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Self-Ambivalence and Resistance to Subtle Self-Change Attempts

Kenneth G. DeMarree¹, Kimberly Rios Morrison²,
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Abstract

Recent research has demonstrated the malleability of self-views to subtle situational influence but has not uncovered features of the self-concept representation that make it susceptible to such change. Using research on attitude ambivalence as a foundation, the current article predicted that the self would be most likely to respond to a subtle change induction when the targeted self-beliefs were objectively ambivalent (e.g., possessed both positive and negative features). Using self-esteem conditioning (Experiment 1) and outgroup stereotype priming (Experiment 2), it was found that people were more susceptible to subtle change inductions as objective self-ambivalence increased. Notably, the consistency between dominant self-views (positive or negative) and the change induction did not influence these results. These effects held for objective ambivalence, but not subjective ambivalence, and only when the objective ambivalence measure was relevant to the change induction. Mechanisms of the observed moderation and the implications of self-ambivalence for understanding self-change are discussed.

Keywords

self, ambivalence, evaluative conditioning, priming, self-strength

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The self-concept and self-esteem are subject to a variety of influences. The people we meet and the situations we encounter can affect how we see ourselves (DeSteno & Salovey, 1997), as can our successes and failures (Jussim, Coleman, & Nassau, 1989), questions from others (Fazio, Effrein, & Falender, 1981), and our own behavior (Bem, 1967). Recent evidence indicates that individuals' self-perceptions can also be affected by subtle stimuli that have no surface connection to the self (DeMarree, Wheeler, & Petty, 2005; Mussweiler, Ruter, & Epstude, 2004). For example, for White college students, outgroup primes, such as the African American stereotype, can lead to perceptions of oneself as more aggressive (DeMarree et al., 2005; Dijksterhuis et al., 1998; for a review, see Wheeler, DeMarree, & Petty, 2007). Similarly, self-evaluations can shift in response to subliminally presented social comparison standards (Mussweiler et al., 2004; Stapel & Blanton, 2004) or evaluative conditioning (EC) procedures (Dijksterhuis, 2004; Riketta & Dauenheimer, 2003).

Although subtle situational factors have been shown to influence self-perceptions, many questions remain with respect to how, when, and for whom self-perceptions will change. Existing research has largely examined differences in how change-inducing stimuli are processed. For example, individual differences in self-monitoring (Snyder, 1974) can determine who will be affected by primes that have the potential to be seen as diagnostic of the self or of social proscriptions

(DeMarree et al., 2005; Morrison, Wheeler, & Smeesters, 2007). Similarly, individual and situational differences in self-consciousness can either decrease priming effects because of their impact on awareness of one's existing chronic internal states (Dijksterhuis & van Knippenberg, 2000; Wheeler, Morrison, DeMarree, & Petty, 2008) or increase priming effects because they increase the likelihood that the primed information will be interpreted as self-relevant (Hull, Slone, Meteyer, & Matthews, 2002; Wheeler, Morrison, et al., 2008).

In contrast to this previous work examining broad individual differences, the current experiments focus on whether structural features of the self-concept representation itself, such as objective self-ambivalence, could also predict self-concept change in response to subtle influences. Examining structural features of the self-concept would not only help determine which individuals are most susceptible to subtle self-change manipulations but also could shed light on the

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antecedents of self-concept stability more generally. We predict that as aspects of the self-concept become more objectively ambivalent, the self-concept will be more susceptible to subtle situational influence.

Ambivalence

Our conceptual framework for understanding self-ambivalence draws from work on attitudinal ambivalence, where ambivalence is defined as the presence of positive and negative associations or beliefs to the same attitude object that produce conflict (Kaplan, 1972; Petty, Briñol, & DeMarree, 2007; Priester & Petty, 1996; Thompson, Zanna, & Griffin, 1995). For example, a person might believe that somebody is a good coworker but a bad friend and therefore hold a mixed evaluation of that person. Ambivalence can also be applied to self-esteem, with ambivalent individuals simultaneously holding positive and negative self-evaluations (e.g., "I'm worthwhile because I am loved by my family, but worthless because I lost my job"; see Gramzow, Sedikides, Panter, & Insko, 2000).

Existing research indicates that ambivalent attitudes are generally more malleable in response to explicit information than are unambivalent attitudes (Armitage & Conner, 2000; Bell & Esses, 2002). For example, ambivalent attitudes are more susceptible to change from a persuasive message than are unambivalent attitudes (Bell & Esses, 2002), and ambivalent self-esteem is more susceptible to change from explicit success or failure feedback than is unambivalent self-esteem (Riketta & Ziegler, 2007). This increased malleability of ambivalent constructs may often occur because ambivalence is associated with discomfort and negative affect (Hass, Katz, Rizzo, Bailey, & Moore, 1992) that individuals are motivated to reduce (van Harreveld, van der Pligt, & de Liver, 2009; but see Riketta & Ziegler, 2007). In a persuasion setting, this motive often manifests as increased thought about attitude-relevant information, which can result in attitude change if message arguments are sufficiently compelling (Bell & Esses, 2002; Maio, Bell, & Esses, 1996). Furthermore, this increased thought is most likely when the information is perceived as relevant to the ambivalence (Briñol, Petty, & Wheeler, 2006) and as capable of reducing it (Clark, Wegener, & Fabrigar, 2008).

One possible consequence of the motivation to reduce ambivalence is that ambivalent attitudes may be more likely to change in one direction than another. Although ambivalent attitudes contain both positive and negative components, one valence tends to dominate the other (e.g., more positive than negative reactions leading to an overall positive, but still ambivalent, evaluation; Priester & Petty, 1996). Because it is easier to reduce ambivalence by bolstering the dominant reaction than by bolstering the conflicting reaction, individuals who are ambivalent may perceive information that is consistent with their dominant reactions to be more helpful in reducing ambivalence

than information consistent with their nondominant (i.e., conflicting) reactions and, as such, may pay more careful attention to proattitudinal than to counterattitudinal information (Clark et al., 2008). That is, the motivation to reduce ambivalence should cause people to selectively attend to information that is consistent with the overall valence of their existing (ambivalent) attitude.

An open question, however, is whether ambivalence would predict malleability to subtle (e.g., nonconscious) as well as explicit influences. Because much of the change that results from ambivalence appears to be driven by a motivation to reduce the experience of ambivalence, would ambivalence matter in situations where there is no apparent opportunity to reduce this ambivalence, such as when there is no information to process? Furthermore, would change occur only when the influence matches the target's dominant reactions, or would mismatching influences also have an effect? We believe that *some* forms of ambivalence will predict malleability even to subtle influences and that this malleability can occur for influences that both match and mismatch people's dominant reactions.

