To Thine Own Self Be True?
Clarifying the Effects of Identity Discrepancies on Psychological Distress & Emotions

ABSTRACT

After many years of research across disciplines, it remains unclear whether people are more motivated to seek appraisals that accurately match self-views (self-verification) or are as favorable as possible (self-enhancement). Within sociology, mixed findings in identity theory have fueled the debate. A problem here is that a commonly employed statistical approach does not take into account the direction of a discrepancy between how we see ourselves and how we think others see us in terms of a given identity, yet doing so is critical for determining which self-motive is at play. We offer a test of three competing models of identity processes, including a new “mixed motivations” model where self-verification and self-enhancement operate simultaneously. We compare the models using the conventional statistical approach versus response surface analysis. The latter method allows us to determine whether identity discrepancies involving over-evaluation are as distressing as those involving under-evaluation. We use nationally representative data and compare results across four different identities and multiple outcomes. The two statistical approaches lead to the same conclusions more often than not and mostly support identity theory and its assumption that people seek self-verification. However, response surface tests reveal patterns that are mistaken as evidence of self-verification by conventional procedures, especially for the spouse identity. We also find that identity discrepancies have different effects on distress and self-conscious emotions (guilt and shame). Our findings have implications not only for research on self and identity across disciplines, but also for many other areas of research that incorporate these concepts and/or use difference scores as explanatory variables.

Keywords: social psychology; identity; emotions; distress; self-verification; differences scores

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1. Introduction

At least since the Chicago School, sociologists and other social and behavioral scientists have theorized and empirically explored the nature and importance of the self in social relations. The self is the ongoing social process in which people examine themselves as others would examine them. It is the ability to take oneself as an object (Mead 1934). One of the major questions that has come to the fore over the last several decades concerns which self-motive dominates individuals' thoughts, feelings, and behaviors, including in interaction with others. On the one hand, the desire to be viewed favorably (i.e., self-enhancement) may be among the most fundamental of human motivations across cultures (Kim 2011:148). On the other hand, despite the incredible amount of research that has been devoted to understanding self-enhancement and its effects (Leary 2007), the competing notion that people want others to view them as they view themselves (i.e., self-verification) is also alive and well in the literature. Based on the results of an extensive meta-analysis, Kwang and Swann (2010) conclude that the desire for self-enhancement does not outmode the desire for self-verification (see p. 275).

In sociology, fervor surrounding the verification/enhancement debate has been building around mixed findings in tests of identity theory, particularly those focusing on control system process for identities (Burke 1991). In this work the concept "identity" refers to the set of meanings that an individual holds for her/himself as a unique person or in connection with a particular occupied role or group membership (Stets and Serpe 2013). Despite being one of the most influential concepts in the social sciences, identity researchers have yet to reach agreement on how exactly identity processes work (Schwartz, Luyckx, and Vignoles 2011). In research on

identity theory, the crux of uncertainty is again whether individuals are principally motivated to verify or enhance self-views. When identity discrepancies arise—that is, when reflected appraisals do not match internalized identity meanings—a critical question is whether “direction” matters in its consequences. That is, are people equally distressed by “over-evaluation” and “under-evaluation” (a U-shaped relationship indicative of self-verification), or are they uniquely distressed by under-evaluation (indicative of self-enhancement)? As we detail below, identity theory assumes that people seek self-verifying evaluations. Yet paralleling mixed findings in psychology, some tests of identity theory lend support to the self-verification principle at its core, while other tests favor competing self-enhancement theories (e.g., Rogers 1961; Jones 1973; Kaplan 1975; Tesser 1988).

Insofar as the validity of an explanation depends upon the validity of its foundation, the uncertainty concerning the relative importance of self-motives in processes involving identity is far from trivial. Whether implicitly or explicitly, all theorizing in the social sciences makes assumptions about the individual (North 1990). We share the view that developing accurate, powerful theories on the micro-level is one of the keys to unlocking “secrets” of patterns on the macro-level (Collins 2004). Furthermore, to the extent that the basic assumptions of a theory are inaccurate, the usefulness of the theory and work that draws on it are correspondingly impaired (Shrivastava and Mitroff 1984). Studying identities is important because our understanding of them informs research on an array of social phenomena, including exchange (Burke 1997), stratification processes (Hunt 2003), distributive justice (Stets and Osborn 2008), morality (Stets and Carter 2011, 2012), life course transitions (Cast 2004), mental health (Marcussen 2006; Wright, King, and Rosenberg 2014), gender issues (Willer, Rogalin, Conlon, and Wojnowicz 2013), environmental behavior (Stets and Biga 2003), and the effects of incarceration (Asencio

and Burke 2011), to name a few. As the study of identities is firmly rooted in the discipline of sociology, accurate knowledge of the basic processes of identity is important. In this respect, advancing our understanding of the motivational aspects of the self will contribute to the goals of building useful theoretical and applied knowledge.

Our concern is that there are problems at the method-theory nexus that compromise the goals of theoretical progress and useful practical application in the program of research on self and identity. Focusing here on sociological contributions, we point out that the accepted procedure for examining the predicted U-shaped relationship between identity discrepancies and negative affect (1) relies on a difference-score measure of identity discrepancy that is not ideal (see, e.g., Edwards 1994, 2001), and (2) has the potential to produce misleading results by not precisely evaluating directional effects of identity discrepancies. Both problems have implications for the growth of the theory. To address them we employ polynomial regression with response surface analysis (see Shanock et al. 2010). This method does not use difference scores, and more importantly, it allows one to determine with statistical confidence whether and how the direction of a discrepancy matters. As we argue below, this is essential for adjudicating the verification/enhancement debate, here in the context of identity theory.

In this research we engage the ongoing debate by examining three different models of identity processes: self-verification (assumed by identity theory), self-enhancement, and a mixed motivations model that allows both motivations to operate concurrently. In what follows, we begin by providing an overview of identity theory with a focus on issues germane to the verification/enhancement debate. We then discuss methodological problems in tests of identity theory that in our view preclude unambiguous conclusions. Next we describe the methods for the current study and provide details about our analysis strategy (response surface analysis). After

presenting our results, we conclude by discussing the implications of our study for future research on identity theory and for other areas of research in the social sciences.

2. Theory

2.1. Identity theory

Identity theory consists of a group of explanations focusing on the interactional dynamics of identities (McCall and Simmons 1978), their structural foundations and organization within the self (Stryker [1980] 2002), and the internal processes of identity (Burke 1991). Our focus is on the latter approach, or what may be referred to as the perceptual control system branch of identity theory (hereafter identity theory).¹

At the core of identity theory is the concept of an “identity,” which again is the set of internalized meanings that a person holds for her- or himself as an individual (person identity) or in connection with an occupied social role (role identity) or group membership (group identity) (Stets and Serpe 2013). In addition to a more or less unique identity as a person, an individual has as many structurally based identities as she or he has roles and group memberships. The set of self-meanings associated with a given identity operates as a referential “identity standard” against which people compare transitory perceptions of self-relevant meanings that arise from the verbal or nonverbal gestures of others during social interaction (i.e., reflected appraisals).

In line with self-verification and self-discrepancy theories in psychology (Swann 1983; Higgins 1987), the crux of identity theory is that people are motivated to seek consistency between their own self-meanings and reflected appraisals conveyed through others' actions. Importantly, though, motivations are not directly measured, but rather are inferred by examining the predicted consequences of identity discrepancies for well-being. According to Burke (1991; see also Carver and Scheier 1981), identities are part of a perceptual control system whereby

individuals dynamically adjust to and correct identity-discrepant feedback. Much as a thermostat continuously monitors the environment and operates to maintain a set temperature, people continuously monitor social feedback and behave to ensure that feedback aligns with an identity standard. When feedback does not align with an identity standard—i.e., when the identity process is disrupted—the predicted result is negative arousal in the form of distress (e.g., feelings of depression and anxiety).²

2.2. *Emotions*

In addition to creating psychological distress, identity discrepancies also produce negative emotions, such as anger and sadness (Stets 2006). As described below, measures of two different emotions (guilt and shame) are available in the data we use. Recent research suggests a link between identity discrepancy and feelings of guilt and shame as well as other emotions. Specifically, Stets and Burke (2014b) reanalyzed seven previously published studies, each of which involved a survey phase as well as a separate laboratory experiment. Six of the seven studies employed a multi-item scale combining four primary emotions (happiness, fear, anger, and sadness) and two secondary emotions (guilt and shame). Importantly, a factor analysis of the six items revealed a *single* dimension. This fact, in combination with the strong support that Stets and Burke report for the hypothesized link between identity discrepancies and negative emotions, suggests that identity discrepancies may have comparable effects on different kinds of emotions. Yet we cannot know this more definitively because the primary emotions and secondary emotions comprising the scale were not analyzed separately and compared.

