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## Intuition, Rational Analysis and the Relation Between Implicit and Explicit Attitudes

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Running head: RATIONAL ANALYSIS, INTUITION, AND ATTITUDES

Intuition, Rational Analysis and the Relation between Implicit and Explicit Attitudes

by

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Bachelor of Arts, University of Waterloo, 2004

Master of Arts, Wilfrid Laurier University, 2005

DISSERTATION

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in partial fulfillment of the requirements for

Doctor of Philosophy in Social Psychology

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2009

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Abstract

Across four experiments, reliance on rational analysis reduced the correspondence between implicit and explicit attitudes relative to reliance on intuition. In each experiment, implicit attitudes were measured, and then participants were induced to rely on either rational analysis or intuition. Following this manipulation, explicit attitudes were measured. We found that participants reported explicit attitudes that were more or less consistent with implicit attitudes depending on whether they relied more on intuitions or rational analysis. Notably, rational analysis only reduced the correspondence between implicit and explicit attitudes when it led participants to consider reasons for their attitudes that were inconsistent with their implicit attitudes. In Studies 3 and 4 we found that reliance on intuition or rational analysis also affected the correspondence between implicit attitudes and behavioral choices. In Study 4 we found that these effects of rational analysis and intuition on behavioral choices affected satisfaction with decisions three weeks later.

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## Intuition, Rational Analysis and the Relation between Implicit and Explicit Attitudes

Gertrude belongs to a book club that is set to discuss James Joyce's *A Portrait of the Artist as a Young Man*. Reflecting on the book, she is impressed by its narrative techniques, expressionistic writing style, and rich allusions to contemporary Irish issues. These deliberately considered points lead her toward a positive evaluation of the book. But as she read the book, she simply did not enjoy it, though she cannot articulate what limits her enthusiasm for it. Given these conflicting reactions, how might she arrive at an overall attitude toward the book? Would she trust her more immediate, intuitive reaction or her more reflective, rational analysis of the book? Would she somehow blend these two sources of evaluation together? In the present article, we argue that both intuitive reactions and more rational judgments play roles in forming explicit attitudes. Note that we use the term rational to refer simply to a more deliberative, reflective mode of thinking, not a mode of thinking that is necessarily more logical or unbiased. We present evidence that implicit attitudes are experienced as intuitive evaluations, which often form the basis of explicit attitudes, though additional deliberative considerations can affect explicit attitudes as well. We demonstrate that greater reliance on intuition, relative to rational analysis, leads to greater correspondence between implicit and explicit attitudes. Such reliance can also cause behavioral choices to correspond more closely to implicit attitudes; in at least some cases, this leads people to be more satisfied with their decisions.

## Implicit and Explicit Attitudes

The traditional, most common way to determine a person's attitude about something is to simply ask him or her (Ajzen, 2001; Fazio & Olson, 2003). Such direct

measures may assess reflective, propositional evaluative judgments. These are the attitudes that people explicitly endorse. More recent research in social psychology, however, has seen the development of indirect, implicit measures, which may assess more automatic or reflexive, associative evaluations that people do not necessarily endorse as valid (Fazio & Olson, 2003; Gawronski & Bodenhausen, 2006). Traditional self-report measures and the new indirect measures are commonly thought of as tapping explicit and implicit attitudes, respectively (e.g., Fazio & Olson, 2003; Greenwald & Banaji, 1995; Wilson, Lindsey, & Schooler, 2000). We retain this terminology in the present article in order to more clearly link our findings to past research in this area, though we acknowledge that these attitudes might be more precisely described as deliberate evaluative judgments and immediate evaluative reactions (see Gawronski & Bodenhausen, 2006).

A major focus of research has been on the degree of association between implicit and explicit attitudes (e.g., Fazio & Olson, 2003; Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005; Nosek, 2005). Research examining implicit and explicit attitudes has sometimes observed striking dissociations between the two, lending the constructs a degree of discriminant validity. Implicit and explicit self-esteem, for example, are typically uncorrelated (e.g., Bosson, Swann & Pennebaker, 1999; Jordan, Spencer, Zanna, Hoshino Browne, & Correll, 2003; Jordan, Spencer, & Zanna, 2005). Thus, people who explicitly report having high self-esteem may show high or low levels of implicit self-esteem. Likewise, explicit reports of prejudice do not typically correlate with implicit measures of prejudice (e.g., Son Hing, Chung-Yan, Hamilton, & Zanna, 2008).

However, meta-analyses examining implicit and explicit attitudes across a variety of attitude domains reveal considerable variability in correlations between the two (Hofmann et al., 2005; Nosek, 2005). Overall there is a modest positive correlation between implicit and explicit attitudes, but the correlation is quite strong in some domains and near-zero in others. These meta-analyses further suggest that significant variability in explicit–implicit attitude correspondence is moderated by factors such as self-presentational concerns and the spontaneity with which people report their attitudes. In domains where people are more concerned with presenting themselves positively, there is less correspondence between explicit and implicit attitudes (Nosek, 2005). Self-presentational concerns may lead people to deliberate on attitudes to a greater extent (Fazio & Olson, 2003). In domains for which people report their attitudes more spontaneously, relying on their “gut feelings” to a greater extent, there is greater correspondence (Hofmann et al., 2005; see also Koole, Dijksterhuis, & Van Knippenberg, 2001).

Because the degree of correspondence between implicit and explicit attitudes is related to important behavioral outcomes and judgments (Bosson et al., 2003; Jordan et al., 2003, 2005; McGregor & Marigold, 2003; McGregor, Nail, Marigold, & Kang, 2005; Schröder-Abé et al., 2007; Son Hing et al., 2008; Zeigler-Hill, 2006), these findings underscore the need to better understand when and under what conditions implicit and explicit attitudes correlate with each other (Fazio & Olson, 2003). Two influential models of attitudes, the Associative-Propositional Evaluation (APE; Gawronski & Bodenhausen, 2006) model and the Motivation and Opportunity as Determinants (MODE; Fazio & Olson, 2003; Olson & Fazio 2009) model, make similar predictions in this respect. These

models, moreover, are consistent with the moderation of explicit–implicit attitude correspondence by self-presentational concerns and the spontaneity of attitude reports.

#### APE and MODE Model Predictions

Although the APE and MODE models make many unique predictions, both models predict that, in reporting explicit attitudes, people may rely on their implicit attitudes and additional deliberative considerations. In both models, implicit attitudes reflect relatively automatic associations between an object and an evaluation. These associative evaluations can be translated into more deliberative, propositional evaluations (e.g., “I don’t like *A Portrait of the Artist as a Young Man*”). One might then simply report such an evaluative judgment as one’s explicit attitude. One might, however, rely on additional, deliberative considerations in forming an explicit attitude (e.g., its innovative writing style and rich allusions) if one has the motivation and opportunity (i.e., sufficient time and cognitive capacity) to do so.

Thus, when motivation or opportunity for deliberation are low, explicit and implicit attitudes should correspond more closely as one’s explicit attitude is more directly based on one’s implicit attitude. This may be why more spontaneously-reported explicit attitudes correspond more closely with implicit attitudes (Hofmann et al., 2005; Koole et al., 2001). When motivation and opportunity to elaborate one’s initial evaluative reaction are high, additional considerations may dilute the influence of implicit on explicit attitudes. This may be why explicit and implicit attitudes correspond less closely in domains for which self-presentational concerns are high (Nosek, 2005). Notably, the APE model specifically posits that additional deliberative considerations will decrease the correspondence between implicit and explicit attitudes *only* when those

considerations are inconsistent with one's implicit attitudes (Gawronski & Bodenhausen, 2006). If, however, additional considerations are consistent with implicit attitudes, the correspondence between implicit and explicit attitudes may remain high.

Thus, the APE and MODE models suggest that the correspondence between implicit and explicit attitudes depends on how much people elaborate their initial, associative evaluations of objects (Fazio & Olson, 2003; Gawronski & Bodenhausen, 2006; Olson & Fazio, 2009). Both models are consistent with the moderation of explicit-implicit attitude correlations by the spontaneity with which people report their explicit attitudes. There is now some evidence that greater cognitive elaboration of explicit attitudes can reduce the correspondence between implicit and explicit attitudes (Florak, Scarabis, & Bless, 2001; Hofmann et al., 2005; Koole et al., 2001; cf. Nosek, 2005). The cognitive processes by which these effects occur, however, remain unclear (Hofmann et al., 2005). We test critical aspects of these models and the processes underlying them in the present studies.

Consistent with the APE and MODE models, we believe people may often use their implicit attitudes as starting points for explicit attitude judgments, and that the two will correspond closely when motivation or opportunity to elaborate initial evaluative reactions are low. We extend these models, however, in predicting that, phenomenologically, people experience their implicit attitudes as intuitions. We thus predict that the more people trust in and rely on their intuitions, the more they will use their implicit attitudes in forming evaluative judgments and thus the greater will be the correspondence between their implicit and explicit attitudes. The more people rely on rational analysis, however, the more they may use additional considerations to form their

explicit attitudes, which can dilute the correspondence between implicit and explicit attitudes if these considerations are inconsistent with one's implicit attitudes.

#### Intuition, Rational Analysis and Implicit–Explicit Attitude Correspondence

Numerous theorists have suggested that we may experience stored patterns of cognitive associations as intuitions (Epstein, 1991; Hogarth, 2001; Lieberman, 2000; Sloman, 1996). Implicit learning in general might largely consist of associative cognitive processes that are experienced as intuition. People may often be aware of the products of efficient, associative processes, but not the cognitive processes underlying them, and in this way implicit learning may give rise to a phenomenal experience of intuition (Bowers, Regehr, Balthazard, & Parker, 1990; Hogarth, 2001; Reber, 1976; 1989; Seger, 1994). Likewise, people may experience implicit attitudes as intuitive evaluations (Jordan, Whitfield, & Zeigler-Hill, 2007). That is, when an associative evaluation is activated by an attitude object, people may be aware of their immediate evaluative response, but not the cognitive processes that produced it. They may thus have difficulty identifying and articulating the cognitive processes that produce their implicit evaluative responses. Experientially, they may seem to “pop” into one's head and thus be experienced as intuitions or gut feelings.

Indeed, some evidence does suggest that people may experience implicit attitudes as intuitions. The extent to which people trust their intuitions moderates the correspondence between implicit and explicit self-esteem (Jordan, Whitfield, & Zeigler-Hill, 2007). In two studies, we measured the extent to which people perceive their intuitions to be valid (i.e., their Faith in Intuition; Epstein, Pacini, Denes-Rej & Heier, 1996) and found that correlations between implicit and explicit self-esteem were higher

for people who perceived their intuitions to be generally valid. In another two studies, we experimentally induced some participants to trust their intuitions to a greater extent, by suggesting that people who trust their intuitions are more successful in business and social relationships. We found that people induced to trust their intuitions reported explicit self-esteem that corresponded more closely to their implicit self-esteem. These findings suggest that people experience their implicit self-esteem as intuitive evaluations of the self, and to the extent that they trust their intuitions, rely on their implicit self-esteem to a greater extent in reporting their explicit self-esteem. In the present studies, we generalize these findings to attitudes other than self-esteem. This is crucial, as self-esteem may behave quite differently than other attitudes (Kernis, 2005), reflecting in particular “the impact of carefully pondered propositions and of self-presentational concerns” (Rudolph et al., 2008, p. 279).