To understand the derivation of our predictions below, it is important to note that researchers studying attitudes have distinguished between two forms of ambivalence: objective ambivalence, which represents the presence of both positive and negative evaluative associations to the same object, and subjective ambivalence, which is the conscious *experience* of evaluative conflict. Although subjective ambivalence is predicted by objective ambivalence, these constructs are not related in a one-to-one manner (Priester & Petty, 1996), and subjective ambivalence has additional antecedents beyond objective ambivalence (e.g., conflict between one's own evaluations and those of close others, Priester & Petty, 2001). Ambivalence (objective or subjective) can be a relatively stable property of an attitude, and as such, whenever a person encounters the attitude object, any conflicting reactions (i.e., objective ambivalence) or experienced conflict (i.e., subjective ambivalence) that the person tends to have in relation to the object can also be activated.¹ The distinction between objective and subjective ambivalence allows us to make unique predictions regarding malleability in response to subtle inductions, which we outline below and test with respect to the self.

Basis for Predictions

There are multiple reasons to predict that objective ambivalence would moderate subtle self-change. First, information activated by subtle change inductions (e.g., EC) might be more easily confused with the self (or another attitude object) if the self is objectively ambivalent (Wheeler et al., 2007; see also Jones, Fazio, & Olson, 2009). This increased likelihood of confusion, or misattribution, of activated content to the self could lead to larger effects of subtle change inductions

on individuals with ambivalent, compared to unambivalent, self-views.

Second, objectively ambivalent self-views, like ambivalent attitudes, might be more prone to construction (rather than retrieval) processes than are unambivalent self-views (see Fazio, 2007; Schwarz & Bohner, 2001; cf. Holland, Verplanken, & van Knippenberg, 2002). When a stored summary self-evaluation exists and is seen as a valid basis for judgment (as is more likely the case with unambivalent attitudes), it will be used in computing relevant self-judgments. However, when such a representation does not exist or is not seen as valid (as is more likely the case with ambivalent beliefs), currently accessible self-contents activated by the context (e.g., primes) will be used instead.

In both of these cases, individuals need not be aware that an experimental induction or other situational variable has the potential to influence their ambivalent self-views or to reduce their ambivalence. Because the *experience* of conflict is not needed to instigate change by these processes, objective—not subjective—ambivalence should be the primary moderator of subtle self-change attempts.

Furthermore, according to several models of subtle change (Jones et al., 2009; Loersch & Payne, in press; expansion model of Wheeler et al., 2007), the direction of dominant reactions (i.e., whether they are congruent or incongruent with the change induction) should also not matter with a subtle change induction. If the motivation to reduce subjective ambivalence is the critical driving force behind the increased malleability of ambivalent self-views, changes in self-views would occur to a greater extent when primes match, rather than mismatch, participants' dominant self-views. However, with subtle change inductions people are not aware that the situation is relevant to their ambivalence and, as such, are unaware of whether the situation will help to easily reduce subjective ambivalence (e.g., by providing information to bolster dominant beliefs).

In short, we predict that subtle self-change situations are less relevant to the motivation to reduce subjective ambivalence than are relatively blatant self-change situations. As such, change in subtle situations should be less likely to depend on subjective ambivalence (experienced conflict) or on participants' preexisting dominant self-views (for further discussion of the role of self-views in priming contexts, see Wheeler et al., 2007).

The Present Research

In the present experiments, we examine the objective ambivalence of self-esteem as a moderator of subliminal self-evaluative conditioning effects (Experiment 1) and introduce objective ambivalence on traits as a moderator of stereotype priming effects (Experiment 2). We chose these two subtle change manipulations because they are typical of those found in the literature and because both EC (Jones et al., 2009) and

stereotype priming (Wheeler et al., 2007) have been proposed to rely on similar mechanisms. In addition, we chose to use both more general evaluative (i.e., self-esteem) and more specific (traits related to a stereotype prime) self-dimensions because these dimensions are typical of those targeted by the change inductions used. We expected that objective ambivalence would apply to both general and specific self-views (see Spencer-Rodgers, Boucher, Mori, Wang, & Peng, 2009; Spencer-Rodgers, Peng, Wang, & Hou, 2004).

Although many studies have shown that self-evaluative conditioning has the potential to change the self (Dijksterhuis, 2004; Riketta & Dauenheimer, 2003), less is known about whether stereotype primes can affect self-perceptions. We based the latter prediction on the Active-Self account of prime-to-behavior effects (DeMarree et al., 2005; Wheeler et al., 2007). This perspective argues that social construct (e.g., stereotype) primes can affect the currently accessible contents of the self-concept, which in turn can drive behavior (see also Wheeler & DeMarree, 2009). One implication of this perspective is that in addition to changes in behavior (Bargh, Chen, & Burrows, 1996), primed constructs can produce temporary changes in participants' identities. For example, primes can increase feelings of closeness to the primed group, as well as increase tendencies to view information relevant to the primed group as self-relevant (Wheeler, DeMarree, & Petty, 2008). Because of these shifts in self-views and identities to be more in line with the primed stereotype, other shifts, such as the adoption of behaviors and attitudes consistent with the primed group (Kawakami, Dovidio, & Dijksterhuis, 2003), can also emerge.

We predicted that people with high levels of objective ambivalence of self-esteem or of non-attitude traits would be more responsive to subtle self-change inductions, regardless of the direction of the induction (i.e., whether it was consistent with the dominant reaction) and regardless of their level of subjective ambivalence. However, based on the idea that people are motivated to reduce the discomfort caused by ambivalence, other predictions were possible. Specifically, if the potential to reduce the experience of conflict were operating, then subjective ambivalence should be an important predictor of change. Furthermore, under these conditions, the congruence of participants' self-views with the change induction should further moderate self-change, with self-change occurring primarily among ambivalent individuals whose self-views match the direction of the change induction.

We tested our hypothesis against these competing possibilities in our studies. Each study incorporated measures of induction-congruent and induction-incongruent self-content (i.e., both positive and negative self-evaluations in a self-evaluative conditioning paradigm, and both stereotypic and counterstereotypic traits in an outgroup priming paradigm). Our hypothesis was that objective ambivalence would interact with the change induction to determine self-change. That is, self-change would be greater as objective ambivalence

increased. This effect was predicted to occur for objective, but not subjective, ambivalence and was predicted to occur regardless of the congruence of existing self-views with the change induction.

