An Extension to Group-Based Uncertainty Reduction: Extreme Self-Perceptions of Ingroup Prototypicality

by

Elizabeth M. Niedbala, B.A.

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Approved

Dr. Zachary P. Hohman
Chairperson of Committee

Dr. Jessica L. Alquist

Dr. Lindsay Rice Greenlee

Dr. Amelia E. Talley

Dr. Mark A. Sheridan
Dean of the Graduate School

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Table of Contents

Abstract

Self-uncertainty causes individuals to adopt extreme attitudes and to join extreme groups because altering the self to possess clear group-based attitudes, feelings, and behavior reduces ambiguity toward one's identity. Yet, research on group-based uncertainty reduction has not tested if self-uncertainty causes group members to adopt extreme positions *within* the ingroup. The current research tested the hypothesis that self-uncertainty causes ingroup members to perceive the self as extremely prototypical to compensate for the lack of certainty they feel about their identity. One-hundred and fifty American adults participated in a mixed subjects experimental design with time as the within-subjects factor (Time 1 vs. Time 2) and condition as the between-subjects factor (Uncertainty vs. Certainty vs. Negative control) to test if manipulating self-uncertainty enhances self-perceptions of prototypicality. Findings showed that uncertainty did not cause differences in perceptions of general prototypicality or in self-stereotyping. However, as predicted, group identification moderated the relationship between uncertainty and self-stereotyping. As group identification increased, self-stereotyping increased among uncertainty participants, but did not change among certainty or negative control participants. These data highlight the importance of identification strength in determining the effect of situational uncertainty on group member perceptions, which offers us a deeper understanding of critical group member behavior such as seeking leadership roles within the ingroup.

List of Tables

List of Figures

Introduction

Every group has at least one member who goes above and beyond the call of duty to represent the group's cause. The star player. The devoted leader. The poster child. They are the epitome of all that the group stands for, and they inspire average group members to follow their example. Even though they seem confident in knowing exactly who they are and what they believe, it is possible that these ideal group members were once plagued with uncertainty about their own identity. Intense feelings of self-uncertainty and identity insecurity may have motivated them to transform into a highly prototypical group member to reassure themselves that they know exactly who they are. Research shows that self-uncertainty causes individuals to adopt extreme attitudes (McGregor et al., 2001) and to join extreme groups (Hogg, 2007), but has not yet tested if self-uncertainty causes group members to adopt extreme positions *within* the group. The current research will test a novel hypothesis that self-uncertainty causes group members to exaggerate their level of ingroup prototypicality to compensate for the lack of certainty they feel about their identity.

Self-uncertainty

A broad definition of uncertainty is "the state of an organism that lacks information about whether, where, when, how, or why an event has occurred or will occur" (Bar-Anan, Eilson, & Gilbert, 2009; p. 123). This definition, however, does not highlight the most important aspect of uncertainty—that it feels aversive (Hogg, 2009; 2012). A little bit of uncertainty can be appealing, but too much uncertainty is theorized to cause discomfort, uneasiness, anxiety, and even fear (Hogg, 2000; 2007). An important predictor of how subjectively uncomfortable uncertainty feels is its degree of self-

relevance (Mullin & Hogg, 1999; Hogg, 2012). The more self-relevant the dimension on which an individual feels uncertain, the more aversive it is, and the more motivated they will be to reduce their uncertainty (Hogg, 2012). One type of uncertainty that is highly self-relevant is uncertainty surrounding the self-concept (Hogg, 2012). Uncertainty about the self is called *self-uncertainty* (Hogg, 2007) and can be described as a sense of doubt in one's self- or world-views (Doosje, Loseman, & Bos, 2013), as a type of identity crisis that is caused from unclear cognitions about the self (McGregor et al., 2001), or as overall uncertainty concerning the self-concept and one's place within the world (Hogg, 2007). Bringing attention to the incompleteness or insecurities of one's identity or self-relevant dimensions is one way to increase self-uncertainty, and self-uncertainty can be experimentally induced by writing about the uncertain aspects of oneself, one's future, and one's place in the world (e.g., Hohman, Gaffney, & Hogg, 2017).

Because self-uncertainty is highly aversive, it motivates uncertainty-reduction behaviors (Hogg, 2007). For instance, one reaction to self-uncertainty is to adopt extreme attitudes. Research on compensatory conviction demonstrates that uncertainty about the self causes stronger conviction in one's attitudes toward important social issues (McGregor et al., 2001; McGregor, Haji, Nash, & Teper, 2008; Nail et al., 2009). Across several experiments, self-uncertainty caused more extreme attitudes toward social and religious beliefs (McGregor et al., 2001; McGregor, Haji, Nash, & Teper, 2008; Nail et al., 2009), support for religious warfare (McGregor et al., 2008) more negative outgroup attitudes (McGregor et al., 2008; Nail et al., 2009), and more prejudice toward value-violating groups (Sekerdej et al., in press). The compensatory conviction model argues that people behave in compensatory ways when they feel uncertain, and one way to

compensate for self-uncertainty is to harden one's attitudes to feel more certain about who one is and what one believes (McGregor et al., 2001; 2008).

Another strategy to reduce self-uncertainty is to define the self through group membership. Self-categorizing into a group resolves the distress of self-uncertainty because it introduces a prototype—a fuzzy set of traits, thoughts, feelings, and behaviors to follow (Turner et al., 1987; Hogg, 2007, 2009). Through self-categorization, group members become depersonalized and define the self by the cognitive representation of the ingroup prototype (Turner et al., 1987). Groups that are tightly structured, distinctive, that possess rigid and clear prescriptions for behavior, and that hold uniform attitudes are called highly *entitative*, and are the most effective at reducing self-uncertainty because they tell group members exactly how to think, feel, and behave (Hogg, 2007). Self-uncertainty makes extreme groups appealing because the more entitative a group is, the more clearly prescribed its norms are, and the more successful it is at defining the self-concept through the group prototype (Hogg, 2007).

In all groups, moderate and extreme, group members differ in how much they express, represent, and embody the group's norms and traits (Hogg, 2007; Pickett & Brewer, 2005; Turner et al., 1987). In other words, group members vary in how prototypical they are. While research on uncertainty shows that self-uncertainty causes more extreme attitudes (McGregor et al., 2001) and an attraction to extremist groups (Hogg, 2007), research has not yet tested if self-uncertainty causes group members to adopt a more extreme position within the group—particularly, if self-uncertainty causes individuals to perceive themselves as extremely prototypical group members.

Prototypicality

When a group member is prototypical, they embody the group's norms in a way that clarifies the boundaries between the ingroup and outgroups (Abrams et al., 2000). Therefore, both intra- and intergroup comparisons determine prototypicality—highly prototypical group members express attitudes, feelings, and behavior that strongly represent the ingroup and that strongly contrast the outgroup (Turner et al., 1987; Abrams & Hogg, 1990; Hogg & Abrams, 1988; Oakes, Haslam, & Turner, 1998). Prototypical group members help define the group norms (Oakes, Haslam, & Turner, 1999; Turner et al., 1987), are evaluated more favorably compared to other group members (Hogg & Hardie, 1991), and are more likely to be group leaders (Eagly, Makhijani, & Klonski, 1992; Hains, Hogg, & Duck, 1997).

The group prototype differs from group stereotypes in that the prototype is the summation of a group's attitudes, traits, and behavior (Turner et al., 1987), while a stereotype is one single attitude, behavior, or trait that is associated with the group. In the current research, the word prototype is used to describe the entire cognitive representation of a group, and the word stereotype is used to describe a specific trait that is attributed to the group (many stereotypes make up the group prototype).

There is also an important distinction between the group prototype and the group mean (Hogg & Turner, 1987). A highly prototypical group member is not the average group member, nor do they possess group traits to an average extent (Hogg & Turner, 1987). Instead, the most prototypical group member is *above average* in the direction *away* from the outgroup (Hogg & Turner, 1987). This is because highly prototypical group members express, represent, and embody the ideal cognitive representation of the

ingroup; they do not merely conform to the average ingroup member's behavior (Hogg & Turner, 1987).

Research shows that deviating from the group norm in a positive way is evaluated favorably. Abrams et al. (2000) made a distinction between pro-norm and anti-norm deviants, such that both deviate from the average group member, but in opposite directions. Pro-norm deviants hold extreme positions that support the group's goals, validate group norms, and uphold a positive social identity, while anti-norm deviants hold extreme positions that threaten the group's goals, reject group norms, or reduce the group's distinctiveness (Abrams et al., 2000). Anti-norm deviants may hold opinions that are similar to an outgroup's attitudes, blurring the boundaries between groups and threatening the ingroup's need for a positive and distinct identity (Abrams et al., 2000). Experiments on ingroup deviants showed that anti-norm deviants were evaluated significantly less positively and less typical than normative and pro-norm deviants (Abrams et al., 2000; Abrams et al., 2002). In another study, Castano, Paladino, Coull, and Yzerbyt (2002) asked psychology students to make typicality evaluations of ingroup members (psychologists) who varied in the extent to which they embodied the group norm empathy. Psychologists that were made to seem lower than average in empathy (anti-norm deviants) were judged as significantly less typical compared to moderately empathic psychologists, and psychologists that were made to seem higher than average in empathy (pro-norm deviants) were judged as significantly more typical compared to moderately empathetic psychologists. In another experiment, when an anti-norm deviant held the same attitude as an outgroup member, the ingroup deviant was evaluated worse than the outgroup member even though they held the exact same attitude (Abrams et al.,

2000). Overall, data suggests that group members who are above average in group traits are seen as highly prototypical and are evaluated more positively (Abrams et al., 2002; Castano et al., 2002; Hogg & Hardie, 1991) because highly prototypical group members express, represent, and embody the cognitive representation of the ingroup (Hogg & Turner, 1987).

The Relationship Between Self-uncertainty and Prototypicality

Group members typically have an accurate idea of how prototypical they are compared to other group members (Hohman et al., 2017), and when a group member does not embody group traits, they are marginalized and are sent to the fringes of the group (Hogg, 2005). There is a relationship between non-prototypicality and self-uncertainty—manipulating group members to feel non-prototypical (in the form of anti-norm deviance) makes them question their identity and causes them to feel significantly more self-uncertain compared to those who are manipulated to feel prototypical (Hohman et al., 2017). Because non-prototypical members are aware of their poor representation of the group, they feel uncertain about who they are and about the security of their group membership (Hohman et al., 2017).

One way group members respond to threatened group membership is to alter the self to be more prototypical (Pickett et al., 2002; Pickett & Brewer, 2005). Self-stereotyping ingroup traits is one method of achieving this goal, because self-stereotyping makes the self feel perceptually closer to the ingroup and more distinct from relevant outgroups (Pickett et al., 2002). In one experiment, Pickett and colleagues (2002) found that threatening sorority girls' group membership caused high-identifiers to self-stereotype both positive and negative qualities that were associated with their group (e.g.,

popular, social, superficial, materialistic; low-identifiers only self-stereotyped positive qualities). Exaggerating the number of ingroup qualities one possesses, regardless of valence, makes high-identifying group members feel more secure in their membership (Pickett et al., 2002). Marginal group members self-stereotype in both public and private contexts, suggesting that self-stereotyping fulfills both self-perceptual and self-presentational goals (Pickett et al., 2002). In this way, self-stereotyping not only psychologically makes one feel more prototypical, but it also publicly reinforces one's position within the group (Pickett et al., 2002; Pickett & Brewer, 2005). Overall, feeling non-prototypical arouses a need to clarify one's group membership (Branscombe et al., 1999), and group members do so by distancing themselves from the outgroup and by aligning themselves with stereotypical ingroup traits (Pickett et al., 2002; Pickett & Brewer, 2005).

Uncertainty identity research has not yet tested if self-uncertainty causes similar strategies to feel like a prototypical member of the group. Because non-prototypicality causes feelings of self-uncertainty (Hohman et al., 2017), perceiving the self as extremely prototypical may be an effective method of psychologically alleviating self-uncertainty. Prototypicality draws clear boundaries between the ingroup and outgroup attitudes, behaviors, traits, and norms (Abrams et al., 2000; Turner et al., 1987), and being high in prototypicality should make an individual feel like they know exactly who they are (Hohman et al., 2017). Further, previous research demonstrates that during subjective uncertainty, group members view ingroup norms as valid and correct and they adhere to the cognitive representation of the ingroup prototype (Abrams, Wetherell, Cochrane, Hogg, & Turner, 1990; Hogg & Turner, 1987). Because the cognitive representation of

the ingroup prototype is more extreme than the average ingroup behavior (Hogg & Turner, 1987), it is likely that self-uncertainty motivates group members to perceive themselves as being above average in representing, expressing, and embodying stereotypic ingroup qualities. In other words, self-uncertainty should cause group members to exaggerate self-perceptions of ingroup prototypicality and stereotypic traits.

The Current Research

The current research tested a novel hypothesis that self-uncertainty causes group members to exaggerate their level of prototypicality within the group. There are three reasons why self-uncertainty should enhance perceived prototypicality. First, adopting extreme attitudes (McGregor et al., 2001) and identifying with extreme groups (Hogg, 2007) alleviates self-uncertainty, so self-uncertainty should cause individuals to become extreme group members in the form of enhanced prototypicality. Self-uncertain individuals may exaggerate the extent to which they are distinct from the outgroup and the extent to which they embody clear ingroup norms to feel as if they know exactly who they are. Second, subjective uncertainty causes group members to view the cognitive representation of the group prototype as valid and correct, which is more extreme than the average, observable group member behavior (Hogg & Turner, 1987). Because of this, self-uncertainly should cause group members to judge themselves as the ideal representation of the ingroup instead of simply conforming to average ingroup traits. Finally, because feeling non-prototypical in the direction of the outgroup (anti-norm deviance) causes self-uncertainty (Hohman et al., 2017), perceiving the self as extremely prototypical should prevent feelings of uncertainty surrounding one's position within the group. Placing the self in an extreme position that is above average and far away from the

outgroup (pro-norm deviance) should be the most effective at protecting against membership insecurity.

