepant feelings can result from experiencing felt ambivalence (Schwarz & Clore, 2007).

Accordingly, Rydell et al. (2008) examined how holding inconsistent explicit and implicit evaluations of Bob (using a modified Bob paradigm involving subliminal priming to induce implicit evaluations of Bob that diverged from written statements describing Bob's actions) might lead to experiencing the discomfort associated with discrepant implicit and explicit evaluations, which in turn might trigger greater information processing about a persuasive appeal authored by Bob. Explicit and implicit evaluations of Bob were then assessed. After assessing attitudes toward Bob, participants reported on how much they felt uncomfortable, uneasy, and bothered (a standard measure of negative arousal; Elliot & Devine, 1994). Later, they read an essay purportedly written by Bob advocating for the adoption of senior comprehensive exams that, based on a between-participants manipulation, featured either strong or weak arguments in support of that position, borrowing from a classic paradigm used in persuasion research (Petty & Cacioppo, 1986). Finally, participants reported their opinion about whether their university should institute senior comprehensive exams. Greater persuasion for strong than weak arguments would be evidence of more elaborative processing, consistent with greater scrutiny of Bob's arguments.

Overall, Rydell et al. (2008) found that the greatest evidence of elaborative processing was exhibited when participants' implicit and explicit evaluations were placed in opposition (e.g., negative subliminal primes coupled with positive behavioral sentences about Bob's actions). More important, the relation between implicit-explicit discrepancy and greater argument scrutiny was mediated by participants' report of negative arousal. That is, having greater implicit-explicit discrepancy appears to trigger discomfort, which in turn instigates greater attentional deployment (in this case,

more scrutiny of Bob's arguments). A follow-up study by these authors introduced a self-affirmation manipulation, which eliminated these effects. Thus, it appears that when people hold inconsistent evaluations derived from the rule-based and associative systems of evaluation, greater information processing results (e.g., Briñol et al., 2006) and the negative arousal that is triggered induces this greater attentional deployment (Rydell et al., 2008). Returning to the example of the "new neighbors next door," it is possible that the *discomfort* one feels could result from having positive explicit evaluations of the neighbors (from the positive stories they share) but holding more negative implicit evaluations of them (from a pejorative group-association cue; McConnell et al., 2008).

In addition to felt ambivalence, it is possible that holding discrepant explicit and implicit evaluations might have broader judgment and decision-making implications. Our SEM account assumes that only evaluations from the rule-based system are available to individuals for full consideration and reflection. Thus, when people look into the future and attempt to anticipate what will make them happy, they can only draw on knowledge from the rule-based system, which ultimately may only represent a subset of the information that goes into their in-the-moment experiences (Gawronski & Bodenhausen, 2006). Indeed, the literature on affective forecasting shows that people routinely reveal systematic errors when predicting how they will feel (Wilson & Gilbert, 2003). Perhaps one source of affective forecasting errors is people's inability to take into account information from their associative system of evaluation when rendering forecasts about future events in which, ultimately, their in-the-moment enjoyment will be shaped by inputs from both systems of evaluation.

This premise was tested by McConnell, Dunn, Austin, and Rawn (2011), who had participants provide their explicit and implicit evaluations of chocolate and apples. Next, participants predicted how much they would enjoy eating each food item. Finally, they actually ate each food item and reported their actual enjoyment. When using their explicit and implicit evaluations as predictors, only their explicit evaluations uniquely