In addition, all of the studies that Stets and Burke examined focused on the “moral” identity in particular, and it makes outward sense that discrepancy in the moral identity would be linked to guilt and shame. It remains unclear whether feelings of guilt and/or shame are linked to

discrepancies in identities other than the moral identity (i.e., in a more general way). That said, guilt and shame are among the “self-conscious emotions” that are fundamental to processes of self-evaluation (Tangney 2003). Furthermore, guilt and shame are especially tightly bound to self-awareness and thus play a uniquely important role in linking people to the basic macro-structures that organize social life, including roles (Turner and Stets 2006). Finally, while the basic emotions (e.g., anger, sadness) *may* arise from self-evaluation, only self-conscious emotions *must* involve this process (Tracy and Robins 2007). Therefore, analysis of self-conscious emotions may help resolve the ambiguity of whether participants in laboratory tests of identity theory are reacting to the mere valence of negative/positive feedback or its identity-relevance (see Stets 2005:51).

Given their importance in fundamental social processes, guilt and shame may in fact be linked to identity discrepancies beyond the moral identity. Our study will help shed light on this question and in so doing contribute to the explicit agenda of advancing our understanding of the role of emotions in identity processes (Stets 2006).

2.3. Discrepancy Direction

While identity discrepancies produce negative emotions as well as psychological distress, the *direction* of a discrepancy does not matter according to identity theory (see, e.g., Figure 1 in Burke and Harrod 2005). In other words, when the dimension of meaning is one of explicit or implicit evaluation, identity theory predicts that reflected appraisals that exceed a person's identity standard will produce just as much distress and negative emotion as reflected appraisals that fall short of the identity standard by a comparable amount (Burke and Harrod 2005). For example, if “moderately attentive” is a self-meaning that is part of a person's role identity as a spouse, identity theory predicts that the person will feel just as bad when feedback from a partner

indicates that she or he is “highly attentive” (over-evaluation) as when feedback indicates that she or he is “highly inattentive” (under-evaluation). Given a discrepancy, the person will change her or his attentiveness up or down, as the case may be, to help ensure that future feedback aligns with the identity standard.³ While competing self-enhancement theories agree that the person would feel bad about the under-evaluative feedback, they oppositely predict that the person would feel *good* (not bad) about the laudatory feedback. In general, then, it is with respect to predicted behavioral and affective responses to *over-evaluation* that identity theory and self-enhancement theories diverge.

An important and persistent question in identity theory research concerns whether the theory is correct in its fundamental assumption that self-verification and not self-enhancement drives the perceptual control of identities. Empirical studies focusing on this question have produced mixed results. Stets (2005; see also Stets 2003) conducted a laboratory experiment invoking the “worker” role identity where participants received feedback that was either consistent with their identity standard (verification), less favorable than their identity standard (negative non-verification), or more favorable than their identity standard (positive non-verification). Contrary to identity theory but consistent with self-enhancement theories from psychology, participants in the positive non-verification condition self-reported *positive* as opposed to negative emotions. In other words, participants in this condition were not bothered by feedback that was more positive (enhancing) than what they expected given their worker identity standard. Stets (2005) suggested that this unexpected finding could have resulted from the laboratory setting that she used because participants in that context may not have become invested in the short-term identity they were led to enact. She concluded that the predictive power of identity theory could be strengthened by specifying the limits of the theory's

applicability; including the possibility that self-verification may only operate when individuals are committed to an identity. This conclusion is consistent with Swann's (1987) argument that self-views are a product of experience that are not easily created or manipulated in an experimental setting.

Stets and Ascencio (2008) conducted a similar laboratory experiment on the worker identity and found the same main result: participants reported positive rather than negative feelings when feedback was more positive than what they expected given their worker identity standard. While this finding is again consistent with self-enhancement theories, it is qualified by the fact that positive reactions to enhancing non-verification diminished over time during the experiment. This suggests that self-enhancement may guide immediate reactions to non-verifying feedback while the self-verification motive would seem to take over as time passes.

Burke and Harrod (2005) offer a direct test of identity theory's self-verification principle versus self-enhancement using longitudinal survey data from newly married couples. To test the curvilinearity hypothesis that people are comparably bothered by under-evaluation and over-evaluation, they employed polynomial regression and examined the effects of "identity discrepancy" (reflected appraisals minus self-meanings) and "discrepancy-squared" on five positive and negative affective outcomes and one behavioral outcome (the probability of separation or divorce). The squared term was significant and had the expected sign in all models. Burke and Harrod interpreted this to mean that increasing discrepancies of under-evaluation *and* over-evaluation both produced decreasing positive affect, increasing negative affect, and an increasing probability of separation or divorce. They concluded that their direct test of self-verification versus self-enhancement "strongly confirmed the predictions from discrepancy

theories” (Burke and Harrod 2005:372). Since then, their statistical approach has become the procedure of choice for testing identity theory predictions (Stets and Serpe 2013).

The latest study to use this statistical approach mostly replicated Burke and Harrod’s (2005) findings. As mentioned above, Stets and Burke (2014b) reanalyzed the data from seven previously published studies, each of which involved a survey component as well as a laboratory component. While they detected a small enhancement effect in the surveys (but not in the laboratory studies), they concluded that the *overall* effect of non-verification was a “strong U-shaped function” that supports the fundamental assumption of self-verification in identity theory (Stets and Burke 2014b:20). Still, the partial support for self-enhancement is noteworthy.

In sum, as in psychology, empirical research in identity theory focusing on the verification/enhancement question has produced mixed results and has raised various substantive issues. However, considering the statistical method that has become convention for testing identity theory (i.e., linear regression with a quadratic term), we see some important problems standing in the way of progress in resolving the verification/enhancement debate.

2.4. Problems at the Method-Theory Nexus

Using polynomial regression with difference scores to examine the curvilinear effect of identity discrepancies raises two methodological problems. First, difference-score analysis, in general, suffers from several problems, not the least of which is an inflated risk of *both* Type I and Type II statistical errors (Edwards 2001). Second, and perhaps more importantly, the method leaves open the possibility that one may misinterpret the data because the coefficient for “identity discrepancy-squared” is ambiguous. A positive and significant coefficient for the squared term could mean one of three things: (1) discrepancies of under-evaluation *and* over-evaluation both increase negative affect at the same rate (a symmetric U-shaped relationship),

which is what identity theory predicts, (2) *either* discrepancies of under-evaluation *or* discrepancies over-evaluation increase negative affect (a half U-shaped relationship), or (3) discrepancies of under-evaluation *and* over-evaluation both increase negative affect, *but at different rates* (an asymmetric U-shaped relationship that is steeper on one side).

All three of the above possibilities would produce a positive and significant coefficient for “identity discrepancy-squared,” but only the pattern associated with the first possibility indicates self-verification. One version of the second possibility above is where negative affect decreases (slopes downward) as the degree of under-evaluation lessens but then flattens out throughout the range of over-evaluation. This would suggest that any amount of over-evaluation is enough to avert *negative* affect, which is arguably most consistent with self-enhancement theories and not consistent with identity theory. Additionally, one version of the third possibility above is where the relationship between discrepancies and negative affect is simply *stronger* for under-evaluation than it is for over-evaluation. This is perhaps the most interesting pattern, though it too is different from what identity theory formally predicts (again, see Figure 1 in Burke and Harrod 2005). It suggests another possibility: that both self-verification and self-enhancement could effectively operate at the same time. People may be driven by a basic motivation to avoid identity discrepancies while also being driven to see themselves in positive light (Gecas 2001). This means that rather than always being guided by *either* self-verification *or* self-enhancement, responses to identity discrepancies may reflect a “negativity bias,” such that feedback that is particularly “bad” with respect to an identity (i.e., under-evaluation) may have a *greater* impact on negative affect than feedback that is “good” (i.e., over-evaluation). In other words, people may respond to over-evaluation as the “lesser of two evils.” The argument here is similar to the claim in distributive justice research that people are *more* bothered by unjust

under-reward than unjust over-reward (Jasso 1980). It also aligns with the support that Mirowsky (1985) found for a “partial equity” model of depression and marital power, where depression is predicted to be lower when the balance of power is tilted in one's favor compared to when it is tilted in favor of one's spouse. Indeed, findings from many different areas of research in social psychology all converge on the conclusion that bad may be stronger than good in a more general sense (Baumeister, Bratslavsky, Finkenauer, and Vohs 2001). In the case of identity processes, we see the mechanism as a possible biasing of self-verification *by* a desire to see the self favorably in a “mixed motivations” model, which we contrast with “pure” self-verification (identity theory) and self-enhancement.

The bottom line is that one cannot simply look at the significance and sign of the squared term in a polynomial regression with difference scores and determine whether or not identity theory is supported. And while useful, graphing is not definitive because one cannot be sure whether any visually apparent asymmetry in a curvilinear relationship between identity discrepancy and negative affect is statistically meaningful. What is needed, then, is a method capable of indicating with statistical confidence whether the *direction* of an identity discrepancy actually matters and, if it does, in what way it matters. The method that does this quite elegantly is polynomial regression with response surface analysis (Shanock et al. 2010). Additionally, the method does not rely on difference scores, and so the limitations associated with their use (e.g., inflated Type I and Type II errors) are not a concern. And as we discuss in more detail below, yet another advantage of polynomial regression with response surface analysis is that “no discrepancy” is treated as a series of points of verification falling along a “line of congruence,” not as a single point. In other words, the method uniquely allows an examination of whether outcomes are different for individuals whose self-meanings and reflected appraisals are the same

across the continuum of self-verification, from low ratings on both to high ratings on both. As an addendum to our analyses of identity discrepancies, then, we can examine the heretofore unasked question of whether negative affect decreases along the continuum of self-verification from equally low self-meanings and reflected appraisals to equally high self-meanings and reflected appraisals. All things considered, response surface analysis has more explanatory potential than other alternatives for analysis of the effects of a discrepancy between two explanatory variables, such as traditional moderated regression (Shanock et al. 2010) or spline regression.