Experiment 1

Experiment 1 tested whether objective ambivalence of self-esteem would moderate the impact of a subtle self-change manipulation on people's self-evaluations and whether such moderation would be limited to change inductions that matched preexisting dominant self-views. We used subliminal EC as our change induction because EC is an effective yet subtle way to influence self-esteem (Baccus, Baldwin, & Packer, 2004; Dijksterhuis, 2004; Riketta & Dauenheimer, 2003). We borrowed our EC paradigm from Dijksterhuis (2004), who demonstrated that repeatedly pairing subliminally presented self-relevant stimuli with positive (vs. neutral) words can lead to increases in participants' implicit self-esteem. In addition, 1 week before the study, we assessed participants' objective and subjective self-esteem ambivalence as well as participants' self-esteem certainty and self-esteem accessibility, two other measures of self-evaluation strength. Certainty and accessibility were selected because they are strength variables that have been associated with decreased change in both the self and the attitudes literatures (DeMarree, Petty, & Briñol, 2007b; Petty, Briñol, Tormala, & Wegener, 2007). Recent research has found that self-esteem accessibility moderates resistance of the self to change, ostensibly via its ability to predict construction versus retrieval processes in social judgment (DeMarree, Petty, & Strunk, 2010). Because accessibility and objective ambivalence are expected to predict these processes (i.e., construction vs. retrieval), we deemed it particularly important to rule out accessibility as accounting for any observed effects of objective ambivalence. It is worth noting, however, that this is not the only process by which objective ambivalence is predicted to moderate subtle self-change.

We predicted that as objective ambivalence increased, the effect of subliminal conditioning on state self-esteem would likewise increase, over and above any impact of subjective ambivalence, certainty, or accessibility in moderating self-change. Specifically, we predicted that the positive (vs. neutral) conditioning stimuli would lead to more favorable state self-esteem, but primarily for participants who were objectively ambivalent in their self-esteem. We further expected this relation to hold regardless of whether ambivalent participants were positive or negative in their overall self-views.

Method

Participants. Forty-two Stanford University students, all native English speakers, participated in this study, conducted over two separate sessions. Participants received \$15

for completing both sessions. Seven participants were dropped from the analysis because they correctly guessed that the conditioning task was meant to influence their self-esteem. The remaining 35 participants (27 women, 8 men) were retained in the final sample.²

Procedure. Participants arrived at the laboratory in groups and completed both experimental sessions in a room with six divided computer workstations. Participants were informed that we were investigating the relation between language usage and personality traits. The first session consisted of personality and self-esteem scales, including measures of objective and subjective ambivalence, self-certainty, and self-esteem accessibility. The second session, administered 1 week after the first, consisted of the EC task and a state self-esteem dependent measure. Each participant was randomly assigned to one of two experimental conditions: positive word conditioning or neutral word conditioning. After completing the second session, participants were probed for suspicion and debriefed.

Objective ambivalence measure. Among the items included in the first session were two questions designed to assess positive and negative feelings about various attitude objects (see Kaplan, 1972). The self was the target attitude object in this case, and we worded the self-esteem objective ambivalence items as follows: Considering only the POSITIVE [NEGATIVE] features of yourself and ignoring the negative [positive] ones, how positive [negative] would you say your thoughts and feelings toward yourself are? (see also Gramzow et al., 2000). Participants responded to both items on a scale from 0 (*not at all*) to 8 (*extremely*).

Following Thompson et al. (1995), we calculated objective ambivalence by subtracting the absolute value of the difference between the positive (P) and negative (N) responses from the average of the two responses (i.e., $(P + N)/2 - |P - N|$). Higher scores on this measure indicated higher levels of objective self-ambivalence.³

Subjective ambivalence measure. Our measure of subjective ambivalence (see Riketta & Ziegler, 2007) consisted of the following three items adapted from previous research (e.g., Priester & Petty, 1996): (a) To what extent do you feel conflict when you think about yourself? (b) To what extent are your thoughts and feelings toward yourself one-sided or mixed? (c) To what extent is your reaction toward yourself confused? Participants responded to these items on a 9-point scale (1 = *not at all*, 9 = *extremely*), and their responses were averaged to form a composite ($\alpha = .77$).

Self-evaluation certainty measure. Certainty in an evaluation represents a person's conviction that the evaluation is correct and valid (e.g., DeMarree, Petty, & Briñol, 2007a; Gross, Holtz, & Miller, 1995). Our measure of self-evaluation certainty consisted of three items adapted from previous research: (a) How confident are you of your thoughts and feelings toward yourself? (b) How certain are you of your thoughts and feelings toward yourself? (c) How sure are you that your

Table 1. Descriptive Statistics and Correlations Among Experiment 1 Variables

	M	(SD)	1	2	3	4	5	6	7
1. Gender ^a	-0.53	(0.86)							
2. EC ^a	0.50	(0.51)	.00						
3. Objective ambivalence	2.99	(2.35)	.24	-.25					
4. Matching ^a	0.26	(0.90)	-.01	.03	-.42*				
5. Subjective ambivalence	5.30	(1.58)	.03	-.27	.30†	-.56**			
6. Certainty	6.12	(1.47)	.00	.31†	-.48**	.69**	-.71**		
7. Accessibility	4.36	(17.91) ^b	-.22	-.31†	.18	-.23	.34*	-.34*	
8. State self-esteem	3.71	(0.71)	.02	.13	.06	.10	-.04	-.04	-.13

^aGender is coded -1 = female, 1 = male. Evaluative conditioning (EC) is coded 1 = positive word, 0 = control. Matching is coded 1 = EC is consistent with dominant self-view, 0 = no dominant self-view, -1 = EC is inconsistent with dominant self-view.

^bAccessibility is reported in seconds to facilitate interpretation; however, correlations and analyses were conducted using log transformations of response times in milliseconds.

† $p \leq .10$. * $p \leq .05$. ** $p \leq .01$.

thoughts and feelings toward yourself are accurate? Participants again responded to each item on a 9-point scale (1 = *not at all*, 9 = *extremely*; $\alpha = .79$).

Self-esteem accessibility measure. Participants also completed the 10-item Rosenberg (1965) Self-Esteem Scale, using a 6-point scale with *strongly disagree* and *strongly agree* as end points (e.g., "All in all, I take a positive attitude toward myself"; $\alpha = .83$). Self-esteem accessibility was computed by log-transforming the amount of time (in milliseconds) that participants took to respond to each of the 10 self-esteem items and then taking the average of these transformed response times.

EC procedure. One week after completing the individual difference measures, participants returned to the lab to complete a lexical decision task adapted from Dijksterhuis (2004, Experiment 1). First, a string of Xs appeared on the screen for 500 ms, followed by a prime for 17 ms. Then a target word or nonword appeared on the screen until the participant indicated whether it was a real word.