The current study measured perceived prototypicality in two different ways: by measuring perceptions of general similarity to the group prototype (e.g., Spears et al., 1997; Verkuyten & Nekuee, 1999; Hardie & McMurray, 1992; Jetten, Spears, & Manstead, 1997) and by measuring self-assessments of specific group traits (e.g., Biernat, Vescio, & Green, 1996; Simon & Hamilton, 1994). Measuring group traits (i.e., self-stereotyping) offers more specific information about how group members perceive themselves and to which group norms they align with (Pickett et al., 2002). Moreover, measuring specific group traits allows researchers to test for selective self-stereotyping, such that group members endorse positive stereotypes but not negative stereotypes (Biernat et al., 1996). Selective self-stereotyping occurs when non-prototypical group members are low in group identification (Pickett et al., 2002). If a group member feels insecure in their membership and the group is not important to them, they will identify with the positive but not the negative stereotypes associated with the group (Pickett et al., 2002). Non-prototypical high identifiers, on the other hand, will self-stereotype both positive and negative group qualities because they are committed to the group and derive positive esteem from assimilating with all group stereotypes (Pickett et al., 2002). Because group identification moderates the relationship between non-prototypicality and self-stereotyping (Pickett et al., 2002), I tested identification as a moderator of the relationship between self-uncertainty and self-stereotyping in the current research.

In summary, this experiment tested if self-uncertainty caused exaggerated perceptions of general prototypicality and of specific group traits. Moreover, the current

research tested if high self-uncertainty caused group members to perceive themselves as being *above average* in group traits. This study used a mixed subjects experimental design with time as the within-subjects factor (Time 1 vs. Time 2) and condition as the between-subjects factor (Uncertainty vs. Certainty vs. Negative control). During Time 1 participants reported how prototypical they felt and to what extent they possessed group traits, and two weeks later during Time 2 participants were randomly assigned into a self-uncertainty, self-certainty, or negative control condition. After the manipulation, participants completed the same prototypicality and group traits measures. This experiment tested the hypothesis that self-uncertainty causes exaggerations in perceived prototypicality compared to a certainty and a negative control condition. The specific hypotheses were:

H1: Self-uncertainty will cause greater increases in perceived general prototypicality from Time 1 to Time 2 compared to self-certainty and a negative control. The relationship between self-uncertainty and general prototypicality will be moderated by group identification, such that self-uncertainty will cause the greatest increase in prototypicality for high identifiers.

H2: Self-uncertainty will cause greater increases in self-stereotyping group trait scores from Time 1 to Time 2 compared to self-certainty and a negative control. Group identification will moderate the relationship between self-uncertainty and group trait scores, such that self-uncertainty will cause increases in positive and negative group traits scores for high identifiers, but will only cause increases in positive group trait scores for low identifiers.

H3: Self-uncertainty will cause greater positive deviations from the group average in group traits compared to self-certainty and a negative control. The relationship between self-uncertainty and deviation scores will be moderated by group identification, such that self-uncertainty will cause the greatest positive deviations for high identifiers.

Method

Participants and Design

Four hundred American adults were recruited from Amazon Mechanical Turk and received up to $1.00 in compensation for their participation. This experiment was a mixed subjects design, with time as the within-subjects factor (Time 1 vs. Time 2) and condition as the between-subjects factor (Uncertainty vs. Certainty vs. Negative control). During Time 1, participants reported the extent to which they felt prototypical of Americans in general and the extent to which they possess stereotypical traits of Americans. Two weeks later during Time 2, participants were randomly assigned to a self-uncertainty, certainty, or negative control condition and completed the same prototypicality and group trait measures. There were three total groups for comparison, uncertainty (n = 50), certainty (n = 53), and negative control (n = 47). The dependent variables of interest were general prototypicality and self-perceptions of group traits.

The need for closure, global self-esteem, and self-concept clarity were measured and treated as covariates in the current study. The need for closure (NFC) can be described as a dispositional desire to reduce uncertainty (Webster & Kruglanski, 1994), and there is evidence to suggest that those high in NFC rely more on prototypicality as a means of reducing uncertainty (Pierro, Bonaiuto, & Kruglanski, 2005). However, high

NFC does not strengthen the effects of uncertainty salience on intergroup judgments (e.g., Brizi, Mannetti, & Kruglanski, 2016), so it is treated as a covariate, rather than a moderator, in the current study. By co-varying NFC, I tested the effect of experimental condition on a participant's perceptions of prototypicality while adjusting for individual differences in NFC.

Global self-esteem was included as a covariate because self-esteem partially motivates social identification (Abrams & Hogg, 1988), and research shows that global self-esteem is positively associated with clarity surrounding the self-concept, such that individuals with lower self-esteem tend to feel more uncertainty about the self (Campbell et al., 1996). By co-varying global self-esteem, I tested the causal relationship between self-uncertainty and prototypicality above and beyond what is explained by self-esteem. State self-esteem was not measured in the current study, because previous research shows that experimentally inducing self-esteem does not erase the relationship between uncertainty and group identification (Hogg & Svensson, 2006; Hogg & Mullin, 1999b; Hogg, 2007). One study manipulated self-uncertainty and measured state self-esteem, and found that self-uncertainty did not cause changes in state self-esteem but did significantly increase uncertainty-reduction behavior (extreme conviction about social issues; McGregor et al., 2001). These findings suggest that state self-esteem does not explain the relationship between uncertainty and group behavior, so was it not included in the current research.

Self-concept clarity was included as a covariate because it is theorized that humans have a fundamental need to define one's self-concept and will engage in self-defining behavior to alleviate the uncertainty surrounding the self (Mullin & Hogg,

1998). An important difference between self-concept clarity and self-uncertainty described by uncertainty identity theory is that self-concept clarity is considered an individual difference factor, while self-uncertainty is context dependent (Grieve & Hogg, 1999). Dispositional differences such as SCC may play a role in uncertainty-reduction behavior, but are thought to play a relatively minor role and are largely considered to be constrained by social context (Hogg & Mullin, 1999). Nonetheless, SCC was included as a covariate in the current research to adjust for individual differences in self-concept clarity.

Materials and Procedure

Pilot data – Stereotypical group traits. A pilot study collected qualitative data on what positive and negative stereotypes were associated with Americans. During summer 2018, American Amazon Mechanical Turk Workers were surveyed, "Please list 5 positive and 5 negative qualities associated with Americans in general. We are not interested in your personal opinions of Americans, but rather in what you think the stereotypes of Americans are" (Biernat et al., 1996).

Four positive and four negative traits were chosen for the study based on frequency and compatibility with outgroup traits. For example, the second highest reported positive trait for Americans was *hardworking*, and the third highest reported negative trait for the French was *lazy*—this information led to *hardworking* being chosen as a positive American trait, because it represented a stereotypical difference between how Americans view themselves compared to the French. Similarly, the eighth highest negative trait for Americans was *ignorant*, and the second highest positive trait for the French was *cultured*—this information led to *ignorant* being chosen as a negative

American trait. Eight total traits were used in the experiment; four positive American traits and four negative American traits. The wording was balanced within each trait group, such that half of the positive traits were worded positively (*hardworking, generous*) and half of the positive traits were worded negatively (*not rude, not cowardly*). The negative traits were balanced in the same fashion (*ignorant, aggressive, not artistic, not sophisticated*).

Time 1. Participants were told that the study was focused on understanding Americans' identity. At the beginning of the survey, participants were asked to create a unique identifying code so their responses from Time 1 could be matched to their responses at Time 2. After creating their unique code, participants completed a four-item measure of general prototypicality (M = 7.07, SD = 2.67, Min = 1.00, Max = 11.00, α = .968; Jetten, Spears, & Manstead, 1997; Appendix B). Next, self-perceptions of positive group traits (M = 69.71, SD = 12.66, Min = 34.75, Max = 98.75, α = .370) and negative group traits (M = 48.15, SD = 16.01, Min = 14.50, Max = 97.25, α = .468) were measured using scales created by the experimenter (Appendix C). Participants were told: "Below are qualities that are typically used to describe how Americans differ from French people. On the scales below, please indicate how much each quality describes you as an American." On each scale, two semi-overlapping distributions were positioned next to each other, with the midpoint of the first distribution labeled, "Average French person" and the midpoint of the second distribution labeled, "Average American person." Participants rated themselves on the four negative and four positive stereotypic traits of Americans. Above each scale, it read, "Use the slider to indicate how [hardworking] you are as an American." Each scale ranged from 0 (*the least [hardworking] person*) to 100

(*the most [hardworking] person*). Under each scale, participants manipulated a slider to report the extent to which they possess each trait as an American (the outgroup mean was positioned at 30 and the ingroup mean was positioned at 65). After the group trait items, participants completed a check where they were asked if each trait is a quality of Americans in general (e.g., "Do you think [hardworking] is a positive quality associated with Americans general?" Yes vs. No; Appendix D). The grand majority of participants answered "Yes" to the trait checks, so all traits were included in analyses (*hardworking* = 90%, *generous* = 91.3%, *not rude* = 84.7%, *not cowardly* = 90%, *ignorant* = 87.3%, *aggressive* = 80%, *not artistic* = 69.3%, *not sophisticated* = 74%).

To test if identification moderated the relationship between self-uncertainty and the dependent measures of interest, participants completed a measure of group identification (M = 7.48, SD = 2.64, *Min* = 1.00, *Max* = 11.00, α = .975) Hohman & Hogg, 2011; Appendix E), and then participants completed a brief measure of need for closure (M = 4.16, SD = .838, *Min* = 1.67, *Max* = 5.73, α = .890; Roets & Van Hiel, 2011; Appendix F), a measure of global self-esteem (*Sum* = 23.37, SD = 5.19, *Min* = 11.00, *Max* = 33.00, α = .741; Rosenberg, 1965; Appendix G), and a measure of self-concept clarity (M = 3.62, SD = .992, *Min* = 1.17, *Max* = 5.00, α = .941; Campbell et al., 1996). Finally, participants reported demographic information (Appendix H) and were reminded that they would be contacted in two weeks to complete the second part of the study. Participants received $.50 for participation in Time 1.

Time 2. Waiting between two days and two weeks is considered a reasonable time interval to avoid recollection bias when using self-report questionnaires in a repeated measures design (Marx, Menezes, Horovitz, Jones, & Warren, 2003). For this

reason, the current study waited two weeks before administering the second part of the experiment. Two weeks after Time 1, participants entered their unique identifying code from Time 1, and then were randomly assigned into an uncertainty, certainty, or negative control condition. The uncertainty manipulation is a validated method of inducing high and low self-uncertainty and has been successfully used in previous research (e.g., Grant & Hogg, 2012; Hohman et al., 2017). To ensure that the effects of the high self-uncertainty manipulation were caused by feelings of uncertainty and not by negative affect, the current research included a negative control condition. Writing about dental pain is typically used as a negative control condition in terror management research because it produces negative affect (Pyszczynski et al., 2004), so this manipulation was adapted to match the wording of the uncertainty manipulations for the current research. Uncertainty participants were instructed:

> "Please take a few minutes and think about those aspects in your life that make you feel the most uncertain about yourself, your future, or your place in the world. Then please list/write three of those below."

Certainty participants were instructed:

> "Please take a few minutes and think about those aspects in your life that make you feel the most certain about yourself, your future, or your place in the world. Then please list/write three of those below."

Negative control participants were instructed:

> "Please take a few minutes and think about dental pain and the emotions that the thought of dental pain arouses in you. Then please list/write three of those thoughts or emotions below."

After the manipulation, participants completed the same general prototypicality (M = 6.84, SD = 2.68, Min = 1.00, Max = 11.00, α = .976), positive group traits (M = 69.29, SD = 13.15, Min = 31.75, Max = 100.00, α = .454), and negative group traits (M = 48.03, SD = 15.63, Min = 4.50, Max = 95.75, α = .519) measures from Time 1. Participants were then fully debriefed and thanked for their participation. Participants received $.50 for participation in Time 2.

Sample size and sample characteristics. An a priori power analysis was conducted using G*Power version 3.1 to determine the appropriate sample size for the experiment. Pickett, Bonner, & Coleman (2002) found a large effect size in comparing self-stereotyping between core and marginal group members (η_p^2 = .190; based on criteria from Cohen, 1988). Other research that has manipulated self-uncertainty (Hohman et al., 2017) found a small effect of self-uncertainty on group identification (η_p^2 = .034; Cohen, 1988). To be conservative, the current study assumed a small effect (f = .176, η_p^2 = .030), using α = 0.05 and 95% power. For a repeated measures ANOVA with an expected within-between groups interaction, the total sample size was estimated to be N = 129. Previous research using repeated measures designs estimated attrition rates between 5% for a one-week interval (Bhaumik et al., 2008) and 20% for a one-year interval (Guo et a., 2013). To be conservative, for the current study I estimated an attrition rate of 20% for the two-week interval, meaning the target sample size for Time 1 was N = 162.

