

Associative and Propositional Processes in Evaluation: Conceptual, Empirical, and Metatheoretical Issues: Reply to Albarracín, Hart, and McCulloch (2006), Kruglanski and Dechesne (2006), and Petty and Briñol (2006)

Bertram Gawronski
University of Western Ontario

Galen V. Bodenhausen
Northwestern University

Commentators on B. Gawronski and G. V. Bodenhausen's (2006) recently proposed associative-propositional evaluation (APE) model raised a number of interesting conceptual, empirical, and metatheoretical issues. The authors consider these issues and conclude that (a) the conceptual criticisms raised against the APE model are based on misinterpretations of its basic assumptions, (b) the empirical criticisms are unfounded, as they are inconsistent with the available evidence, and (c) the proposed alternative accounts appear to be less parsimonious and weaker in their predictive power than the APE model. Nevertheless, the commentators offered valuable suggestions for extensions of the APE model, which the authors discuss with respect to their implications for new directions in attitude research.

Keywords: attitude change, cognitive consistency, dual-process models, evaluative conditioning, implicit measures

Even though research on attitudes is regarded as one of the primary concerns of social psychology (Allport, 1935), the processes underlying evaluation are highly relevant for many other psychological disciplines. One of the most important questions in this area is how attitudes are formed and changed. To address this question, we recently proposed a new conceptual framework, the associative-propositional evaluation (APE) model (Gawronski & Bodenhausen, 2006). Our primary goal for this model was to integrate the available evidence on the formation and change of what are known as *implicit* and *explicit* attitudes. Whereas explicit attitudes are often equated with self-reported evaluations, implicit attitudes are typically inferred from responses on indirect measures, such as the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) or affective priming tasks (Fazio, Jackson, Dunton, & Williams, 1995).

The APE model provoked several comments by distinguished scholars in the field of attitudes research. Kruglanski and Dechesne (2006) and Albarracín, Hart, and McCulloch (2006) questioned whether associative and propositional processes are indeed qualitatively distinct, as proposed by the APE model. Petty and Briñol (2006) adopted the distinction between (associative) activation and

(propositional) validation processes proposed by the APE model and suggested an alternative dual-process model. The commentators also raised a number of concerns regarding empirical assumptions of the APE model and pointed to some interesting extensions for future research.

We greatly appreciate the comments of these eminent scholars. In fact, their observations made us aware of some ambiguities in the original presentation of our model, which may have led to misinterpretations of the conceptual assumptions made by the APE model. Thus, we are grateful for the opportunity to respond to their comments, so that we can clarify aspects that may have been ambiguous or misleading in the original presentation. In addition, we respond to comments regarding empirical assumptions of the APE model and discuss some metatheoretical issues with regard to the proposed alternatives. Finally, we seize the commentators' suggestions for extensions of our model and note some new directions for future research.

Conceptual Issues

Processes Versus Entities

Kruglanski and Dechesne (2006) as well as Albarracín et al. (2006) questioned whether associative and propositional processes are qualitatively distinct. In their critiques, they advanced several arguments indicating that a qualitative distinction between associations and propositions is difficult to maintain. In evaluating this criticism, it is crucially important to distinguish between processes and entities. For instance, in the title of their article Kruglanski and Dechesne (2006) asked whether associative and propositional processes are qualitatively distinct. However, the question in their running head concerns qualitative differences between associations and propositions (i.e., entities). Despite surface similarities, the two questions address completely different issues. It is impor-

Bertram Gawronski, Department of Psychology, University of Western Ontario, London, Ontario, Canada; Galen V. Bodenhausen, Department of Psychology, Northwestern University.

Preparation of this article was supported by Canada Research Chairs Program Grant 202555, Social Sciences and Humanities Research Council of Canada Grant 410-2005-1339, and Academic Development Fund of the University of Western Ontario Grant 05-303.