In both conditions, each target word was preceded by a self-relevant stimulus (*I*, *me*, or *myself*), and each nonword by a single X, as a subliminal prime. Target words in the positive word condition were positive in valence (e.g., *nice*, *smart*) and were taken from Dijksterhuis (2004), whereas target words in the neutral word condition were neutral in valence (e.g., *chair*, *bike*). Nonwords (e.g., *pluwry*, *optipe*) were identical across conditions. There were 15 target words and 15 nonwords in both conditions, and each appeared twice. Thus, the conditioning procedure consisted of 60 trials.

State self-esteem measure. Upon completion of the EC procedure, participants completed a 20-item state self-esteem measure (Heatherton & Polivy, 1991; see Riketta & Dauenheimer, 2003), using a 5-point scale (1 = *not at all*, 5 = *extremely*). The items load onto three distinct factors: performance (e.g., "I feel confident about my abilities"), social (e.g., "I am worried about what other people think of me"), and

appearance (e.g., "I feel unattractive"). As Heatherton and Polivy (1991) noted, some of these factors may be more relevant to particular contexts than others. Because the words in the Dijksterhuis (2004) conditioning task were primarily associated with the social (e.g., *nice*, *honest*) and performance (e.g., *smart*, *wise*) domains, we analyzed the average of the 14 items from these subscales ($\alpha = .91$). Analyses on the appearance subscale, which had only one relevant word in the conditioning task (*beautiful*), revealed no effects.

Results

Correlations among predictors can be found in Table 1.

Objective ambivalence. We hypothesized that as self-esteem objective ambivalence increased, so would the magnitude of self-esteem change in response to the subliminal EC manipulation. This hypothesis was tested using multiple regression. Participants' ambivalence scores were mean centered, and the EC variable was dummy coded (1 = *positive word*, 0 = *neutral word*). We also computed a matching variable that assessed the direction of dominant reactions, to determine whether change would occur primarily when the change induction matched existing dominant self-views (1 = *more positive than negative self-evaluations [i.e., a match with direction of EC]*, $n = 20$; -1 = *more negative than positive self-evaluations*, $n = 10$; 0 = *equivalent positive and negative self-evaluations*, $n = 5$).

The state self-esteem (performance and social subscale) scores were then regressed onto EC condition (neutral vs. positive EC task), ambivalence (continuous variable), matching, and all two- and three-way interaction terms. Following the suggestion of Kashy and colleagues (Kashy, Donnellan, Ackerman, & Russell, 2009), main effects are interpreted in the highest model for which there is a significant interaction term (e.g., in the second model if there is a significant two-way but no significant three-way interaction). When a

Table 2. Evaluative Conditioning (EC) \times Objective Ambivalence Regression Model, Experiment 1

	<i>b</i>	<i>SE</i>	β	<i>t</i>
Intercept	3.59	.20		18.05***
EC	0.20	.26	.14	0.75
Objective ambivalence	-0.06	.10	-.19	-0.60
Direction of ambivalence	0.22	.20	.28	1.10
EC \times Objective Ambivalence	0.26	.12	.63	2.19*
EC \times Matching	-0.01	.31	-.01	-0.03
Objective Ambivalence \times Matching	-0.04	.09	-.11	-0.46

Note: $R^2 = .23$.

* $p < .05$. *** $p < .001$.

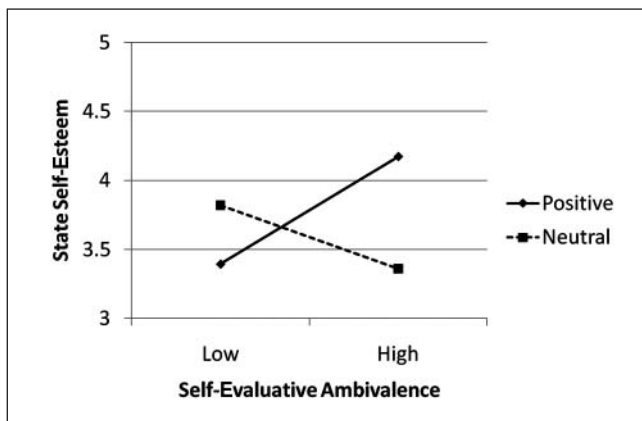


Figure 1. State self-esteem as a function of evaluative conditioning (positive vs. neutral words) and self-evaluative ambivalence (Experiment 1)

Note: Results plotted at ± 1 SD of self-evaluative ambivalence.

significant interaction emerged, it was decomposed using a simple slopes analysis (Aiken & West, 1991).

Preliminary inspection of the data revealed a statistical outlier (studentized deleted residual = -3.32 , $p < .001$; see McClelland, 2000). Thus, we analyzed the data both with and without this outlier. When the outlier was included, the predicted EC \times Objective Ambivalence interaction was marginally significant ($b = .24$, $SE = .14$), $t(28) = 1.70$, $p < .10$. However, when the outlier was excluded, the EC \times Objective Ambivalence interaction was significant (see Table 2; Figure 1).

Decomposition of this interaction at 1 SD above and below the mean of ambivalence revealed an assimilative effect of conditioning among participants high in objective ambivalence ($b = .81$, $SE = .35$), $t(27) = 2.30$, $p < .03$, but no effect among participants low in objective ambivalence ($b = -.42$, $SE = .41$), $t(27) = -1.02$, *ns*. The three-way EC \times Objective Ambivalence \times Matching interaction was not significant ($b = .10$, $SE = .18$), $t(26) = .52$, *ns*, indicating that the self-evaluative conditioning effects were a function of the magnitude (not direction) of ambivalence. In other words, this finding does *not* support the notion that objective ambivalence fosters subtly

induced self-change only when the change induction matches (i.e., is in a direction consistent with) the dominant self-view. No other effects were significant.^{4,5}

Subjective ambivalence. To test whether subjective self-ambivalence moderated the relation between EC and self-esteem, participants' state self-esteem scores were regressed onto EC condition, subjective ambivalence, and the two-way interaction term. The EC \times Subjective Ambivalence interaction was not significant ($b = .25$, $SE = .17$), $t(30) = 1.45$, $p > .15$, nor was either main effect. Furthermore, when the EC \times Objective Ambivalence \times Matching regression analysis was rerun controlling for subjective ambivalence and its interaction with EC, the EC \times Objective Ambivalence interaction remained significant ($b = .32$, $SE = .12$), $t(25) = 2.55$, $p < .02$, whereas the EC \times Subjective Ambivalence interaction remained nonsignificant ($b = .29$, $SE = .20$), $t(25) = 1.40$, $p = .17$. This suggests that the effects of EC and objective self-esteem ambivalence on state self-esteem were not due to high subjective ambivalence.