predicted their forecasts (e.g., people who reported on a feeling thermometer that they especially liked chocolate more than apples anticipated that they would prefer chocolate to a greater degree). However, their actual in-the-moment enjoyment of the food items was predicted by both their explicit and implicit evaluations (greater positivity on both explicit and implicit measures predicted greater happiness while actually eating the food items). But most important, the magnitude of their misforecasts (i.e., being “off” in their predictions relative to their actual enjoyment) was uniquely predicted by their implicit evaluations. For example, when some *underestimated* how much they really would enjoy a piece of chocolate more than a piece of apple, the magnitude of their misforecast was predicted by their having an especially positive implicit evaluation of chocolate relative to apples. In other words, the information from their associative system (which may not be available for conscious reflection, according to the SEM) was unavailable at the time of the forecast, yet this knowledge contributed to their in-the-moment enjoyment. Thus, implicit evaluations can represent a blind spot in people’s pursuit of happiness. When thinking about our couple that should have gone to the beach instead of the city for a vacation, perhaps there were many positive associations with beaches in memory that defied conscious access and articulation that, while walking on the beach, would have made the smell of fresh salt water and the feeling of warm sand between their toes especially delightful.

Finally, we would propose that implicit–explicit discrepancies might lead to unhappiness not only through affective forecasting errors but also self-regulatory failures. Many important goal-directed behaviors involve people’s ability to focus on long-term goals (e.g., losing weight) and avoid short-term temptations (e.g., tasty desserts). When people lose the ability to engage in executive control, they often give in to temptation (e.g., Vohs & Heatherton, 2000). In a study that lends support to the tenets of the SEM, Hofmann et al. (2007) obtained measures of participants’ explicit and implicit evaluations of a tempting food item (M&M’s candies) and allowed participants to eat as many as they wanted as part of a purported prod-

uct testing study. Half of their participants were first induced to have cognitive depletion, whereas control participants were not. For those who were not cognitively depleted, their explicit evaluations, but not their implicit evaluations of M&M’s, predicted how much of the candy they ate. But in the cognitive depletion condition, implicit evaluations, not explicit evaluations, predicted M&M’s consumption. Although Hoffmann et al. did not test the SEM explicitly in their study, we view their findings as quite supportive of it. When cognitive resources are diminished, behavior is less deliberate and action (in this case, eating M&M’s) is therefore better predicted by implicit evaluations, because the associative system is not compromised by reductions in central executive resources. Thus, returning to the dieter’s dilemma at the beginning of our chapter, the interplay of different systems of evaluation can help predict the individuals for whom reductions in cognitive resources will be especially problematic—those with greater implicit–explicit discrepancies.

### SYSTEMS VERSUS PROCESSES: THE SEM IN RELATION TO OTHER ATTITUDE MODELS

The SEM was influenced by several dual-process models of attitudes, most notably the MODE model (motivation and opportunity as determinants; Fazio, 2007), the APE model (associative–propositional evaluation; Gawronski & Bodenhausen, 2006), and the MCM (metacognitive model; Petty, Briñol, & DeMarree, 2007). These models assume that attitudes are the product of two sometimes interrelated processes: an associative process that involves the activation of an association from memory, and a controlled process that, given motivation and cognitive capacity, can transform or invalidate the association accessed from memory. As such, they assume that a single evaluative response to an attitude object is refined over time both to provide the best fit with the context and past experience, and to remain consistent with other motivations and cognitions. The SEM departs from these models in two important ways by hypothesizing that (1) there are distinct systems (not distinct processes) that account for evaluations,



and (2) these systems, while potentially interacting, can operate independently and concurrently.

Using the term *system* to describe and explain the joint effect of many different psychological processes that usually work in concert to produce a common output has been criticized (e.g., Keren & Schul, 2009). Two complaints often leveled against systems approaches are that theorizing in terms of systems leads to less specificity than theorizing in terms of processes, and that theorizing in terms of distinct systems does not engender the same level of integration or interaction between the systems as theorizing about distinct processes (e.g., Gawronski & Bodenhausen, 2006). However, we employ the term *system* in the SEM for two reasons. First, we believe more is gained by describing systems than by describing processes. Why might this be? In most dual-process models of attitudes, the associative process and the controlled process each can comprise several different processes; thus, each “process” in traditional dual-process models of attitudes may include many processes or underlying mechanisms. In terms of more associative processes, people must attend to relevant attitude objects, categorize them (either explicitly or implicitly), and integrate the immediate context with past experiences with the object. For more controlled processes, people can validate or invalidate certain evaluations, strive for consistency, embrace social norms, and engage in self-presentation or self-protection. These processes dynamically interact to determine the subsequent evaluation; moreover they are organized in such a way that they “work together.” This approach does not reduce the value of understanding any one process within the system or of explicating how this process fits into the system as a whole; instead, it simply recognizes that these processes, when combined together, are part of a greater structure or system that renders evaluations.