The APE and MODE model formulations of the relation between implicit and explicit attitudes are further supported by recent experimental evidence (Gawronski & LeBel, 2008). Gawronski and LeBel manipulated implicit attitudes (e.g., toward Pepsi and Coke) through associative conditioning. They also manipulated whether participants were instructed to focus on feelings or reasons for their evaluations when reporting their explicit attitudes toward the same attitude objects. They found that evaluative conditioning affected implicit attitudes regardless of whether participants focused on feelings or reasons, but that it affected explicit attitudes only when participants focused on feelings when reporting their attitudes. This produced stronger correlations between implicit and explicit attitudes when participants focused on feelings rather than reasons. Consistent with the APE and MODE models, these findings suggest that evaluative



conditioning changes implicit attitudes, which can then inform explicit attitudes if participants focus primarily on their feelings, but not if they focus on other more deliberative considerations.

The present research aims to complement and extend these findings and to further test the possibility that reliance on intuition increases the correspondence between implicit and explicit attitudes, whereas rational analysis decreases this correspondence. Although Gawronski and LeBel's findings are consistent with this formulation, they measured both implicit and explicit attitudes after their evaluative conditioning procedure. It is thus difficult to rule out the possibility that a focus on feelings amplified a direct effect of evaluative conditioning on explicit attitudes, rather than this change being mediated by changes to implicit attitudes. In the present studies, we do not focus on attitude change per se, but concentrate on the extent to which reliance on intuition or rational analysis causes explicitly reported attitudes to correspond more or less closely with implicit attitudes. We do so by first measuring implicit attitudes and then manipulating the extent to which people rely on intuitions or rational analysis in reporting their explicit attitudes. In this way, we can be sure that changes in the correspondence between implicit and explicit attitudes reflect changes in explicitly reported attitudes.

We expect that greater reliance on intuition will lead people to report explicit attitudes that are more consistent with their implicit attitudes, and that greater reliance on rational analysis will lead people to report explicit attitudes that are less consistent with their implicit attitudes, at least to the extent that rational analysis leads people to rely more heavily on considerations that are inconsistent with their implicit attitudes. Such findings would meaningfully extend the results of Jordan et al. (2007) while

demonstrating that their findings generalize beyond implicit self-esteem to implicit attitudes in general. In addition, in Studies 3 and 4, we extend our analysis to examine how reliance on intuition or rational analysis affects the correspondence between implicit attitudes and behavioral choices.

Wilson and colleagues found across a number of studies that introspection changes (explicit) attitudes (see Wilson, Dunn, Kraft, & Lisle, 1989), and can reduce the quality of decisions (Wilson et al., 1993; Wilson, Hodeges, & LaFleur, 1995; Wilson & Kraft, 1993). Wilson et al. (1989) note that thinking about reasons for one's attitudes can change explicit attitudes because it can lead one to focus on a biased subset of reasons. In our view, thinking about reasons reduces the extent to which implicit attitudes determine explicit attitudes by leading people to recruit additional considerations, some of which may contradict implicit attitudes. In addition, behavioral choices that occur soon after a reasons analysis are likely to conform more to the changed explicit attitude (Wilson et al., 1989), and less to implicit attitudes. However, in the absence of continued rational analysis, one's implicit attitudes may reassert themselves in determining responses to the attitude object over time, causing people to be less satisfied with decisions that are made soon after a reasons analysis. This may be because rational analysis can sometimes lead people to underemphasize or ignore aspects of objects that are actually quite consequential in how they respond to them in daily interactions, and to overemphasize aspects that are not very important. We explore these possibilities in Studies 3 and 4 by examining how reliance on intuition versus rational analysis affects the relation between implicit attitudes and behavioral choices, and how this translates into later decision satisfaction.

## Study 1

In Study 1 we tested the influence of reliance on intuition and reliance on rational analysis on the correspondence between implicit and explicit attitudes. We examined attitudes toward television shows as an attitude domain that should be relatively familiar to participants. We predict that a focus on intuition will lead explicitly reported attitudes to correspond more closely to implicit attitudes than a focus on rational analysis. Notably, we expect this to occur only when rational analysis leads people to rely on considerations that are inconsistent with their implicit attitudes (Gawronski & Bodenhausen, 2006). If, however, rational analysis leads people to focus on additional considerations that support their implicit attitudes, then it should not reduce the correspondence between implicit and explicit attitudes. We examined this possibility in an exploratory manner in Study 1.

Specifically, we examined comparisons between television shows that belong to the same genre and comparisons of shows that belong to different genres, positing that these different kinds of comparisons would lead participants to recruit qualitatively different kinds of reasons for their preferences. If, for example, Susie prefers the show *Friends* to *CSI: Crime Scene Investigation*, when thinking deliberately about her preference, she might reason that she prefers comedies to crime dramas, or values humor in shows more than suspense, a preference that aligns with her preference for specific shows. In considering her preference for *Friends* over *Frasier*, however, she may need to “dig deeper” than attributes based on a simple genre preference, because both shows are comedies. In this case, she may need to consider additional aspects of the plot and characters that are more likely to contradict her preference for *Friends*.

Television shows are commonly categorized on the basis of genre. Different shows are classified in *TV Guide* according to different genres, and Emmy Awards are awarded to shows in different genre categories such as comedy, drama, and variety. Perceptions of similarities between objects or concepts that are categorized similarly and differences between objects or concepts that are categorized differently tend to be accentuated (Rosch et al., 1976; Rosch & Mervis, 1975; Tajfel, 1957; 1959). As a consequence, comparisons between members of different categories are naturally differentiated on the basis of a salient category distinction. Because some genre distinctions for television shows (e.g., the distinction between dramas and comedies) are commonly-used, we expected that deliberative comparisons between television shows that are within-genre may be quite different than comparisons between television shows that cross genres.

If one must consider their preference between two shows that belong to different genres, they may readily perceive differences between the shows based on the genre distinction itself as reasons for their preference. Because the genre preference is aligned perfectly with their preference between the two shows, the reasons they recruit to support their preference will be largely consistent with their initial evaluative reaction, or implicit attitude. Consequently rational analysis will not reduce the correspondence between implicit and explicit attitudes in this case. If, on the other hand, the two shows belong to the same genre, then people can no longer rely simply on a genre distinction to support their preference and will need to consider additional, more content-based factors when comparing the two shows. The greater the number of factors they consider, in this case, the greater the likelihood that some of these factors will contradict their implicit

preference, thus diluting the correspondence between implicit and explicit attitudes.

Thus, in Study 1, we predicted that rational analysis would disrupt the correspondence between implicit and explicit attitudes for a within-genre comparison between television shows but not for a cross-genre comparison.

## Method

### Participants

Ninety-nine undergraduates enrolled in psychology courses participated in exchange for course credit. One participant's data were lost due to computer error. We also excluded the data of participants with error rates over 20% on either of the two implicit measures (described below) from analyses involving the measure in question. Three participants had high error rates on both implicit measures, making the final sample 95 participants (23 male). Five additional participants had high error rates on one or the other of the implicit measures and their data were excluded only from analyses involving that measure.

### Procedure

Up to eight participants at a time participated in sessions, though they were seated at individual workstations and did not interact with each other. Participants were met by a female experimenter who described the study as an investigation of "the psychology behind popular television shows." Participants first completed two implicit measures regarding their attitudes toward three television shows. We then induced participants to trust either intuition or rational analysis. This was followed by explicit measures of their attitudes toward the television shows. Lastly, participants completed a manipulation check testing their degree of trust in intuition and in rational analysis.

*Implicit attitudes toward television shows.* Participants completed two Implicit Association Test (IAT; Greenwald, McGhee, & Schwarz, 1998) measures of implicit attitudes toward three television shows: *Friends*, *Frasier*, and *CSI: Crime Scene Investigation*, two comedies and one drama, respectively. One IAT measured the extent to which participants associated *Friends* more than *Frasier* with positive affect, and the other measured the extent to which they associated *CSI* more than *Friends* with positive affect. Thus, we examined one within-genre comparison and one cross-genre comparison, respectively.

In the *Friends* vs. *Frasier* IAT, participants categorized words and images, as quickly as possible, along two dimensions, respectively. Words were categorized as *pleasant* or *unpleasant* (i.e., holiday, warmth, nice, smile, sunshine, gift, love, happy, party, joy; agony, death, disease, vomit, evil, cockroach, pain, stink, disaster, garbage). Images were categorized as *Friends* or *Frasier* (i.e., pictures of the characters: Rachel, Ross, Joey, Monica, and Chandler from *Friends*; and Frasier, Niles, Daphne, Martin, and Eddie-the-dog from *Frasier*). These images were retrieved from network websites. The target stimuli appeared in the center of the screen, and the category labels appeared in the upper left and right corners of the screen, corresponding to the response keys (*e* and *i*) used to indicate category membership. There were seven blocks of trials in the first IAT. Within each block, stimuli were presented in random order.

Blocks 1, 2, and 5 were practice blocks (20 trials each) for which participants made single categorizations. In Block 1 words were categorized as unpleasant or pleasant, and in Block 2 images were categorized as *Friends* or *Frasier*. In the remaining blocks, participants made both sets of categorizations, on alternate trials, using a single

set of response keys. In Block 4, participants used one response key to indicate if a stimulus belonged to the unpleasant or *Friends* categories and the other key if the stimulus belonged to the pleasant or *Frasier* categories (40 trials). In Block 5, participants categorized images as *Frasier* or *Friends* with the response keys now reversed. In Block 7, participants used one response key to indicate if a stimulus belonged to the unpleasant or *Frasier* categories and the other key if the stimulus belonged to the pleasant or *Friends* categories (40 trials). Blocks 3 and 6 were practice blocks (20 trials each) for Blocks 4 and 7, though data from these blocks were used in calculating IAT scores (Greenwald, Nosek, & Banaji, 2003).

The scoring of the *Friends* vs. *Frasier* IAT was premised on the logic that individuals with strong implicit preference for *Friends* over *Frasier* should respond faster when *Friends* and pleasant share a response than when *Friends* and unpleasant share a response, because the positive semantic association with *Friends* should facilitate responding in the former pairing but interfere with responding in the latter pairing. This facilitation effect serves as an index of implicit preference for *Friends* over *Frasier*. We calculated IAT scores using the algorithm advocated by Greenwald et al. (2003), with higher scores indicating more positive implicit attitudes toward *Friends*.

The second IAT compared the shows *CSI* vs. *Friends*. Using images from these shows, the procedures for this IAT were identical to the first IAT except that participants were presented with only the four blocks corresponding to Blocks 3, 4, 6, and 7. This IAT was scored so that higher scores reflected more positive implicit attitudes toward *CSI* relative to *Friends*. We counterbalanced the order of the two IATs. Half of the participants received the order described above; the remaining half completed the *CSI* vs.

*Friends* IAT first. For participants in this latter condition, the *CSI* vs. *Friends* IAT included the full seven blocks and the *Friends* vs. *Frasier* IAT included only four blocks. This order manipulation did not affect any of the dependent measures and so is not discussed further. We calculated split-half reliabilities for the two IATs using separate scores for the critical blocks (Blocks 4 and 7) and the practice blocks (Blocks 3 and 6). This revealed that each IAT had acceptable, albeit somewhat low, levels of reliability (Spearman-Brown coefficients = .56, and .63, respectively).