Self-evaluation certainty. To test whether self-evaluation certainty moderated the effect of condition on state self-esteem, participants' state self-esteem scores were regressed on condition, self-evaluation certainty, and the two-way interaction term. The only result to emerge was a marginally significant EC \times Self-Evaluation Certainty interaction ($b = -.37$, $SE = .19$), $t(30) = -1.93$, $p = .06$, such that participants low (but not high) in self-evaluation certainty tended to show assimilation. However, when the EC \times Objective Ambivalence \times Matching regression analysis was rerun controlling for certainty and its interaction with condition, the EC \times Objective Ambivalence interaction was marginally significant ($b = .24$, $SE = .12$), $t(25) = 1.97$, $p = .06$, but the EC \times Self-Evaluation Certainty interaction was reduced to nonsignificance ($b = -.17$, $SE = .28$), $t(25) = -.62$, *ns*. This suggests that the EC \times Objective Ambivalence interaction on state self-esteem could not be explained by low certainty among objectively ambivalent participants.

Self-esteem accessibility. To test whether self-esteem accessibility moderated the effect of condition on state self-esteem, participants' state self-esteem scores were regressed on condition, self-esteem accessibility (log-response time), and the two-way interaction term. No significant effects emerged ($ps > .12$). Moreover, the EC \times Objective Ambivalence interaction held after controlling for self-esteem accessibility and its interaction with EC ($b = .25$, $SE = .12$), $t(25) = 2.00$, $p < .06$.

Discussion

Experiment 1 provided evidence that objectively ambivalent self-esteem, relative to objectively unambivalent self-esteem, is more susceptible to a subtle self-change manipulation (i.e., subliminal EC). The current moderation results were found with objective but not subjective ambivalence, and objective ambivalence predicted self-change when controlling for subjective ambivalence, self-evaluation certainty, and

self-esteem accessibility. Although subjective ambivalence is often associated with the resistance of attitudes to change (e.g., Haddock, 2003) and is often correlated with objective ambivalence (e.g., Priester & Petty, 1996), this change has generally been examined in situations in which the change-inducing agent is relatively blatant (e.g., a persuasive message). In our subtle self-change paradigm, objective ambivalence appears to be more relevant to the prediction of resistance (vs. susceptibility) to change than does subjective self-esteem ambivalence. Notably, self-esteem certainty did marginally predict resistance to change in this study, but not when controlling for objective ambivalence. Furthermore, self-esteem accessibility did not moderate resistance to self-esteem change in this study, even though accessibility has been shown to confer resistance to change in other research (DeMarree et al., 2010). As noted above, self-esteem accessibility is thought to predict resistance to self-esteem change at least in part because of its ability to moderate construction versus retrieval processes. However, accessibility did not moderate the effects of EC in the current study. Although it is difficult to draw strong conclusions from a single null effect, one possible implication of this is that objective ambivalence exerted its impact by affecting misattribution, rather than construction processes, in the current study.

In this sample, neither the impact of EC nor its interaction with ambivalence was qualified by the valence of dominant reactions to the self, consistent with the idea that participants did not perceive the EC induction as having the potential to resolve their ambivalence. However, because the direction of the change manipulation matched the dominant reaction (i.e., positivity) among most participants, there may not have been sufficient variability or power to detect any moderation by the direction of dominant reactions caused by the motivation to reduce ambivalence. Thus, although the present data do not support the matching account discussed earlier, they do not provide definitive evidence against it either. Our next study addresses this interesting issue and builds on Experiment 1 in several other ways.

Experiment 2

In Experiment 2, we examined self-change as the result of a different subtle change induction. As noted in the Introduction, the Active-Self model (Wheeler et al., 2007) of prime-to-behavior effects predicts that the self can change in response to primes and that these changes in the self can guide subsequent judgment and behavior. One prediction made by the Active-Self model is that the structural consistency of the self can affect the likelihood that a prime will affect the currently accessible contents of the self-concept (Wheeler et al., 2007). Specifically, as the self becomes less consistent on dimensions related to the prime (i.e., more objectively ambivalent), the likelihood of self-change, and the attitudinal and behavioral consequences of such change, can increase. Importantly, this prediction has not been explicitly tested.

In Experiment 2, we examined the impact of an African American stereotype prime on personal endorsement of prime-consistent attitudes. Kawakami et al. (2003) showed that priming college students with the elderly stereotype led them to adopt attitudes consistent with the presumed attitudes of the elderly (e.g., supporting health care). In the current research, we examined whether priming students with the African American stereotype would lead them to adopt the presumed attitudes of this group (e.g., supporting affirmative action). However, we extended the prior work by examining moderation of the priming effect by self-ambivalence on prime-relevant traits. We predicted that those who had high levels of objective ambivalence regarding their own self-views along stereotype dimensions would show larger effects of the stereotype prime on their stereotype-relevant attitudes.

In this study, we extended our examination of ambivalence to a new form of ambivalence that is not in reference to a summary evaluation (such as self-esteem or other attitudes), namely, simultaneously possessing conflicting traits. In addition to allowing us to test our effects on a new, nonattitudinal form of ambivalence, this study provided a stronger test of moderation by direction of self-traits. Unlike self-esteem, on which positive feelings predominate for most Americans, there is considerable variation in the degree to which people believe they possess traits consistent (vs. inconsistent) with the African American stereotype, which although containing primarily negative elements (e.g., aggressive, unintelligent) also contains positive elements (e.g., athletic, funny). This greater variation in the congruence of people's dominant reactions with the change manipulation allowed us to provide a stronger test of the matching hypothesis. According to this alternative, if the motivation to reduce ambivalence is the critical driving force behind the increased malleability of ambivalent self-views, the matching hypothesis would predict that such changes occur to a greater extent when the prime matches, rather than mismatches, participants' dominant self-views.

We additionally tested whether objective ambivalence on prime-irrelevant dimensions would moderate self-change. If both relevant and irrelevant objective ambivalence were to moderate change, it would suggest a more general structural inconsistency is responsible for our findings. We predicted that the degree of inconsistency on prime-relevant traits (i.e., regarding the African American stereotype) would be more likely than the degree of inconsistency on prime-irrelevant dimensions (e.g., self-esteem) to determine whether the African American stereotype prime would affect the self. We drew this inference from research on attitude structure, which has shown that structural features of an attitude only affect the resistance of that attitude to change (Chaiken & Yates, 1985). Thus, we predicted that the effects of the prime would be strongest among those high in objective trait ambivalence along the primed dimension and that objective ambivalence on irrelevant traits would not matter.