Correspondence concerning this article should be addressed to Bertram Gawronski, Department of Psychology, University of Western Ontario, Social Science Centre, London, Ontario N6A 5C2, Canada. E-mail: bgawrons@uwo.ca

tant to note that, whereas the APE model is primarily concerned with associative and propositional processes, the commentators' arguments exclusively address associations and propositions as entities. As outlined in our original presentation of the APE model, we define associative processes as mere activation processes that are independent of subjective truth or falsity and propositional processes as the validation of evaluations and beliefs (see also Strack & Deutsch, 2004). These processes are qualitatively distinct in the sense that their intrinsic nature is defined by a nonoverlapping property: the dependency on truth values (see Moors & De Houwer, 2006). In fact, even Kruglanski and Dechesne (2006) seemed to agree with this contention when they state that the process of activation cannot be assigned truth values on logical grounds.

As for associations and propositions, we generally agree with the commentators that a qualitative distinction between the two types of entities is difficult to maintain. Any association—by definition—turns into a proposition as soon as it is assigned a truth value. Conversely, any proposition depends on activated associations, as there is no independent storage of propositions in long-term memory (see Gawronski & Bodenhausen, 2006, Footnote 3). Thus, even though associative and propositional processes can be regarded as qualitatively distinct because of their nonoverlapping process properties (see Moors & De Houwer, 2006), a qualitative distinction between associations and propositions at the representational level seems difficult to maintain. In fact, a distinction between two entities may even be misleading, in that it may suggest the storage of two independent attitudes in memory (cf. Wilson, Lindsey, & Schooler, 2000), an idea that is rejected within the APE model. Even though the APE model has sometimes been interpreted in this manner (e.g., Rydell & McConnell, in press), the central distinction proposed by the APE model is between two qualitatively different processes, not between two distinct entities or representations.

Representations Versus Outcomes

Drawing on the distinction between associative and propositional processes, the APE model further distinguishes between affective reactions and evaluative judgments. In the original presentation of the APE model, we labeled these two outcomes as *implicit attitudes* and *explicit attitudes*. Again, this depiction may have been misleading in the sense that it may (incorrectly) be taken to imply the existence of two distinct attitudes that are stored independently in memory. As outlined above, the APE model does not assume such independent representations. Rather, we argue that affective reactions reflect a particular outcome of associative processes (i.e., activation), whereas evaluative judgments reflect a particular outcome of propositional processes (i.e., validation). These two types of *proximal outcomes* typically correlate with *distal outcomes* at the behavioral level, such that affective reactions predict spontaneous behavior, whereas evaluative judgments predict deliberate behavior (e.g., Dovidio, Kawakami, & Gaertner, 2002; Fazio et al., 1995; Hofmann, Rauch, & Gawronski, in press). Note, however, that affective reactions and evaluative judgments are not completely independent. The APE model asserts that people typically translate their affective reactions into propositional format (e.g., a negative affective reaction toward X is translated into the proposition "I dislike X"; see Strack & Deutsch,

2004). This proposition is assumed to provide the basis for an evaluative judgment, unless it is invalidated by processes of propositional reasoning. Thus, given that subjective validity depends on the consistency of a proposition with other momentarily considered propositions (Gawronski, Strack, & Bodenhausen, in press), affective reactions and evaluative judgments should be positively correlated unless an affective reaction is rejected as a basis for an evaluative judgment because of its inconsistency with other salient propositions.

Rule-Based Versus Propositional Processes

Another concern raised about the APE model was that both associative and propositional processes follow "if . . . then" rules, thus undermining a qualitative distinction between the two processes as associative versus rule based (Kruglanski & Dechesne, 2006). We generally agree that associative processes operate in a lawful manner that can be described in terms of "if . . . then" rules, as discussed in our original exposition of the APE model. However, the mere fact that associative processes are lawful does not affect the validity of our distinction between associative and propositional processes. In the APE model, the two processes are defined in terms of their dependency on truth values (Strack & Deutsch, 2004), rather than in terms of syllogistic rules (Smith & DeCoster, 2000). To be sure, our definition in terms of truth values implies that syllogistic reasoning is a propositional process, as syllogistic relations cannot even be defined without reference to truth values. However, this notion is an implication of our definition, rather than the definition per se. Moreover, even though association activation can be described by abstract "if . . . then" rules, the existence of such conditional regularities within associative processes does not in any way imply that associative processes involve a transfer of truth values between propositions, which represents the classic definition of syllogistic inference.