*Manipulation of the perceived validity of rational analysis or intuition.* After the implicit measures, we induced participants to trust either rational analysis or intuition (following Jordan et al., 2007). We did so by having participants make a series of decisions either rationally or intuitively. Half of the participants were told that, “There is clear evidence that people who adopt a rational approach to decision making are more successful in many areas of their lives.” Such individuals were said to excel in business, be popular, and have more successful romantic relationships. The remaining participants were told that “people who adopt an intuitive approach to decision making” are more successful. We told participants that we were interested in why rational (or intuitive) decision makers are more successful, and that we wanted to see how well they made such decisions. To this end, they were shown a series of fictitious personality profiles and were asked to decide whether they would live with each person in a co-ed house. They were asked to make decisions either rationally or intuitively, depending on condition.

Participants in the rational condition were encouraged to decide carefully, to write down each consideration and why they felt it was important. They were encouraged to list pros and cons. Participants in the intuitive condition were instead encouraged to use



gut feelings to decide, relying on how they felt overall about each person. They were asked to work quickly and not think too much about their decisions. All participants then saw seven personality profiles presented by computer, four of which were male. Each profile included a short written description and a photograph of the individual. Profiles included information that most people would likely deem to be relevant to deciding (e.g., the person's agreeableness, responsibility, or finances), as well as information that would likely be more peripheral (e.g., the person's hobbies, tastes in movies, or career aspirations). For example, one profile indicated that "Trent treats everyone with the utmost respect and decency," and that he "spends his weekends with his competitive bowling team." Participants indicated whether they would accept each individual as a housemate. Although the instructions to be intuitive or rational applied only to the hypothetical roommate selection task, we expected our manipulation of general trust in intuition or rational analysis would carry over into subsequent tasks (cf. Mussweiler, 2001).

*Explicit attitudes toward television shows.* Following the manipulation, participants indicated their explicit liking for *Friends*, *Frasier*, and *CSI* by rating their agreement with three statements for each (e.g., "I like *CSI*," "*CSI* is a good show," "I enjoy watching *CSI*"). Responses ranged from 1 (*disagree*) to 5 (*agree*). Difference scores were computed to reflect relative preferences for shows; that is, *Friends* over *Frasier* and *CSI* over *Friends* (Cronbach's  $\alpha = .98$ , and  $.97$ , respectively), to be consistent with our implicit attitude measures (see Nosek, 2005).

*Manipulation check.* Finally, participants completed the short form of the Rational Experiential Inventory (REI), including subscales measuring Need for Cognition and

Faith in Intuition (Pacini & Epstein, 1999). Participants were asked to, "Please answer according to how you feel right now at this moment. Do not worry about what you are generally like or how you might have felt in the past." We could thus assess whether our manipulation affected Faith in Intuition and Need for Cognition. For the Need for Cognition subscale, respondents rated their agreement with twelve items such as, "I have a logical mind," "I enjoy problems that require hard thinking," and "I am not a very analytical thinker" (reversed). For the Faith in Intuition subscale, respondents rated their agreement with twelve items such as, "I suspect my hunches are often inaccurate" (reversed), "If I were to rely on my 'gut feelings,' I would often make mistakes" (reversed), and "I like to rely on my intuitive impressions." Responses were made on 5-point scales ranging from 1 (*definitely not true of myself*) to 5 (*definitely true of myself*). These subscales showed good reliability (Cronbach's  $\alpha = .81$  for Need for Cognition and  $.86$  for Faith in Intuition). Scores on the items for each subscale were averaged together.

### Results and Discussion

*Manipulation Check.* Following the manipulation, participants reported more Need for Cognition in the rational condition ( $M = 3.66$ ,  $SD = .53$ ) than in the intuitive condition ( $M = 3.34$ ,  $SD = .58$ ),  $t(93) = 2.85$ ,  $p < .01$ . Participants also reported more Faith in Intuition in the intuitive condition ( $M = 3.70$ ,  $SD = .56$ ) than the rational condition ( $M = 3.30$ ,  $SD = .54$ ),  $t(94) = -3.46$ ,  $p < .001$ .

*Rational analysis and implicit-explicit correspondence.* Across the entire sample, we found modest positive correlations between implicit and explicit attitudes toward television shows (*Friends* vs. *Frasier*,  $r = .36$ ,  $p < .001$ ; *CSI* vs. *Friends*,  $r = .34$ ,  $p < .001$ ). We expected that the correspondence between implicit and explicit attitudes would

be greater in the intuitive than in the rational condition for the within-genre comparison of *Friends* vs. *Frasier*. To test this possibility, we first conducted a multiple regression analysis predicting explicit attitudes toward *Friends* vs. *Frasier* from the corresponding IAT scores (centered), experimental condition (effect coded: rational condition = 1, intuitive condition = -1), and their interaction term (Aiken & West, 1991). There was a main effect of implicit attitudes on explicit attitudes ( $\beta = .36$ ),  $t(89) = 3.70$ ,  $p < .001$ , but not of condition on explicit attitudes, ( $\beta = -.06$ ),  $t(89) = -.68$ ,  $p = .50$ . As predicted, the correspondence between implicit and explicit attitudes was moderated by experimental condition ( $\beta = -.74$ ),  $t(89) = -1.79$ ,  $p = .08$ , albeit marginally. The sign of this interaction was negative, indicating that the relation between implicit and explicit attitudes was lower for those in the rational condition, relative to the intuitive condition (see Figure 1). As can be seen in Figure 1, there was a significant positive relation between IAT scores and explicit attitudes for *Friends* vs. *Frasier* in the intuitive condition ( $\beta = .53$ ),  $t(89) = 3.91$ ,  $p < .001$ , but not the rational condition ( $\beta = .18$ ),  $t(89) = 1.34$ ,  $p = .18$ .

The same analysis was conducted for the comparison of *CSI* vs. *Friends*, but as predicted the interaction here was not significant, ( $\beta = -.10$ ),  $t(87) = -.28$ ,  $p = .78$ . There was a main effect of implicit attitudes on explicit attitudes ( $\beta = .34$ ),  $t(89) = 3.41$ ,  $p < .001$ , but not of condition on explicit attitudes, ( $\beta = -.04$ ),  $t(89) = -.42$ ,  $p = .67$ . This suggests that rational analysis might not disrupt the correspondence between implicit and explicit attitudes for cross-genre comparisons, as we predicted. This finding supports the possibility that the correspondence between implicit and explicit attitudes will only be disrupted by deliberative, cognitive elaboration if the additional considerations brought to bear on an explicit attitude are inconsistent with one's implicit attitude. In the case of

cross-genre comparisons, there is a salient difference between the television shows that is aligned with one's preference. In this case, additional considerations are more likely to be aligned with one's implicit preference and so the correspondence between implicit and explicit attitudes is not diluted.

## Study 2

In Study 2 we attempted to replicate the findings of Study 1. We specifically wanted to further explore the differences observed for cross-genre and within-genre comparisons of television shows, and to generalize them by examining a different within-genre comparison. The results of Study 1 support the notion that rational analysis reduces the correspondence between implicit and explicit attitudes only when it leads people to consider factors that are inconsistent with their implicit attitudes. In Study 2, we sought more direct support for this possibility. We did so by having participants in the rational condition report the considerations that they relied on when reporting their explicit attitudes toward the television programs. We expected that participants would rely primarily on genre-based reasons when comparing shows that belong to different genres. Because these reasons are likely to align with their implicit preferences, they should not disrupt the correspondence between implicit and explicit attitudes. In the case of within-genre comparisons, we expected participants to report more content-based reasons which were more likely to contradict their implicit attitudes. We thus coded participants' reasons according to whether they were consistent or inconsistent with their implicit attitudes. We expected more inconsistent reasons to be reported for within-genre comparisons than cross-genre comparisons. For either type of comparison, we expected

participants who reported more inconsistent reasons, and fewer consistent reasons, would demonstrate less correspondence between their implicit and explicit attitudes.

## Method

### Participants

Sixty-three undergraduates enrolled in business courses participated in exchange for \$8 Canadian. We excluded four participants with error rates over 20% on both of the IATs. Results are reported for the remaining 59 participants (18 males). However, we again excluded individual IAT scores with error rates over 20% from relevant analyses. Thus, analyses comparing *Law & Order* vs. *CSI* exclude 10 participants with high error rates and, likewise, analyses comparing *Friends* vs. *CSI* exclude 4 participants.

### Procedure

The procedure was identical to Study 1 with three exceptions. We examined the pairings, *Friends* vs. *CSI* and *Law & Order* vs. *CSI* as the cross-genre and within-genre comparisons, respectively. Second, participants indicated their explicit attitudes toward the television shows by indicating their relative preference for each pairing, rating their agreement with three statements for each (e.g., “*Friends* is a good show relative to *CSI*,” “I like *Friends* more than *CSI*,” and “I enjoy watching *Friends* more than *CSI*”). This change allowed us to examine whether the results of Study 1 would replicate when the explicit measures were direct measures of relative preferences for the shows (as in the current study) rather than indirect measures of preferences constructed from attitude ratings for each show. They also allowed us to more easily examine the reasons for participants’ preferences. Thus, following the explicit attitude measures, participants in the rational condition were asked: “When you compared *Friends* vs. *CSI* [*Law & Order*

vs. *CSI*], what factors were important for your judgment?" These questions had an open-ended response format. Participants in the intuitive condition were not asked these questions because they had been discouraged from engaging in rational analysis.

### Results and Discussion

*Manipulation check.* Participants again reported more Faith in Intuition in the intuitive condition ( $M = 3.37, SD = .41$ ) than the rational condition ( $M = 2.96, SD = .57$ ),  $t(57) = 3.09, p < .01$ . However, the manipulation appeared to primarily target Faith in Intuition, because there was no difference in reported Need for Cognition between the rational condition ( $M = 3.75, SD = .62$ ) and the intuitive condition ( $M = 3.76, SD = .53$ ),  $t(57) = 0.07, p = .94$ .

*Rational analysis and implicit-explicit correspondence.* Across the entire sample, we again found modest positive correlations between implicit and explicit attitudes toward television shows (*Law & Order* vs. *CSI*,  $r = .34, p < .01$ ; *Friends* vs. *CSI*,  $r = .28, p < .05$ ). We expected that for the within-genre comparison (*Law & Order* vs. *CSI*), the correspondence between implicit and explicit attitudes would be greater in the intuitive than in the rational condition, as found in Study 1. To test this possibility, we conducted multiple regression analyses predicting explicit attitudes from IAT scores, experimental condition, and their interaction. There was a main effect of implicit attitudes on explicit attitudes ( $\beta = .36$ ),  $t(45) = 2.71, p = .01$ , but not of condition on explicit attitudes, ( $\beta = -.20$ ),  $t(45) = -1.09, p = .28$ . The interaction was significant ( $\beta = -.51$ ),  $t(45) = -2.90, p = .01$ , with a negative sign indicating that the relation between implicit and explicit attitudes was lower for those in the rational condition than the intuitive condition. As can be seen in Figure 2, there was a significant positive relation between IAT scores and

explicit attitudes for *Law & Order* vs. *CSI* in the intuitive condition ( $\beta = .45$ ),  $t(45) = 4.09$ ,  $p < .001$ , but not the rational condition ( $\beta = -.02$ ),  $t(45) = -0.13$ ,  $p = .90$ .