Second, we believe that a systems approach more accurately explains the findings presented previously. Specifically, the data showing dissociations between implicit and explicit evaluations in response to presenting valence-inconsistent subliminal primes and behavioral statements about Bob (e.g., Rydell et al., 2006) are more in line with associative

and rule-based systems that are sensitive to different types of information. Other attitude models would argue that both implicit and explicit evaluations should be, at least to some degree, affected by both behavioral statements and subliminal primes (cf. Whitfield & Jordan, 2009). That is, because they do not propose distinct evaluative systems that can use different forms of information, they have greater difficulty in explaining these dissociations. Perhaps other models could argue that certain correction processes eliminate the impact of subliminal primes or associative cues on explicit evaluations (e.g., Loersch, McCaslin, & Petty, 2012), but it is harder to understand why behavioral statements would not impact implicit evaluations when presented along with associative forms of information. For example, without putting forward different systems of evaluation, it is difficult to explain why implicit evaluations are more responsive to the valence of the behavioral statements when no associative cues are present but are relatively unaffected by these same behavioral statements when strong associative cues are also present (e.g., McConnell et al., 2008). In the next section of our chapter, we expand more on these findings and why they may occur.

Evidence of implicit–explicit dissociations is also integral to the second assumption of the SEM that is inconsistent with dual-process models of attitudes: The associative and rule-based systems can operate independently and concurrently. For example, it is hard to explain strong dissociations in response to valence-inconsistent subliminal primes and behavioral statements without assuming a relatively strong independence between systems that are operating in parallel. Although we acknowledge that it is difficult to provide unequivocal support for independent systems because implicit and explicit measures (like most psychological measures) are not process-pure (Sherman, 2006), these dissociations, especially because they occur with a diversity of associative cues (some of which may be unavailable to the individual and therefore less likely to be corrected for), provide initial evidence of independence (cf. Keren & Schul, 2009).

Another, related point involves work on explicit–implicit discrepancies, or *implicit ambivalence*. How would prominent dual-process models such as the MODE or the

APE explain implicit ambivalence findings (e.g., Petty et al., 2006)? If inconsistency is solely a function of propositional processes (Gawronski & Bodenhausen, 2006), why would explicit-implicit discrepancies have any impact on subsequent behavior when people are unaware of the discrepancy? Furthermore, any model that starts with a highly accessible attitude being activated from memory, then being altered by subsequent controlled processing, because of its sequential nature and the relative lack of influence of controlled processing on attitudes stored in memory, provides little or no opportunity for explicit-implicit discrepancies to lead to implicit ambivalence (Fazio, 2007). That is, because the MODE model predicts that attitudes are evaluative summaries stored in memory, where the process of forming this summary knowledge eliminates ambivalence, and proposes that more controlled processes have little impact or influence on this stored knowledge (Fazio, 2007), the MODE model seems to have difficulty in explaining implicit ambivalence findings. All of the “conflict resolution” in the MODE and the APE models takes place during controlled processing or by subsequent controlled behavior (e.g., biased information exposure). If there is no reason for controlled processing to occur because one cannot report any ambivalence (e.g., Petty et al., 2006), why would these effects occur?