Lateral Versus Hierarchical Inhibition

In originally presenting the APE model, we primarily discussed activation and validation processes. Albarracín et al. (2006) correctly noted that this discussion may be incomplete as it does not include the notion of inhibition. Drawing on Bodenhausen and Macrae's (1998) distinction between lateral and hierarchical inhibition, we argue that both associative and propositional processes involve a notion of inhibition, though their prototypical nature differs for the two types of processes. Whereas associative processes often lead to a lateral inhibition of certain associations that is driven by processes of pattern activation (Gawronski & Bodenhausen, 2006; see also Smith, 1996), propositional processes sometimes involve hierarchical inhibitions when these processes lead to a rejection (or negation) of an affective reaction as a basis for an evaluative judgment (see Strack & Deutsch, 2004). Thus, lateral inhibition on the associative level may be capable of reducing the activation level of certain associations in memory. However, hierarchical inhibition may simply reduce the impact of affective reactions on evaluative judgments without changing the affective reaction per se.

In addition to these prototypical cases, it is important to note that propositional processes can sometimes lead to the lateral inhibition of associations. This phenomenon should occur when proposi-

tional reasoning leads to changes in pattern activation. In the original presentation of the APE model, we argued that such propositionally driven changes in pattern activation occur when propositional reasoning implies an affirmation (rather than a negation) of a particular evaluation (see also Strack & Deutsch, 2004).

Empirical Issues

Evaluative Conditioning (EC)

An empirical assumption of the APE model is that EC effects are mediated by associative processes. This assumption was challenged by Kruglanski and Dechesne (2006), who argued that EC effects are not well understood at this time and that it seems premature to conclude that EC is nonpropositional in nature. We agree that current knowledge about EC effects is still limited. Nevertheless, the available evidence was sufficient to lead De Houwer, Thomas, and Baeyens (2001) to conclude that (a) EC is distinct from Pavlovian conditioning and (b) EC effects are most likely mediated by associative processes. De Houwer et al. (2001) provided an excellent review of research on EC, so we will refrain from reiterating the major findings. Instead, we highlight two relevant predictions of the APE model that have been empirically confirmed. First, the APE model predicts that EC effects on self-reported explicit evaluations should be mediated by indirectly assessed implicit evaluations. This assumption has been confirmed by a reanalysis of data obtained by Olson and Fazio (2001; see Gawronski & Bodenhausen, 2006). Second, the APE model predicts that EC may influence indirectly assessed implicit evaluations but not self-reported explicit evaluations when people reject their affective reactions as a basis for their evaluative judgments. This prediction has been confirmed in a recent study by Gawronski, LeBel, Heilpern, and Wilbur (2006), who found that EC influenced explicit evaluations only when participants were asked to focus on their feelings toward the attitude objects but not when they were asked to think about what they know about the attitude object. In contrast, implicit evaluations were influenced by the EC manipulation regardless of whether participants adopted an affective (feelings) or a cognitive (knowledge) focus. Moreover, implicit and explicit evaluations showed a significant positive correlation in the feelings condition but not in the knowledge condition. These results provide further support for our assumption that EC effects are mediated by associative processes.

Another concern raised by Kruglanski and Dechesne (2006) was that EC may lead to a gestaltlike, "holistic" representation in memory, such that the conditioned stimulus (CS) becomes a member of a general category of (dis)likable objects or individuals (see Martin & Levey, 1987). Again, this criticism can be ruled out by empirical evidence. Walther, Gawronski, Blank, and Langer (2006) recently showed that subsequent changes in the valence of the unconditioned stimulus (US) lead to corresponding changes in the valence of the CS, even when the CS is never presented with any additional information (US revaluation effect; see also Baeyens, Eelen, Van den Bergh, & Crombez, 1992). This result is quite difficult to explain with the "holistic" mechanism proposed by Kruglanski and Dechesne (2006). However, it is a direct implication of the associative account, suggesting that EC creates an associative link between the CS and the US in memory.

Skill Acquisition and Efficiency

Referring to "automatic" phenomena in general, Kruglanski and Dechesne (2006) claimed that skill acquisition involves routinizing the application of general rules, which incrementally become more efficient over time. Even though this position is shared by prominent scholars (e.g., Anderson, 1993), it is still controversial (e.g., Logan, 1988). Most important, the assumption of generalized rule strengthening seems empirically inaccurate for the processing of valence. In a series of studies, Deutsch, Gawronski, and Strack (in press) have shown that the general process of negating valence (i.e., reversing the truth value of a given evaluation) is unaffected by enhanced practice. Rather, "automatic" negations were limited to conditions in which the negation could be incorporated in the associative representation of the stimulus. These results suggest that enhanced practice in the negation of valence does not lead to procedural learning of general rules (see Anderson, 1993) but to instance learning for particular stimuli (see Logan, 1988).