Four hundred Mturk workers participated in Part 1 of this study. Out those participants, 209 returned to complete Part 2, showing a 48% attrition rate. Due to experimenter error, n = 44 of those who returned received the wrong Part 2 survey link. This yielded three distinct groups to compare for equivalency of participant

characteristics: those who completed both correct parts ("completers," $n = 165$), those who completed the correct Part 1 but completed the erroneous Part 2 ("error participants," $n = 44$), and those who completed the correct Part 1 but dropped out and did not complete Part 2 ("dropouts," $n = 191$). Chi-square tests for independence were conducted to test the relationship between participants (completers vs. error participants vs. dropouts) and gender identity, political identity, and ethnic identity.

Within gender identity, identities with expected counts lower than ten were treated as missing (female $n = 211$, male $n = 186$, transgender $n = 2$, other $n = 1$). A chi-square test for independence showed that gender identity was distributed significantly differently across completion groups, $\chi^2(2) = 6.98$, $p = .030$, so gender was included as a covariate in all analyses. Within the completers group, 39.9% were male and 60.1% were female. Within the dropout group, 53.7% were male and 46.3% were female. Within the error group, 43.2% were male and 56.8% were female.

Within political identity, identities with expected counts lower than ten were treated as missing (Democrat $n = 168$, Republican $n = 128$, moderate/do not identify with a party $n = 100$, other $n = 4$). A chi-square test for independence showed that political identity was distributed significantly differently across completion groups, $\chi^2(4) = 13.85$, $p = .008$, so political identity was included as a covariate in all analyses. Within the completers group, 47.9% were Democrat, and 22.7% were Republican, and 29.4% were Moderate/Do not identify. Within the dropout group, 37.9% were Democrat, and 41.1% were Republican, and 21.1% were Moderate/Do not identify. Within the error group, 41.9% were Democrat, and 30.2% were Republican, and 27.9% were Moderate/Do not identify.

Within ethnic identity, identities with expected counts lower than ten were combined and included as a separate group (White/European American/Caucasian n = 288, Black/African American n = 41, Asian/Pacific Islander n = 31, Hispanic/Latino n = 28, multi-racial n = 6, Native American/Alaska Native n = 4, other n = 2). A chi-square test for independence showed that ethnic identity was not distributed significantly differently across completion groups, $\chi^2(8) = 14.76$, $p = .064$. Within the completers group, 7.9% were Black/African American, 9.1% were Asian/Pacific Islander, 74.5% were White/European American/Caucasian, 7.3% were Hispanic/Latino, and 1.2% were all other identities. Within the dropouts group, 13.1% were Black/African American, 6.8% were Asian/Pacific Islander, 71.7% were White/European American/Caucasian, 4.7% were Hispanic/Latino, and 3.7% were all other identities. Within the error group, 6.8% were Black/African American, 63.6% were Asian/Pacific Islander, 15.9% were White/European American/Caucasian, 6.8% were Hispanic/Latino, and 11.0% were all other identities.

A one-way ANOVA tested for significant differences in age, global self-esteem, need for closure, self-concept clarity, and group identification between completion groups at Time 1. There were no significant differences between groups for age ($F(2, 397) = 1.80$, $p = .167$, $\eta_p^2 = .009$), global self-esteem ($F(2, 397) = .781$, $p = .459$, $\eta_p^2 = .004$), need for closure ($F(2, 397) = .595$, $p = .552$, $\eta_p^2 = .003$), or group identification ($F(2, 397) = 1.75$, $p = .175$, $\eta_p^2 = .009$). However, there was a significant difference between completion groups in self-concept clarity ($F(2, 397) = 3.92$, $p = .021$, $\eta_p^2 = .019$). Completers reported significantly more self-concept clarity ($M = 3.53$, $SD = .998$) compared to dropouts ($M = 3.26$, $SD = .972$), $M_{Diff} = .266$, $SE_{Diff} = .104$, $p = .029$, 95%

CI [.022, .510], d = .273. There were no significant differences between completers and error participants (M = 3.56, SD = .905), M_{Diff} = -.030, SE_{Diff} = .166, p = .981, 95% CI [-.420, .359], d = -.031, or between dropouts and error participants, M_{Diff} = -.297, SE_{Diff} = .163, p = .164, 95% CI [-.681, .087], d = -.310. It seems that the current study's sample could have had higher levels of self-concept clarity compared other samples, which is a detail that is considered in the general discussion.

There were N = 165 participants who successfully completed both parts of the study. Out of those participants, n = 1 was removed because they completed Part 2 two times (their initial response was kept and their second response was thrown out), n = 3 participants were removed because their unique identifying code could not be matched up between Part 1 and Part 2, and n = 1 was removed because they did not consent to us using their data after being debriefed. There were three attention checks embedded in the study (e.g., "If you are reading this and paying attention, please select 4"), and participants were thrown out if they failed any of the three checks (n = 10)[1]. This left N = 150 cases for analysis (M_{age} = 37.91, SD_{age} = 11.13), the majority of which was female (61.3% Female, 37.3% Male, .007% Transgender, .007% other), White (75.0% White/European American/Caucasian, 9.3% Asian/Pacific Islander, 8.0% Black/African American, 1.5% Hispanic/Latino, .133% Multi-racial), and Democrat (47.3% Democrat, 31.3% Moderate/Do not identify with a party, 20.7% Republican, .007% other).

Data screening. Prior to analysis, variables of interest (group identification Time 1, NFC Time 1, SE Time 1, SCC Time 1, general prototypicality Time 1/Time 2, positive

[1] All analyses were also run including participants who failed the manipulation checks (N = 160). Any differences in findings are included in footnotes.

traits Time 1/Time 2, negative traits Time 1/Time 2) were screened in IBM SPSS Version 22 for data entry accuracy, missing values, outliers, and adherence to the assumptions of univariate analysis. See Table 1 for a correlation table of all variables.

Table 1

Bivariate Correlations Between Variables of Interest

	1	2	3	4	5	6	7	8	9	10
1. Proto. T1	---									
2. Proto. T2	.838*	---								
3. Pos. Traits T1	.293*	.304*	---							
4. Pos. Traits T2	.276*	.341*	.429*	---						
5. Neg. Traits T1	.211*	.176*	.114	-.033	---					
6. Neg. Traits T2	.297*	.228*	-.023	-.035	.482*	---				
7. Ident. T1	.833*	.794*	.363*	.320*	.151	.227*	---			
8. NFC T1	.205*	.162*	-.086	.050	-.155	.001	.253*	---		
9. SE T1	.300*	.271*	.203*	.182*	.021	-.056	.257*	-.030	---	
10. SCC T1	.078	.089	.234*	.085	-.107	-.055	.055	-.159	.445*	---

Note. * $p < .05$

There were no missing values for any dependent measure. All dependent measures were normally distributed except for group identification. Identification showed a negative skew (skewness = -3.59), and was square root transformed. There were no outliers for any variable (+/- 3 SD's) except one case for need for cognition (z = -3.42). This case was windsorized to the next lowest value (z = -2.95). No issues for nonlinearity or multicollinearity were identified between dependent measures.

Chi-square analyses were conducted to test the relationship between experimental condition (Uncertainty vs. Certainty vs. Negative control) and gender identity, political identity, and ethnic identity. Chi-square tests for independence showed that gender identity was not distributed significantly differently across experimental conditions, $\chi^2(2)$

= .986, p = .611, nor was political identity distributed significantly differently across conditions, $\chi^2(4) = 1.58$, p = .812, nor was ethnic identity distributed significantly differently across conditions, $\chi^2(8) = 11.27$, p = .187.

A one-way ANOVA tested for significant differences in age, global self-esteem, need for closure, self-concept clarity, and group identification between experimental conditions at Time 1. There were no significant differences between conditions for age ($F(2, 147) = 1.07$, p = .346, η_p^2 = .014), global self-esteem ($F(2, 147) = .007$, p = .993, $\eta_p^2 < .001$), need for closure ($F(2, 147) = .400$, p = .671, η_p^2 = .005), self-concept clarity ($F(2, 147) = 1.02$, p = .364, η_p^2 = .014), or group identification ($F(2, 147) = 1.69$, p = .188, η_p^2 = .022).

Covariates. All analyses were conducted with and without including gender, political identification, need for closure, self-concept clarity, and global self-esteem as covariates. The covariate models are reported in the body of the manuscript, and any differences between covariate and non-covariate models are highlighted in footnotes and discussed in the general discussion.

Results

H1: General prototypicality. The four general prototypicality items were averaged together to create a composite score of perceived prototypicality at Time 1 and Time 2, where higher values indicate higher perceived prototypicality. A three-way mixed ANCOVA was conducted on prototypicality with time as the within-subjects factor (Time 1 vs. Time 2), condition as the between-subjects factor (Uncertainty vs. Certainty vs. Negative control), and identification as a continuous between-subjects factor while co-varying gender identity, political identity, NFC, SCC, and SE scores.

Time. There was no main effect for time, $F(1, 136) = .900$, $p = .345$, $\eta_p^2 = .007$. Participants reported the same levels of prototypicality at Time 1 ($M = 7.06$, $SE = .124$) and at Time 2 ($M = 6.87$, $SE = .139$), $M_{Diff} = .190$, $SE_{Diff} = .130$, $p = .147$, 95% CI [-.067, .447].

Condition. There was no main effect for condition, $F(2, 136) = 1.24$, $p = .294$, $\eta_p^2 = .018$. Participants in the certainty condition did not differ in general prototypicality ($M = 7.55$, $SE = .336$) compared to those in the uncertainty condition ($M = 6.81$, $SE = .197$), $M_{Diff} = .335$, $SE_{Diff} = .279$, $p = .232$, 95% CI [-.217, .886], and did not differ in general prototypicality compared to those in the negative control condition ($M = 6.94$, $SE = .207$), $M_{Diff} = .204$, $SE_{Diff} = .285$, $p = .474$, 95% CI [-.358, .767]. Participants in the uncertainty condition did not significantly differ than those in the negative control condition, $M_{Diff} = -.130$, $SE_{Diff} = .288$, $p = .652$, 95% CI [-.700, .440].

Time x Condition. The interaction between condition and time was not significant, $F(2, 136) = .110$, $p = .896$, $\eta_p^2 = .002$ (see Table 2 and Figure 1). Planned post-hoc analyses showed at Time 1, the certainty condition reported the same prototypicality ($M = 7.32$, $SE = .212$) as the uncertainty condition ($M = 6.95$, $SE = .213$), $M_{Diff} = .361$, $SE_{Diff} = .302$, $p = .234$, 95% CI [-.236, .958], and the same prototypicality as the negative control condition ($M = 6.92$, $SE = .225$), $M_{Diff} = .401$, $SE_{Diff} = .308$, $p = .196$, 95% CI [-.209, 1.01]. There were no significant differences between the uncertainty and negative control condition at Time 1, $M_{Diff} = .040$, $SE_{Diff} = .312$, $p = .899$, 95% CI [-.577, .657]. At Time 2, the certainty condition reported the same prototypicality ($M = 6.98$, $SE = .237$) as the uncertainty condition ($M = 6.67$, $SE = .239$), $M_{Diff} = .308$, $SE_{Diff} = .339$, $p = .364$, 95% CI [-.361, .978]. There were no significant differences between the certainty condition and

the negative control group (M = 6.97, SE = .252), M_{Diff} = .008, SE_{Diff} = .346, p = .981, 95% CI [-.675, .692], and no differences between the negative control group and the uncertainty condition at Time 2, M_{Diff} = -.300, SE_{Diff} = .350, p = .393, 95% CI [-.992, .392].

Table 2

General Prototypicality Between Conditions Across Time

Condition	Time 1	Time 2
Uncertainty	6.95_a (.213)	6.67_a (.239)
Certainty	7.32_a (.212)	6.98_a (.237)
Negative control	6.92_a (.225)	6.97_a (.252)

Note. Means not sharing the same letter differ at $p < .05$. Standard error in parentheses.

Observing the interaction another way, there were no significant differences within each condition across time. The uncertainty group scored the same at Time 1 (M = 6.95, SE = .213) and at Time 2 (M = 6.67, SE = .239), M_{Diff} = .286, SE_{Diff} = .224, p = .204, 95% CI [-.156, .728], the certainty group scored the same at Time 1 (M = 7.32, SE = .212) and at Time 2 (M = 6.98, SE = .237), M_{Diff} = .338, SE_{Diff} = .222, p = .130, 95% CI [-.101, .778], and the negative control group scored the same at Time 1 (M = 6.92, SE = .225) and at Time 2 (M = 6.97, SE = .252), M_{Diff} = -.054, SE_{Diff} = .236, p = .819, 95% CI [-.521, .413].