Employing response surface analysis, the present research addresses two main questions. First, can we replicate past identity theory research by following the conventional practice of regressing negative affect on “identity discrepancy” measured as a difference-score variable (i.e., reflected appraisals minus self-meanings) and “identity discrepancy-squared”? Second, and more importantly, do we obtain the same or different results when we use polynomial regression with response surface analysis? As described above, the latter approach does not rely on difference scores and involves statistical tests to determine whether the direction of the discrepancy matters and in what way it matters. If identity theory is correct, it should not matter. If self-enhancement theories are correct, negative affect will decrease linearly from the highest levels of under-evaluation to the highest levels of over-evaluation (Burke and Harrod 2005). Finally, if “mixed motivations” are operating, discrepancies in either direction will increase negative affect, but discrepancies of under-evaluation will have a stronger effect on negative affect than discrepancies of over-evaluation.

Overcoming methodological limitations in sociological research on identities is an important key to adjudicating the verification/enhancement question and ensuring continued theoretical, empirical, and applied progress in the area and in related areas of research. In our

analyses we will also address the exploratory question of whether negative affect decreases along the continuum of self-verification from equally low self-meanings and reflected appraisals to equally high self-meanings and reflected appraisals. We describe polynomial regression with response surface analysis and our analytic strategy and statistical predictions in more detail below.

3. Method

3.1. Data and Sample

For this research we use data from a telephone survey that was designed to test an identity theory model of psychological distress.⁴ The data were drawn from a national, multi-stage cluster sample of 1,409 U.S. adults. The response rate was 47 percent.⁵ In addition to questions about demographics and questions measuring emotions and dimensions of psychological distress, each respondent was questioned about two identities that were randomly assigned from among those that she or he occupied, including the “person” identity (Stets and Serpe 2013) as well as several possible role identities. To gauge the robustness of the relationships explored in this research, we separately examine the person identity as well as three different role identities available in the data: spouse, parent, and friend. In addition we examine the effects of identity discrepancies across two different dimensions of negative affect: psychological distress (depression and anxiety) and two self-conscious emotions (guilt and shame).

3.2. Measures

3.2.1. Independent Variables

During the survey each respondent was asked to indicate, from *their own* perspective, the extent to which a series of seven evaluative meanings applied to them with reference to each of

the two randomly assigned identities. The response categories ranged from 0 (“not at all”) to 10 (“extremely”). In addition, respondents were also asked to use the same response categories to indicate the extent to which the evaluative meanings applied to them from the point of view of *others*.⁶ For example, a respondent who was asked about her or his parent identity would be asked the following set of questions: (a) “As a parent, *I see myself as* attentive,” and (b) “As a parent, *others see me as* attentive.” For each identity, these questions were repeated seven times—once for each of seven evaluative meanings. The sets of meanings were chosen to reflect aspects of each identity based on the results of a pilot study, and therefore vary. For example, the meanings for the parent identity include attentive, cool-headed, forgiving, optimistic, methodical, patient, and unselfish, and the meanings for the friend identity include dependable, direct, forgiving, honest, individualistic, interesting, and optimistic. Table 1 lists the specific evaluative meanings for each identity along with the alpha reliabilities for the self-meanings and reflected appraisals associated with each set.

Table 1 About Here.

Following Burke and Harrod (2005), we performed principal component analyses on the evaluative meanings for each identity. For the spouse identity, the Kaiser-Guttman criterion indicated that a single component was optimal for both self-meanings and reflected appraisals when one evaluative meaning (“independent”) was removed, thus we eliminated it. In doing so the first principal component explained 47% of the variance for self-meanings (eigenvalue = 2.849) and 49% of the variance for reflected appraisals (eigenvalue = 2.947). For each of the remaining identities, principal component analyses revealed that a single component was optimal for both self-meanings and reflected appraisals using all seven of the original items. For the parent identity, the first principal component explained 47% of the variance for both self-

meanings and reflected appraisals (eigenvalues = 3.297 and 3.320, respectively). For the friend identity, the first principal component explained 45% of the variance for self-meanings (eigenvalue = 3.118) and 44% of the variance for reflected appraisals (eigenvalue = 3.087). Finally, for the person identity, the first principal component explained 44% of the variance for both self-meanings and reflected appraisals (eigenvalues = 3.079 and 3.083, respectively).

For each PCA, and again following Burke and Harrod (2005), we saved the standardized component scores (zero mean and unit variance) on the component that was extracted. This produced eight new variables: component scores constituting a measure of *self-meanings* and component scores constituting a measure of *reflected appraisals* for each of the four identities. To create measures of *identity discrepancy*, each respondent's overall self-view for a given identity (i.e., her or his component score for the self-meanings associated with the identity) was subtracted from the overall perceived view of others (i.e., the component score for the reflected appraisals associated with the identity). A negative value for this difference indicates that others are perceived to see the respondent more negatively than she sees herself (i.e., under-evaluation), while a positive value indicates that others are perceived to see the respondent more positively than she sees herself (i.e., over-evaluation). Zero is “no discrepancy.” Thus for each of the four identities we have measures of self-meanings and reflected appraisals (for the analyses using polynomial regression with response surface analysis) and a measure of identity discrepancy (for the replication analyses regressing negative affect on “identity discrepancy” and “identity discrepancy-squared”).

3.2.2. *Dependent Variables*

As mentioned above, we examine the effects of identity discrepancies across two different dimensions of negative affect, psychological distress (depression and anxiety) and two

self-conscious emotions (guilt and shame). In the data we use, depression and anxiety were measured using the Hopkins Symptom Checklist (HSCL-25; Derogatis et al. 1974; Hesbacher et al. 1980). Respondents indicated the extent to which each of 10 anxiety symptoms and each of 15 depression symptoms bothered or distressed them during the past week, including the day of the interview.⁷ The response categories ranged from 1 (“not at all”) to 4 (“extremely”). We created measures of *anxiety* and *depression* by summing the respective items for each construct. The alpha reliability for the 10-item anxiety symptoms scale is .885, and the alpha reliability for the 15-item depressive symptoms scale is .910.

In addition to examining the effect of identity discrepancies on distress, we also examine its effects on emotions. Measures of two different self-conscious emotions, guilt and shame, are available in the data we use. To measure guilt, respondents were asked to indicate the extent to which they were bothered or distressed by each of the following during the past week, including the day of the interview: (1) “Feeling 'not right' with myself because of something I have done,” (2) “Thinking of certain things I've done and feeling almost sick,” (3) “Constantly thinking of things I have done which I consider to be wrong,” (4) “Feeling a strong sense of regret,” (5) “Worrying about things I have done in the past,” and (6) “Wanting to change things I have done.” As with the measures of anxiety symptoms and depressive symptoms, the response categories ranged from 1 (“not at all”) to 4 (“extremely”). To measure shame, respondents used the same response categories to indicate the extent to which they were bothered or distressed by each of the following during the past week, including the day of the interview: (1) “Feeling ashamed,” and (2) “Feeling embarrassment.” We created measures of *guilt* and *shame* by summing the respective items for each construct. The alpha reliability for the 6-item guilt scale is

.882, and the Spearman-Brown reliability for the 2-item shame scale is .722.⁸ Table 2 reports the descriptive statistics for all of the additive variables used in the analyses, separately by identity.⁹

Table 2 About Here.

3.3. Analysis Strategy

3.3.1. Central questions

As indicated above, our analysis strategy sheds light on two main empirical questions that we have raised.

Question 1: Can we replicate past identity theory research? We will first attempt to replicate Burke and Harrod's (2005) findings by following the currently accepted approach of regressing affective outcomes on “identity discrepancy” measured as a difference-score variable (i.e., reflected appraisals minus self-meanings) and “identity discrepancy-squared.” Specifically, we will examine the effects of “identity discrepancy” and “identity discrepancy-squared” on each of the four outcomes (depression, anxiety, guilt, and shame) across each of the four identities (spouse, parent, friend, and person). Burke and Harrod's findings will be replicated for identity/outcome combinations where the coefficient for the squared (quadratic) term is positive and significant.

Question 2: Self-Verification, Self-Enhancement, or Mixed Motivations? In our second set of analyses, we will go beyond previous research by examining the effect of identity discrepancies on distress and self-conscious emotions using polynomial regression with response surface analysis. In this type of analysis, a polynomial regression equation of the following general form is estimated first:

$$Z = b_0 + b_1X + b_2Y + b_3X^2 + b_4XY + b_5Y^2 + e,$$

where Z is the dependent variable (e.g., anxiety symptoms), X is Predictor 1 (e.g., reflected appraisals), Y is Predictor 2 (e.g., self-meanings), X^2 and Y^2 are the squared terms for each of the two predictors, and XY is the interaction between the two predictors. However, rather than directly interpreting the results from estimation of this equation, the coefficients are used to compute and evaluate four separate surface values labeled a_1 , a_2 , a_3 , and a_4 (see Shanock et al. 2010 for the formulae used to calculate the surface values and their statistical significance).¹⁰ What do these tests mean? Visual examples will help convey what they reveal.