Another concern raised by Kruglanski and Dechesne (2006) is that the APE model seems to reserve the feature "efficient" for associative processes. This criticism is based on a misinterpretation of our model, which is probably due to our use of the term *automatic* in the context of association activation and affective reactions. As we argue elsewhere (Gawronski & Bodenhausen, in press), the APE model does not assume that propositional reasoning per se is a cognitively effortful process. Rather, the capacity required by propositional reasoning depends on the number and complexity of momentarily considered propositions. For instance, if people do not consider any other information in addition to their affective reaction, there is no reason to assume that the corresponding evaluative judgment (i.e., the judgment "I dislike X" resulting from a negative affective reaction toward X) would require a high amount of cognitive effort. This assumption is indirectly supported by research showing that the relation between implicit and explicit evaluations increases as a function of increasing spontaneity in the course of making an evaluative judgment (e.g., Hofmann, Gawronski, Gschwendner, Le, & Schmidt, 2005; Koole, Dijksterhuis, & Van Knippenberg, 2001).

Desirability Versus Consistency

Directly related to the issue addressed in the last section, Albarracín et al. (2006) questioned how the APE model would deal with evidence showing that enhanced self-esteem at the implicit level does not result in corresponding effects on the explicit level (e.g., Baccus, Baldwin, & Packer, 2004). Given that a positive self-evaluation is a personally desirable outcome, this finding may seem counterintuitive. Even though several researchers have suggested that motivation is one of the primary factors influencing the correspondence of explicit and implicit evaluations (e.g., Fazio et al., 1995), the APE model adopts a more cognitive perspective. Specifically, we argue that whether people rely on their affective reactions as a basis for their evaluative judgments depends on the propositional consistency of these reactions with other momentarily considered information. Thus, if a "desirable" change in affective reactions is inconsistent with other information, evaluative judgments may nevertheless be unaffected. This assumption is consistent with findings by Gawronski et al. (2006), who found strong relations between implicit and explicit evaluations of Coke

and Pepsi when participants focused on their feelings toward the two soft drinks but not when they were asked to think about reasons why they prefer one over the other. From the perspective of the APE model, thinking about reasons may have directed participants' attention toward other information that may be inconsistent with the affective reaction, thereby reducing the impact of affective reactions on evaluative judgments. Importantly, given that evaluations of Coke and Pepsi are unaffected by desirability concerns, these results suggest a major role for cognitive rather than motivational processes. To be sure, motivational processes may nevertheless be important, as they can influence propositional processes via motivated reasoning (see Gawronski & Bodenhausen, 2006). However, such motivational influences are indirect rather than direct, such that they are mediated by cognitive processes. This conclusion is supported by a meta-analysis conducted by Hofmann et al. (2005), who found that social desirability did not predict variations in correlations between implicit and explicit evaluations above and beyond spontaneity in the course of making a judgment.¹

Stability and Elaboration

In line with the APE model, Albarracín et al. (2006) correctly noted that stability of a particular type of evaluation (i.e., affective reaction, evaluative judgment) is not determined a priori by the nature of its underlying process (i.e., associative vs. propositional). Rather, relative stability is jointly determined by the nature of the underlying process and the nature of an influencing factor, such that mismatches between the two imply higher stability than matches. These issues have been discussed in the original presentation of the APE model (Gawronski & Bodenhausen, 2006) and are further elaborated elsewhere (Gawronski & Bodenhausen, in press). Thus, we refrain from an extensive discussion of these considerations here. However, we would like to address another determinant of stability that was discussed by Petty and Briñol (2006): cognitive elaboration. Drawing on a central assumption of the elaboration likelihood model (ELM; Petty & Wegener, 1999), Petty and Briñol argued that the stability of evaluations generally increases as a function of cognitive elaboration. Even though the APE model does not directly address the role of attitude strength (see Petty & Briñol, 2006), we generally agree that higher elaboration may strengthen associative links in memory, which should enhance future activation and thus stability. However, according to the APE model, cognitive elaboration can also have a dysfunctional effect on stability when enhanced elaboration leads to a rejection of affective reactions as a basis for evaluative judgments (e.g., Hofmann et al., 2005; Koole et al., 2001). As demonstrated by Petty, Tormala, Briñol, and Jarvis (2006), such discrepancies between affective reactions and explicitly endorsed evaluations can create a state of ambivalence. Thus, given that ambivalence is associated with lower stability (Armitage & Conner, 2000), enhanced elaboration may reduce rather than enhance stability under certain conditions.