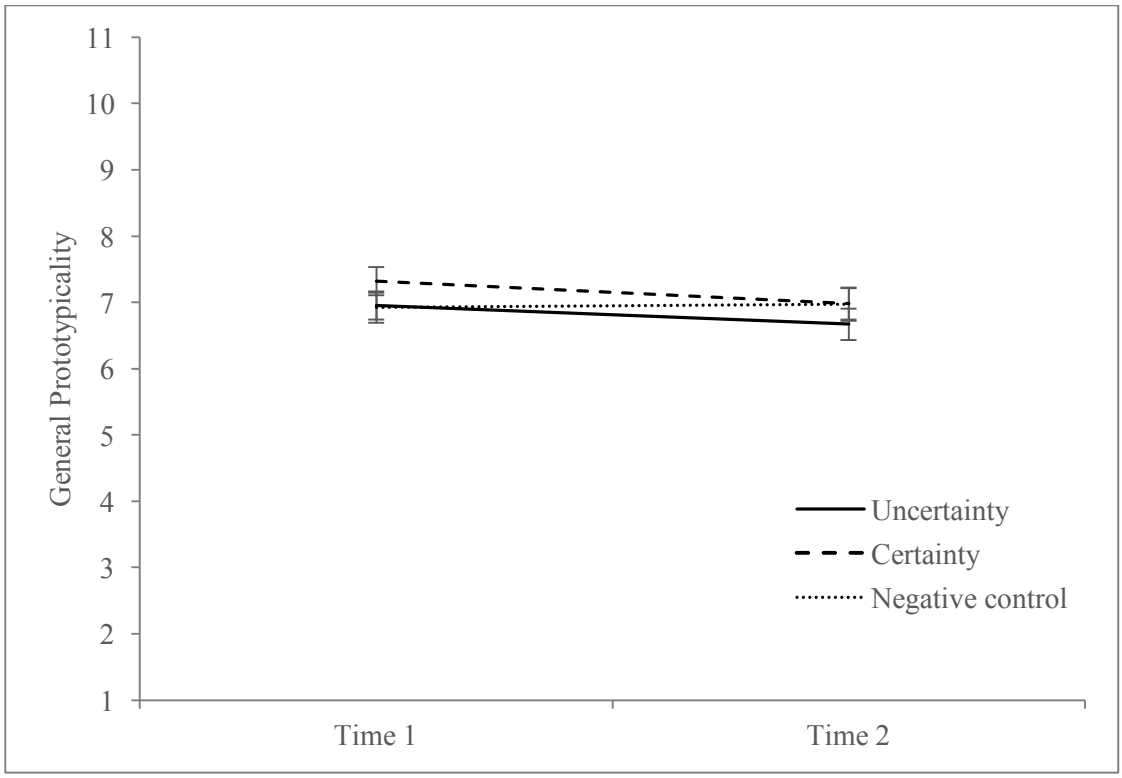

Figure 1. General prototypicality between conditions across time. Error bars are standard error.

Time x Condition x Identification. The predicted three-way interaction between time, condition, and identification was not significant, $F(2, 136) = .021$, $p = .979$, $\eta_p^2 < .001$. To examine the interaction, I conducted a moderation analysis using Model 1 of the PROCESS macro in SPSS (Hayes, 2018), see Figure 2. Condition was dummy coded using indicator coding (Hayes & Rockwood, 2016), with the uncertainty condition as the reference group. The dependent variable was Time 2 general prototypicality, and Time 1 general prototypicality was entered as a covariate (in addition to NFC, SCC, self-esteem, political ID, and gender ID). Results indicated that the overall model was significant in predicting general prototypicality, $F(11, 135) = 35.00$, $p < .001$, $R^2 = .740$). Examining the simple slopes, as identification increased, there were significant increases in general

prototypicality for the uncertainty condition, $b = 1.36$, $t = 3.02$, $p = .003$, for the certainty condition, $b = 1.21$, $t = 2.72$, $p = .008$, and for the negative control condition, $b = 1.49$, $t = 3.40$ $p < .001$. Examining the two-way interaction between condition and identification, in comparing the uncertainty condition and the certainty condition, the strength of the effect of group identification on general prototypicality was not significantly different in the uncertainty condition than in the certainty condition, $b = -.149$, $t = -.299$, $p = .766$. Comparing the uncertainty condition and the negative control condition, there was also no significant difference in strength of effect, $b = .131$, $t = .279$, $p = .781$.

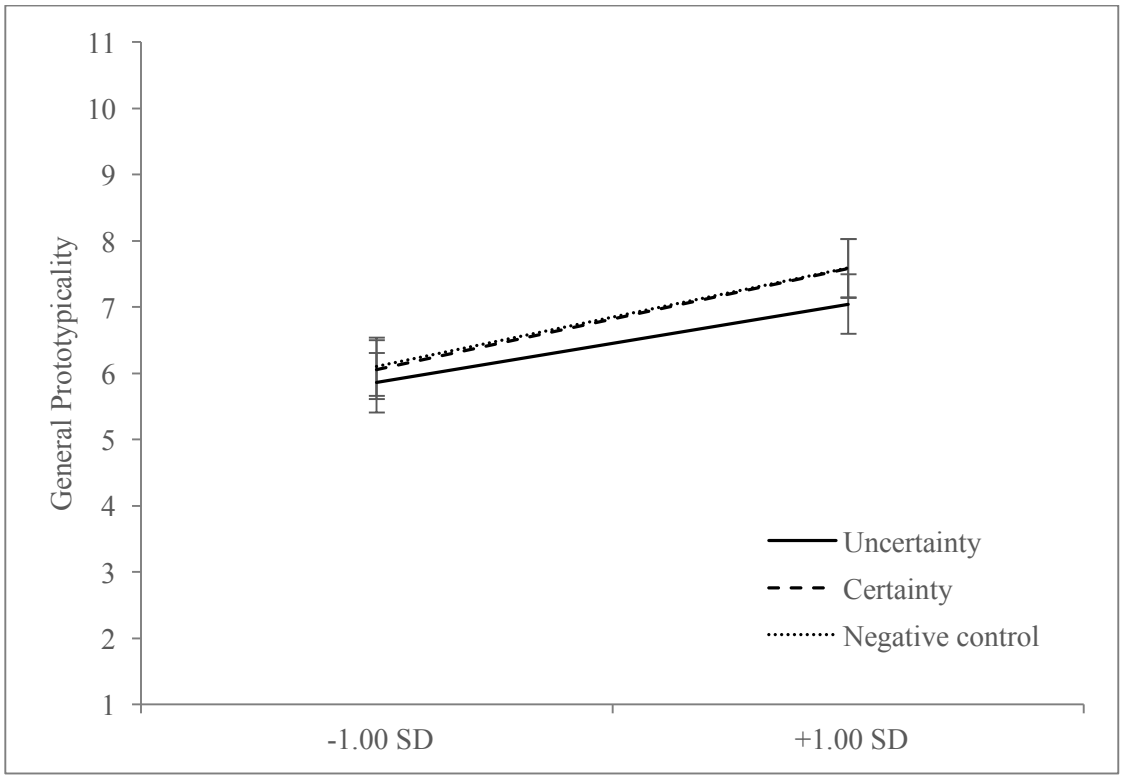

Figure 2. Moderating effect of identification on prototypicality by condition. Error bars are standard error.

Overall, Hypothesis 1 was not supported. Self-uncertainty did not cause greater perceived general prototypicality compared to self-certainty and a negative control condition. Group identification moderated the relationship between condition and general

prototypicality, such that higher group identification predicted higher prototypicality ratings, but the effect did not differ between experimental groups as predicted.

H2: Prototypicality for group traits. The four positive trait items and four negative trait items were averaged together to create composite scores of positive and negative self-stereotyping, where higher values indicate greater self-stereotyping. A four-way mixed ANCOVA was conducted on self-stereotyping with time as a within-subjects factor (Time 1 vs. Time 2), valence as a within-subjects factor (Positive traits vs. Negative traits), condition as a between-subjects factor (Uncertainty vs. Certainty vs. Negative control), and identification as a continuous between-subjects factor while co-varying gender identity, political identity, NFC, SCC, and SE scores. Need for cognition was a significant predictor in the model, $F(1, 136) = 5.70$, $p = .018$, $\eta_p^2 = .040$, which is a detail that is discussed in the general discussion.

Time. There was no main effect for time, $F(1, 136) = 2.31$, $p = .131$, $\eta_p^2 = .017$. Participants reported the same levels of self-stereotyping at Time 1 ($M = 58.83$, $SE = .840$) and at Time 2 ($M = 58.75$, $SE = .799$), $M_{Diff} = .078$, $SE_{Diff} = .945$, $p = .934$, 95% CI [-1.79, 1.95].

Condition. There was no main effect for condition, $F(2, 136) = .280$, $p = .756$, $\eta_p^2 = .004$. Participants in the certainty condition reported the same levels of self-stereotyping ($M = 60.16$, $SE = 1.15$) as those in the uncertainty condition ($M = 57.63$, $SE = 1.15$), $M_{Diff} = 2.53$, $SE_{Diff} = 1.63$, $p = .124$, 95% CI [-.699, 5.76]. The certainty condition did not differ in self-stereotyping compared to those in the negative control condition ($M = 58.59$, $SE = 1.22$), $M_{Diff} = 1.57$, $SE_{Diff} = 1.67$, $p = .348$., 95% CI [-1.73,

4.87]. Participants in the uncertainty condition did not significantly differ than those in the negative control condition, M_{Diff} = -.961, SE_{Diff} = 1.69, p = .570, 95% CI [-4.30, 2.38].

Valence. There was no main effect for valence[2], $F(1, 136) = .404$, $p = .526$, $\eta_p^2 = .003$, but the planned post-hoc comparison showed that participants reported significantly greater self-stereotyping of positive group traits (M = 69.47, SE = .800) than negative group traits (M = 48.11, SE = 1.12), M_{Diff} = 21.35, SE_{Diff} = 1.41, $p < .001$, 95% CI [18.56, 24.15].

Time x Condition. The interaction between condition and time was not significant, $F(2, 136) = 2.30$, $p = .105$, $\eta_p^2 = .033$. Planned post-hoc analyses showed at Time 1, the certainty condition reported the same self-stereotyping (M = 60.29, SE = 1.44) as the uncertainty condition (M = 57.48, SE = 1.44), M_{Diff} = 2.81, SE_{Diff} = 2.05, p = .172, 95% CI [-1.24, 6.86], and the same self-stereotyping as the negative control condition (M = 60.29, SE = 1.44), M_{Diff} = 1.57, SE_{Diff} = 2.09, p = .453, 95% CI [-2.56, 5.70]. There were no significant differences between the uncertainty and negative control condition at Time 1, M_{Diff} = 1.24, SE_{Diff} = 2.12, p = .558, 95% CI [-2.94, 5.43]. At Time 2, the certainty condition reported the same self-stereotyping (M = 60.02, SE = 1.37) as the uncertainty condition (M = 57.78, SE = 1.37), M_{Diff} = 2.25, SE_{Diff} = 1.95, p = .251, 95% CI [-1.61, 6.10]. There were no significant differences between the certainty condition and the

[2] When excluding all covariates, the main effect for valence was significant, $F(1, 144) = 10.85$, $p = .001$, $\eta_p^2 = .070$, showing the same exact pattern in the planned comparison. Likewise, when using the N = 160 sample size with the covariate model, the main effect for valence was significant, $F(1, 146) = 4.94$, $p = .028$, $\eta_p^2 = .033$, showing the same exact pattern in the planned comparison. Finally, for the non-covariate model using the N = 160 sample size, the main effect for time was significant, $F(1, 155) = 10.93$, $p = .001$, $\eta_p^2 = .066$, showing the same pattern.

negative control group (M = 58.46, SE = 1.45), M_{Diff} = 1.57, SE_{Diff} = 1.99, p = .432, 95% CI [-2.37, 5.50], and no differences between the negative control group and the uncertainty condition at Time 2, M_{Diff} = -.681, SE_{Diff} = 2.01, p = .736, 95% CI [-4.66, 3.30]. Observing the interaction another way, there were no significant differences within each condition across time. The uncertainty group scored the same at Time 1 (M = 57.48, SE = 1.44) and at Time 2 (M = 57.68, SE = 1.37), M_{Diff} = -.297, SE_{Diff} = 1.62, p = .855, 95% CI [-3.51, 2.91], the certainty group scored the same at Time 1 (M = 60.29, SE = 1.44) and at Time 2 (M = 60.02, SE = 1.37), M_{Diff} = .269, SE_{Diff} = 1.61, p = .868, 95% CI [-2.92, 3.46], and the negative control group scored the same at Time 1 (M = 58.72, SE =1.52) and at Time 2 (M = 58.46, SE = 1.45), M_{Diff} = .263, SE_{Diff} = 1.71, p = .878, 95% CI [-3.12, 3.65].

Condition x Valence. The interaction between condition and valence was not significant, $F(2, 136) = 2.03$, p = .136, η_p^2 = .029. However, planned post-hoc analyses showed that for positive traits, the certainty condition reported significantly more self-stereotyping (M = 73.44, SE = 1.37) than the uncertainty condition (M = 67.12, SE = 1.37), M_{Diff} = 6.32, SE_{Diff} = 1.95, p = .001, 95% CI [2.46, 10.17], and significantly more self-stereotyping than the negative control condition (M = 67.85, SE = 1.45), M_{Diff} = 5.59, SE_{Diff} = 1.99, p = .006, 95% CI [1.66, 9.52]. There were no significant differences between the uncertainty and negative control condition for positive traits, M_{Diff} = -.727, SE_{Diff} = 2.01, p = .719, 95% CI [-4.71, 3.26]. For negative traits, the certainty condition reported the same self-stereotyping (M = 46.88, SE = 1.92) as the uncertainty condition (M = 48.13, SE = 1.93), M_{Diff} = -1.26, SE_{Diff} = 2.73, p = .646, 95% CI [-6.66, 4.15]. There were no significant differences between the certainty condition and the negative control

group (M = 49.33, SE = 2.03), M_{Diff} = -2.45, SE_{Diff} = 2.79, p = .381, 95% CI [-7.97, 3.06], and no differences between the negative control group and the uncertainty condition for negative traits, M_{Diff} = -1.20, SE_{Diff} = 2.83, p = .673, 95% CI [-6.78, 4.39]. Observing the interaction another way, there were significant differences within each condition between trait types. The uncertainty group self-stereotyped positive traits (M = 67.12, SE = 1.37) significantly more than negative traits (M = 48.13, SE = 1.93), M_{Diff} = 18.99, SE_{Diff} = 2.43, p < .001, 95% CI [14.18, 23.79], the certainty group self-stereotyped positive traits (M = 73.44, SE = 1.37) significantly more than negative traits (M = 46.88, SE = 1.92), M_{Diff} = 26.56, SE_{Diff} = 2.42, p < .001, 95% CI [21.78, 31.34], and the negative control group self-stereotyped positive traits (M = 67.85, SE = 1.45) significantly more than negative traits (M = 49.33, SE = 2.03), M_{Diff} = 18.52, SE_{Diff} = 2.56, p < .001, 95% CI [13.45, 23.59].