Figure 1 shows three hypothetical 3-D surface plots of negative affect as predicted by the reflected appraisals/self-meanings discrepancy. Note first that the dashed line along the floor of each graph represents the “line of incongruence” between reflected appraisals and self-meanings ($X \neq Y$). Where identity theory and competing explanations are concerned, this line is the most relevant one. In the present case, moving outward in either direction from the midpoint of the line reveals whether negative affect *increases* as discrepancies of *either* under-evaluation *or* over-evaluation increase. The surface test value for a_4 captures this curvature (as related to the “height” of the outcome). When the curvature is upward, the value of a_4 is positive, and this means that negative affect increases as *both* under-evaluation and over-evaluation increase. Importantly, using the formulae in Shanock et al. (2010), we can also calculate a significance test of a_4 .

Figure 1 About Here.

For testing different models of identity processes, though, we must also determine, as we have argued, whether and how the *direction* of a discrepancy matters. Even if we find that a_4 is significant and positive, a second important question arises: does under-evaluation influence negative affect differently than over-evaluation? The surface value for a_3 answers this critical

question. In the present case a_3 represents the slope of under-evaluation to over-evaluation along the line of incongruence as it relates to negative affect. If under-evaluation is associated with greater negative affect than over-evaluation, the value of a_3 will be negative. Here too we can calculate a significance test of a_3 using the formulae in Shanock et al. (2010). As mentioned above, this is an important advantage of response surface analysis over linear regression with a quadratic term. The significance tests for the surface values produced by response surface analysis allow us to determine with statistical confidence whether and how an outcome is affected differently when a discrepancy between predictors is in one direction (e.g., under-evaluation) versus the other (e.g., over-evaluation). Plots may *suggest* asymmetry in a curvilinear relationship, but the statistical tests for the surface values produced by response surface analysis are unique and important because they tell us whether a visually detectable pattern is actually statistically significant (e.g., whether under-evaluation has a *statistically* stronger effect on negative affect than over-evaluation).

The three hypothetical plots in Figure 1 help convey how the results of the surface tests for a_3 and a_4 , *considered together*, can be taken to support one theoretical view over others. In Panel A of Figure 1, note the curvature along the dashed line of incongruence. The graph shows that toward the ends of the line of incongruence where reflected appraisals and self-meanings become more and more discrepant with *either* under-evaluation *or* over-evaluation, negative affect increases, exactly as identity theory would predict. Again, the surface value for a_4 captures this curvature, and because the curvature is upward, we would expect a_4 to be significant and positive. Furthermore, note that levels of negative affect seem to be *the same* at maximum under-evaluation (the very back of the graph) and maximum over-evaluation (the front-left of the graph), which is also exactly what identity theory predicts. Because negative affect increases

similarly as the discrepancy between self-meanings and reflected appraisals increases in either direction, we would expect a_3 to be non-significant. Thus Panel A in Figure 1 represents what we would expect to find if identity theory is correct.

Panel B in Figure 1 represents a very different scenario. Here there is no curvature along the line of incongruence because negative affect is positively related to under-evaluation, but inversely related to over-evaluation, which is what self-enhancement theories predict (Burke and Harrod 2005). Because there is no curvature along the line of incongruence (i.e., because negative affect only increases as under-evaluation increases), we would expect a_4 to be non-significant in this case. However, because negative affect decreases along the line of incongruence from under-evaluation to over-evaluation, we would expect a_3 to be significant and negative. Thus Panel B in Figure 1 represents what we would expect to find if self-enhancement theories are correct.

Finally, Panel C in Figure 1 represents what we expect to find if “mixed motivations” are operating—i.e., if self-verification is biased or “clouded” to some extent by a concurrently operating desire to see the self favorably. Here note that negative affect is highest toward the very back of the graph where reflected appraisals are much *lower* than self-meanings, which represents maximum under-evaluation. By contrast, negative affect is comparably less toward the front-left of the graph where reflected appraisals are much *higher* than self-meanings, which represents maximum over-evaluation. In essence, what this graph shows is that people are bothered by both under-evaluation and over-evaluation, but *not as much* by over-evaluation. In terms of the surface value tests, because negative affect *increases* as discrepancies of *either* under-evaluation *or* over-evaluation increase (positive curvature), we would expect a_4 to be

significant and positive. But because under-evaluation is associated with greater negative affect than over-evaluation, we would expect a_3 to be significant and negative.

Based on the above discussion, our analyses will compare three competing models of identity processes. Support for identity theory and self-verification will be shown in models where (1) a_4 is significant and positive, and (2) a_3 is *not* significant. By contrast, self-enhancement theories will be supported in models where (1) a_4 is *not* significant (no curvature along the line of incongruence), and (2) a_3 is significant and negative. Finally, the “mixed motivations” model will be supported in models where (1) a_4 is significant and positive, and (2) a_3 is significant and negative. Table 3 summarizes the specific predictions from the three competing models of identity processes.

Table 3 About Here.

3.3.2. Exploratory Questions

While not of central concern to theories focusing on the deleterious effects of identity *discrepancies*, one of the advantages of polynomial regression with response surface analysis, in general, is that it permits examination of how the congruence or equivalence of two predictor variables across their range relates to an outcome. Fixed in two dimensions, the conventionally used difference-score approach in identity theory research requires that we treat self-verification or “no discrepancy” as a single point or value (i.e., “0”). That is, the approach does not and cannot distinguish between self-verification that occurs when an individual has low self-meanings and equally low reflected appraisals versus self-verification that occurs when an individual has high self-meanings and equally high reflected appraisals. These cases and all cases in between are always treated the same. That is, in every case where self-meanings are equivalent to reflected appraisals, discrepancy = 0. In other words, the *absolute levels* of the self-

meanings and reflected appraisals are ignored, yet explanatory potential is increased by not ignoring these levels.

In the three dimensions of polynomial regression with response surface analysis, “no discrepancy” is not a single point, but rather a series of points falling along what is termed a “line of congruence” (i.e., the solid line in panels A, B, and C of Figure 1). This approach increases explanatory potential by allowing us to examine whether outcomes are different for individuals along the entire line of congruence or what we might refer to as the continuum of self-verification (i.e., from the case with the lowest self-meanings and equally low reflected appraisals to the case with the highest self-meanings and equally high reflected appraisals). Here absolute levels of self-meanings and reflected appraisals are not ignored. We think this is important because it seems reasonable to expect that negative affect will decrease as the evaluative meanings that individuals have for themselves (i.e., self-meanings) increase *along with* the evaluative meanings that they perceive others have for them (i.e., reflected appraisals). When it comes to self-verification, we would expect individuals with equally/congruently low self-meanings and reflected appraisals to experience more negative affect than individuals with equally/congruently high self-meanings and reflected appraisals. In other words, if a person has a negative view of herself with respect to a particular identity and perceives that others agree with that view, she will experience more negative affect compared to a person who has a more positive view of herself and perceives that others agree. If there is in fact an additive relationship along the continuum of self-verification (or line of congruence) as it relates to negative affect, the surface test of a_1 will be negative and significant.

Any nonlinearity in the relationship would be captured by the surface test for a_2 . For example, if the relationship curves downward, a_2 will be significant and *negative*, which would

suggest a pattern of “increasing returns” where negative affect decreases more sharply as we move along the continuum of self-verification from equally low self-meanings and reflected appraisals to equally high self-meanings and reflected appraisals. If a_2 is significant and *positive*, this would suggest a pattern of “diminishing returns” where negative affect decreases less sharply as we move along the continuum of self-verification from equally low self-meanings and reflected appraisals to equally high self-meanings and reflected appraisals.

In sum, our analyses address two main empirical questions. First, can we replicate past identity theory research by following the conventional practice of regressing the measures of negative affect on “identity discrepancy” measured as a difference-score variable (i.e., reflected appraisals minus self-meanings) and “identity discrepancy-squared”? And second, do we obtain the same or different results when we use polynomial regression with response surface analysis? In answering the second question, and as explained above, we will also address the exploratory question of whether negative affect changes along the continuum of self-verification (or line of congruence) from equally low self-meanings and reflected appraisals to equally high self-meanings and reflected appraisals. The larger question at stake is how robust the effects turn out to be across identities and outcomes. Do any clear and consistent patterns emerge?

4. Results

4.1 Handling of missing data

We began with 634, 549, 632, and 586 cases for the spouse, parent, friend, and person identities, respectively. Across all of the models estimated below, missing values arising from listwise deletion range from 6.57 percent to 17.30 percent (11.02 percent on average). Loss of statistical power is not a serious concern as the final N s for the models, ranging from 454 to 582, are quite large given the number of independent variables. While listwise deletion has a number

of advantages over more complex methods of handling missing data such as multiple imputation (Allison 2014), as a safeguard we also imputed item nonresponse using multiple imputation of five datasets (Little 1988) and repeated all of the analyses reported below using pooled estimates. In no case do the substantive conclusions we reach change. Accordingly, the analyses to follow all use listwise deletion. The comparable MI results are available upon request.