Feature Activation Versus Propositional Categorization

Albarracín et al. (2006) pointed out that the correlation between different implicit measures has been shown to vary, suggesting that the findings obtained with different measures cannot be treated as

unitary. Even though low correlations between implicit measures are often due to low reliability (Cunningham, Preacher, & Banaji, 2001), the APE model points to at least one important factor that may lead to different outcomes: the propositional categorization of the stimuli presented in the task. For example, whereas the IAT (Greenwald et al., 1998) requires a propositional categorization of the presented stimuli in terms of a given category dimension (e.g., Black vs. White), other measures do not require such categorizations (e.g., Fazio et al., 1995). Thus, given that different propositional categorizations can activate different associative patterns for a given stimulus (see Gawronski & Bodenhausen, 2006), responses in the IAT may be strongly influenced by the particular categorization implied by the task (e.g., Mitchell, Nosek, & Banaji, 2003). Moreover, measures that do not involve a propositional categorization may be primarily influenced by specific features of the presented exemplars (e.g., Livingston & Brewer, 2002). Thus, as the associations activated in response to these features may or may not correspond to the associations activated by propositional categorizations, different measures may produce different outcomes depending on whether they do or do not imply a propositional categorization of the presented stimuli. This assumption is consistent with research by Olson and Fazio (2003), who found that correlations between the IAT and affective priming were close to zero when participants were not required to propositionally categorize the presented stimuli in the affective priming task. However, correlations between the two measures substantially increased when the affective priming task implied the same categorization that was required in the IAT.²

Metatheoretical Issues

Parsimony

Drawing on their criticism of our distinction between associative and propositional processes, Kruglanski and Dechesne (2006) as well as Albarracín et al. (2006) proposed a single-process alternative. Whereas Kruglanski and Dechesne (2006) seemed to favor a single-process model that limits its focus to propositional processes, Albarracín et al. (2006) proposed a single-process model that primarily focuses on associative processes. In appreciation of Occam's razor, we agree with our critics that more parsimonious theories should be preferred over less parsimonious ones (see Quine, 1963). Thus, single-process models may appear superior compared with dual-process models when the two capture the same empirical evidence. However, when evaluating the parsimony of a given theory, it is important to consider not only the number of processes postulated by the core theory but also the

¹ In fact, when they controlled for spontaneity in the course of making a judgment, Hofmann et al. (2005) found a positive rather than negative relation between social desirability and implicit–explicit correlations. That is, correlations between implicit and explicit evaluations increased rather than decreased as a function of social desirability.

² Another task-related factor that may influence the relation between different types of implicit measures is whether they correspond with regard to the type of compatibility that is employed by these measures (e.g., stimulus–stimulus compatibility vs. stimulus–response compatibility; see Gawronski & Bodenhausen, 2005). Such task-related factors are not covered by the APE model.

complete set of auxiliary and background assumptions that is necessary to explain the available evidence (Lakatos, 1970). For instance, even though Kruglanski's unimodel proposes only a single process, it draws on an additional set of five "parameters" that are required to explain the available evidence (Kruglanski, Erb, Pierro, Mannetti, & Chun, in press). Thus, even though Kruglanski et al.'s (in press) single-process alternative may appear more parsimonious from a superficial perspective, it may in fact be less parsimonious than the APE model, which derives most of its predictions from the simple distinction between associative and propositional processes.