We conducted the same multiple regression analysis to test whether the correspondence between implicit and explicit attitudes for *Friends* vs. *CSI* was greater in the intuitive condition than the rational condition. As in Study 1, the interaction did not predict explicit attitudes for the cross-genre comparison, ( $\beta = -.08$ ),  $t(51) = -.57$ ,  $p = .57$ . There was a main effect of implicit attitudes on explicit attitudes ( $\beta = .28$ ),  $t(51) = 2.11$ ,  $p = .04$ , but not of condition on explicit attitudes, ( $\beta = .03$ ),  $t(51) = .19$ ,  $p = .85$ .

*Analysis of reasons reported in the rational condition.* We expected that participants in the rational condition were likely to focus primarily on reasons that are related to the genre difference in the cross-genre comparison. Thus, rational analysis might not dilute the correspondence between implicit and explicit preferences for cross-genre comparisons because the genre difference is aligned with implicit preferences between the television shows (e.g., a preference for *Friends* over *CSI* is likely aligned with a preference for comedies over dramas). In contrast, for within-genre comparisons, people may be more likely to recruit additional, content-based considerations that are more likely to be inconsistent with implicit preferences, thus diluting the correspondence between implicit and explicit attitudes. We thus expect more reasons that are inconsistent with implicit attitudes to be listed for the within-genre than for the cross-genre comparison. In addition, we expect the proportion of inconsistent relative to consistent reasons that participants list will decrease the correspondence between implicit and explicit attitudes.

To test these predictions, we had two independent raters count the number of reasons listed by each participant. Inter-rater reliabilities for the number of reasons listed by each participant and for the coding of reasons as consistent or inconsistent with implicit attitudes, were acceptable ( $\alpha$ 's = .81 & .94, respectively) and differences were resolved by discussion. Based on centered IAT scores, each reason was then categorized as consistent or inconsistent with participants' implicit attitudes. Reasons such as "I find *CSI* more interesting because I really loved biology in high school", and "*Law & Order* is overly dramatic and not as original in plot and character as *CSI*", were coded as consistent if the IAT showed a preference for *CSI* over *Law & Order* (i.e., they had a score below zero on the *Law & Order* vs. *CSI* IAT), but as inconsistent if they had an implicit preference for *Law & Order* (i.e., a score above zero). As predicted, the within-genre comparison, *Law & Order* vs. *CSI*, had more inconsistent reasons listed (51%) than the cross-genre comparison, *CSI* vs. *Friends* (11%).

We also examined whether the number of consistent reasons relative to inconsistent reasons moderated the relation between implicit and explicit attitudes toward *Law & Order* vs. *CSI*. We reasoned that more consistent reasons relative to inconsistent reasons would be associated with greater correspondence between implicit and explicit attitudes. We calculated an index of the predominance of consistent relative to inconsistent reasons by subtracting the number of inconsistent reasons from the number of consistent reasons for each participant. Higher numbers thus reflect more consistent than inconsistent reasons. We then regressed explicit attitudes toward *Law & Order* vs. *CSI* onto this consistency index (centered), implicit attitudes toward *Law & Order* vs. *CSI* (centered), and their interaction. There was neither a main effect of implicit attitudes



on explicit attitudes ( $\beta = .16$ ),  $t(21) = .72$ ,  $p = .48$ , nor of the consistency of reasons on explicit attitudes, ( $\beta = .37$ ),  $t(21) = 1.67$ ,  $p = .11$ . The interaction of the consistency of reasons and implicit attitudes was significant, ( $\beta = .43$ ),  $t(21) = 2.12$ ,  $p = .05$ . There was a marginally significant positive relation between IAT scores and explicit attitudes for *Law & Order* vs. *CSI* for participants who listed many consistent reasons (+ 1 standard deviation above the mean) ( $\beta = .58$ ),  $t(21) = 1.79$ ,  $p = .08$ , but not for participants who listed many inconsistent reasons (-1 standard deviation below the mean) ( $\beta = -.27$ ),  $t(21) = -1.02$ ,  $p = .32$ , though the direction of the relation was negative in this case.

We also examined whether the number of consistent reasons moderated the relation between implicit and explicit attitudes toward *CSI* vs. *Friends*. Although, as expected, there were far fewer inconsistent reasons listed for this cross-genre comparison, we would still expect that people who list many consistent relative to inconsistent reasons would show more correspondence between their implicit and explicit attitudes for this comparison, relative to those who list more inconsistent reasons. We again calculated an index of the predominance of consistent relative to inconsistent reasons. We then regressed explicit attitudes toward *CSI* vs. *Friends* onto this consistency index (centered), implicit attitudes toward *CSI* vs. *Friends* (centered), and their interaction. There was neither a main effect of implicit attitudes on explicit attitudes ( $\beta = .12$ ),  $t(22) = .70$ ,  $p = .49$ , nor of consistency of reasons on explicit attitudes, ( $\beta = -.04$ ),  $t(22) = -.22$ ,  $p = .83$ . The interaction of consistency of reasons and implicit attitudes was significant, ( $\beta = .60$ ),  $t(22) = 3.19$ ,  $p < .01$ . There was a significant positive relation between IAT scores and explicit attitudes for *Law & Order* vs. *CSI* for participants who listed many consistent reasons (+1 standard deviation above the mean) ( $\beta = .79$ ),  $t(22) = 3.29$ ,  $p < .01$ , but a

marginally negative relation for participants who listed many inconsistent reasons (-1 standard deviation below the mean) ( $\beta = -.55$ ),  $t(22) = -1.84$ ,  $p = .08$ . This latter effect should be taken as somewhat tentative, however, as few participants listed many inconsistent reasons for this cross-genre comparison.

Taken together, these results provide support for the APE and MODE models of the relation between implicit and explicit attitudes. Implicit attitudes may often form the basis for explicit attitudes, particularly when people are focused on their intuitions or gut feelings. To the extent that they engage in cognitive elaboration, or rational analysis, of their attitudes, however, the additional considerations they bring to bear on their explicit attitudes may dilute the extent to which implicit attitudes determine explicit attitudes. We specifically found that the more reasons people recruit that are inconsistent with their implicit attitudes, the lower is the correspondence between their implicit and explicit attitudes. This provides unique evidence for an important aspect of the APE model. Notably, when people primarily recruit reasons that support their implicit attitudes—as in the case of cross-genre comparisons of television shows—then rational analysis does not reduce the influence of implicit on explicit attitudes.

### Study 3

We predict that reliance on intuition increases the correspondence between implicit and explicit attitudes and that rational analysis decreases it. In Studies 1 and 2, we found evidence that reliance on intuition leads to closer correspondence between implicit and explicit attitudes than does reliance on rational analysis, but were unable to determine if this effect reflects the influence of reliance on intuition, reliance on rational analysis, or both. Thus, in Study 3 we included a neutral baseline condition, in which

participants were not induced to rely on either intuition or rational analysis, against which to compare the effects of rational analysis and intuition. This is particularly important as the effects of rational analysis specifically have not previously been tested. We previously found that an increased reliance on intuition brings explicit self-esteem into closer correspondence with implicit self-esteem relative to a baseline condition (Jordan et al., 2007, Study 4), but this study did not include a condition that increased reliance on rational analysis. Thus, the present study promises the first direct evidence that an increased reliance on rational analysis can lead people to report explicit attitudes that are less consistent with their implicit attitudes.

In Study 3 we also expand our analysis to consider how reliance on rational analysis or intuition might affect behavioral choices. In an impressive program of research, Wilson and colleagues documented how thinking about reasons for one's attitudes can change those attitudes (Wilson et al., 1989). Thinking about reasons can also change behaviors that are enacted soon after thinking about reasons. In one study, for example, Wilson et al. (1993) had some participants think about reasons for their preferences between various art and humor posters. Although control participants who did not think about reasons preferred the art posters in this study, those who thought about reasons preferred the humor posters more and were more likely to choose to keep a humor poster. As Wilson et al. note, thinking about reasons can lead participants to focus on a biased subset of reasons that are salient, accessible, and easily verbalized, causing poster choices to change.

In our view, thinking about reasons may often lead people to change their explicit attitudes to be less consistent with their implicit attitudes. We expect that participants in

Wilson et al.'s study had implicit attitudes that favored the art posters, but that thinking about reasons led to a predominance of reasons that favored the humor posters.

Subsequently participants' behavioral choices were also less consistent with their implicit attitudes. We explore this possibility in the present study by examining participants' attitudes toward art and humor posters. This focus also generalizes the results of Studies 1 and 2 to a new attitude domain.

Notably, we expect reliance on intuition and rational analysis to change the correspondence between implicit and explicit attitudes in this study despite the fact that the comparisons in question cross "genre" categories (comparing art and humor posters). Although we found in Studies 1 and 2 that rational analysis did not reduce the correspondence between implicit and explicit attitudes toward television shows that belonged to different genres, the categorization of posters as humor or art posters is less familiar and common than the classification of television shows as dramas or comedies. With little or no prior experience thinking about posters in terms of art and humor categories, participants should be less likely to draw on this category distinction when considering their preferences for specific art and humor posters. We thus expect rational analysis to reduce the correspondence between implicit and explicit attitudes in this case.

## Method

### Participants

One hundred and twenty-two undergraduates enrolled in psychology courses participated in exchange for course credit. We excluded eight participants with error rates over 20% on the IAT. The final sample was thus 114 participants (37 male).

### Procedure

Up to eight participants at a time participated in sessions, though they were seated at individual workstations and did not interact with each other. Participants were met by a female experimenter who described the study as an investigation of “decision-making and poster preferences,” and gestured to a wall in the lab on which hung two traditional art posters (*Nymphs and willows* by Monet and *Les Irises de Saint-Remy* by Van Gogh) and two contemporary humor posters (a dog smoking with the caption “It doesn’t get any better!” and a dog wearing glasses and apparently reading with the caption “It only hurts when I study”). Participants completed an IAT of preference for art posters over humor posters. We then induced participants to trust either intuition or rational analysis. We also included a control condition in which participants were given no instructions for thinking about their preferences. This was followed by a measure of explicit attitudes and a hypothetical choice measure in which participants indicated which of the four posters they would choose to take home with them if given the choice.

*Implicit attitudes toward posters.* Participants completed an IAT measure of implicit preferences for the art posters over the humor posters. This IAT was identical to those administered in Studies 1 and 2, except that participants categorized images of the four individual posters using the category labels “Art Poster” and “Humor Poster”. We calculated IAT scores using the algorithm advocated by Greenwald et al. (2003), with higher scores indicating stronger implicit preferences for art posters (Spearman-Brown coefficient = .79).

*Manipulation of the perceived validity of rational analysis or intuition.* After the measure of implicit attitudes toward the posters, we induced participants to trust intuition or rational analysis as in Studies 1 and 2. In this study, however, we also included a

control condition in which participants were not guided to make decisions either rationally or intuitively. This manipulation differed from the manipulation used in the previous studies in that participants did not evaluate potential roommates but were instead directed to make judgments about the posters either rationally, intuitively, or with no specific instructions.

Although the general manipulation of reliance on intuition or rational analysis used in Studies 1 and 2 may provide a particularly compelling test of our hypotheses in that it does not directly target the attitudes in question, but only a general focus on intuition or rational analysis, it is not a central part of our hypotheses. Thus, in Study 3, we opted for a more direct manipulation and had participants think more rationally or intuitively about the specific attitudes under study; this should provide a more powerful and direct test of our predictions. Participants in the rational condition were encouraged to think carefully about their reasons for liking or disliking each poster and to consider how important each reason was to them. They were encouraged to think about the pros and cons of each poster. Participants in the intuitive condition were encouraged to rely on their intuitions and report how they felt about the posters overall. They were asked to work quickly and not think too much about their judgments. Participants in the control condition were asked simply to “use whatever information seems most relevant to you.”