4.2. Can we replicate past identity theory research?

Using polynomial regression with difference scores, the results for each of the 16 identity/affective outcome combinations are shown in Table 4. Twelve of the 16 models replicate Burke and Harrod's (2005) findings.¹¹ In these models, the squared term for identity discrepancy has the expected significant and positive effect on the outcome. In four instances, though, we fail to replicate past identity theory research. Specifically, the squared term does not have a significant effect on anxiety for the friend identity, nor does it have a significant effect on shame for *any* of the role identities (spouse, parent, and friend). Yet the squared term does have a significant and positive effect on shame for the person identity. To us this is the most interesting finding thus far. Contrary to what we expected based on previous research (Stets and Burke 2014b), it suggests that identity discrepancies may have different consequences for self-conscious emotions, particularly shame, depending on the *type* of identity. We return to this interesting issue and its implications for identity theory and related research in the discussion below. For now it will suffice to say that while we mostly replicated Burke and Harrod's (2005) findings with respect to the distress outcomes, we did not consistently do so for the two self-conscious emotions we examined.

Table 4 About Here.

For illustrative purposes, Figure 2 shows graphs of the relationship between discrepancies in the parent identity and predicted values for each of the four outcomes. Figure 3 shows the same graphs for the spouse identity.¹² The graphs in Figure 2 support a fairly strong case for identity theory. The relationship between identity discrepancy and each of the four outcomes is U-shaped and quite symmetrical, though there would seem to be no effect in the case of shame, which aligns with what we found in the regression analysis. For the spouse identity, though, the graphs in Figure 3 are more ambiguous, thus helping to demonstrate the main limitation of this approach. While the relationship between identity discrepancy and each of the four outcomes is still U-shaped, in every case the response curve is “tilted” to the right, suggesting that increasing over-evaluation (to the right of the dashed reference line) is not as deleterious as increasing under-evaluation (to the left of the dashed reference line). That said, we have no way of determining whether what seems to be the case in the graphs is actually statistically meaningful. Yet as we have argued and as should now be clear, being able to determine with statistical confidence whether direction matters and precisely how it matters is critical for adjudicating among the different theoretical explanations of how people respond to identity discrepancies. We aim to resolve this important problem at the method-theory nexus using response surface analysis.

Figures 2 and 3 About Here.

4.3. Self-Verification, Self-Enhancement, or Mixed Motivations?

Table 5 shows the response surface analysis results for the spouse identity separately by affective outcome. As explained above, rather than directly interpreting the main, interactive, and quadratic effects from the polynomial regression analyses, the coefficients from these analyses are used to compute the response surface values for each equation. These values are shown in the

bottom half of each table. Recall, a_1 and a_2 are the linear and nonlinear effects, respectively, along the line of self-verification/congruence (the exploratory values in our analyses), and a_3 and a_4 are the linear and nonlinear effects, respectively, along the line of non-verification/incongruence. The latter two values are of primary interest. Taken together, they indicate support for one or another of the three explanations of responses to identity discrepancies (i.e., identity theory/self-verification, self-enhancement, or mixed motivations).

Table 5 About Here.

While the results for *shame* and the spouse identity are the same as we found above (i.e., no effects—the R^2 in this model is not significantly different from zero, and so we do not evaluate the polynomial regression results with regard to the surface test values), our use of polynomial regression with response surface analysis reveals, in fact, that the *direction* of the discrepancy matters in a fashion that supports a “mixed motivations” account. That is, for depression, anxiety, and guilt in the spouse identity, the coefficient for a_3 is negative and significant, and the coefficient for a_4 is positive and significant. The fact that a_4 is positive and significant means that both under-evaluation and over-evaluation are undesirable; however, contrary to identity theory, the fact that a_3 is negative and significant means that *under-evaluation produces more depression, anxiety, and guilt, than over-evaluation*. Thus for the spouse identity, the response surface tests dominantly support the “mixed motivations” account over identity theory and self-enhancement theories. In other words, while both under-evaluation and over-evaluation increase depression, anxiety, and guilt, over-evaluation is the “lesser of two evils,” at least for the spouse identity. As an illustrative example, Figure 4 shows the 3-D surface plot of depression as predicted by the reflected appraisals/self-meanings discrepancy in the

spouse identity. Note the considerably higher peak for under-evaluation along the line of incongruence.

Figure 4 About Here.

Finally, in terms of the exploratory tests of the surface tests for a_1 and a_2 , neither is significant for any of the affective outcomes in the spouse identity. There are no differences along the continuum of self-verification. That is, for the spouse identity, individuals with equally high reflected appraisals and self-meanings fair no better in regard to depression, anxiety, guilt, and shame than individuals with equally low reflected appraisals and self-meanings.

The results for the remaining parent, friend, and person identities across the four affective outcomes are shown in tables 6, 7, and 8, respectively. Because the results for these three identities are more similar than different, we consider them together. Most importantly, as we found using the conventional statistical technique, the results for these three identities are mostly consistent with identity theory and the self-verification motive. For eight of the 12 surface tests across these identity/affective outcome combinations (i.e., two-thirds of the tests), a_4 is positive and significant and a_3 is *not* significant. This indicates, as identity theory uniquely predicts, that (1) both under-evaluation and over-evaluation increase negative affect, and (2) the direction of the discrepancy does not matter. As a particularly illustrative example, Figure 5 shows the 3-D surface plot of anxiety symptoms as predicted by the reflected appraisals/self-meanings discrepancy in the parent identity. Note the peaks of approximately equal height for under-evaluation and over-evaluation along the line of incongruence.

Tables 6, 7, and 8 About Here.

Figure 5 About Here.

Among the parent, friend, and person identities, the only exceptions where support is *not* shown for identity theory are for anxiety in the friend identity (where again we find no effects at all) and also for shame in all three of these identities. As we found using the conventional statistical technique, there are no effects on shame for the parent and friend identities. However, contrary to what we found using the conventional statistical technique, the response surface tests for shame in the *person* identity are consistent with the mixed motivations account, not identity theory. No matter what statistical method is used, though, it is interesting to note that shame is uniquely linked to discrepancies in the *person* identity. Again, we will return to this issue in the discussion below.

Finally, in terms of the exploratory tests of the surface tests for a_1 and a_2 , the results vary across the parent, friend, and person identities. As we found for the spouse identity, neither a_1 nor a_2 is significant for any of the affective outcomes with respect to the friend identity. For both the spouse and friend identities, then, there are no differences along the continuum of self-verification. Individuals with equally high reflected appraisals and self-meanings fair no better in regard to depression, anxiety, guilt, and shame than individuals with equally low reflected appraisals and self-meanings.

For the parent and person identities, though, some significant effects begin to emerge. For the parent identity, a_1 is negative and significant for depression and guilt, indicating that depression and guilt decrease as the evaluative meanings that individuals have for themselves (i.e., self-meanings) increase together with the meanings that others have for them (i.e., reflected appraisals). And for depression in the person identity, both a_1 and a_2 are significant. Specifically, the effect of a_1 is negative and significant, and the effect of a_2 is positive and significant. Thus for depression in the person identity, we find a pattern of “diminishing returns,” such that the

beneficial effect of self-verification lessens as self-meanings and reflected appraisals increase together. That said, the fact that there are only four significant results among the surface tests for a_1 and a_2 across all of the identity/affective outcome combinations leads us to conclude that collateral increases or decreases in self-meanings and reflected appraisals have much less impact on well-being than discrepancies in identities.

5. Discussion

5.1. Main findings & conclusions

In both psychology and sociology, it is a vexed question whether, or under what conditions, verification or enhancement motives guide people's reactions to self-relevant feedback. Our main contribution to the ongoing discourse surrounding this theoretically and empirically important issue has been to introduce a straightforward statistical modeling approach (polynomial regression with response surface analysis) that unambiguously indicates whether and in what way the direction of an identity discrepancy matters (i.e., whether under-evaluation and over-evaluation have comparable effects). As we have argued, doing so is essential for adjudicating among competing accounts of identity processes that implicate different self-motives.

In the research reported above we used data from a national, multi-stage cluster sample of U.S. adults to empirically compare three different identity models: self-verification (identity theory), self-enhancement, and a "mixed motivations" model where we assume that self-verification is biased to some extent by a concurrently operating desire to view oneself favorably (Gecas 2001). In the mixed motivations model, under-evaluative feedback is more deleterious than over-evaluative feedback, and the model is generally similar in that respect to Jasso's (1980) distributive justice theory and Mirowsky's (1985) "partial equity" model of depression and

marital power. We compared the self-verification, self-enhancement, and mixed motivations models across four different identities and four separate measures of psychological distress and self-conscious emotions, and our analyses were guided by two orienting questions. First, using Burke and Harrod's (2005) now conventional statistical approach, we attempted to replicate the strong support they found for identity theory over self-enhancement theories. Second, employing polynomial regression with response surface analysis and taking into account the *direction* of identity discrepancies, we examined whether the results support identity theory, self-enhancement theories, or the mixed motivations model.