Time x Valence. The interaction between time and valence was not significant, $F(1, 136) = 1.19$, p = .278, η_p^2 = .009. Planned post-hoc analyses showed that there was no difference in self-stereotyping positive traits between Time 1 (M = 69.58, SE = .943) and Time 2 (M = 69.36, SE = 1.04), M_{Diff} = .220, SE_{Diff} = 1.17, p = .850, 95% CI [-2.09, 2.53], nor was there a difference in self-stereotyping negative traits between Time 1 (M = 48.08, SE = 1.32) and Time 2 (M = 48.15, SE = 1.30), M_{Diff} = -.064, SE_{Diff} = 1.36, p = .963, 95% CI [-2.75, 2.62]. Observing the interaction another way, at Time 1 participants self-stereotyped positive traits significantly more (M = 69.58, SE = .943) than negative traits (M = 48.08, SE = 1.32), M_{Diff} = 21.50, SE_{Diff} = 1.56, p < .001, 95% CI [18.42, 24.58], and at Time 2 participants self-stereotyped positive traits significantly more (M =

69.36, *SE* = 1.06) than negative traits (*M* = 48.17, *SE* = 1.30), M_{Diff} = 21.21, SE_{Diff} = 1.73, $p < .001$, 95% CI [17.79, 24.63].

Time x Valence x Condition. The three-way interaction between time, valence, and condition was not significant, $F(2, 141) = .019$, $p = .981$, $\eta_p^2 < .001$ (See Figures 3-4 and Table 3).

Table 3

Self-Stereotyping Group Traits Between Conditions Across Time

	Positive Traits	
Condition	Time 1	Time 2
Uncertainty	67.32_b (1.62)	66.92_b (1.78)
Certainty	73.35_a (1.61)	73.53_a (1.77)
Negative control	68.06_b (1.71)	67.63_b (1.88)
	Negative Traits	
Condition	Time 1	Time 2
Uncertainty	47.63_c (2.26)	48.64_c (2.24)
Certainty	47.24_c (2.25)	46.51_c (2.23)
Negative Control	49.38_c (2.39)	49.28_c (2.36)

Note. Means not sharing the same letter differ at $p < .05$. Standard error in parentheses.

Planned post-hoc analyses showed that for positive traits, self-stereotyping did not change from Time 1 (*M* = 67.32, *SE* = 1.62) to Time 2 (*M* = 66.92, *SE* = 1.78) for uncertainty participants, M_{diff} = .409, SE_{diff} = 2.00, p = .839, 95% CI [-3.55, 4.37], nor did it change from Time 1 (*M* = 73.35, *SE* = 1.61) to Time 2 (*M* = 73.52, *SE* = 1.77) for certainty participants, M_{diff} = -.181, SE_{diff} = 1.99, p = .928, 95% CI [-4.12, 3.76], nor did it change from Time 1 (*M* = 68.06, *SE* = 1.71) to Time 2 (*M* = 67.63, *SE* = 1.88) for negative control participants, M_{diff} = .434, SE_{diff} = 2.11, p = .838, 95% CI [-3.75, 4.61]. Likewise, for negative traits, self-stereotyping did not change from Time 1 (*M* = 47.63, *SE* = 2.26) to Time 2 (*M* = 48.64, *SE* = 2.24) for uncertainty participants, M_{diff} = -1.00,

SE_{diff} = 2.33, p = .668, 95% CI [-5.61, 3.61], nor did it change from Time 1 (M = 47.24, SE = 2.25) to Time 2 (M = 46.52, SE = 2.23) for certainty participants, M_{diff} = .720, SE_{diff} = 2.32, p = .757, 95% CI [-3.86, 5.30], nor did it change from Time 1 (M = 49.38, SE = 2.39) to Time 2 (M = 49.28, SE = 2.36) for negative control participants, M_{diff} = .092, SE_{diff} = 2.46, p = .970, 95% CI [-4.77, 4.96].

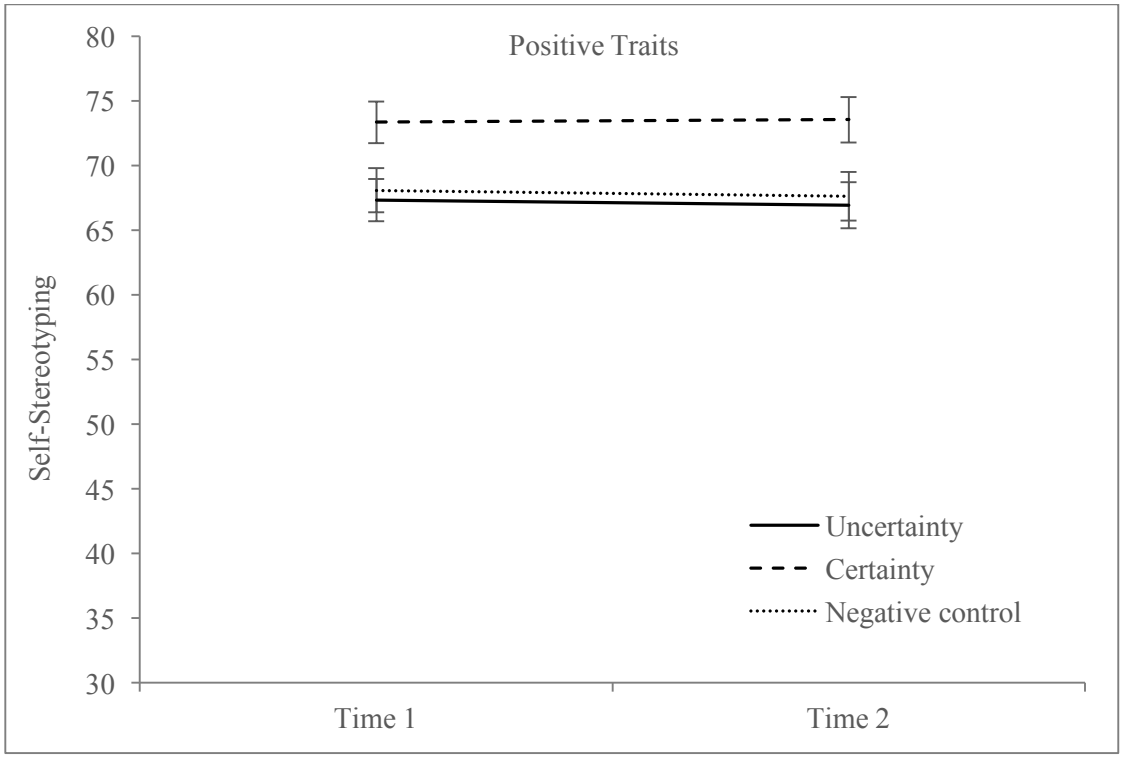

Figure 3. Self-stereotyping positive traits between conditions across time. Error bars are standard error.

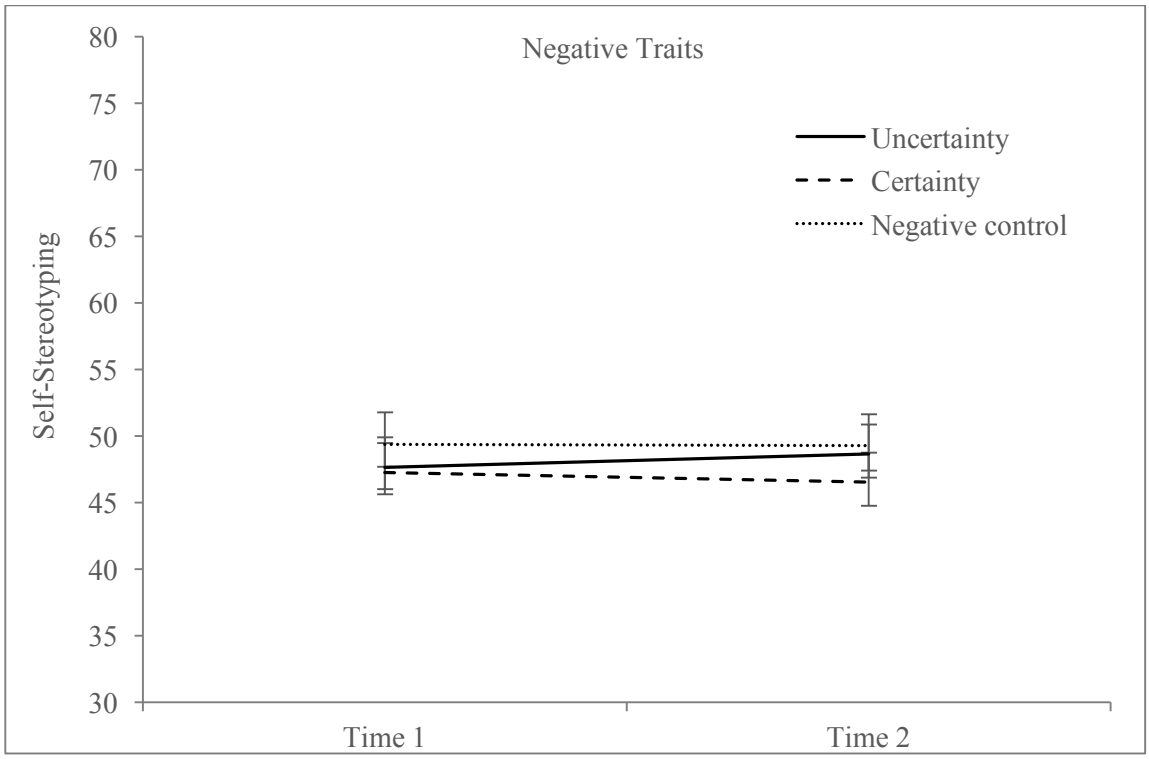

Figure 4. Self-stereotyping negative traits between conditions across time. Error bars are standard error.

Observing the interaction another way, at Time 1, certainty participants self-stereotyped positive group traits significantly more (M = 73.35, SE = 1.61) than uncertainty participants (M = 67.32, SE = 1.62), M_{diff} = 6.02, SE_{diff} = 2.30, p = .010, 95% CI [1.48, 10.56], and significantly more than negative control participants (M = 68.06, SE = 1.71), M_{diff} = 5.28, SE_{diff} = 2.34, p = .026, 95% CI [.647, 9.92]. There were no differences in self-stereotyping positive traits at Time 1 between uncertainty and negative control participants, M_{diff} = .739, SE_{diff} = 2.37, p = .756, 95% CI [-3.96, 5.44]. These differences suggest a failure of random assignment, which is a threat to internal validity that is discussed in the general discussion section. The same patterns emerged for positive traits at Time 2—certainty participants self-stereotyped positive group traits significantly more (M = 73.53, SE = 1.77) than uncertainty participants (M = 66.92, SE = 1.78), M_{diff} =

6.61, SE_{diff} = 2.52, p = .010, 95% CI [1.63, 11.60], and significantly more than negative control participants (M = 67.63, SE = 1.88), M_{diff} = 5.90, SE_{diff} = 2.57, p = .023, 95% CI [.808, 10.99]. There were no differences in self-stereotyping positive traits at Time 2 between uncertainty and negative control participants, M_{diff} = .714, SE_{diff} = 2.61, p = .784, 95% CI [-4.44, 5.87]. At Time 1, certainty participants self-stereotyped negative group traits the same (M = 47.24, SE = 2.25) as uncertainty participants (M = 47.63, SE = 2.26), M_{diff} = -.396, SE_{diff} = 3.21, p = .902, 95% CI [-6.74, 5.95], and the same as negative control participants (M = 49.38, SE = 2.39), M_{diff} = -2.14, SE_{diff} = 3.28, p = .515, 95% CI [-8.62, 4.34]. There were no differences in self-stereotyping negative traits at Time 1 between uncertainty and negative control participants, M_{diff} = 1.74, SE_{diff} = 3.32, p = .600, 95% CI [-4.82, 8.31]. At Time 2, certainty participants self-stereotyped negative group traits the same (M = 46.52, SE = 2.23) as uncertainty participants (M = 48.34, SE = 2.24), M_{diff} = -2.12, SE_{diff} = 3.18, p = .506, 95% CI [-8.40, 4.17], and the same as negative control participants (M = 49.28, SE = 2.36), M_{diff} = -2.77, SE_{diff} = 3.24, p = .395, 95% CI [-9.18, 3.65]. There were no differences in self-stereotyping negative traits at Time 1 between uncertainty and negative control participants, M_{diff} = -.648, SE_{diff} = 3.29, p = .844, 95% CI [-7.14, 5.85]. Observing the interaction a third way, there were significant differences between trait type within each condition at each time point. At Time 1, uncertainty participants reported significantly more self-stereotyping of positive traits (M = 67.32, SE = 1.62) than negative traits (M = 47.63, SE = 2.26), M_{diff} = 19.69, SE_{diff} = 2.68, p < .001, 95% CI [14.40, 24.98], certainty participants reported significantly more self-stereotyping of positive traits (M = 73.35, SE = 1.61) than negative traits (M = 47.24, SE = 2.25), M_{diff} = 26.11, SE_{diff} = 2.66, p < .001, 95% CI [20.85, 31.37], and negative

control participants reported significantly more self-stereotyping of positive traits (M = 68.06, SE = 1.71) than negative traits (M = 49.38, SE = 2.39), M_{diff} = 18.69, SE_{diff} = 2.82, $p < .001$, 95% CI [13.10, 24.27]. The same pattern was true at Time 2—uncertainty participants reported significantly more self-stereotyping of positive traits (M = 66.92, SE = 1.78) than negative traits (M = 48.37, SE = 2.24), M_{diff} = 18.28, SE_{diff} = 3.00, $p < .001$, 95% CI [12.41, 24.15], certainty participants reported significantly more self-stereotyping of positive traits (M = 73.53, SE = 1.77) than negative traits (M = 46.52, SE = 2.23), M_{diff} = 27.01, SE_{diff} = 2.95, $p < .001$, 95% CI [21.17, 32.85], and negative control participants reported significantly more self-stereotyping of positive traits (M = 67.63, SE = 1.88) than negative traits (M = 49.28, SE = 2.36), M_{diff} = 18.35, SE_{diff} = 3.13, $p < .001$, 95% CI [12.15, 24.54].