However, we hasten to add two points. First, it should be noted that because each evaluative system is sensitive to specific types of information does not necessarily make it unresponsive to other forms of information. Rydell and McConnell (2006) showed that implicit evaluations can be influenced by the valence of the behavioral information presented in the absence of associative forms of information (e.g., subliminal primes, associative cues). Also, it has been shown in several lines of research that presenting subliminal primes can impact explicit evaluations (e.g., Murphy & Zajonc, 1993). Thus, it is clear that additional work is needed to understand better when and how associative and behavioral information presented in conjunction with one another selectively affects implicit and explicit evaluations, respectively. The SEM proposes that each system becomes more fully engaged with information to which it is most sensi-

tive and neglects (at least in part) information to which it is less sensitive. Nonetheless, understanding the processes underlying this “engagement” and “neglect” will be important to explain better the attitudinal dissociations obtained in our work and how these systems of evaluation interact.

Finally, we would like to point out that the SEM is different from the dual attitude model (Wilson, Lindsey, & Schooler, 2000), which proposes that “older” attitudes are not replaced by “newer” attitudes when attitude change occurs; instead, these older attitudes are still present in memory and can impact behavior when cognitive resources are reduced. Although both models propose that relatively independent evaluations can exist, the SEM does not require that an attitude change manipulation is necessary to produce these distinct evaluations, nor does it assume that attitude change manipulations are ineffective insofar as “old” attitudes are not stored intact separately in memory from “new” attitudes. Instead, the SEM predicts when, how, and by which types of information evaluations based on each system are likely to form and change.

### A MORE ELABORATED, BUT MORE SPECULATIVE, ACCOUNT OF THE SEM

In an effort to explicate the processes underlying somewhat amorphous concepts such as “engagement” and “neglect,” as well as to provide a better explanation of how the associative and rule-based systems interact, we speculate on additional elements of the SEM. We start with two basic assumptions. First, systems provide a means to organize different types of mechanisms or processes that have similar features (e.g., Deutsch & Strack, 2006; Smith & DeCoster, 2000), which simply serve to transform inputs, in whatever form, to outputs. Second, all attitude-relevant information that is encoded could, in theory, serve as an input for any process.

Perceivers encode an array of potentially attitude-relevant information when they encounter, interact with, or learn about an attitude object. This information is not represented in a simple way (e.g., a coherent memory, a singular node or concept in an associative network) but is instead rep-

resented in a more distributed fashion, and some of these representations may be redundant with others. We use the term *codes* to describe these representations, which is similar to Anderson's (1978) view of mental representations within systems: "Well-designed systems tend to have special representations for the kinds of information they have to process frequently. These representations are designed to facilitate the kind of computations useful for this kind of information" (p. 273). Thus, many different codes that can be created during encoding in response to the same information (e.g., learning about an individual's behavior) are relevant to appraising an object and other object-specific information (e.g., context, goal relevance).

According to this extension of the SEM, specific types of codes should provide the most informative output of a process—with essentially the code that is most easily usable and has the greatest amount of informational value for the most accessible process. The accessibility of the code can also be based on recent or repeated use, with more commonly used codes for a process being the most accessible. A specific code also becomes more accessible if the context during retrieval is similar to the context during encoding, with the role of the context in code accessibility being due in large part to the extent to which the context garnered attention during encoding (Gawronski, Rydell, Verilet, & De Houwer, 2010; Rydell & Gawronski, 2009). In addition, codes that were encoded when certain goals were activated should be more accessible when those goals are also activated during retrieval. As with contexts, the extent to which goals were accessible during encoding should determine how accessible certain codes are to attitudinal processes when goals are activated.