*Explicit attitudes toward posters.* Following the manipulation, participants viewed images of each of the four posters and rated their liking for each one (“How much do you like this poster?”). Response options ranged from 1 (*strongly dislike*) to 5 (*strongly like*). The rating scores for the two art posters were averaged together, as were the rating scores for the two humor posters, and mean humor poster ratings were subtracted from mean art

poster ratings. This created an index of explicit preference for art posters over humor posters, with higher scores reflecting a stronger preference for the art posters.

*Hypothetical poster choice.* Participants were also asked to make a hypothetical decision. They were asked, “If you could have one of the posters, which one would you choose?” Images of each of the four posters were presented simultaneously on the computer monitor and were linked to four response keys. We coded a choice of an art poster as 1 and a choice of a humor poster as 0.

### Results and Discussion

*Explicit attitudes.* Implicit and explicit attitudes toward the posters correlated significantly across the entire sample ( $r = .55, p < .001$ ). In order to test whether our manipulation of trust in rational analysis or intuition affected the correspondence between implicit and explicit attitudes toward posters, we conducted a multiple regression analysis predicting explicit attitudes toward posters from IAT scores (centered) and two coded vectors representing the experimental conditions (dummy coded: rational = 0, 0; intuitive = 1, 0; and control = 0, 1). Interaction terms for the IAT and condition variables were also entered in the model. There was a main effect of implicit attitudes on explicit attitudes ( $\beta = .30$ ),  $t(108) = 2.32, p = .02$ , but not of condition on explicit attitudes, ( $\beta$ s =  $-.09$  and  $-.13$ ),  $t$ s (108) =  $-1.45$  and  $-1.03, p$ s  $> .15$ . As predicted, the interaction was significant,  $R^2$ -change =  $.05, F(2, 108) = 4.25, p = .02$  (see Figure 3). As can be seen in Figure 3, there was a strong positive relation between implicit attitudes and explicit attitudes in the control condition ( $\beta = .53$ ),  $t(108) = 4.07, p < .001$ . The association was lower in the rational condition ( $\beta = .30$ ),  $t(108) = 2.32, p = .02$ , a significant decrease from the control condition,  $t(108) = -2.43, p = .02$ . The association between implicit and

explicit attitudes was highest in the intuitive condition ( $\beta = .86$ )  $t(108) = 6.09, p < .001$ , a significant increase from the control condition,  $t(108) = 2.64, p = .01$ . Thus, notably, this study provides evidence that both reliance on intuition and reliance on rational analysis affect the correspondence between implicit and explicit attitudes. It provides the first evidence that rational analysis can decrease this correspondence relative to a neutral baseline condition.

*Hypothetical poster choice.* We conducted a parallel logistic regression analysis to examine the effect of condition and implicit attitudes on hypothetical poster choices. There was no main effect of condition on poster choice ( $b = -.03$ ), Wald's = .01,  $p = .92$ , but there was a significant main effect of implicit attitudes on poster choice ( $b = -1.81$ ), Wald's = 17.57,  $p < .001$ . We expected, however, that the hypothetical poster choice would correspond with implicit attitudes less in the rational condition and more in the intuitive condition, relative to the control condition. Consistent with this prediction, the interaction was significant, Nagelkerke's  $R^2$ -change = .04,  $F(2, 108) = 3.30, p = .04$ . The correspondence between implicit attitudes and poster choice was marginally higher in the intuitive condition than in the control condition ( $b = 1.72$ ), Wald's = 3.37,  $p = .07$ , and nonsignificantly lower in the rational condition than in the control condition ( $b = -.91$ ), Wald's = 1.91,  $p = .17$ . The correspondence between implicit attitudes and choice was higher in the intuitive condition than in the rational condition, ( $b = 2.63$ ), Wald's = 3.16,  $p = .07$ . Although the effects of condition on the correspondence between hypothetical poster choice and implicit attitudes were consistent with our predictions, they were not as strong as the results for explicit attitudes.



*Mediation analysis.* We were also interested in whether the effect of condition and implicit attitudes on hypothetical poster choices (though somewhat weak) might be mediated by explicit attitudes. That is, we posit that reliance on rational analysis leads explicit attitudes to be less consistent with implicit attitudes, relative to reliance on intuition. Behavioral choices are then determined by these changed explicit attitudes more than implicit attitudes. We thus tested a mediated moderation model (following Muller, Judd, & Yzerbyt, 2005) to determine whether the interaction effect of implicit attitudes and condition on poster choice is mediated by explicit attitudes. To conduct this analysis we excluded the control condition and examined the interaction of condition and implicit attitudes predicting poster choice, controlling for the main effects of implicit attitudes and condition. This interaction was marginally significant ( $b = 1.31$ ), Wald's = 3.16,  $p = .07$ . Next, we tested the effect of the interaction, controlling for main effects, on the proposed mediator, explicit attitudes. This interaction effect was significant ( $\beta = .29$ ),  $t(69) = 3.19$ ,  $p < .01$ . We then tested the effect of explicit attitudes on choice, controlling for implicit attitudes, condition, and their interaction, as well as the interaction of explicit and implicit attitudes (following Muller et al., 2005). The effect of explicit attitudes on choice was significant ( $b = .69$ ), Wald's = 9.06,  $p < .01$ . Moreover, controlling for explicit attitudes and the interaction of explicit and implicit attitudes, the interaction effect of implicit attitudes by condition on choice was reduced to nonsignificance ( $b = .77$ ), Wald's = .86,  $p = .28$ . These results suggest that the effect of implicit attitudes and condition on poster choice is mediated by explicit attitudes.

In Study 4, we sought to replicate the findings of Study 3 with real choice behavior rather than hypothetical choices. Although the results of Study 3 were consistent with our predictions, particularly in the significant interaction between implicit attitudes and reliance on intuition or rational analysis on hypothetical poster choices, some key contrasts were only marginally significant. This may be because hypothetical choices are less engaging to participants than actual choices would be. We thus examined actual behavioral choices in Study 4 as they may provide a more powerful and realistic test of our predictions. Accordingly, we conducted a more direct replication of Wilson and colleagues' original poster study, giving participants a choice of a poster to keep. In doing so, we also conducted a follow-up survey to examine the effects of rational analysis and intuition on subsequent satisfaction with their poster choices. Wilson and colleagues found that participants who thought about reasons were more likely to change their explicit poster preferences and the poster they chose to keep. Specifically, they found in their study that participants who thought of reasons preferred humor posters more and were more likely to keep a humor poster. They were also subsequently less satisfied with their choices. We did not expect this specific pattern of attitude change (in the direction of humor posters), because we did not pretest stimuli specifically to elicit an initial preference for art posters, as Wilson and colleagues did. But we did expect participants who engaged in rational analysis to change their explicit attitudes to be less consistent with their implicit attitudes and to choose posters less consistently with their implicit attitudes. We also expected them to ultimately be less satisfied with their choices.

Wilson and colleagues theorized that when people think about reasons, they may shift their attitudes to be more predominantly cognitively-based than affectively-based. This focus on cognitive factors in determining attitudes causes attitude change in the immediate situation. However, the effect of this altered attitude and focus on cognitively-based factors may often be temporary because over time the affective bases of attitudes may reassert themselves and determine responses to attitude objects to a greater extent. Thus, preferences for posters may normally be predominantly affectively-based, but rational analysis may lead people to rely to a greater extent on cognitive factors. Thus, after thinking about reasons, they will report more cognitively-based attitudes and make choices that are more consistent with these attitudes. Over time, however, the cognitive factors may recede in importance and responses to the posters may be predicted more by one's affective responses to them.

We believe that this model can be usefully framed in terms of implicit and explicit attitudes. As already noted, we posit that implicit attitudes are experienced as intuitions or gut feelings that are primarily affectively-based. Explicit attitudes, in contrast, can be more cognitively based, particularly when one has engaged in rational analysis, or thinking about reasons. In our view, rational analysis can lead people to change their explicit attitudes to be less consistent with their implicit attitudes. They may then choose posters more consistently with their changed explicit attitudes, and less consistently with implicit attitudes. Over time, however, implicit attitudes may determine responses to the posters to a greater extent, leading to less satisfaction with poster choices if people engaged in rational analysis prior to choosing. This model is consistent with Wilson et al.'s model though it is framed in somewhat different terms. It has the advantage,

however, of allowing measures of initial implicit, or affectively-based attitudes, which their studies did not include, allowing a more complete test of the model.

## Method

### Participants

Seventy-two undergraduates enrolled in psychology courses participated in exchange for course credit. We excluded eight participants with error rates over 20% on the IAT. An additional seven participants' data were excluded because they could not be contacted to follow up on their post-choice satisfaction (following Wilson et al., 1993); inclusion of these data did not appreciably change the pattern of results for the attitude and choice measures. Results are reported for the remaining 57 participants (17 male).

### Procedure

The procedure was identical to Study 3 with the following exceptions: Only one art poster (Van Gogh) and one humor poster (the smoking dog) hung on the wall and were the target stimuli for the attitude measures. The IAT and explicit attitude measures examined attitudes toward these two posters but were otherwise the same as in Study 3. For the IAT, participants categorized images (five images taken from sections of each poster) as either "Van Gogh poster" or "Doesn't Get Better poster". Both the IAT and the explicit measures were coded such that higher scores reflected greater preference for the art poster over the humor poster. The manipulation was the same as in Study 3, except that a control condition was not included in order to simplify the design. Finally, following the measures of explicit attitudes, participants chose one of the two posters to keep. Approximately three weeks later, we contacted participants to assess their satisfaction with their choice.

*Behavioral poster choice.* Participants were asked to choose one of the two posters to take home with them. They were told, “before you go I have a surprise for you. The professor in charge of this study likes to give participants a small gift as thanks for participating. This time he was able to obtain copies of the posters in this study from the manufacturer. You may choose one of the posters to take home with you,” (following Wilson et al., 1993, p. 334). There were several copies of each poster stacked on a table and after participants took a poster and left the lab, the experimenter recorded which poster they chose. A choice of the art poster was scored as 1, a choice of the humor poster was scored as 0.

*Post-choice satisfaction.* At the beginning of the session, participants were informed that this study involved a brief phone-call from the experimenter following up on their experiences. Participants received a phone call from the experimenter approximately three weeks after their session ( $M = 21.00$  days,  $SD = 7.21$ ). The experimenter reminded participants of the reason for the call and proceeded to ask participants questions about the study (adapted from Wilson et al., 1993). First, participants were asked if they still had the poster (confirmed by reporting the name of the manufacturer on the poster). Participants were asked whether they had hung the poster on their wall. They were then asked whether they intended to take it with them when they went home for the summer. Participants were asked how much money it would now cost to buy the poster from them. Finally, participants were asked to rate how much they now liked the poster on a 10-point scale (1 = *dislike very much* and 10 = *like very much*). Following Wilson and colleagues, we averaged participants’ responses to

these five items into a single measure of post-choice satisfaction (Cronbach's  $\alpha = .75$ ).

We first standardized the continuous measures.