Comparing the results from the two different statistical approaches across all of the identities and outcome measures yields three important empirical conclusions. **First**, the majority of models we estimated, regardless of statistical approach, support identity theory and its fundamental assumption of self-verification—i.e., that under-evaluation and over-evaluation have comparable effects on negative affect. The exceptions are three outcomes (depression, anxiety, and guilt) in the spouse identity and one outcome (shame) in the person identity. When we take into account the direction of identity discrepancies using polynomial regression with response surface analysis, the results for these four identity/affective outcome combinations support the mixed motivations explanation, not identity theory as we found using the conventional statistical approach. It is especially interesting that we found no clear support for self-enhancement among the affective outcomes (guilt and shame). According to Kwang and Swann (2010), even though self-enhancement does not appear to be the 'master' of others (p. 275), its effects do tend to be strongest for affective outcomes. It may be that these outcomes do not specifically include *self-conscious* emotions such as the ones we examined. It could also be that levels of "rejection risk" tended to be low, on average, across the role relationships

implicated in the identities we examined. When relationships are more or less secure, rejection risk is low, and individuals are freer to pursue self-verification (Kwang and Swann 2010). These are very interesting possibilities for future studies to investigate.

It is also interesting that the mixed motivations explanation stands out in connection with the spouse identity and otherwise only accounts for shame in the person identity. In comparison with the other three identities (parent, friend, and person), what is it about the spouse identity that may make people uniquely less bothered by over-evaluation? According to past identity theory research, such self-serving biases may be likely to present themselves in short-term, uninvolved relationships (Burke and Harrod 2005; Stets 2005); however, that explanation is not outwardly convincing for the spouse identity. While we can only speculate, a selection process may be one reason why we found that over-evaluation is not as detrimental as under-evaluation with specific regard to the spouse identity. Past research has found that “unrealistic optimism” (i.e., an optimism bias) is higher among married individuals than divorced individuals (Shriner, Larwood, and Peterson 1985). Self-verification mixed with a “healthy dose” of self-enhancement may be part of a more general adaptive strategy that individuals operate by to manage the unique stressors of long-term, committed unions such as marriage. Importantly, then, factors other than the length and strength of a relationship may determine whether one self-motive or another operates. Our findings lead us to agree with other identity theory researchers that gaining a better understanding of these conditions is an important area for future research on self and identity.

A **second** conclusion from our research is that while discrepancies between reflected appraisals and self-meanings had no impact on shame within any of the role identities in our dataset, we did find evidence that they do matter for the person identity in a manner consistent with the mixed motivations account. Again, while we can only speculate at this point, our

findings point to the possibility that the dynamics of one's identity *as a person* may be especially bound up with the "moral self." To the extent that this is so, we might find, as in fact we did, that guilt and shame are more strongly related to person identity discrepancies than to role identity discrepancies. And to the further extent that shame uniquely targets a person's *self* while guilt targets specific *acts* (Tangney, Steuwig, and Mashek 2007), we might find, as in fact we did, that only discrepancies in the person identity predict shame while discrepancies in both role identities and the person identity predict guilt as it may arise from behaviors tied to roles and unique personal experiences. With the growing interest in applying identity theory to elucidate the moral self, our findings contribute two important ideas: (1) discrepancies would seem to have implications for moral feelings beyond the "moral" identity itself, which so far has been the focus of identity theory research on the moral self (Stets and Carter 2011, 2012), and (2) different types of identity discrepancies (i.e., as they arise in connection with roles, group memberships, and unique personal experiences) may channel the experience of specific self-conscious/moral emotions.

Finally, and somewhat unexpectedly, a **third** conclusion from our research is that people do not seem to benefit consistently, or even much at all, from collaterally increasing evaluative self-meanings and reflected appraisals. Intuitively, we thought that people would experience the least negative affect in cases where they evaluate themselves highly and also perceive that they are evaluated highly by others. We found this to be the case only with respect to depression and guilt in the parent identity and depression in the person identity. Now being able to see the relative unimportance of "congruence" between self-meanings and reflected appraisals takes us that much further toward understanding the special significance of the relationship between identity *discrepancies* and negative affect. That said, by treating "no discrepancy" as a series of

points falling along a continuum of self-verification (or line of congruence), we have demonstrated another way in which polynomial regression with response surface analysis allows us to expand how we think about and analyze identity discrepancies (or their absence) in relation to negative affect. The method would be useful in any research program where the effect of a discrepancy or lack of discrepancy (along a continuum) between two predictors is the focus.

Indeed, we see the main strength of this research as illustrating the use of polynomial regression with response surface analysis in the particular context of identity theory research. As one of the goals at the forefront of identity research on the perceptual control system is to gain a better understanding of the conditions that activate one self-motive over others in response to identity discrepancies, we now have a simple, easy-to-use, and unequivocal statistical method for determining the most accurate model. We do not think that the importance of this for advancing theory and research on self and identity can be understated. And again, because change scores and differences scores are “fundamental” in social and behavioral research (Ye 2010), the method would be useful in any program of sociological research where the main question concerns how non-equivalence or equivalence (along a continuum) between two explanatory variables affects one or more outcomes.

5.2. Limitations and Future Directions

Our study has some limitations that should inform future research. First, our measure of reflected appraisals is in the form of feedback from others *in general*—i.e., without specifying the source of the feedback. It is possible that individuals consider particular others and even role-complimentary others when responding to the question “others see me as” in relation to specific identities (e.g., one’s own partner when responding about the spouse identity or specific friends when responding about the friend identity); however, we cannot know that from our measure.

Future studies should consider examining specific sources of input, particularly in light of studies that find that verification and enhancement motives may be influenced by the source of feedback, including whether the source is higher status, is a partner in an intimate relationship, etc. (Stets and Asencio 2008).

Second, while we follow previous research in using PCA to derive component-score measures of self-meanings and reflected appraisals, it occurs to us that future researchers may want to pay attention to the relative impact of specific identity meanings for specific respondents. Following convention, we have assumed that even in cases where one scale item or another is more or less important to a given individual's identity standard, the discrepancy arising from reflected appraisals is likely to have an impact in ways predicted by verification or enhancement arguments. By including an array of meanings that may vary in terms of their importance to individuals' identity standards, variation in the degree of discrepancy would reflect such individual variation. That said, variation in the importance of identity meanings may be particularly important to account for when focusing on differences within identities and across roles, especially if those differences lead to differences in the magnitude of discrepancies and/or if they render discrepancies less impactful. In other work (citation omitted), we examine the extent to which individuals value the various aspects of an identity by examining the extent to which they endorse them as "ideals." We find that while there is some variation in how individuals evaluate identity meanings, the relationship between discrepancy and distress remains fairly consistent. Still, more research is needed to better understand individual differences in the value of specific identity meanings that comprise the identity standard.

A third limitation of our research is that we use cross-sectional data to test the theoretical relationships, which does not allow us to statistically assess causal order. While the theoretical

arguments made for both self-verification and self-enhancement theories have received a great deal of empirical support over the years, there is reason to believe that the relationships among self-meanings, reflected appraisals, and negative affect are reciprocal. In other words, negative affect may influence our internalized identity meanings, as well as our perceptions of how others see us. Longitudinal data would be necessary to disentangle these relationships within a survey design. That said, recent experimental work has shown support for the causal relationship between discrepancy and affective outcomes in a manner that is consistent with the models described here (Stets 2003, 2005; Stets and Asencio 2008). Furthermore, for the purposes of this study, establishing the causal order of these relationships is less critical as it might be for formal tests of identity theory.

A final limitation of our research is that the data we used do not have the variables needed to explore and compare the range of substantive factors that might explain the conditional activation of one self-motive or another in connection with different identities. Some of these factors are likely to be abstract and general. For example, identity theory researchers have already pointed to the potential importance of the timing of discrepancies and the strength of the relationship with the source of discrepancy-producing feedback. Other factors may include the degree of organization of an identity (i.e., how established it is), how tightly controlled the identity is, and whether an identity is perceived as voluntary or obligatory (Burke 1991; Thoits 2003). For instance, given the differences between voluntary and obligatory roles in terms of length and degree of involvement, they may vary in terms of identity meaning and/or expectations for reflected appraisals (Thoits 2003), which has implications for how much distress one will experience and also potentially for the activation of one self-motive or another. Yet other factors related to the conditional activation of self-motives may be unique to the identity in

question. For example, and as mentioned above, the importance of “unrealistic optimism” to enduring marital unions may help explain why we found that the mixed motivations model stands out in connection with the spouse identity. Taking the argument a step further, given the unique oppositional dimension built into the spousal role due to its specially gendered nature (Cast 2003), we should not be surprised that perhaps the more general tendency to self-verify is adaptively modulated by an optimism bias in marriages that last. With a more clear-cut statistical methodology available, an obvious and important next step is to more thoroughly theorize and examine the specific and more general factors that may direct the influence of self-motives over behavioral and affective responses to identity discrepancies.

The self-verification versus self-enhancement debate is now about halfway through its sixth decade. Mixed findings across disciplines continue to drive research on the topic. While much of the recent research, including sociological work on identity theory, has emphasized the importance of specifying the conditions under which one self-motive versus another may matter, our approach stresses the generally accepted yet too easily underplayed dictum that theory and method are intertwined in a “double helix” (Fawcett 1978). We have demonstrated a method that allows identity researchers to determine more clearly whether outcomes reflect self-verification, self-enhancement, or both. We agree that elucidating the conditions under which various self-motives matter is theoretically important, but for continued theoretical progress to occur, one must employ a method that yields unambiguous results. Here in the context of testing identity theory, we have shown how application of response surface analysis provides more definitive answers to theoretically motivated questions and raises new questions that will spur on further progress. As identity theory is improved, the many areas of research that draw on it will profit. Additionally, other research areas that use difference scores as independent variables would

similarly do well to explore the theoretically relevant consequences of response surface analysis. The more definite and more nuanced view it provides will be useful in any research program where multisource feedback is explanatory.