Method

Participants. One hundred twenty-two Ohio State University undergraduates who participated in partial fulfillment of a course requirement were randomly assigned to experimental condition. Because some participants were members of the primed group, and because the effects of ingroup and outgroup primes can differ (Shih, Ambady, Richeson, Fujita, & Gray, 2002), 9 African American participants and 3 participants who did not indicate their race were dropped from the analyses. In addition, 1 participant identified the theme of the scrambled sentence task (as relating to race) and 2 participants drew (incorrect) connections between the scrambled sentence task and their subsequent responses. To be conservative, these participants were deleted from subsequent analyses.⁶ The data from the remaining 107 participants (67 women, 40 men) were retained. Participants were randomly assigned to either the African American ($n = 53$) or control ($n = 54$) prime condition.

Procedure. This experiment was described as examining how language skills are related to different personality variables and social attitudes. Participants first completed the priming manipulation, followed by measures of social attitudes, including our target dependent measure. Next, participants completed several filler questionnaires followed by the self-structure measures. Finally, participants completed suspicion probes and were debriefed.

Priming manipulation. The priming manipulation, a sentence-unscrambling task used successfully in previous research (Wheeler, DeMarree, et al., 2008, Study 2), was modeled after earlier priming procedures (e.g., Bargh et al., 1996). In the African American prime condition, sentences contained words related to the African American stereotype (e.g., is fear he *dishonest* very; watch net they *basketball* professional; orange unsafe the is *ghetto*). In the control condition, the sentences contained nonstereotype words in place of the stereotype-relevant words (is fear he *straightforward* very; watch net they *tennis* professional; orange unsafe the is *bridge*). Participants were given 7 min to complete as many of the 30 sentences as they could.

African American-relevant attitude items. After the priming manipulation, participants indicated their level of agreement with two attitude statements associated with the African American stereotype (“Policies aimed to reduce racial inequalities, such as affirmative action, are important to our society” and “The government should adequately fund welfare and work training programs to help our nation’s inner cities”). To minimize suspicion, these statements were interspersed with several others that were unrelated to the African American stereotype (e.g., “I like to eat apples and other fruit”). Participants responded to each statement using a 9-point scale anchored at *strongly disagree* and *strongly agree*.

In a pretest conducted with 24 individuals from the same population, the African American target items were rated as

statements that African Americans were likely to agree with ($M = 5.88$ on a 7-point scale, $SD = 1.25$) and that White Americans were neutral toward ($M = 3.94$, $SD = 1.36$), paired samples $t(23) = 5.53$, $p < .001$. We averaged participants’ responses to the stereotype attitude items to create a composite ($\alpha = .65$).

Objective trait ambivalence. At the end of the session, after several filler questionnaires consisting of more than 50 items, all participants completed six questions that assessed self-views along three stereotype-relevant dimensions. The dimensions were industrious-lazy, unathletic-athletic, and peaceful-aggressive. Items were worded as follows: Considering only the LAZY [INDUSTRIOUS] features of yourself and ignoring the industrious [lazy] ones, how lazy [industrious] would you say you are? Participants responded to all items on a scale from 1 (*not at all*) to 9 (*extremely*). Responses to these items were not affected by the prime induction, nor was the ambivalence index described below. This provides evidence that we included sufficient filler material following the main part of the study to eliminate any impact of the prime on these self-ratings.

To calculate trait ambivalence, we first averaged ratings on stereotype consistent (C) attributes and stereotype inconsistent (I) unipolar ratings. These values were then submitted to the formula from Experiment 1 (i.e., $(C + I)/2 - |C - I|$). Higher scores on this measure indicated more ambivalence with respect to these trait dimensions.

Self-esteem objective ambivalence. To assess structural inconsistencies along a stereotype-irrelevant dimension, we included the two self-esteem objective ambivalence items used in Experiment 1. Self-esteem ambivalence was calculated in the same manner as in Experiment 1.

Results

Correlations among predictors can be found in Table 3.

Stereotype-relevant objective trait ambivalence. As in Experiment 1, we mean centered participants’ ambivalence scores and dummy coded the priming condition variable (0 = *control prime*, 1 = *African American prime*). Then we submitted the results to a Prime (African American vs. control) \times Stereotype Trait Ambivalence (continuous variable) \times Matching (direction of dominant self-view; 1 = *stereotype consistent*, $n = 50$; -1 = *stereotype inconsistent*, $n = 45$; 0 = *equal*, $n = 12$) multiple regression analysis, with attitudes toward the African American-relevant issues as the dependent measure (see Table 4). Results revealed a significant main effect of stereotype trait ambivalence, indicating that in the control condition, as ambivalence increased, participants reported less stereotype-consistent attitudes. Furthermore, consistent with our hypothesis, the Prime \times Stereotype Trait Ambivalence interaction was the only other significant effect to emerge (see Figure 2). Decomposition of the interaction revealed that participants with high levels of ambivalence assimilated to the

Table 3. Descriptive Statistics and Correlations Among Experiment 2 Variables

	M	(SD)	1	2	3	4	5
1. Gender ^a	-0.23	(0.98)					
2. Prime ^a	0.50	(0.50)	-.09				
3. Stereotype ambivalence	-0.02	(1.71)	.07	.13			
4. Matching ^a	-0.05	(0.95)	.31**	-.05	.08		
5. Self-esteem ambivalence	0.04	(3.08)	-.25*	.04	.31**	-.16	
6. Prime-relevant attitudes	5.90	(1.98)	.08	.08	-.09	-.02	.01

^aGender is coded -1 = female, 1 = male. Prime is coded 1 = African American, 0 = control. Matching is coded 1 = prime is consistent with dominant self-view, 0 = no dominant self-view, -1 = prime is inconsistent with dominant self-view.

* $p < .05$. ** $p < .01$.

Table 4. Regression for Primary Analyses, Experiment 2

Variable	<i>b</i>	<i>SE</i>	β	<i>t</i>
Intercept	5.65	.27		21.01***
Prime ^a	0.41	.39	.11	1.07
Stereotype trait ambivalence	-0.42	.16	-.36	2.59*
Matching ^b	-0.10	.28	-.05	0.37
Prime \times Ambivalence	0.53	.23	.31	2.31*
Prime \times Matching	0.10	.41	.03	0.24
Ambivalence \times Matching	-0.12	.14	-.09	0.87

Note: $R^2 = .078$.

^a1 = African American, 0 = control.

^b1 = prime is consistent with dominant self-view, 0 = no dominant self-view, -1 = prime is inconsistent with dominant self-view.

* $p < .05$. *** $p < .001$.