The most important feature of codes for this elaboration of the SEM is the makeup of the code or the information contained within the code (e.g., Anderson, 1978; Wyer & Srull, 1989). Some types of codes should serve as "better" inputs (in terms of the ease with which they can lead to usable outputs) into associative processes. The *associative system* is defined in large part as an interrelated group of processes that utilize specific types of codes. Codes used by the associative system are not verbalizable, not easily

used for attributions, not easily converted into propositions, and not easily used for syllogistic reasoning. People may be aware of the outputs of the processes based on these codes, but they should not, under most circumstances, be aware of the codes' existence, because they are unaware of the processes that transform these codes into output. On the other hand, other types of codes serve as "better" inputs into rule-based processes. These types of codes are verbalizable, can be used when making attributions, can be part of propositions, and can be used in syllogistic reasoning. They also make up many aspects of our subjective experiences, especially if one assumes that the outputs of associative processes can be turned into propositions (e.g., Strack & Deutsch, 2004).

To a large extent, research on the SEM has been concerned with differentiating between the associative and rule-based systems in engineering situations where implicit and explicit attitude measures should presumably be most discrepant. As described earlier, Rydell et al. (2006) found that subliminal primes (100 primes of one valence presented before each behavior) influenced implicit evaluation measures, whereas behavioral information (50 positive and 50 negative descriptive behaviors about which participants received feedback to determine whether the target person performed good or bad actions) influenced explicit evaluation measures, creating a large discrepancy in valence between these measures. Findings such as these may be explained by subliminal primes and behavioral information creating qualitatively different types of codes that are accessible to and utilized by processes underlying the associative system and the rule-based system, respectively. Because codes generated by subliminal primes would likely be perceptual and not verbalizable, these codes should impact mostly processes in the associative system and would be unlikely to impact processes in the rule-based system. Thus, these codes would lead participants to be "engaged" by these processes, and codes based on the behavioral information, at least in part, may be "neglected" by processes that comprise the associative system. In the most straightforward interpretation of Rydell et al.'s results, encoding behavioral information would provide codes that mostly serve as input for

processes underlying the rule-based system. As a result, encoding behavioral information could lead to codes that almost exclusively serve as input for processes that are part of the rule-based system (i.e., codes that are “engaged” by the rule-based system and “neglected” by the associative system).

Such purity, however, seems somewhat unlikely. Instead, it seems more plausible that the behavioral information could lead to the generation of codes that could serve as input to processes in both the associative system and the rule-based system. For example, encoding behavioral information may lead to codes similar to those that underlie processes, such as spontaneous trait inferences (e.g., Winter & Uleman, 1984), which would likely be utilized by processes that are part of the associative system. In addition to these codes, other codes that serve as input for processes of the rule-based system would also be created. If so, the reason why Rydell et al. (2006) might find such large discrepancies between implicit and explicit attitude measures in this paradigm might be that the codes created by encoding behavioral information that influences processes in the associative system may be insensitive to negation (e.g., Deutsch, Gawronski, & Strack, 2006). That is, the valence of the behaviors, and not the feedback about the behaviors, influences these processes, whereas processes that are part of the rule-based system are sensitive to negation (i.e., they are influenced by both the valence of the behaviors and the feedback). Consistent with the idea that behavioral information has less influence on processes that are part of the associative system, Rydell et al. (2008) found that completely crossing the valence of the prime and the behavioral information showed that primes only influenced implicit attitude measures, and that behavioral information only influenced explicit measures. However, Whitfield and Jordan (2009), in a similar study, showed that both primes and behaviors influenced implicit and explicit attitude measures. This difference observed in the Rydell et al. (2008) findings may have been due to the way they presented behavioral information. Unlike Rydell et al., Whitfield and Jordan (2009) presented all positive or all negative behavioral information instead of using feedback to distinguish between positive and negative behavioral information.

Given these differences, further research is needed to understand exactly how encoding behavioral information influences measures of implicit evaluation when inconsistent associative information is available.