Time x Valence x Condition x Identification. The predicted four-way interaction between time, condition, valence, and identification was not significant, $F(2, 136) = .013$, $p = .987$, $\eta_p^2 < .001$. To examine the interaction, I conducted a moderation analysis using Model 1 of the PROCESS macro in SPSS (Hayes, 2018). Condition was dummy coded using indicator coding (Hayes & Rockwood, 2016), with the uncertainty condition as the reference group. The dependent variable was Time 2 positive group traits, and Time 1 positive group traits was entered as a covariate (in addition to NFC, SCC, self-esteem, political ID, and gender ID). Results indicated that the overall model was significant in predicting positive self-stereotyping, $F(11, 135) = 4.50$, $p < .001$, $R^2 = .268$). Examining the simple slopes, as identification increased, the uncertainty condition showed a significant increase in positive self-stereotyping, $b = 7.73$, $t = 2.55$, $p = .012$. As identification increased, there was no change in positive self-stereotyping for the

certainty condition, $b = .050$, $t = .016$, $p = .987$, nor for the negative control condition, $b = 2.28$, $t = .844$, $p = .400$. Examining the two-way interaction between condition and identification, in comparing the uncertainty condition and the certainty condition, the effect of group identification on self-stereotyping positive traits was marginally stronger in the uncertainty condition than in the certainty condition[3], $b = -7.68$, $t = -1.87$, $p = .064$. Comparing the uncertainty condition and the negative control condition, there was no significant difference in strength of effect, $b = -5.45$, $t = -1.40$, $p = .165$ (see Figure 5).

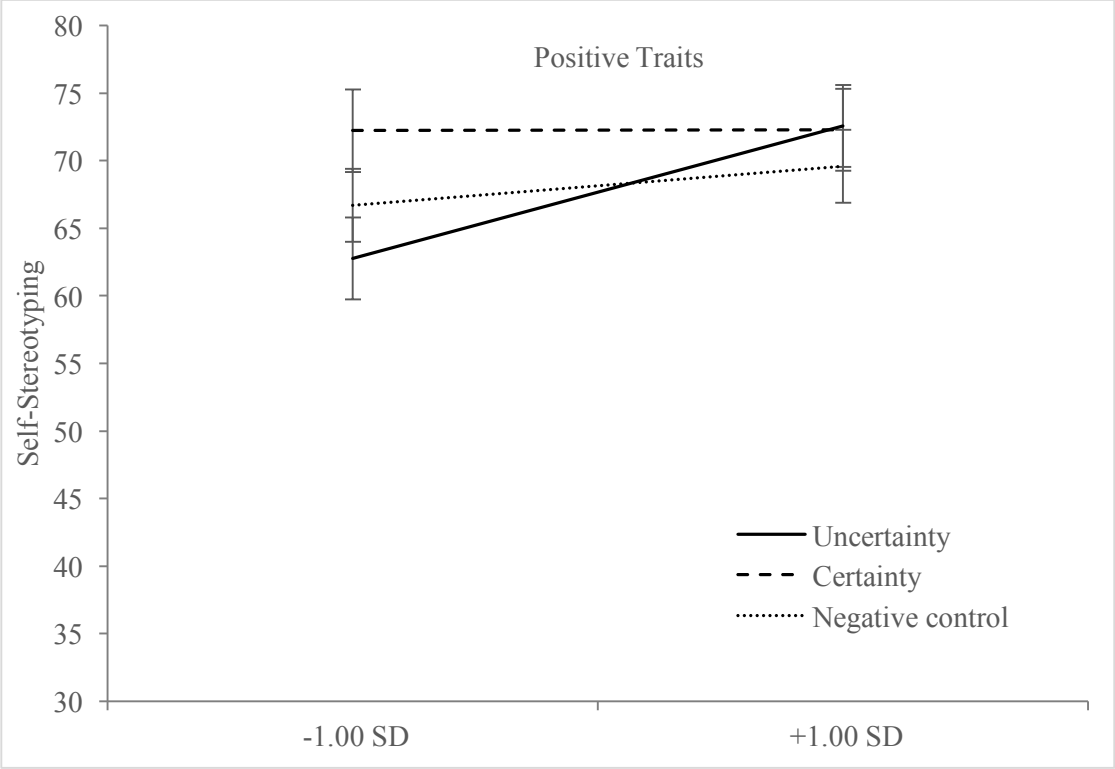

Figure 5. Moderating effect of identification on positive self-stereotyping by condition. Error bars are standard error.

[3] Using the $N = 150$ sample excluding all covariates except for Time 1 scores, the results were unchanged. Using the $N = 160$ sample excluding all covariates except for Time 1 scores, the effect of group identification on self-stereotyping positive traits was significantly stronger in the uncertainty condition than in the certainty condition, $b = -8.43$, $t = -2.16$, $p = .032$. Using the $N = 160$ sample including all covariates, the effect of group identification on self-stereotyping positive traits was significantly stronger in the uncertainty condition than in the certainty condition, $b = -9.24$, $t = -2.25$, $p = .026$.

The same model was run for negative self-stereotyping. Results showed that the overall model was significant in predicting negative self-stereotyping, $F(11, 135) = 4.81$, $p < .001$, $R^2 = .281$). Examining the simple slopes, as identification increased, the uncertainty condition showed a nonsignificant marginal increase in negative self-stereotyping, $b = 6.54$, $t = 1.87$, $p = .064$. As identification increased, there was no change in negative self-stereotyping for the certainty condition, $b = 3.60$, $t = 1.01$, $p = .316$, nor for the negative control condition, $b = 3.60$, $t = 1.18$, $p = .240$. Comparing the uncertainty condition and the certainty condition, the effect of group identification on self-stereotyping negative traits was not significantly different in the certainty condition than in the uncertainty condition, $b = -2.94$, $t = -.604$, $p = .547$, nor was the effect significantly different when comparing the uncertainty and negative control condition, $b = -2.94$, $t = -.640$, $p = .523$ (see Figure 6).

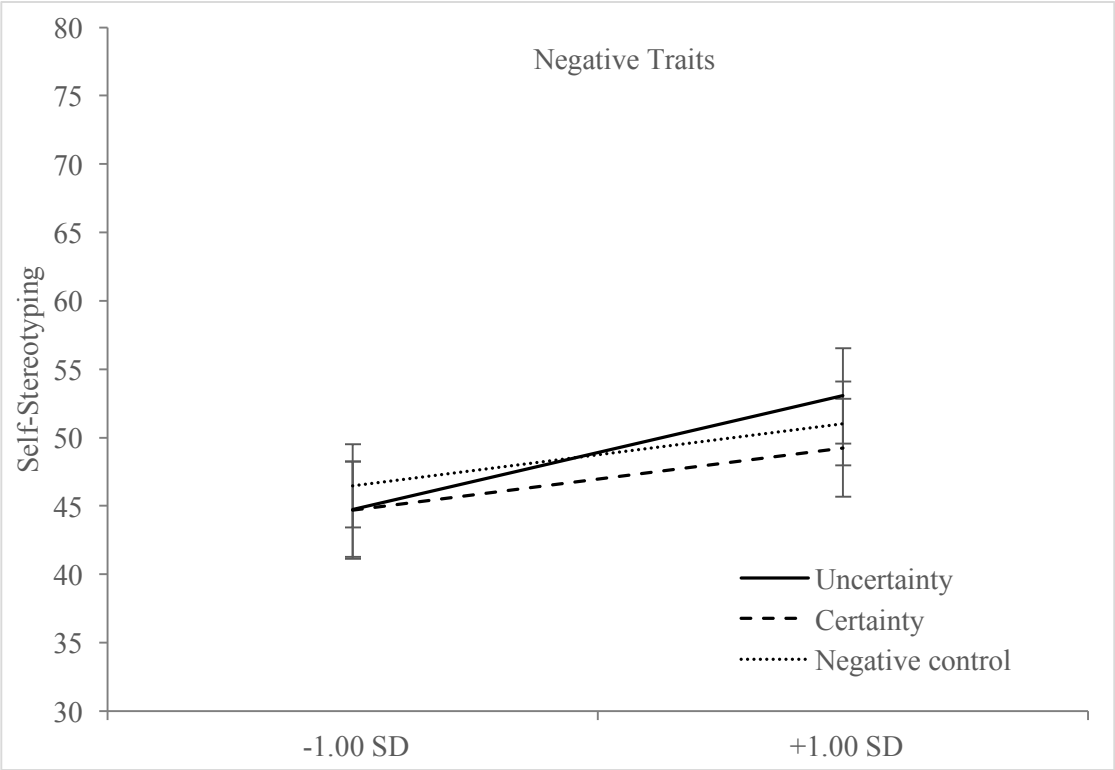

Figure 6. Moderating effect of identification on negative self-stereotyping. Error bars are standard error.

Overall, Hypothesis 2 was mostly unsupported. Self-uncertainty did not cause greater self-stereotyping of positive or negative group traits compared to a certainty and a negative control condition, and results also pointed to a failure of random assignment to conditions. However, there was evidence to suggest identification moderated the relationship between condition and self-stereotyping, such that as group identification increased, positive self-stereotyping significantly increased among uncertainty participants but did not change among certainty or negative control participants. Additionally, as identification increased, data showed a nonsignificant marginal increase in negative self-stereotyping among the uncertainty group but no change among the certainty or negative control group.

H3: Deviations from the group mean. To test for above-average self-perceptions in group traits, difference scores were calculated by subtracting 65 from the positive and negative group trait measures at Time 2 (the ingroup mean was positioned at 65 on the sliding scale). Positive difference scores indicate above average group traits, difference scores of zero indicate group traits equal to the group mean, and negative difference scores indicate below average group traits.

A one-way ANCOVA was conducted for positive traits, comparing Time 2 difference scores between conditions (Uncertainty vs. Certainty vs. Negative control) while co-varying difference scores from Time 1[4], NFC, SCC, global self-esteem, gender

[4] The model was also run co-varying the absolute value of Time 1 scores instead of Time 1 difference scores. There was a nonsignificant marginal effect for condition, $F(2, 146) = 2.55$, $p = .082$, $\eta_p^2 = .036$. The certainty group showed marginally higher difference

identification, and political identification. Time 1 difference scores was the only significant covariate in the model, $F(1, 146) = 14.07$, $p < .001$, $\eta_p^2 = .094$.

Condition. There was a nonsignificant marginal effect for condition, $F(2, 146) = 2.55$, $p = .082$, $\eta_p^2 = .036$ (see Figure 7). The certainty group showed marginally higher difference scores ($M = 7.25$, $SE = 1.72$) than the uncertainty group ($M = 2.67$, $SE = 1.71$), $M_{diff} = -4.58$, $SE_{diff} = 2.47$, $p = .066$, 95% CI [-9.46, .300], and the same difference scores as the negative control group ($M = 3.14$, $SE = 1.80$), $M_{diff} = 4.12$, $SE_{diff} = 2.50$, $p = .102$, 95% CI [-.835, 9.07]. There was no difference between the uncertainty and negative control group, $M_{diff} = .465$, $SE_{diff} = 2.49$, $p = .852$, 95% CI [-4.46, 5.39]. Each condition rated themselves as above the group mean on positive group traits.

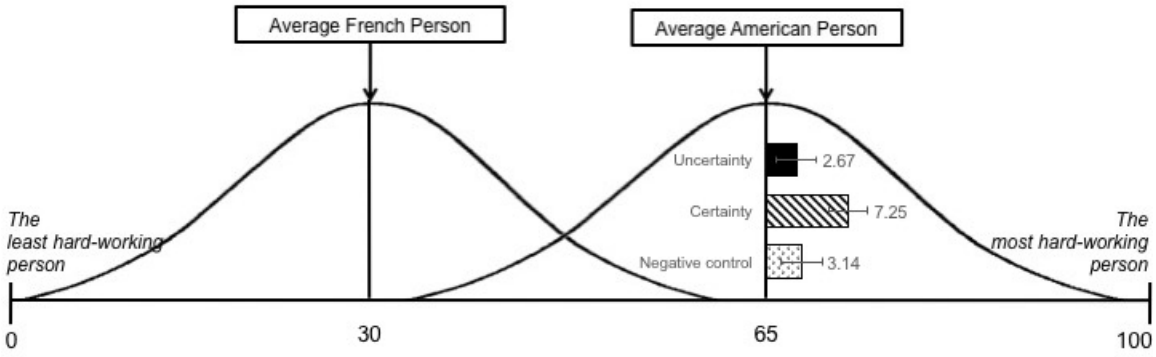

Figure 7. Difference scores for positive traits overlaid on bell curves. Scores are from Time 2 after co-varying Time 1 scores. Error bars are standard error.

Condition x Identification. The interaction between condition and group identification was not significant, $F(2, 146) = 1.85$, $p = .161$, $\eta_p^2 = .027$.