### Results and Discussion

Across the entire sample, implicit and explicit attitudes toward the two posters correlated highly ( $r = .68, p < .001$ ). In order to test whether our manipulation of rational analysis affected the correspondence between implicit and explicit attitudes toward the posters, we conducted a multiple regression analysis predicting explicit attitudes toward the posters from IAT scores (centered), condition (rational or intuitive), and their interaction. The main effect of implicit attitudes on explicit attitudes was significant ( $\beta = .70, t(53) = 6.91, p < .001$ ), but the main effect of condition on explicit attitudes was not ( $\beta = .02, t(53) = .22, p = .83$ ). As predicted, the interaction was significant ( $\beta = -.20, t(53) = -2.03, p < .05$ ). The sign of this interaction was negative, indicating that the relation between implicit and explicit attitudes was lower for those in the rational condition, relative to the intuitive condition. As can be seen in Figure 4, there was a strong positive relation between implicit attitudes and explicit attitudes in the intuitive condition ( $\beta = .90, t(53) = 6.16, p < .001$ ). The association between implicit and explicit attitudes was lower in the rational condition ( $\beta = .49, t(53) = 3.54, p < .01$ ). Thus, a significant relation between implicit and explicit attitudes was found in both conditions, though the correspondence was significantly lower in the rational condition.

*Behavioral poster choice.* To test whether participants in the rational condition showed less correspondence between implicit attitudes and behavioral choice, we conducted a logistic regression predicting choices from implicit attitudes, condition and their interaction. As in Study 3, we did not find a main effect of condition on poster

choice ( $b = -.14$ ), Wald's = .28,  $p = .60$ . There was also no significant main effect of implicit attitudes on poster choice ( $b = .95$ ), Wald's = 2.45,  $p = .12$ , although it approached significance. More pertinently, as predicted, the interaction between IAT and condition was significant ( $b = -1.43$ ), Wald's = 5.53,  $p = .02$ . As Figure 5 shows, the correspondence between implicit attitudes and poster choice was significantly positive in the intuitive condition ( $b = 2.39$ ), Wald's = 5.88,  $p = .02$ , suggesting that poster choices were based on implicit preferences. By contrast, the correspondence between implicit attitudes and poster choice was non-significant in the rational condition ( $b = -.48$ ), Wald's = .44,  $p = .51$ .

*Mediation analysis.* We again tested a mediated moderation model consistent with the interactive effect of implicit attitudes and condition on poster choice being mediated by explicit attitudes. As mentioned above, the interaction of implicit attitudes and condition significantly predicted choice (the dependent variable) and explicit attitudes (the mediator). We also tested the effect of explicit attitudes on choice, controlling for implicit attitudes, condition, and their interaction, as well as the interaction of explicit and implicit attitudes (following Muller et al., 2005). The effect of explicit attitudes on choice was marginally significant ( $b = .23$ ), Wald's = 2.81,  $p = .09$ . Moreover, controlling for explicit attitudes and the interaction of explicit and implicit attitudes, the interaction effect of implicit attitudes by condition on choice was reduced to marginal significance ( $b = -1.16$ ), Wald's = 3.29,  $p = .07$ . These results are consistent with the possibility that the effect of implicit attitudes and condition on choice is mediated by changes in explicit attitudes.

*Post-choice satisfaction.* Consistent with Wilson et al.'s (1993) findings, participants were less satisfied with their chosen poster in the rational condition ( $M = -.21$ ;  $SD = .13$ ) than the intuitive condition ( $M = .24$ ;  $SD = .12$ ), ( $\beta = -.31$ ),  $t(55) = -2.46$ ,  $p < .02$  (also see Dijksterhuis et al., 2006).

Finally, to test whether the findings of post-choice satisfaction are explained by the particular poster that participants chose and participants' implicit attitudes toward that poster, we conducted a multiple regression analysis predicting post-choice satisfaction from implicit attitudes and poster choice (effect coded: humor poster chosen = -1; art poster chosen = 1). We expected that participants who chose consistently with their implicit preference would ultimately be more satisfied with their choice. This should occur regardless of whether participants were in the intuitive or rational condition, though as we have already demonstrated, those in the intuitive condition were more likely to choose consistently with their implicit preferences. As predicted, we found a significant interaction between implicit attitude and poster choice predicting post-choice satisfaction,  $t(53) = 3.00$ ,  $p < .01$ . As Figure 6 shows, participants who chose the art poster tended to be more satisfied to the extent that their implicit preference for the art poster was stronger,  $t(53) = 1.61$ ,  $p = .11$ . In contrast, participants who chose the humor poster were less satisfied with their choice to the extent that their implicit preference for the art poster was stronger,  $t(53) = -2.53$ ,  $p = .01$ . We also included condition in this analysis, including its main effect and higher-order interactions with implicit attitudes, choice, and both; only a main effect of condition on post-choice satisfaction was found (as described above). Thus, condition did not moderate the results of this analysis.



Taken together, these findings suggest that rational analysis led participants to focus on more aspects of the art and humor posters that were inconsistent with their implicit preferences. Relative to relying on intuition, rational analysis led participants to report explicit attitudes that diverged more from their implicit attitudes. Consequently, participants who engaged in rational analysis were more likely to choose posters that diverged from their implicit attitudes. Lastly, to the extent that participants chose a poster that was inconsistent with their implicit preferences, they were ultimately less satisfied with their choice.

### General Discussion

We found across four experiments that a reliance on rational analysis reduces the correspondence between implicit and explicit attitudes relative to a reliance on intuition. In each experiment, we first measured implicit attitudes and then manipulated the extent to which participants relied on rational analysis or intuition, before measuring explicit attitudes. This allowed us to observe the extent to which reliance on rational analysis or intuition caused changes in explicit attitudes that brought them more or less into line with implicit attitudes. We found that reliance on rational analysis, relative to intuition, decreased the correspondence between implicit and explicit attitudes, to the extent that the considerations introduced by rational analysis were inconsistent with implicit attitudes. Notably, in Study 3, we found that, relative to a baseline condition, reliance on rational analysis decreased the correspondence between implicit and explicit attitudes and reliance on intuition increased this correspondence. In Studies 3 and 4 we found that reliance on intuition or rational analysis also affected the correspondence between

implicit attitudes and behavioral choices. Finally in Study 4, we found that this effect on behavioral choices affected satisfaction with decisions three weeks later.

These findings provide novel support for two influential models of the relations between implicit and explicit attitudes, the APE and MODE models (Fazio & Olson, 2003; Gawronski & Bodenhausen, 2006; Olson & Fazio 2009). Both models posit that implicit attitudes form the basis of explicit attitudes, but that cognitive elaboration can reduce the correspondence between implicit and explicit attitudes as additional considerations are integrated into explicit attitude reports. In keeping with these models, we found that people reported explicit attitudes that were less consistent with implicit attitudes when they thought deliberatively about the reasons for their preferences. We found in particular that the effect of deliberation on explicit attitudes occurred when analysis led people to consider reasons that contradicted their implicit attitudes, consistent with APE model predictions. We also extend the APE and MODE models, however, by predicting that implicit attitudes are experienced as intuitions. When our participants relied to a greater extent on their intuitions, they reported explicit attitudes that were more consistent with their implicit attitudes, suggesting that they increased their reliance on implicit attitudes when reporting explicit attitudes.

A notable aspect of our findings is thus that both reliance on rational analysis and intuition can affect the extent to which explicit attitudes correspond with implicit attitudes. In Study 3, we included a neutral baseline condition in which participants were not instructed in how to formulate their explicit attitudes. Relative to this condition, greater reliance on rational analysis decreased the correspondence between implicit and explicit attitudes and greater reliance on intuition increased this correspondence. In

earlier studies, we demonstrated that greater reliance on intuition increases the correspondence between implicit and explicit self-esteem (Jordan et al., 2007). The present studies thus generalize this effect to other attitude domains, which is noteworthy because self-esteem may often behave differently than other attitudes (see Kernis, 2005). In addition, in this earlier work, we did not specifically test whether rational analysis reduces the correspondence between implicit and explicit attitudes relative to a baseline condition. Study 3 thus provides the first evidence of this effect.

Another notable aspect of our findings is that not all rational analysis decreased the correspondence between implicit and explicit attitudes. The APE model specifically posits that cognitive elaboration, or rational analysis, may dilute the influence of implicit attitudes on explicit attitudes to the extent that it leads people to consider factors that contradict their implicit attitudes (Gawronski & Bodenhausen, 2006). In Studies 1 and 2 we found that rational analysis decreased the correspondence between implicit and explicit attitudes for within-genre comparisons of television shows but not cross-genre comparisons. We hypothesized that people would primarily recruit reasons that were genre-based in cross-genre comparisons and that these reasons would mainly be consistent with their implicit preferences. In contrast, for within-genre comparisons, we expected people to recruit more content-based reasons that were more likely to be inconsistent with their implicit preferences. Indeed, in Study 2 we found that participants in the rational condition reported more reasons that were inconsistent with their implicit attitudes for within-genre than cross-genre comparisons. The number of inconsistent reasons participants reported relative to consistent reasons, moreover, moderated the

correspondence between implicit and explicit attitudes. When participants reported more inconsistent than consistent reasons, there was less correspondence.

Thus our results not only demonstrate that reliance on rational analysis or intuition affects the correspondence between implicit and explicit attitudes, but they also speak to the mechanisms underlying these effects. Extending past work (e.g., Gawronski & LeBel, 2008), we demonstrate that changes to the correspondence between implicit and explicit attitudes can specifically reflect changes to explicit attitudes as people focus to a greater extent on their intuitions or engage in more rational analysis. We demonstrate, moreover, that the considerations brought to bear on explicit attitudes through rational analysis are important. If these considerations are consistent with implicit attitudes, then rational analysis will not reduce the correspondence between implicit and explicit attitudes, and may even increase it. If, however, rational analysis leads people to consider factors that contradict their implicit attitudes, their explicit attitudes are likely to become less consistent with their implicit attitudes. These studies thus provide novel evidence for a number of critical aspects of the relation between implicit and explicit attitudes, which are consistent with the APE and MODE models.

#### Thinking About Reasons, Attitudes, and Behavioral Choices

These studies may also shed new light on earlier research demonstrating that thinking about reasons can change (explicit) attitudes and reduce satisfaction with decisions (Wilson et al., 1989). Wilson and colleagues found that thinking about reasons can change attitudes, particularly affectively-based attitudes. They posited that thinking about reasons for attitudes can lead people to consider a biased subset of possible reasons that are salient, accessible, and easily verbalized. People may then change their attitudes

to be more consistent with this set of reasons, which entails a shift toward attitudes that are more cognitively based. We replicate these effects in the present studies, and suggest that Wilson et al.'s model may be usefully framed in terms of implicit and explicit attitudes. Implicit attitudes, we suggest, may be primarily affectively based, in the sense that people experience their immediate evaluative reactions to attitude objects as intuitions or gut feelings without clear ties to supporting reasons. As they recruit reasons, people will often consider reasons that contradict their implicit attitudes, leading their explicit, more cognitively based attitudes to diverge from them (see Wilson et al., 1989 for consideration of why people may recruit inconsistent reasons).

Wilson et al. also found that changed attitudes can affect behaviors that are enacted soon after thinking about reasons. Thus, participants who had thought about reasons for their preferences between art and humor posters were more likely to choose humor posters than were participants who had not thought about reasons (Wilson et al., 1993). Their participants were, however, less satisfied with their decisions three weeks later. We found parallel effects. When people carefully considered the reasons for their preferences between art and humor posters, their poster choices were less consistent with their implicit attitudes. Participants in Study 4 were also less satisfied with their choices three weeks later, if they had engaged in rational analysis before choosing. We found specifically that participants who chose a poster that was inconsistent with their implicit preferences were less satisfied with their choice.