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Footnotes

¹ While sociologists working in identity theory have always viewed the interactional (McCall and Simmons 1978), structural (Stryker 1980) and perceptual (Burke 1991) approaches to identity as theoretical "variants" sharing a common metatheoretical foundation, some researchers have erroneously treated them as different theories in competition with one another (see Wagner and Berger 1985 for a discussion of types of theory growth). Therefore, where the approaches must be delineated, we advocate the use of terms that distinguish their unique foci. For example, what has been referred to as "identity control theory" is more precisely referred to as a variant of identity theory with a focus on the perceptual control system. For further details, please see Burke and Stets (2009), Serpe and Stryker (2011), Stets and Serpe (2013), and Stets and Burke (2014a).

² Like identity theory, affect control theory in sociology also derives from symbolic interactionism and assumes that people are basically motivated to achieve consistency (i.e., to confirm identities) (Robinson and Smith-Lovin 1992). However, unlike identity theory, affect control theory postulates that negative emotions result when an identity is disconfirmed in a negative/unfavorable direction (Robinson and Smith-Lovin 2006). Despite the consistency principle at its core, affect control theory is more aligned with psychological enhancement theories in this prediction.

³ If a person cannot *do* anything to bring reflected appraisals into line with her or his identity standard, the standard itself will ultimately change to match the meanings that are persistently conveyed through others' behavior (Stets and Burke 2003).

⁴ The focus of this research is on role and person identities as conceptualized within the identity theory framework. Specifically, we examine social roles (e.g., spouse, parent, friend), where self-perceptions refer to the meanings these roles hold for individuals and their perceptions of how others see them in these roles. For identity theory, identities are considered stable and fairly well established. As such, the majority of work in this area is based on survey designs (e.g., Tallman, Burke and Gecas 1998; Marcussen and Large 2003; Asencio 2011), including telephone surveys (Owens and Serpe 2003; Stryker, Serpe, and Hunt 2005; Schultz et al. 2011; Brenner, Serpe, and Stryker 2014), where individuals are asked to report on identities they currently hold. As such, the model differs from theories of self-perception (e.g., self-perception theory, cognitive dissonance theory, etc.) that have a somewhat different focus and tend to use experimental methods. There are some exceptions to the survey design (e.g., Stets 2003, 2005). These studies attempt to “create” identities, and they do tend to show somewhat different findings from survey research. Of course, there are advantages and limitations to each methodological approach. We further address this issue in the discussion of the paper.

⁵ The response rate was calculated using the AAPOR Response Rate 3. The formula is: $I/(I+P)+(R+NC+O) + e(UH+UO)$, where I = completes, P = partials, R = Refusals, NC = noncontacts, O = other, e = estimated proportion of cases of unknown eligibility that are eligible, UH = Unknown Household, and OU = Unknown Other (American Association for Public Opinion Research 2011).

⁶ The use of perceptions of others’ views of self has been well established in the literature within sociology and is one of the standard ways that reflected appraisals have been measured (Felson 1985; Hughes and Demo 1989; Matsueda 1992; Ichiyama 1993; Milkie 1999).

⁷ These are established measures with a time frame that is often used in community surveys. As indicated above, though, we measure identity meanings (self-appraisals and reflected appraisals) without referencing a time frame. Therefore, our measure of discrepancy (reflected appraisals minus self-appraisals) is not time bound either. This is consistent with previous research using perceptual control models (e.g., Marcussen and Large 2003; Marcussen 2006; Asencio 2011; Asencio and Burke 2011). However, while identities and the self-meanings that define them are assumed to be fairly stable over time, reflected appraisals can and do change. The average stability of reflected appraisals, though, is an empirical question that remains to be answered. It is possible, while perhaps not common, that reflected appraisals could change dramatically within a period as short as one week. If respondents tend to self-report reflected appraisals at the moment of being surveyed, this would attenuate the relationship between non-time-bound identity discrepancies (computed in part from reflected appraisals) and measures of negative affect that reference the past week. To the extent that this occurs, identity discrepancies measured within the same time frame as these outcomes would provide useful information. A suggestion for future research, then, might be to inquire about feedback from others, distress, and emotions with reference to varying time periods.

⁸ Spearman-Brown reliability is recommended over Cronbach's alpha for two-item scales (Eisinga, te Grotenhuis, and Pelzer 2013). Also, using principal axis factoring, a one-factor solution was supported for the anxiety, guilt, and shame scales. For the depression scale, a two-factor solution was produced. However, none of the loadings on the second factor exceeded .5, and most of them were low (.1 or less). Also, the second factor for the depression scale had an eigenvalue near the cutoff (1.030) and explained only 6.866% of the variance, compared to 45.865% of the variance explained by the first factor (eigenvalue = 6.880). Finally, the loading

for "Difficulty falling asleep or staying asleep" (.491) was the only one less than .5 for the first factor. Accordingly, a one-factor solution is reasonable for the depression scale. These analyses are available upon request.

⁹ While mean discrepancy (RA – SA) is small for each of the four identities, the means need to be considered alongside their standard deviations. The absolute value of the grand mean of the four discrepancy means is .042, and the average of their standard deviations is quite large by comparison (.691). The (standardized) coefficient of variation for discrepancy is $.691/.042 = 16.45$. By comparison, this value is 2.48 for Burke and Harrod (2005). So, while respondents, on average, have small discrepancy scores, there is considerable variability in our data to be explained. The question is whether that variability helps account for variability in the outcomes.

¹⁰ In addition, for a very helpful Excel spreadsheet that calculates the surface test values and their significance and graphs the result, visit the following website:

<http://www.springer.com/psychology/community+psychology/journal/10869>. In the "For Authors and Editors" section on the right, click on the grey down arrow to expand the section and then click on the menu item for "Response Surface Analysis Excel" to download the spreadsheet.

¹¹ As in Burke and Harrod (2005), we do not include control variables in any of our analyses. However, we did run all of our models controlling for marital status (except for the spouse identity), age, education, employment status, sex, and racial/ethnic background (available upon request). As these controls do not alter our conclusions, we omit them from consideration here.

¹² Graphs for the friend and person identities are available upon request.

Table 1. Evaluative Meanings and Alpha Reliabilities by Identity

Spouse Identity (N = 618/584)	Parent Identity (N = 491/470)
<ul style="list-style-type: none">– Attentive– Cooperative– Forgiving– Interesting– Patient– Reasonable	<ul style="list-style-type: none">– Attentive– Cool-Headed– Forgiving– Methodical– Optimistic– Patient– Unselfish
$\alpha_{\text{self-meanings}} = .764$ $\alpha_{\text{reflected appraisals}} = .786$	$\alpha_{\text{self-meanings}} = .797$ $\alpha_{\text{reflected appraisals}} = .795$
Friend Identity (N = 582/557)	Person Identity (N = 562/543)
<ul style="list-style-type: none">– Dependable– Direct– Forgiving– Honest– Individualistic– Interesting– Optimistic	<ul style="list-style-type: none">– Ambitious– Cooperative– Creative– Dependable– Independent– Optimistic– Tolerant
$\alpha_{\text{self-meanings}} = .778$ $\alpha_{\text{reflected appraisals}} = .769$	$\alpha_{\text{self-meanings}} = .776$ $\alpha_{\text{reflected appraisals}} = .779$

The sample sizes next to each identity are for the self-meanings and reflected appraisals, respectively. For the spouse identity, one of the original seven meanings (“independent”) was eliminated based on the results of factor analysis.