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scores ($M = 7.25$, $SE = 1.72$) than the uncertainty group ($M = 2.67$, $SE = 1.71$), $M_{diff} = -4.58$, $SE_{diff} = 2.47$, $p = .066$, 95% CI [-9.46, .300], and the same difference scores as the negative control group ($M = 3.14$, $SE = 1.80$), $M_{diff} = 4.12$, $SE_{diff} = 2.50$, $p = .102$, 95% CI [-.835, 9.07]. There was no difference between the uncertainty and negative control group, $M_{diff} = .465$, $SE_{diff} = 2.49$, $p = .852$, 95% CI [-4.46, 5.39].

A one-way ANCOVA was also conducted for negative traits, comparing Time 2 difference scores between conditions (Uncertainty vs. Certainty vs. Negative control) while co-varying difference scores from Time 1[5], NFC, SCC, global self-esteem, gender identification, and political identification. Time 1 difference scores was a significant covariate in the model, $F(1, 146) = 37.15$, $p < .001$, $\eta_p^2 = .216$.

Condition. There was no main effect for condition, $F(2, 146) = .197$, $p = .821$, $\eta_p^2 = .003$ (see Figure 8). The certainty group showed the same difference scores ($M = -18.04$, $SE = 1.98$) as the uncertainty group ($M = -16.10$, $SE = 1.99$), $M_{diff} = 1.94$, $SE_{diff} = 2.82$, $p = .494$, 95% CI [-3.65, 7.52], and the same difference scores as the negative control group ($M = -16.25$, $SE = 2.10$), $M_{diff} = -1.78$, $SE_{diff} = 2.89$, $p = .538$, 95% CI [-7.49, 3.93]. There was no difference between the uncertainty and negative control group, $M_{diff} = .154$, $SE_{diff} = 2.92$, $p = .958$, 95% CI [-5.63, 5.93]. Each condition rated themselves as below the group mean on negative group traits.

[5] The model was also run co-varying the absolute value of Time 1 scores instead of Time 1 difference scores. There was no main effect for condition, $F(2, 146) = .197$, $p = .821$, $\eta_p^2 = .003$. The certainty group showed the same difference scores ($M = -18.04$, $SE = 1.98$) as the uncertainty group ($M = -16.10$, $SE = 1.99$), $M_{diff} = 1.94$, $SE_{diff} = 2.82$, $p = .494$, 95% CI [-3.65, 7.52], and the same difference scores as the negative control group ($M = -16.25$, $SE = 2.10$), $M_{diff} = -1.78$, $SE_{diff} = 2.89$, $p = .538$, 95% CI [-7.49, 3.93]. There was no difference between the uncertainty and negative control group, $M_{diff} = .154$, $SE_{diff} = 2.92$, $p = .958$, 95% CI [-5.63, 5.93].

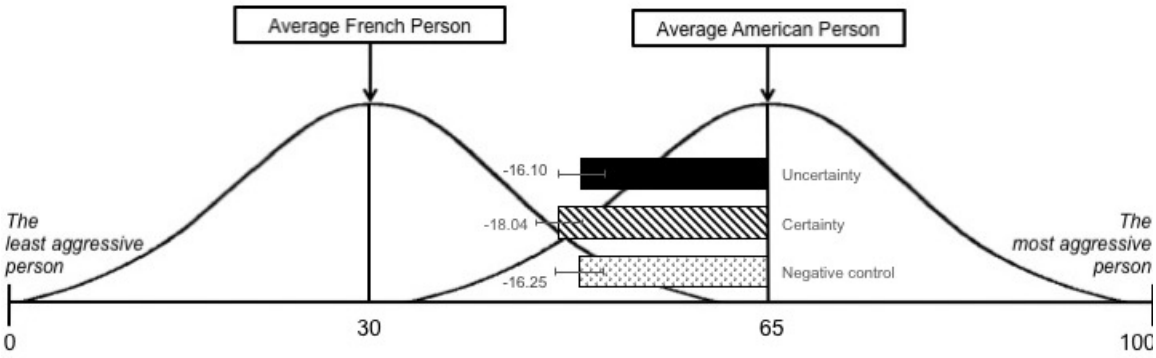

Figure 8. Difference scores for negative traits overlaid on bell curves. Scores are from Time 2 after co-varying Time 1 scores. Error bars are standard error.

Condition x Identification. The interaction between condition and group identification was not significant, $F(2, 146) = .250$, $p = .779$, $\eta_p^2 = .004$.

Overall, Hypothesis 3 was not supported. Self-uncertainty did not cause participants to exaggerate their level of self-stereotyping by placing themselves higher above the group mean in positive and negative group traits compared to certainty and negative control participants.

Discussion

The current research tested a novel hypothesis that self-uncertainty causes group members to exaggerate their perceived level of prototypicality within the group. Prototypicality was measured using two different methods: by measuring perceptions of general representations of the group prototype and by measuring self-assessments of specific positive and negative group traits.

In Hypothesis 1, it was predicted that self-uncertainty would cause greater self-perceptions of general prototypicality compared to a certainty and a negative control condition. This hypothesis was unsupported. Manipulating participants to feel self-uncertain did not cause significantly greater perceptions of general prototypicality.

Additionally, all participants saw themselves as more prototypical as group identification increased, regardless of experimental condition.

Hypothesis 2 stated that self-uncertainty would cause more self-stereotyping of positive and negative group traits compared to a certainty and a negative control condition. This prediction was also unsupported. However, there was evidence that group identification moderated the relationship between uncertainty and self-stereotyping. Uncertainty participants showed significantly more positive self-stereotyping as group identification increased, while there was no change in positive self-stereotyping for the certainty or negative control conditions. For negative group traits, uncertainty participants showed marginally more negative self-stereotyping as group identification increased, while there was no change in negative self-stereotyping for the certainty or negative control conditions. Although self-stereotyping did not significantly differ between groups among high identifiers as predicted, these data support the idea that the relationship between self-uncertainty and important group outcomes is amplified by group identification (Hogg 2007).

Hypothesis 3 tested if self-uncertainty would cause group members to perceive themselves as being above-average in positive and negative group traits (i.e., greater pro-norm deviance) compared to a certainty and a negative control condition. This hypothesis was not supported. All groups rated themselves above the group mean on positive group traits and below the group mean on negative group traits.

Overall, this experiment does not support the notion that self-uncertainty increases self-perceptions of group member prototypicality. However, there are several research artifacts that must be considered as possible explanations for the null findings.

First, it is possible that the outgroup France was not the best fit for the current experiment. France was chosen as the outgroup because it has been successfully used as an outgroup in previous research on Americans (e.g., Hohman et al., 2017), and it was thought to possess clear stereotypical differences when compared to America (e.g., rude, cowardly, artistic), but not be tightly associated with political or moral issues that could make additional outgroups and ideologies salient. However, perhaps France was *too* neutral to the point where participants did not mind placing themselves close to the outgroup's distribution. Choosing a more hostile or antagonistic outgroup (e.g., Russia, China, ISIS) could have sparked a greater emotional reaction (in addition to the cognitive shift during self-categorization), strengthening the results. On the other hand, previous research shows that even arbitrary group identities spark social categorization and cause intergroup discrimination (Mullin & Hogg, 1998; Tajfel, 2001), so using a neutral or minimal outgroup should have been sufficient in causing self-categorization and accentuating group differences.

Perhaps instead, the null findings were due to the positive and negative self-stereotyping measures not working as intended. The alpha levels for the positive trait and negative trait composite measures were very low ($\alpha = .370$ and $\alpha = .468$ respectively), signaling an unacceptable amount of inter-item reliability. The four positive and four negative traits were chosen based on pilot data, and a trait check showed that the majority of participants in the current experiment agreed that each trait was representative of Americans, but it is possible that the trait scales still failed to detect differences in the underlying outcome of interest. For instance, each trait was represented on a sliding scale between two overlapping bell curves that represented American people and French

people, so perhaps the sliding scales were too confusing or contained too much information for participants to reliably record their self-perceptions. Previous research used a similar scale with overlapping bell curves to successfully manipulate feelings of marginal membership (Jetten et al., 1997), but it is possible that this particular population did not respond to the image the same way. It is reasonable to assume that Amazon Mechanical Turk (i.e., Mturk) participants have the goal of completing as many surveys as possible in the smallest amount of time (Downs, Holbrook, Sheng, & Cranor, 2010), so perhaps the Mturk population took less time to read and understand the sliding scales before recording their answers. On the other hand, the general prototypicality measure (which was a simple Likert-type scale) showed the same null findings as the self-stereotyping measures, so it is possible that there was a larger issue with the experiment beyond the complexity of the materials.

More likely, the issue lies in the current ambiguity surrounding the American identity as a whole. Uncertainty-identity theory explains that during high self-uncertainty, individuals look to the group because the group will tell them exactly how to feel, think, and act (Hogg, 2012). Self-uncertain individuals use the group prototype to clarify who they are and what their identity is (Abrams et al., 2000; Turner et al., 1987). Naturally, if the group identity is conflicting or ambiguous, it will not provide the clarity that uncertain individuals seek, so they will not define themselves by the group prototype (Hogg 2007; Reid & Hogg, 2005). Unfortunately for the current research, the American identity at present is both conflicting and ambiguous. The year 2018 was wrought with examples of political and ideological conflict for Americans—the year started off with a government shutdown, momentum for (and criticism of) the #MeToo movement

continued, there were deeper investigations into the alleged Russian cyberattacks during the U.S. Presidential Election, and threats of nuclear war were exchanged between President Trump and Kim Jong-un, all as Americans were preparing themselves for the mid-term elections in November. Even more, the data for the current research was collected between October 1st and October 21st 2018, which happened to be right after Dr. Christine Blasey Ford appeared before a Senate Judiciary Committee to testify against Brett Kavanaugh (September 27th), and during the Senate's decision to confirm Brett Kavanaugh's Supreme Court nomination (October 6th). Over 20 million viewers watched the Kavanaugh hearing (NBC News, 2018), and for many it could be described as one of the most politically and socially divisive events that the American people experienced in years. Data collection for the current experiment may very well have captured the conflicting feelings of Americans during that particular time. Traits such as "generous," "aggressive," and "ignorant" could have been unintentionally associated with opposing political groups instead of with Americans in general, muddying the waters of the experiment by making additional outgroups cognitively salient. Equally as plausible, the overall American identity is simply unknown. If participants do not know what the typical American looks like, they cannot position themselves in relation to the "average American." During high uncertainty, looking to the American identity would not tell an individual how to think, feel, or act, making it difficult to define themselves by the group prototype. Future research on uncertainty-identity theory should consider using clearer, more distinctive group identities in their experimental materials since the overarching American identity may currently be too difficult to define.

In addition to the possible explanations for null findings, this study had several other limitations. For instance, there were significant differences in self-concept clarity between samples (dropouts, completers, error participants). Those who completed both parts of the experiment were significantly higher in SCC than those who dropped out after Time 1. Self-concept clarity is an individual difference variable that is thought to play a minor role, if any, in the reactions to context-dependent events such as high situational self-uncertainty (Hogg & Mullin, 1999). Additionally, to the author's knowledge, there is no empirical research showing that SCC moderates the relationship between uncertainty and group-based outcomes. Therefore, it is reasonable to hypothesize that the completers and the dropouts would have reacted the same to the uncertainty manipulations even though they reported different levels of SCC. However, some have theorized that identity complexity (another structural component of the self-concept; Campbell et al., 1996) could moderate the relationship between self-uncertainty and identification with extreme groups, such that lower complexity would strengthen identification with extreme groups during high self-uncertainty (Hogg, 2014). To test if SCC played a similar moderating role in the current research, we re-ran all of our analyses using SCC as a moderator, and found no moderating effects. Thus, while the differences in SCC between samples is a limitation in the current research, we do not consider it a significant issue.

Another limitation to this study was that there was a failure of random assignment between experimental conditions. At Time 1 and at Time 2, certainty participants reported significantly more positive self-stereotyping than the other two conditions. Failure of random assignment is a threat to the internal validity of the study and limits our

ability to draw firm conclusions about the relationships between variables. For instance, in testing the moderating effect of identification on positive self-stereotyping, the means for the certainty group were higher than all means for the other two groups, making it seem as though the certainty group showed the highest positive-self stereotyping of any condition at any identification level. However, if random assignment had been successful, the means for the certainty group likely would have been lower (or the means for the other two conditions could have been higher), allowing the highest self-stereotyping mean belong to the high identifiers in the uncertainty group (as predicted). However, without successful random assignment, we cannot be sure that this is the case.

Similarly, it is possible that the pattern of results for Hypothesis 2 were partially due to regression to the mean, which is another threat to internal validity. Perhaps the certainty group reported higher than normal self-stereotyping at Time 1 (or the other two groups reported lower than normal self-stereotyping at Time 1), and regressed toward the mean at Time 2. This could explain the lack of change in scores from Time 1 to Time 2 in self-stereotyping group traits. To address this possible limitation in future replications, a hanging control group should be included at Time 1 and Time 2 to observe normal responses to the measures at both time points, without the influence of the experimental manipulation at Time 2. This would allow us to draw more firm conclusions about the specific pattern of results observed across time.