Predictive Power

Another important metatheoretical issue is the distinction between explanation and prediction. Many theories are very general in the sense that they explain everything yet predict nothing (Quine & Ullian, 1978). Thus, when evaluating competing theories, it is also important to take a close look at their ability to make new predictions. We argue that the APE model generates a number of new predictions that have not been derived from other models. For instance, the APE model implies that cognitive dissonance arising from counterattitudinal behavior should change self-reported explicit evaluations but not indirectly assessed implicit evaluations (Gawronski & Strack, 2004). Conversely, the APE model predicts that EC effects on self-reported explicit evaluations should be fully mediated by indirectly assessed implicit evaluations (Olson & Fazio, 2001; see Gawronski & Bodenhausen, 2006) and that EC effects on implicit evaluations may still emerge even when explicit evaluations are unaffected by EC manipulations (Gawronski et al., 2006). Even though single-process models have proven their capacity to make new predictions in research on persuasion (e.g., Kruglanski & Thompson, 1999), we are uncertain how a single-process model would predict these outcomes in an a priori (rather than post hoc) manner.

APE Model Versus the Metacognitive Model (MCM; Petty & Briñol, 2006)

In the context of theory evaluation, it also seems worthwhile to compare the APE model with the MCM proposed by Petty and Briñol (2006). In contrast to the single-process models proposed by Kruglanski and Dechesne (2006) and Albarracín et al. (2006), the MCM proposes two qualitatively distinct processes that resemble our distinction between activation and validation. In fact, the MCM shares a large number of assumptions with the APE model. These similarities are well outlined by Petty and Briñol (2006). However, Petty and Briñol (2006) also note a number of conceptual differences, such as the predominant focus on structural aspects and attitude strength in the MCM, which stands in contrast to the predominant focus on processes in the APE model. Petty and Briñol (2006) provided an excellent discussion of these conceptual differences, and we need not reiterate them. Instead, we highlight two empirical differences that we regard as important when it comes to evaluating the explanatory and predictive power of the two models.

First, we argue that the MCM does not generate a priori predictions for different patterns of attitude change. Even though the MCM can explain cases in which (a) implicit evaluations change

but explicit evaluations do not, (b) explicit evaluations change but implicit evaluations do not, and (c) both implicit and explicit evaluations change, there appears to be no specification of when each of these patterns should emerge. Such predictions are clearly stated by the APE model. For instance, the APE model predicts changes in implicit but not explicit evaluations as a result of EC manipulations when participants focus on their knowledge about the attitude object (e.g., Gawronski et al., 2006). Conversely, the APE model predicts changes in explicit but not implicit evaluations when cognitive dissonance leads to a rejection of affective reactions as a basis for evaluative judgments (e.g., Gawronski & Strack, 2004).

Second, and directly related to this point, the APE model predicts different patterns of mediation for corresponding changes in explicit and implicit evaluations. For example, even though EC may lead to corresponding changes in explicit and implicit evaluations, changes in explicit evaluations should be fully mediated by changes in implicit evaluations (e.g., Olson & Fazio, 2001; see Gawronski & Bodenhausen, 2006). As noted by Petty and Briñol (2006), such mediation patterns are not covered by the MCM.

New Perspectives

Aside from the criticism raised against the APE model, the commentators also pointed to some interesting extensions of our model. For instance, Albarracín et al. (2006) provided an excellent discussion of how a consideration of goals could enhance the integrative capacity of the APE model. This integration may further benefit from research on the associative representation of goal systems (e.g., Kruglanski et al., 2002). Petty and Briñol (2006) correctly noted that the distinction between associative and propositional processes is orthogonal to the distinction between central and peripheral processing proposed by the ELM (Petty & Wegener, 1999). Thus, research on persuasion may gain new insights from combining the assumptions of the ELM with the basic assumptions of the APE model. Some implications of this integration have already been discussed by Gawronski and Bodenhausen (2006), but much more research is needed to test these predictions. To be sure, this conclusion applies not only to the suggested extensions but also to any untested assumption implied by the APE model. Eventually, empirical research will decide about the usefulness and the accuracy of the APE model, and we are curious to see more empirical data.