Wilson et al. note that, "When people think about reasons, the cognitions that become salient may determine people's attitude reports and their *initial* behavior. As they continue to interact with the attitude object, however, their basic affective reaction to it is

more likely to reassert itself, thereby driving their behavior in a way that is likely to be inconsistent with their previously stated, cognitively based attitude” (p. 302; italics in original). In our view, implicit attitudes reflect initial affective reactions to attitude objects, in this case posters. When people think rationally about their attitudes, however, they may incorporate reasons that are inconsistent with their implicit preferences into their explicit attitudes. The resultant attitudes then diverge from implicit attitudes, and may influence behaviors enacted soon after rational analysis. But, over time, as the reasons recede from attention, more ingrained implicit attitudes may again determine responses to attitude objects. Thus, when people make decisions that run counter to their implicit attitudes, they may often be less satisfied with these decisions over time.

This model is consistent with Wilson et al.’s model, but the present studies may provide a more fine-grained test of these ideas. In Wilson and colleagues’ studies, they did not measure participants’ initial, affectively-based attitudes, instead demonstrating attitude change by showing differences in reported attitudes between participants who thought about reasons and those who did not (Wilson & Dunn, 1986; Wilson et al., 1984; Wilson et al., 1988; see Wilson et al., 1989). By using implicit measures to gauge more affectively-based attitudes, we are able to demonstrate that engaging in rational analysis can lead to explicit attitudes that are less consistent with implicit attitudes. Wilson et al. similarly looked for behavioral differences resulting from thinking about reasons, and measured the extent to which behavior corresponded with reported attitudes. In the present studies, we were able to demonstrate that behavioral choices enacted soon after rational analysis are less consistent with implicit attitudes. In addition, we specifically demonstrated that people are less satisfied with their decisions three weeks later to the

extent that they chose posters that were inconsistent with their implicit preferences. Our results thus support Wilson et al.'s model, and also link it in a novel way to recent work on the distinction between implicit and explicit attitudes.

#### Affectively-based and Cognitively-based Attitudes

This reframing of Wilson et al.'s work may also suggest more widespread parallels between implicit and explicit attitudes on the one hand, and affectively-based and cognitively-based attitudes on the other (e.g., Breckler, 1984; Zajonc, 1980; Zajonc & Markus, 1982). Affectively-based attitudes are viewed as having a strong affective component without being clearly tied to supporting beliefs, whereas cognitively-based attitudes are based more directly on conscious beliefs. The more recent distinction between implicit and explicit attitudes may parallel this earlier distinction in many ways (Greenwald & Banaji, 1995; Wilson et al., 2000). Both distinctions have advanced theory, allowing more accurate prediction of attitudinal ambivalence and persuasion effects (Conner & Armitage, 2008; Fabrigar & Petty, 1999; Petty, Tormala, Briñol, & Jarvis, 2006), of the attitude-behavior relation (Millar & Tesser, 1986; Olson & Fazio, 2003), and in suggesting that one type of attitude can sometimes influence the other (Whitfield & Jordan, 2009; Wilson et al., 1989). Both affectively-based and implicit attitudes appear to be particularly susceptible to conditioning (e.g., Olson & Fazio, 2001; Gibson, 2008; Walther, 2002; Zanna, Kiesler, & Pilkonis, 1970). In addition, explicit attitude measures that focus on affect correlate more strongly with implicit attitudes than do measures that include a stronger cognitive component (Nosek, 2005). Thus, as we have done here, it may be profitable to revisit effects that have been interpreted in terms

of the distinction between affectively- and cognitively-based attitudes with implicit and explicit attitudes in mind.

This is not to suggest that any implicit construct will be affectively based and that any explicit construct will be cognitively based. Work on the distinction between implicit prejudice and implicit stereotyping suggests, for example, that people can demonstrate implicit race bias both affectively and cognitively, and that the two are separable constructs (Amodio & Devine, 2006). The important distinction between implicit and explicit constructs may thus be whether they are associative or propositional in nature (Gawronski & Bodenhausen, 2006), rather than affective or cognitive. Indeed, implicit attitudes may be based on earlier rational consideration of attitude objects (e.g., Whitfield & Jordan, 2009); the evaluative summary of these considerations may simply be stored associatively without clear connections to the reasons on which they were based. Whether an implicit construct reflects a belief or feeling, we expect it to be experienced as intuition. In the case of attitudes, as they have been so far conceptualized and measured, implicit attitudes reflect associations between attitude objects and positive and negative affect. In this way, we believe they correspond closely to affectively-based attitudes.

#### Relations to Unconscious Thought

Recent evidence suggests that distracting people from thinking consciously about decisions can improve the quality of those decisions (see Dijksterhuis & Nordgren, 2006). In another study that was based on Wilson et al. (1993), Dijksterhuis and van Olden (2005) had participants choose between various art and humor posters. They found that participants who first viewed the posters and were then distracted from thinking



about them chose posters that they were ultimately more satisfied with than participants who thought carefully about the posters. Dijksterhuis and colleagues have found similar results across a variety of decision making contexts (Dijksterhuis, 2004; Dijksterhuis, Smith, van Baaren, & Wigboldus, 2005; Dijksterhuis & van Olden, 2005). The superiority of deciding after distraction from the decision problem in these studies has been attributed to unconscious thought or “unconscious processing dealing with a problem while consciousness is directed elsewhere” (Dijksterhuis & van Olden, 2005, p. 628). Unlike conscious thought, unconscious thought may be less biased by undue weighting factors that are salient, accessible, and easily verbalized (consistent with the model of Wilson et al., 1993).

There are clear similarities between our findings and those of Dijksterhuis and colleagues. We both find that conscious, rational analysis can contribute to less satisfying decisions. They find, however, that carefully considered decisions can be less satisfying relative to a distraction condition (as was also the case in Wilson et al., 1993), whereas we find that carefully considered decisions can be less satisfying relative to focusing on intuition. Although speculative, we suggest that distraction from a decision may not be critical for unconscious processing to improve decisions. Our participants focused on their preferences and thought consciously about them, but focused in particular on gut feelings and holistic judgments. Our results may thus provide preliminary support for the contention that intuitions are “summary judgments the unconscious provides when it is ready to decide” (Dijksterhuis & Nordgren, 2006, p. 106), and may suggest that implicit attitudes often reflect these summary judgments. Thus, focusing on intuitions may put people in better touch with the products of unconscious thought. Alternatively, the

unconscious thought that occurs when people are distracted and not actively thinking about decisions may put people into better touch with their intuitions. These are possibilities worth exploring in future research. We suggest, furthermore, that implicit attitude measures may provide a useful tool in further testing how unconscious thought affects decisions.

### Conclusions

The present studies contribute in a number of ways to our understanding of how implicit and explicit attitudes relate to each other. Consistent with the APE and MODE models, implicit attitudes may form the basis of explicit attitudes, but the correspondence between the two may be reduced by cognitive elaboration or rational analysis. We found that people reported explicit attitudes that were consistent with their implicit attitudes when they focused on their intuitions, but reported explicit attitudes that were less consistent with implicit attitudes when they engaged in rational analysis. This latter effect was particularly pronounced when rational analysis led people to consider factors that were inconsistent with their implicit attitudes. These findings further suggest that people experience their implicit attitudes as intuitions. Thus, rather than being unconscious, people may have conscious experiences of implicit attitudes in the form of intuitions or gut feelings. We also found that rational analysis can lead people to behave in ways that are less consistent with their implicit attitudes, and in some cases this may lead to less satisfying decisions. These studies thus contribute substantially to an understanding of how implicit attitudes are experienced and how they relate to explicit attitudes and behavior.

## Figure Captions

*Figure 1:* Study 1: Explicit attitudes for *Friends* vs. *Frasier* as a function of condition (rational or intuitive) and corresponding implicit attitudes (IAT scores; higher scores indicate a stronger preference for *Friends*). Predicted values are displayed for one standard deviation above and below the mean of implicit attitudes.

*Figure 2:* Study 2: Explicit attitudes for *Law & Order* vs. *CSI* as a function of condition (rational or intuitive) and corresponding implicit attitudes (IAT scores; higher scores indicate a stronger preference for *Law & Order*). Predicted values are displayed for one standard deviation above below the mean of implicit attitudes.

*Figure 3:* Study 3: Explicit attitudes for art vs. humor posters as a function of condition (rational, intuitive, or control) and corresponding implicit attitudes (IAT scores; higher scores indicate a stronger preference for art posters). Predicted values are displayed at one standard deviation above below the mean of implicit attitudes.

*Figure 4:* Study 4: Explicit attitudes for the art vs. humor poster as a function of condition (rational or intuitive) and corresponding implicit attitudes (IAT scores; higher scores indicate a stronger preference for art posters). Predicted values are displayed at one standard deviation above and below the mean of implicit attitudes.

*Figure 5:* Study 4: Poster choice (art poster = 1, humor poster = -1) as a function of condition (rational or intuitive) and implicit attitudes toward art vs. humor posters (IAT scores; higher scores indicate a stronger preference for art posters). Predicted values are displayed at one standard deviation above and below the mean of implicit attitudes.

*Figure 6:* Study 4: Post-choice satisfaction as a function of poster choice (art poster = 1, humor poster = -1) and implicit attitudes toward art vs. humor posters (IAT scores; higher

scores indicate a stronger preference for art posters). Predicted values are displayed at one standard deviation above and below the mean of implicit attitudes.

*Figure 1: Study 1: Explicit attitudes for Friends vs. Frasier as a function of condition (rational or intuitive) and corresponding implicit attitudes (IAT scores; higher scores indicate a stronger preference for Friends). Predicted values are displayed for one standard deviation above and below the mean of implicit attitudes.*

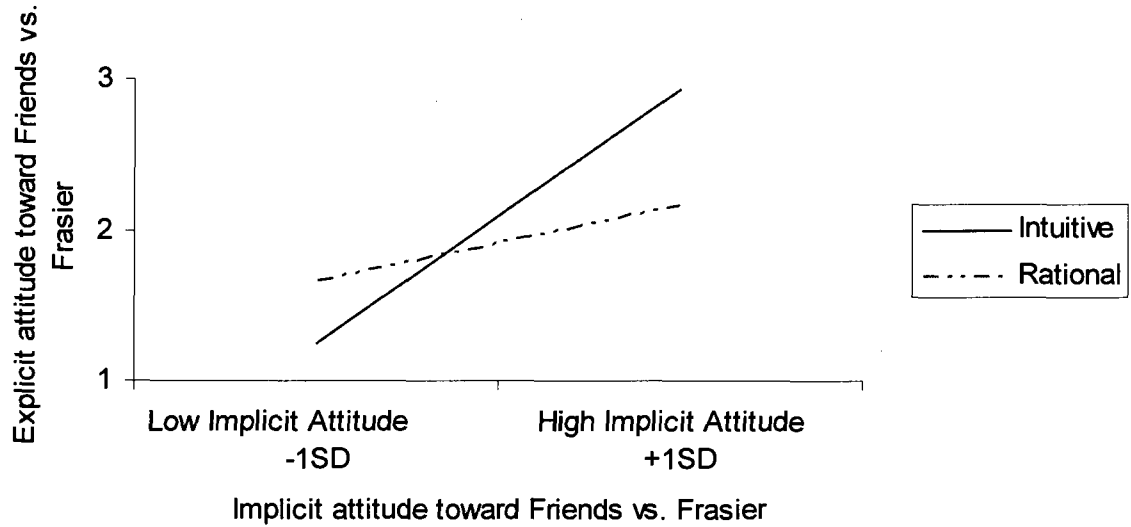


Figure 2: Study 2: Explicit attitudes for *Law & Order* vs. *CSI* as a function of condition (rational or intuitive) and corresponding implicit attitudes (IAT scores; higher scores indicate a stronger preference for *Law & Order*). Predicted values are displayed for one standard deviation above below the mean of implicit attitudes.