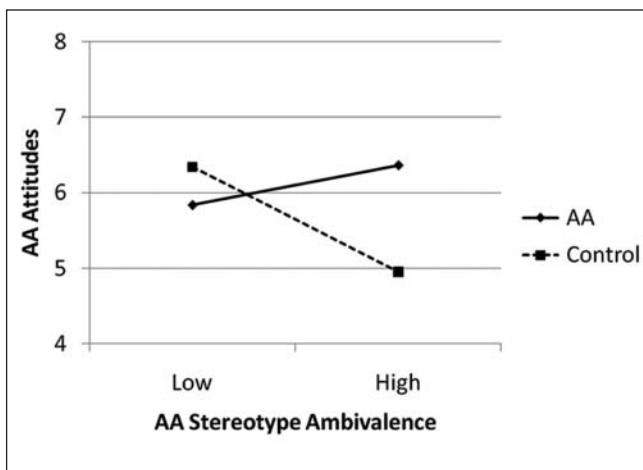


Figure 2. Attitudes toward African American–related issues as a function of stereotype priming (African American vs. control) and self-ambivalence on African American–related traits (Experiment 2) Note: Results plotted at ± 1 SD of trait self-ambivalence. AA = African American.

prime ($b = 1.31$, $SE = .55$), $t(100) = 2.41$, $p < .02$, whereas participants with low ambivalence were not influenced by the prime ($b = -.48$, $SE = .55$), $t(100) < 1$, ns .

Because objective ambivalence is an individual difference, people high and low in ambivalence could have different baseline responses to the attitude items. Indeed, ambivalent individuals started out with attitudes less consistent with stereotyped African American views than did unambivalent individuals, as evidenced by the main effect of ambivalence in the control condition (see Table 4). Importantly, the prime moved these ambivalent individuals to be more favorable than they were to start with, whereas the prime did not produce any movement from the baseline for less ambivalent individuals.

The Prime \times Stereotype Trait Ambivalence \times Matching interaction was not significant ($b = -.09$, $SE = .90$), $t(99) < 1$, ns , indicating that the primary interaction was not dependent on the direction of dominant self-views regarding the stereotype traits. In addition, the Prime \times Stereotype Trait Ambivalence interaction did not emerge when we conducted the analysis with stereotype-irrelevant attitude items as the dependent measure ($B = -.07$, $SE = .15$), $t(100) < 1$, ns .⁷

Stereotype-irrelevant objective ambivalence. The priming manipulation targeted self-beliefs that were related to the African American stereotype, and the stereotype trait ambivalence measure represented the consistency of the targeted beliefs. However, the inconsistency may not have to be specific to the self-beliefs targeted by the change induction to moderate self-change. To examine this possibility, we used self-esteem objective ambivalence as an indicator of prime-irrelevant self-ambivalence and entered it and its interaction with prime into a regression predicting stereotype-consistent attitudes. The two-way Prime \times Self-Esteem Objective Ambivalence interaction did not emerge ($b = -.01$, $SE = .13$), $t(103) < 1$, ns . Furthermore, when self-esteem ambivalence and its interaction with prime were added to the primary analysis (Prime \times Stereotype Trait Ambivalence \times Matching) described above, the Prime \times Stereotype Trait Ambivalence interaction remained significant ($b = .61$, $SE = .24$), $t(98) = 2.53$, $p < .02$, whereas the Prime \times Self-Esteem Ambivalence interaction was not ($b = -.14$, $SE = .13$), $t(98) = 1.01$, ns . These null results of self-esteem objective ambivalence suggest that for a structural feature of the self to moderate the impact of a prime, the structural feature must be relevant to the primed construct.

Discussion

Experiment 2 provides evidence that individuals who are objectively ambivalent (i.e., who hold conflicting self-beliefs) regarding their stereotype prime-relevant traits are more likely than unambivalent individuals to alter their stereotype-relevant attitudes in response to an African American stereotype prime. This further supports our primary hypothesis and extends the

results of our first study to a nonattitudinal dimension of the self. To our knowledge, this is the first application of objective ambivalence to examine the strength of traits. In addition, the moderation by objective ambivalence occurred when the ambivalence was relevant to the prime but not when the ambivalence was related to another self-dimension (i.e., self-esteem). Furthermore, there was a more equal distribution of prime-congruent and -incongruent dominant self-views in this sample, and the sample size was larger than in Experiment 1. Thus, Experiment 2 provides more compelling evidence that these effects do not occur only when primes match participants' dominant self-views and, as such, do not appear to result from a conscious motivation to reduce ambivalence. It is important to note that whereas Experiment 1 used a positive change induction (i.e., conditioning of positive self-esteem vs. a neutral control condition), Experiment 2 used a more evaluatively mixed change induction (i.e., priming the African American stereotype).

In addition to the above advances, the current study provides novel support for the Active-Self account of prime-to-behavior effects (Wheeler et al., 2007). Recall that the expansion model of the Active-Self account predicts that primes should be incorporated into self-perceptions to the extent that existing self-perceptions on prime-relevant dimensions are relatively inconsistent (vs. consistent). The patterns of attitude change we observed are consistent with this idea (see Wheeler et al., 2007).

General Discussion

The present studies explored self-change in response to subtle situational inductions, as moderated by the objective ambivalence of the targeted self-views. In Experiment 1, objective self-esteem ambivalence moderated the impact of subliminal self-evaluative conditioning on state self-esteem. This study demonstrated that as objective ambivalence decreased, so did self-change. Furthermore, the effect of objective ambivalence occurred even after controlling for subjective ambivalence and self-esteem ambivalence and certainty, and did not vary as a function of whether participants had dominant positive or negative self-views. This is the first study to examine the moderating impact of self-esteem objective ambivalence on a subtle self-change induction. In Experiment 2, we examined the moderation of prime-induced attitude-change as a function of objective ambivalence on prime-relevant traits. Participants primed with the African American stereotype reported more stereotype-consistent attitudes than control participants to the extent that they were ambivalent on relevant stereotypic traits. Again, the direction of participants' ambivalence (i.e., whether prime-congruent or incongruent self-perceptions were dominant) did not further moderate the primary finding. Furthermore, prime-irrelevant (i.e., self-esteem) objective ambivalence did not moderate the impact of the prime.

Together, these studies show that objective self-ambivalence can moderate self-change in response to subtle inductions. The present results were obtained using two different change paradigms (subliminal EC and outgroup priming) and are the first to demonstrate that objective ambivalence can increase self-change in response to subtle situational inductions.

Experiment 2 was also the first use of ambivalence as a strength indicator of a non-attitude dimension (i.e., traits). Previous research has only examined consequences of ambivalence of attitudes toward the self or other people and objects. However, our results, combined with recent work exploring the extent to which different cultures vary in the extent to which people hold contradictory self-beliefs (Spencer-Rodgers et al., 2009), suggest that objective ambivalence can apply to a broader range of targets than previously considered. Indeed, research on personality traits, goals, and stereotypes might benefit from a consideration of how ambivalence moderates change.