Regardless, finding dissociations between implicit and explicit attitude measures does not mean, as noted earlier, that the associative and rule-based systems do not interact. For instance, in many cases, processes that are part of the associative system often support the processes involved in the rule-based system. Seeing a TV commercial for a politician may activate positive or negative affect via processes subsumed by the associative system. This affective reaction may be altered or corrected by considering other information about the candidate. Many processes that are part of the rule-based system (e.g., thinking about whether a friend’s bad behavior when she was drunk should change one’s liking for her) are likely supplemented and directed in large part by processes that are part of the associative system. For example, the propositional information used during this attributional process is likely guided by relatively automatic evaluations of drinking, the friend, and the self (see Strack & Deutsch, 2004, for a similar conceptualization of behavior). If so, how might these processes that are part of different systems interact?

These systems should interact at the level of codes in three main ways. First, they could interact as a result of the presence of codes that contain information that can be used by processes from both the associative system and the rule-based system. This could occur because the codes have different features, or because distinct codes with different features are highly interrelated. Second, they could interact in a sequential manner, whereby the output from one type of process, for example, an associative process, provides information that can be used as a code for a process that is part of the rule-based system. Third, they could interact as a result of previous information processing involving both the associative and rule-based system, creating new codes that contain more complicated pieces of information that reduce the number of processes needed to render an evaluation.

Even when codes exist that lead to inconsistent evaluations by the associative and

rule-based systems, the systems may interact for a different reason. When the output generated by the systems is highly discrepant in response to an attitude object, this may lead to sufficient arousal (Rydell et al., 2008) that, when attributed to the object (Rydell & Durso, 2012), would lead to increased utilization of processes underlying the rule-based system. Under certain conditions, there may be sufficient processing by the rule-based system, such that the output of this processing might “feed back” into the associative system (e.g., Gawronski & Bodenhausen, 2006). This may be why, for instance, presenting counterattitudinal information impacts implicit measures over time in accordance with the amount of counterattitudinal information presented (e.g., Rydell & McConnell, 2006). However, when there is a relatively large store of associative information (e.g., when the attitude object is a member of a stigmatized group), the impact of the interaction between the associative and rule-based systems would be negligible on implicit measures (e.g., McConnell et al., 2008).

### A CAVEAT ABOUT METHODS

One limitation with empirical demonstrations of the SEM to date is that they rely on discrepancies between implicit and explicit evaluation measures to provide evidence for distinct systems. In addition to issues with the logic of “double-dissociation” experiments (e.g., Keren & Schul, 2009), we should reiterate that no measure is process-pure (e.g., Sherman, 2006). That is, there is not a one-to-one correspondence between a measure and a system. While modeling data may shed light on the interaction and how manipulations influence the associative system and the rule-based system, many still unaccounted for pieces of the puzzle are needed to provide evidence for a systems approach (or for that matter, a dual-process approach). Thus, there is a real need to develop measures, paradigms, and sophisticated modeling techniques to elucidate more fully the strengths and weaknesses of all current attitude models. Furthermore, there needs to be greater development of new methods. The most relevant criterion for these new measures, at least in our view, is that they should be designed to address important theoretical

debates in the attitudes literature. Creating new measures is not enough. New measures must also address and possibly resolve current debates in the field.

### CONCLUSION

In our chapter, we have outlined the SEM and reviewed empirical findings supporting many of its key predictions. The SEM stands apart from other attitude models by asserting that there are two distinct systems of evaluation, the associative system and the rule-based system, each of which can operate relatively independently of the other in terms of attitude formation and revision. Moreover, the SEM anticipates a number of important consequences that result from discrepancies between these two systems of evaluation, ranging from specific asymmetries in behavior to judgment and decision-making shortcomings. We contend that these outcomes are more difficult for existent dual-process models of attitudes to explain than they are for a dual-systems approach. As such, the SEM not only sheds light on a number of important theoretical issues in attitudes and persuasion research, but it also provides a process account that can help explain a variety of interesting phenomena revealed in impression formation (e.g., an odd but undeniably uncomfortable feeling one can have with new acquaintances), in judgment and decision making (e.g., why people might pick the wrong vacation destination), and in self-regulation (e.g., why dieters can have such a hard time putting down a tempting slice of cheesecake).

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