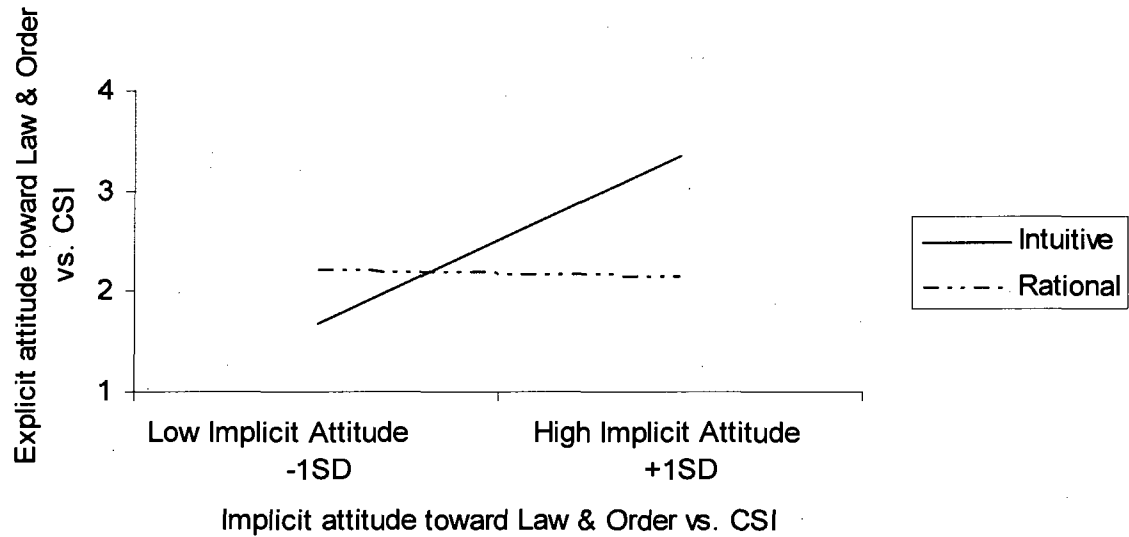
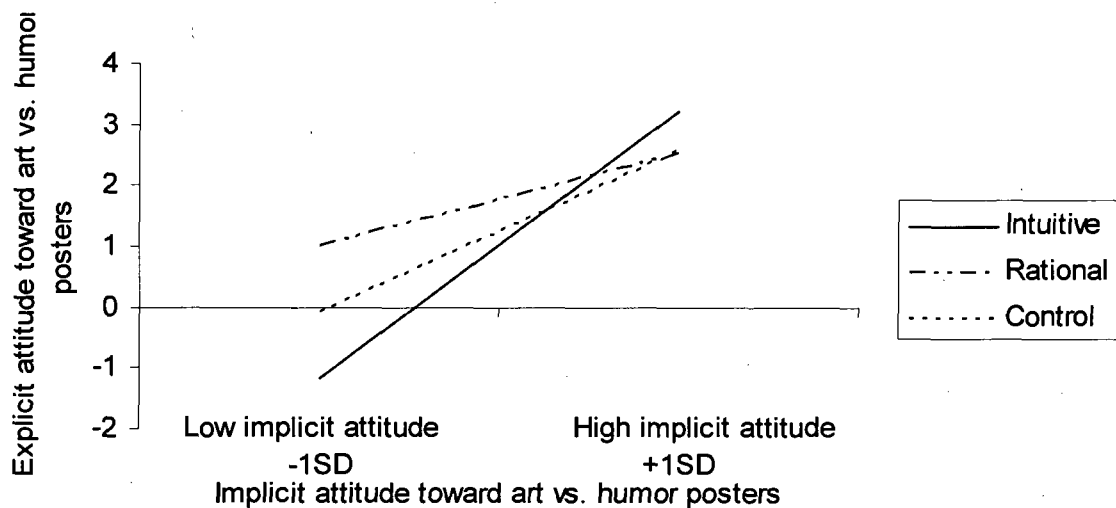


Figure 3: Study 3: Explicit attitudes for art vs. humor posters as a function of condition (rational, intuitive, or control) and corresponding implicit attitudes (IAT scores; higher scores indicate a stronger preference for art posters). Predicted values are displayed at one standard deviation above below the mean of implicit attitudes.



*Figure 4:* Study 4: Explicit attitudes for the art vs. humor poster as a function of condition (rational or intuitive) and corresponding implicit attitudes (IAT scores; higher scores indicate a stronger preference for art posters). Predicted values are displayed at one standard deviation above and below the mean of implicit attitudes.

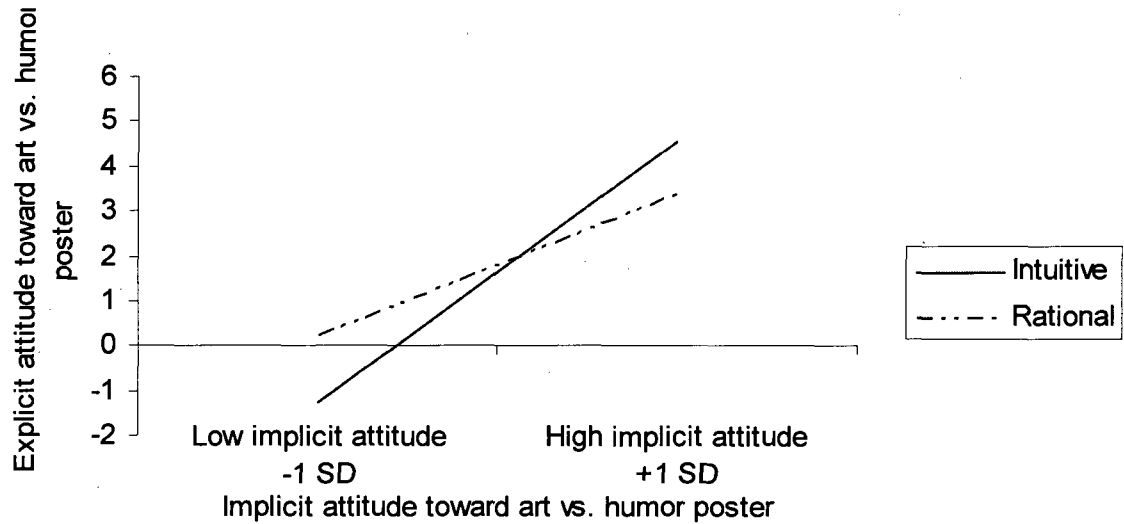
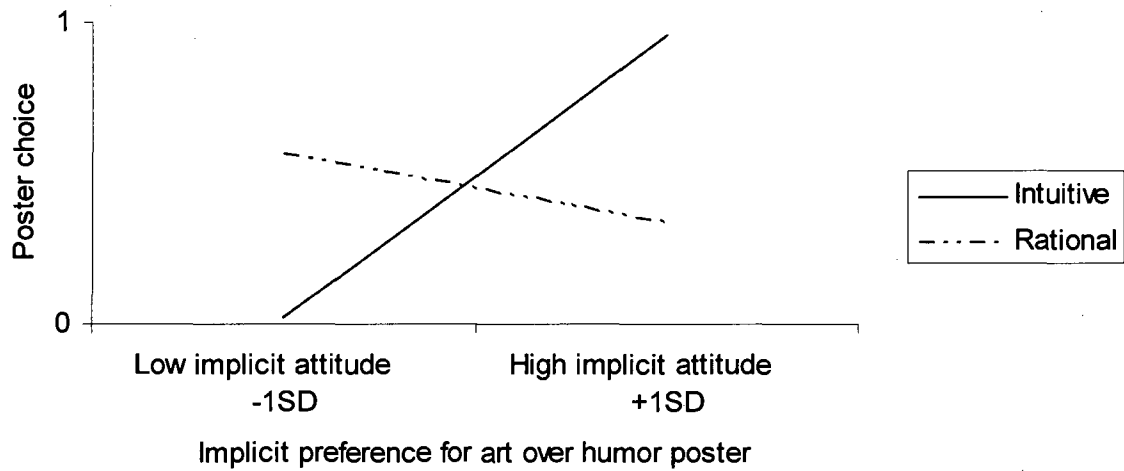
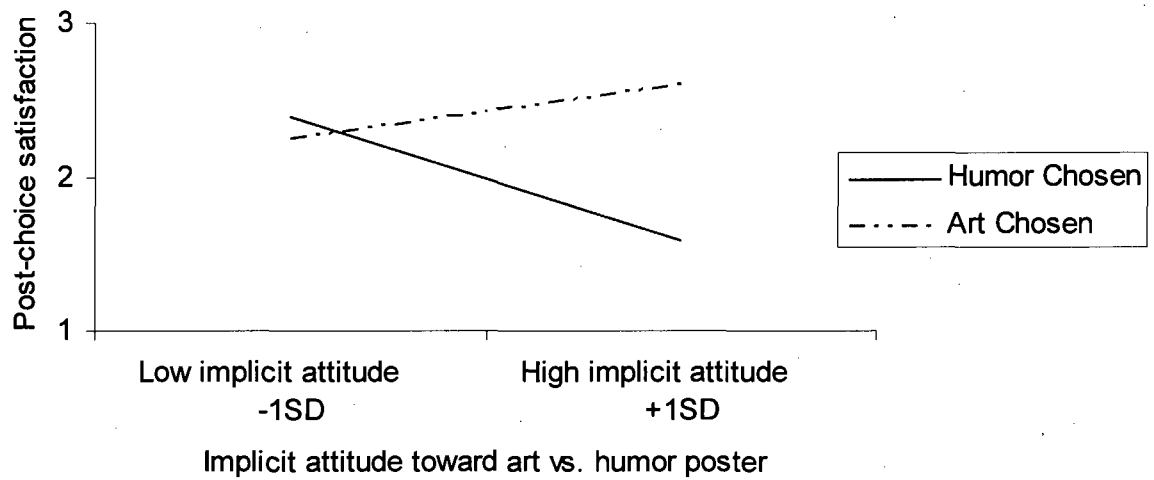




Figure 5: Study 4: Poster choice (art poster = 1, humor poster = -1) as a function of condition (rational or intuitive) and implicit attitudes toward art vs. humor posters (IAT scores; higher scores indicate a stronger preference for art posters). Predicted values are displayed at one standard deviation above and below the mean of implicit attitudes.



*Figure 6:* Study 4: Post-choice satisfaction as a function of poster choice (art poster = 1, humor poster = -1) and implicit attitudes toward art vs. humor posters (IAT scores; higher scores indicate a stronger preference for art posters). Predicted values are displayed at one standard deviation above and below the mean of implicit attitudes.



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