As noted earlier, some prior studies have suggested that self-change might be most likely to occur among ambivalent individuals when the information encountered is perceived as consistent with their dominant views. For instance, participants in one set of studies paid more attention to proattitudinal information when they were (subjectively) ambivalent rather than unambivalent, as this information was perceived to have the greatest potential to reduce their ambivalence (Clark et al., 2008). When the arguments encountered were strong, the attitudes of ambivalent participants became polarized, but weak arguments, even though they were proattitudinal, backfired. Importantly, in that research, it was the *perception* that the information could reduce ambivalence that mediated the change pattern. By contrast, because the paradigms used in our studies were subtle, participants did not consciously perceive any information as relevant to their ambivalent self-views. Thus, the information designed to elicit change was "below the radar," suggesting that the motivation to resolve ambivalence-induced discomfort was unlikely to be responsible for our effects. Indeed, structural inconsistency in the form of objective self-ambivalence moderated self-change, regardless of the direction of participants' dominant self-views.

Whereas the dependent measure used in Experiment 1 pertained to self-evaluations, the dependent measure used in Experiment 2 pertained to specific attitudes. As such, Experiment 2 extended beyond Experiment 1 by showing that subtle inductions can lead self-ambivalent individuals to change those attitudes that are based on their self-views (e.g., policies that an African American might be stereotyped to endorse; Kawakami et al., 2003). Our results are therefore applicable not only to the self-concept in general but also to attitudes toward specific policies, which may have broader social consequences.

The present experiments also speak to two plausible mechanisms by which subtle situational variables may affect self-perceptions. First, according to implicit *misattribution* accounts, the content made accessible by change inductions is misinterpreted as being part of the self-concept (Jones et al., 2009; the expansion mechanism of Wheeler et al., 2007). Because accessible constructs should be more easily misattributed to an ambiguous target (e.g., ambivalent) than to a clearly represented target (see Higgins, 1996), one prediction of this account is that as objective ambivalence decreases, so does self-change, consistent with the present data. Another plausible explanation is that objectively ambivalent attitudes and self-views are more likely to be constructed based on currently accessible information, whereas unambivalent attitudes and self-views are more likely to be based on a stored summary evaluation (e.g., Holland et al., 2002; Markus & Wurf, 1987; see also Schwarz & Bohner, 2001). In other words, people with ambivalent (but not unambivalent) self-views may rely on primes to make spontaneous judgments about themselves. The results from Experiment 1, in which accessibility did not moderate the effect of the EC paradigm on self-esteem, might speak to the plausibility of these two mechanisms in our studies. Specifically, accessibility is expected to moderate construction (see DeMarree et al., 2010), but the existing literature makes no clear predictions about misattribution processes. Thus, because accessibility did not moderate self-change but objective ambivalence did, it may be more likely that our results were due to the impact ambivalence has on misattribution processes. Further disentangling these two mechanisms is an interesting potential direction for future research.

The subtle change inductions in our studies, although using different paradigms, are hypothesized to operate via similar processes. However, the mechanisms we proposed might not apply to all subtle change inductions. For example, subliminal social comparisons (e.g., Mussweiler et al., 2004), although certainly subtle in nature, are thought to operate via comparison, not via misattribution, processes. It is unclear whether objective ambivalence would moderate the direction or the magnitude of comparison processes in the same way that it moderates misattribution and construction processes.

Summary and Conclusion

The present studies demonstrate that structural features of the self-concept, specifically objective self-ambivalence, can affect individuals' responses to subtle change inductions. As such, they provide evidence for the conditions under which stimuli with no obvious connection to the self can alter people's self-esteem and social attitudes. The present findings also extend work on attitudinal ambivalence by showing that objective ambivalence is a useful construct for understanding self-change. Furthermore, by documenting these effects using objective ambivalence with respect to

traits, this is the first research to examine the strength-related consequences of ambivalence regarding non-attitude dimensions. Thus, a consideration of objective ambivalence appears to provide relatively unique prediction of self-change and related phenomena, such as changes in personal attitudes toward policies.

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Notes

1. Objective and subjective ambivalence (Priester & Petty, 1996) are sometimes referred to by different terms including potential versus felt ambivalence (e.g., Newby-Clark, McGregor, & Zanna, 2002). As noted, objective ambivalence is but one antecedent of subjective ambivalence. In this article, we focus on relatively stable or chronic antecedents of subjective ambivalence. However, subjective ambivalence can also arise from features of the context, such as being presented with information that counters one's preexisting attitude.
2. Readers might worry about the high suspicion rate in this study. However, these participants were evenly divided across experimental conditions (4 in the positive evaluative conditioning [EC] condition, 3 in the neutral EC condition). If participants drew a connection between the positivity of the EC stimuli and the self-evaluation questions that immediately followed the EC task, we would expect suspicion to occur only among participants in the positive EC condition. Furthermore, including these 7 participants in the analysis did not change the results reported.
3. Parallel results were obtained when other ambivalence formulae were used as might be expected because the various formulae are highly correlated with each other (Priester & Petty, 1996).
4. Including self-esteem as a control variable did not change the results reported.
5. Locke and Braun (2009) recently proposed an alternative strategy for examining objective ambivalence that breaks ambivalence into its component parts (positivity and negativity) as well as whether the attitude is, on balance, positive or negative, and the interactions of balance and the individual components. This strategy was designed to examine main effects of objective ambivalence on ambivalence-related constructs (subjective ambivalence) as well as nonambivalence outcomes (e.g., life satisfaction), and as such, recommendations for examining resistance were not offered. Ancillary analyses of both studies that examined the proposed model terms (Locke & Braun, 2009) in addition to condition and its interaction with all model terms revealed results that were generally consistent with ambivalence moderation of subtle self-change, although not at conventional significance levels. However, low power for these complex

analyses, as well as uncertainties about whether the model can accommodate interactive effects of ambivalence, leads us to view the traditional assessment strategy presented in the main text as more appropriate.

6. Analyses including these participants revealed nearly identical effects.
7. We also analyzed this model with the addition of participant gender as a factor in the analyses. In this study, gender significantly qualified our primary effect. The Prime \times Ambivalence \times Gender interaction was significant ($b = -.77$, $SE = .26$, $t(92) = 2.91$, $p = .005$). The interaction was such that the effects were present among female participants but not among male participants. Because there is likely greater overlap between the stereotype of men and African Americans than women and African Americans, this finding is consistent with research indicating that supraliminal stereotype primes, such as the one employed here, are more effective on nontargets (whereas subliminal primes are more effective on targets; Shih et al., 2002).

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