Table 2. Descriptive Statistics for All Additive Variables by Identity

Identity Model/ Variable	N	Mean	SD	Statistical Range
Spouse				
Depressive Symptoms	570	22.414	7.361	45.000
Anxiety Symptoms	580	13.581	4.601	30.000
Guilt	579	8.630	3.505	18.000
Shame	582	2.576	1.133	6.000
Reflected Appraisals (RA)	584	0.000	1.000	6.764
Self-Meanings (SM)	618	0.000	1.000	5.644
Discrepancy (RA-SM)	583	-.014	.795	10.154
Parent				
Depressive Symptoms	454	23.469	8.658	42.000
Anxiety Symptoms	462	14.268	5.562	30.000
Guilt	462	8.892	3.709	18.000
Shame	467	2.664	1.210	6.000
Reflected Appraisals (RA)	470	0.000	1.000	5.852
Self-Meanings (SM)	491	0.000	1.000	6.039
Discrepancy (RA-SM)	469	-.016	.728	7.064
Friend				
Depressive Symptoms	523	23.862	8.702	45.000
Anxiety Symptoms	544	14.485	5.580	30.000
Guilt	546	9.057	3.977	18.000
Shame	551	2.715	1.243	6.000
Reflected Appraisals (RA)	557	0.000	1.000	7.994
Self-Meanings (SM)	582	0.000	1.000	7.548
Discrepancy (RA-SM)	553	-.007	.616	5.664
Person				
Depressive Symptoms	508	24.669	8.936	45.000
Anxiety Symptoms	529	14.953	6.036	30.000
Guilt	534	9.315	4.126	18.000
Shame	540	2.748	1.245	6.000
Reflected Appraisals (RA)	543	0.000	1.000	6.873
Self-Meanings (SM)	562	0.000	1.000	6.778
Discrepancy (RA-SM)	541	-.005	.625	7.351

Table 3. Summary of Predictions from Three Competing Models of Identity Processes

	Surface Test Value	
	a_4	a_3
(1) Self-Verification (identity theory)	Significant and positive	Not Significant
(2) Self-Enhancement	Not significant	Significant and negative
(3) Mixed Motivations	Significant and positive	Significant and negative

Table 4. Polynomial Regression Results by Identity and Affective Outcome

Identity/ Outcome	Effect		R^2
	Main Effect	Squared Term	
Spouse			
Depression (N=570)	-.413 (.388)	.412* (.166)	.014
Anxiety (N=580)	-.409 (.242)	.221* (.104)	.014
Guilt (N=579)	-.286 (.183)	.226** (.079)	.021
Shame (N=582)	-.062 (.060)	.009 (.026)	.002
Parent			
Depression (N=454)	.856 (.544)	1.182*** (.298)	.038
Anxiety (N=462)	.039 (.351)	.694*** (.192)	.028
Guilt (N=462)	.078 (.236)	.547*** (.133)	.036
Shame (N=467)	.032 (.077)	.047 (.042)	.003
Friend			
Depression (N=523)	-.791 (.628)	1.286** (.405)	.025
Anxiety (N=544)	-.366 (.398)	.328 (.260)	.006
Guilt (N=546)	-.398 (.280)	.557** (.184)	.024
Shame (N=551)	-.151 (.087)	.065 (.057)	.009
Person			
Depression (N=508)	1.099 (.696)	.955** (.310)	.019
Anxiety (N=529)	.630 (.454)	.866*** (.204)	.033
Guilt (N=534)	.334 (.312)	.448** (.141)	.019
Shame (N=540)	-.107 (.092)	.091* (.042)	.018

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; standard errors are shown in parentheses.
Models with no squared term effect are shaded grey.

Table 5. Polynomial Regression with Response Surface Analysis for the SPOUSE Identity by Affective Outcome

	Depression (N = 570)	Anxiety (N = 580)	Guilt (N = 579)	Shame (N = 582)
Constant	21.961*** (.388)	13.315*** (.238)	8.471 (.180)	2.560*** (.059)
Reflected Appraisals (RA	-1.298** (.483)	-.833** (.298)	-.738** (.225)	-.143 (.074)
Self Meanings (SM)	1.061* (.465)	.994** (.288)	.724** (.218)	.127 (.072)
RA x SM	-.911* (.374)	-.582* (.232)	-.607** (.175)	-.035 (.058)
RA squared	-.199 (.246)	-.160 (.152)	-.135 (.115)	-.050 (.038)
SM squared	1.266*** (.296)	.815*** (.181)	.704*** (.137)	.088 (.045)
R^2	.037**	.042***	.054***	.011
<i>Surface tests</i>				
a_1	-.237 (.349)	.161 (.227)	-.014 (.162)	
a_2	.156 (.265)	.073 (.160)	-.038 (.112)	
a_3	-2.359** (.882)	-1.827** (.551)	-1.462*** (.412)	
a_4	1.978*** (.516)	1.237*** (.313)	1.176*** (.238)	
Motive	Mixed Motivations	Mixed Motivations	Mixed Motivations	No Effects

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; standard errors are shown in parentheses.

Table 6. Polynomial Regression with Response Surface Analysis for the PARENT Identity by Affective Outcome

	Depression (N = 454)	Anxiety (N = 462)	Guilt (N = 462)	Shame (N = 467)
Constant	23.180*** (.512)	14.037*** (.320)	8.848*** (.216)	2.709*** (.070)
Reflected Appraisals (RA	.059 (.650)	-.243 (.421)	-.408 (.278)	-.091 (.092)
Self Meanings (SM)	-1.341* (.651)	-.331 (.421)	-.186 (.278)	-.086 (.092)
RA x SM	-2.144** (.629)	-1.299** (.400)	-1.014*** (.278)	-.076 (.088)
RA squared	.752 (.459)	.594* (.297)	.165 (.203)	-.036 (.065)
SM squared	1.121** (.420)	.591* (.272)	.629 (.180)**	.048 (.059)
R^2	.054***	.035**	.062***	.021
<i>Surface tests</i>				
a_1	-1.282** (.465)	-.574 (.301)	-.594** (.196)	
a_2	-.271 (.336)	-.114 (.190)	-.220 (.145)	
a_3	1.400 (1.215)	.088 (.786)	-.222 (.520)	
a_4	4.017*** (.899)	2.484*** (.576)	1.808*** (.396)	
Motive	Verification	Verification	Verification	No Effects

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; standard errors are shown in parentheses.

Table 7. Polynomial Regression with Response Surface Analysis for the FRIEND Identity by Affective Outcome

	Depression (N = 523)	Anxiety (N = 544)	Guilt (N = 546)	Shame (N = 551)
Constant	23.398*** (.443)	14.375*** (.280)	8.838*** (.199)	2.705*** (.062)
Reflected Appraisals (RA	-1.177 (.721)	-.565 (.456)	-.664* (.321)	-.193 (.100)
Self Meanings (SM)	.645 (.725)	.249 (.456)	.364 (.321)	.150 (.100)
RA x SM	-2.433** (.828)	-.562 (.531)	-1.032** (.375)	-.133 (.116)
RA squared	1.041* (.497)	.216 (.319)	.363 (.226)	.035 (.070)
SM squared	1.416* (.580)	.353 (.365)	.707** (.261)	.082 (.080)
R^2	.029*	.008	.031**	.011
<i>Surface tests</i>				
a_1	-.532 (.493)		-.300 (.219)	
a_2	.024 (.212)		.038 (.099)	
a_3	-1.822 (1.359)		-1.028 (.603)	
a_4	4.890*** (1.030)		2.102*** (.467)	
Motive	Verification	No Effects	Verification	No Effects

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; standard errors are shown in parentheses.

Table 8. Polynomial Regression with Response Surface Analysis for the PERSON Identity by Affective Outcome

	Depression (N = 508)	Anxiety (N = 529)	Guilt (N = 534)	Shame (N = 540)
Constant	23.915*** (.457)	14.397*** (.306)	9.048*** (.209)	2.677*** (.062)
Reflected Appraisals (RA	-.196 (.781)	.160 (.518)	-.239 (.354)	-.316** (.103)
Self Meanings (SM)	-.978 (.779)	-.521 (.516)	-.064 (.353)	.233* (.103)
RA x SM	-1.287* (.628)	-1.468** (.419)	-.748** (.287)	-.147 (.084)
RA squared	.426 (.464)	.676* (.304)	.052 (.208)	-.075 (.061)
SM squared	1.361** (.447)	1.063*** (.303)	.821*** (.207)	.265*** (.062)
R^2	.063***	.050***	.046***	.061***
<i>Surface tests</i>				
a_1	-1.174* (.455)	-.361 (.301)	-.303 (.205)	-.083 (.057)
a_2	.500* (.244)	.271 (.161)	.125 (.112)	.043 (.025)
a_3	.782 (1.492)	.681 (.989)	-.175 (.677)	-.549** (.198)
a_4	3.074** (.899)	3.207*** (.588)	1.621*** (.401)	.337** (.112)
Motive	Verification	Verification	Verification	Mixed Motivations

* $p \leq .05$; ** $p \leq .01$; *** $p \leq .001$; standard errors are shown in parentheses.

Figure 1. Hypothetical 3-D Surface Plots and Surface Test Value Results for Negative Affect as Predicted by Reflected Appraisals/Self-Meanings Discrepancy

The solid line on each graph floor is the “line of congruence” along which reflected appraisals and self-meanings are equal (i.e., $X = Y$). The dashed line on each graph floor is the “line of incongruence” along which reflected appraisals and self-meanings are not equal (i.e., $X \neq Y$).

Figure 2. Relationship Between Parent Identity Discrepancy and Predicted Distress and Emotion Outcomes

Figure 3. Relationship Between Spouse Identity Discrepancy and Predicted Distress and Emotion Outcomes

Figure 4. 3-D Surface Plot for Depressive Symptoms as Predicted by Reflected Appraisals/Self-Meanings Discrepancy in the Spouse Identity (showing mixed motivations)

Depressive Symptoms: <30; = 31-35; >35

The dashed line on the graph floor is the “line of incongruence” along which reflected appraisals and self-meanings are not equal (i.e., $X \neq Y$).

Figure 5. 3-D Surface Plot for Anxiety Symptoms as Predicted by Reflected Appraisals/ Self-Meanings Discrepancy in the Parent Identity (showing self-verification)

Anxiety Symptoms: <20; = 21-25; >25

The dashed line on the graph floor is the “line of incongruence” along which reflected appraisals and self-meanings are not equal (i.e., $X \neq Y$).