References

- Albarracín, D., Hart, W., & McCulloch, K. C. (2006). Associating versus proposing or associating what we propose: Comment on Gawronski and Bodenhausen (2006). *Psychological Bulletin*, *132*, 732–735.
- Allport, G. W. (1935). Attitudes. In C. Murchison (Ed.), *Handbook of social psychology* (pp. 798–844). Wooster, MA: Clark University Press.
- Anderson, J. R. (1993). *Rules of the mind*. Hillsdale, NJ: Erlbaum.
- Armitage, C. J., & Conner, M. (2000). Attitudinal ambivalence: A test of three key hypotheses. *Personality and Social Psychology Bulletin*, *26*, 1421–1432.
- Baccus, J. R., Baldwin, M. W., & Packer, D. J. (2004). Increasing implicit self-esteem through classical conditioning. *Psychological Science*, *15*, 498–502.
- Baeyens, F., Eelen, P., Van den Bergh, O., & Crombez, G. (1992). The content of learning in human evaluative conditioning: Acquired valence is sensitive to US revaluation. *Learning and Motivation*, *23*, 200–224.

- Bodenhausen, G. V., & Macrae, C. N. (1998). Stereotype activation and inhibition. In R. S. Wyer, Jr. (Ed.), *Advances in social cognition* (Vol. 11, pp. 1–52). Mahwah, NJ: Erlbaum.
- Cunningham, W. A., Preacher, K. J., & Banaji, M. R. (2001). Implicit attitude measurement: Consistency, stability, and convergent validity. *Psychological Science*, *12*, 163–170.
- De Houwer, J., Thomas, S., & Baeyens, F. (2001). Associative learning of likes and dislikes: A review of 25 years of research on human evaluative conditioning. *Psychological Bulletin*, *127*, 853–869.
- Deutsch, R., Gawronski, B., & Strack, F. (in press). At the boundaries of automaticity: Negation as reflective operation. *Journal of Personality and Social Psychology*.
- Dovidio, J. F., Kawakami, K., & Gaertner, S. L. (2002). Implicit and explicit prejudice and interracial interaction. *Journal of Personality and Social Psychology*, *82*, 62–68.
- Fazio, R. H., Jackson, J. R., Dunton, B. C., & Williams, C. J. (1995). Variability in automatic activation as an unobtrusive measure of racial attitudes: A bona fide pipeline? *Journal of Personality and Social Psychology*, *69*, 1013–1027.
- Gawronski, B., & Bodenhausen, G. V. (2005). Accessibility effects on implicit social cognition: The role of knowledge activation and retrieval experiences. *Journal of Personality and Social Psychology*, *89*, 672–685.
- Gawronski, B., & Bodenhausen, G. V. (2006). Associative and propositional processes in evaluation: An integrative review of implicit and explicit attitude change. *Psychological Bulletin*, *132*, 692–731.
- Gawronski, B., & Bodenhausen, G. V. (in press). Unraveling the processes underlying evaluation: Attitudes from the perspective of the APE model. *Social Cognition*.
- Gawronski, B., LeBel, E. P., Heilpern, K., & Wilbur, C. J. (2006). *Understanding patterns of implicit and explicit attitude change: A test of the APE model*. Unpublished manuscript, University of Western Ontario, Canada.
- Gawronski, B., & Strack, F. (2004). On the propositional nature of cognitive consistency: Dissonance changes explicit, but not implicit attitudes. *Journal of Experimental Social Psychology*, *40*, 535–542.
- Gawronski, B., Strack, F., & Bodenhausen, G. V. (in press). Attitudes and cognitive consistency: The role of associative and propositional processes. In R. E. Petty, R. H. Fazio, & P. Briñol (Eds.), *Attitudes: Insights from the new implicit measures*. Mahwah, NJ: Erlbaum.
- Greenwald, A. G., McGhee, D. E., & Schwartz, J. K. L. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology*, *74*, 1464–1480.
- Hofmann, W., Gawronski, B., Gschwendner, T., Le, H., & Schmitt, M. (2005). A meta-analysis on the correlation between the Implicit Association Test and explicit self-report measure. *Personality and Social Psychology Bulletin*, *31*, 1369–1385.
- Hofmann, W., Rauch, W., & Gawronski, B. (in press). And deplete us not into temptation: Automatic attitudes, dietary restraint, and self-regulatory resources as determinants of eating behavior. *Journal of Experimental Social Psychology*.
- Koole, S. L., Dijksterhuis, A., & Van Knippenberg, A. (2001). What's in a name: Implicit self-esteem and the automatic self. *Journal of Personality and Social Psychology*, *80*, 669–685.
- Kruglanski, A. W., & Dechesne, M. (2006). Are associative and propositional processes qualitatively distinct? Comment on Gawronski and Bodenhausen (2006). *Psychological Bulletin*, *132*, 736–739.
- Kruglanski, A. W., Erb, H.-P., Pierro, A., Mannetti, L., & Chun, W. Y. (in press). On parametric continuities in the world of binary either ors. *Psychological Inquiry*.
- Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, R., Chun, W. Y., & Sleeth-Keppler, D. (2002). A theory of goal-systems. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 34, pp. 331–378). New York: Academic Press.
- Kruglanski, A. W., & Thompson, E. P. (1999). Persuasion by a single route: A view from the unimodel. *Psychological Inquiry*, *10*, 83–109.
- Lakatos, I. (1970). Falsification and the methodology of scientific research programs. In I. Lakatos & A. Musgrave (Eds.), *Criticism and the growth of knowledge* (pp. 91–195). Cambridge, England: Cambridge University Press.
- Livingston, R. W., & Brewer, M. B. (2002). What are we really priming? Cue-based versus category-based processing of facial stimuli. *Journal of Personality and Social Psychology*, *82*, 5–18.
- Logan, G. D. (1988). Toward an instance theory of automatization. *Psychological Review*, *95*, 492–527.
- Martin, I., & Levey, A. B. (1987). Learning will happen next: Conditioning, evaluation, and cognitive processes. In G. Davey (Ed.), *Cognitive processes and Pavlovian conditioning in humans* (pp. 57–81). Chichester, England: Wiley.
- Mitchell, J. P., Nosek, B. A., & Banaji, M. R. (2003). Contextual variations in implicit evaluation. *Journal of Experimental Psychology: General*, *132*, 455–469.
- Moors, A., & De Houwer, J. (2006). Automaticity: A theoretical and conceptual analysis. *Psychological Bulletin*, *132*, 297–326.
- Olson, M. A., & Fazio, R. H. (2001). Implicit attitude formation through classical conditioning. *Psychological Science*, *12*, 413–417.
- Olson, M. A., & Fazio, R. H. (2003). Relations between implicit measures of prejudice: What are we measuring? *Psychological Science*, *14*, 636–639.
- Petty, R. E., & Briñol, P. (2006). A metacognitive approach to “implicit” and “explicit” evaluations: Comment on Gawronski and Bodenhausen (2006). *Psychological Bulletin*, *132*, 740–744.
- Petty, R. E., Tormala, Z. L., Briñol, P., & Jarvis, W. B. G. (2006). Implicit ambivalence from attitude change: An exploration of the PAST model. *Journal of Personality and Social Psychology*, *90*, 21–41.
- Petty, R. E., & Wegener, D. T. (1999). The elaboration likelihood model: Current status and controversies. In S. Chaiken & Y. Trope (Eds.), *Dual process theories in social psychology* (pp. 41–72). New York: Guilford Press.
- Quine, W. V. O. (1963). On simple theories in a complex world. *Synthese*, *15*, 103–106.
- Quine, W. V. O., & Ullian, J. S. (1978). *The web of belief* (2nd ed.). New York: McGraw-Hill.
- Rydell, R. J., & McConnell, A. R. (in press). Understanding implicit and explicit attitude change: A systems of reasoning analysis. *Journal of Personality and Social Psychology*.
- Smith, E. R. (1996). What do connectionism and social psychology offer each other? *Journal of Personality and Social Psychology*, *70*, 893–912.
- Smith, E. R., & DeCoster, J. (2000). Dual-process models in social and cognitive psychology: Conceptual integration and links to underlying memory systems. *Personality and Social Psychology Review*, *4*, 108–131.
- Strack, F., & Deutsch, R. (2004). Reflective and impulsive determinants of social behavior. *Personality and Social Psychology Review*, *8*, 220–247.
- Walther, E., Gawronski, B., Blank, H., & Langer, T. (2006). *One date, bad fate? Indirect attitude change through association*. Manuscript submitted for publication.
- Wilson, T. D., Lindsey, S., & Schooler, T. Y. (2000). A model of dual attitudes. *Psychological Review*, *107*, 101–126.

Received April 24, 2006

Accepted April 25, 2006 ■