In addition to the limitations, this research also had notable strengths. For example, because this study employed a two-part experimental design, we were able to observe how group members tend to see themselves in relation to the group mean at Time 1 without the influence of experimental manipulations (see Figures 9-11 in Appendix J

for the distribution of participant responses for general prototypicality, positive self-stereotyping, and negative self-stereotyping at Time 1). At Time 1, participants rated themselves on average a 7.07 (*SD* = 2.67) out of 11.00 on general prototypicality, which was significantly above the midpoint of the scale, $t(149) = 4.89$, $p < 001$, $d = .401$. This suggests that group members generally see themselves as highly representative of the ingroup. Examining specific group stereotypes, participants rated themselves on average 4.71 (*SD* = 12.66) points above the mean on positive groups traits (significantly above the mean, $t(149) = 4.56$, $p < .001$, $d = .373$), and 16.85 (*SD* = 16.00) points below the group mean on negative group traits (significantly below the mean, $t(149) = -12.89$, $p < .001$, $d = 1.00$). To the author's knowledge, this is the first study to collect data on group members' normal self-perceptions of prototypicality compared to the group mean. These data suggest that group members rate themselves below average on negative traits and rate themselves above average on positive traits. This suggests the tendency to selectively self-stereotype (Biernat et al., 1996), such that they endorse the positive stereotypes but not negative stereotypes for their group. This selective self-stereotyping effect is an interesting contrast to participants' general prototypicality responses, where they claimed that they were highly representative group members in general, but were unwilling to see themselves representing the negative group traits. These patterns of responses may vary according to the specific group identity used, but it offers some insight as to how group members normally view themselves in relation to other group members in an intergroup context. Future research should test if certain group characteristics determine where group members place themselves on the bell curve (e.g., group size, cohesiveness, norms).

Another strength that should be noted is that the uncertainty group and the negative control group did not react identically to the manipulations when group identification was included as a factor in the analyses. For instance, in testing the moderation model for positive and negative self-stereotyping, the uncertainty group showed a significant (or nonsignificant marginal) positive slope as identification increased, while the negative control condition did not. This lends support to the idea that self-uncertainty is a unique fundamental human motivational that is distinct from general negative affect (Hogg & Turner, 1987).

One topic that should be discussed is the use of covariates in the current research. Need for cognition, global self-esteem, and self-concept clarity are theoretically related to the outcome variables of interest, so all models were run with and without adjusting for the control variables. When including the covariates in the models, the only covariate that was significant was NFC when testing Hypothesis 2 (the relationship between condition and positive/negative self-stereotyping). Generally, though, the covariates used were not important predictors in the current research. There were no differences between covariate and non-covariate models, and none of the covariates (NFC, global self-esteem, SCC) were significant moderators of the relationships tested in this research. Overall, while NFC, global self-esteem, and SCC can be related to group-related outcomes, they do not influence the relationship between self-uncertainty and prototypicality or self-stereotyping, strengthening the position that situational self-uncertainty is not influenced by the individual difference variables adjusted for in this research (Hogg & Mullin, 1999).

Although hypotheses in the current study were mostly unsupported, this experiment paves the way for future research on self-perceptions of ingroup prototypicality. Future research should replicate this study using a more cohesive and distinctive ingroup identity, as well as a more antagonistic outgroup. Additionally, future research should replicate this study using different types of group traits. If group members exaggerate their self-assessments of *subjective* group stereotypes, they may also exaggerate their estimations of how well they would perform on *objective* group behaviors. For example, for a highly uncertain student who strongly identifies with the group "graduate students," he may predict that he will score above average on the GRE to cope with his feelings of self-uncertainty. Performance on the GRE is much more objective than the self-assessment, "I am smart," but both might be exaggerated during high self-uncertainty to make one feel that they represent the group's most prototypical member. Over-exaggerations of one's performance on objective group behaviors may pose serious problems if those perceptions lead to risky behavior (e.g., over-estimating one's ability as a firefighter, police officer, politician, etc.). Future research should test which types of self-perceptions are affected by situational self-uncertainty, and if those self-perceptions are powerful enough to cause changes in behavior.

This research also builds upon previous work by Pickett et al. (2002) in that a selective self-stereotyping effect was found for low identifiers in the uncertainty condition. The moderation analyses showed evidence that high identifiers endorsed both positive and negative traits (although the negative traits analysis did not quite reach significance), while low identifiers only endorsed positive traits. The current study extends Pickett et al.'s (2002) findings by showing that the relationship between group

identification and selective self-stereotyping is amplified by situational self-uncertainty. These data suggest that self-stereotyping will be the strongest when individuals identify strongly with the group and when they feel temporarily self-uncertain, which is valuable knowledge that social groups could presumably leverage to their advantage when attempting to strengthen ingroup support and loyalty.

The current study should also be compared to recent work by Hohman et al. (2017), which found that being made to feel non-prototypical in the form of anti-norm deviance caused greater self-uncertainty (Study 1), which then caused greater group identification and ingroup bias (Studies 2-3). Hohman et al.'s (2017) research established a directional relationship where non-prototypicality caused greater self-uncertainty, which then motivated group-level responses. The current research attempted to test if one of the group-level responses to self-uncertainty included exaggerated self-perceptions of prototypicality, particularly because being on the periphery of the group is an uncertain place to be that individuals want to avoid (Hohman et al., 2017). Unfortunately, the current data did not support this idea. Our data did not suggest that self-perceptions of prototypicality and self-stereotyping are motivational responses to situational self-uncertainty. One explanation for the inconsistency between Hohman et al.'s (2017) results and the current experiment is that the self-uncertainty manipulation used in our study was not the best match for the motivational response measured. Hogg, Hohman, and Rivera (2008) theorize that an important moderator of the uncertainty-identification relationship is the *fit* between the type self-uncertainty aroused and the ability of the group to alleviate that form of uncertainty (e.g., religious groups may be well-suited to address existential uncertainty). Based on this logic, it may also be the case that the type

of self-uncertainty aroused will cause group-level responses that are the best fit for the situation. For instance, in the current research if we had manipulated self-uncertainty by instructing participants to write about a time that they were on the periphery of a group, then perhaps they would have shown the group-level reaction we hypothesized—that they would have exaggerated their perceived prototypicality. Instead, we asked participants to write about *anything* that they felt uncertain about, so exaggerating their position in the ingroup may not have been a successful method of alleviating their discomfort. Future research should investigate fit as a moderator of the relationship between uncertainty threats and important group responses.

Overall, the mismatch between uncertainty type and group response as well as the conflicting and ambiguous American identity may explain why the current experiment failed. However, despite the largely unsupported predictions, this research offers a novel hypothesis on group-based uncertainty reduction as well as new experimental methodology that can be used to measure self-stereotyping. Continued research on self-perceptions of ingroup prototypicality is critical, as it would uncover an additional method of reducing self-uncertainty via group membership specifically for those who already identify as group members. If future research finds that self-uncertainty alters self-assessments of important group traits, then we would have a much deeper understanding of what motivates individuals to step up and be more than just a group member—to be the leader, the poster child, or the star player.

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Appendices

Appendix A: Expanded Literature Review

Every group has at least one member who goes above and beyond the call of duty to represent the group's cause. The star player. The devoted leader. The poster child. They are the epitome of all that the group stands for, and they inspire average group members to follow their example. Even though they seem confident in knowing exactly who they are and what they believe, it is possible that these ideal group members were once plagued with uncertainty about their own identity. Intense feelings of self-uncertainty and identity insecurity may have motivated them to transform into a highly prototypical group member to reassure themselves that they know exactly who they are. Research shows that self-uncertainty causes individuals to adopt extreme attitudes (McGregor et al., 2001) and to join extreme groups (Hogg, 2007), but has not yet tested if self-uncertainty causes group members to adopt extreme positions *within* the group. The current research tested a novel hypothesis that self-uncertainty causes group members to exaggerate their level of ingroup prototypicality to compensate for the lack of certainty they feel about their identity.

Self-uncertainty

Current research on uncertainty in social contexts stems from experiments on social comparison and social conformity processes. Festinger (1954) theorized that humans have a fundamental need to assess oneself and to know that one is correct, because correctness allows us to have confidence in our surroundings and to see the world as meaningful (Festinger, 1954). To feel we are correct, he argued, we use physical reality to base our judgments, and only when physical reality is not useful, then we turn

to social reality. Specifically, we turn to similar others because those who are similar to us in judgment and ability will be the most useful at informing us of our own judgments and abilities (Festinger, 1954). Decades later, Hogg and Turner (1987) published a theoretical paper reinforcing the idea that reality is based primarily on social, not physical, reality, and that social consensus ultimately defines what is correct. When individuals self-categorize into a group, not only do they see group norms and traits as valid (because they are consensual), but the process of identification causes group members to internalize and embody the group prototype (as opposed to merely conforming to it; Hogg & Turner, 1987). In turn, the prototype reduces uncertainty because it informs group members of correct and appropriate group behavior and it defines the self-concept through group traits and norms (Hogg & Turner, 1987).

Over the past two decades, research on uncertainty has expanded by focusing on specific behavioral and perceptual responses to uncertainty (e.g., Lind & Van den Bos, 2002; McGregor et al., 2001) as well as the processes through which groups reduce uncertainty (Hogg, 2000). The crucial motivating feature of uncertainty is that it feels aversive (Hogg, 2009; 2012). A little bit of uncertainty can be appealing, but too much uncertainty is theorized to cause discomfort, uneasiness, anxiety, and even fear (Hogg, 2000; 2007). An important predictor of how subjectively uncomfortable uncertainty feels is its degree of self-relevance (Mullin & Hogg, 1999; Hogg, 2012). The more self-relevant the dimension on which an individual feels uncertain, the more aversive it is, and the more motivated they will be to reduce their uncertainty (Hogg, 2012). One type of uncertainty that is highly self-relevant is uncertainty surrounding the self-concept (Hogg, 2012). Uncertainty about the self is called *self-uncertainty* (Hogg, 2007) and can be

described as a sense of doubt in one's self- or world-views (Doosje, Loseman, & Bos, 2013), as a type of identity crisis that is caused from unclear cognitions about the self (McGregor et al., 2001), or as overall uncertainty concerning the self-concept and one's place within the world (Hogg, 2007). Self-uncertainty has been experimentally manipulated by having participants think of a personal dilemma that had not yet been solved (e.g., McGregor et al., 2001), by reading a highly complex statistics passage that highlights one's inadequacy as a psychology major (e.g., McGregor, Haji, Nash, & Teper, 2008), by listening to other students voice relevant uncertainties about tuition costs (e.g., Hogg, Meehan, & Farquharson, 2010), by writing about uncertain aspects of oneself, one's future, and one's place in the world (e.g., Hohman, Gaffney, & Hogg, 2017), and by acquiescing to statements related to self-uncertainty (e.g., Sekerdej, Kossowska, & Czernatowicz-Kukuczka, in press).

Because self-uncertainty is highly aversive, it motivates uncertainty-reduction behaviors (Hogg, 2007). For instance, one reaction to self-uncertainty is to adopt extreme attitudes. Research on compensatory conviction demonstrates that uncertainty about the self causes stronger conviction in one's attitudes toward important social issues (McGregor et al., 2001; McGregor, Haji, Nash, & Teper, 2008; Nail et al., 2009). Across several experiments, self-uncertainty caused more extreme attitudes toward social and religious beliefs (McGregor et al., 2001; McGregor, Haji, Nash, & Teper, 2008; Nail et al., 2009), support for religious warfare (McGregor et al., 2008) more negative outgroup attitudes (McGregor et al., 2008; Nail et al., 2009), and more prejudice toward value-violating groups (Sekerdej et al., in press). In one study, McGregor et al. (2008) found that manipulating self-uncertainty caused participants to report significantly more

conviction toward religious zealotry items such as, "I am confident in my belief system," "My belief system is grounded in objective truth," "If my belief system were being publically criticized I would argue to defend it," "If it came down to it I would sacrifice my life to defend my belief system." The compensatory conviction model argues that people behave in compensatory ways when they feel uncertain, and one way to compensate for self-uncertainty is to harden one's attitudes to feel more certain about who one is and what one believes (McGregor et al., 2001; 2008). Further, manipulating self-uncertainty causes compensatory conviction of attitudes without causing changes in state self-esteem, positive affect, or negative affect (McGregor et al., Study 1), and the causal relationship between self-uncertainty and compensatory conviction remains while adjusting for global self-esteem (McGregor et al., 2001; Study 1). Overall, data suggests that self-uncertainty uniquely motivates extreme attitude conviction as means of restoring feelings of certainty about the self.

Another strategy to reduce self-uncertainty is to define the self through group membership. Self-categorizing into a group resolves the distress of self-uncertainty because it introduces a prototype—a fuzzy set of attributes, thoughts, feelings, and behaviors to follow (Turner et al., 1987; Hogg, 2007, 2009). Through self-categorization, group members become depersonalized and define the self by the cognitive representation of the ingroup prototype (Turner et al., 1987). Groups that are tightly structured, distinctive, that possess rigid and clear prescriptions for behavior, and that hold uniform attitudes are called highly *entitative*, and are the most effective at reducing self-uncertainty because they tell group members exactly how to think, feel, and behave (Hogg, 2007). In one study, Hogg, Meehan, and Farquharson (2010) demonstrated that

self-uncertainty erased participants' normal preference for moderate groups and strengthened identification with a highly entitative, radical group that expressed forceful intentions for action. They further found that compared to low self-uncertainty, high self-uncertainty caused group members to be significantly more willing to behave in radical ways for the highly entitative group (e.g., participate in demonstrations, sit ins, and blockades on behalf of the group), which was mediated by group identification. Self-uncertainty makes extreme groups appealing because the more entitative a group is, the more clearly prescribed its norms are, and the more successful it is at defining the self-concept through the group prototype (Hogg, 2007).

In all groups, moderate and extreme, group members differ in how much they express, represent, and embody the group's norms and attributes (Hogg, 2007; Pickett & Brewer, 2005; Turner et al., 1987). In other words, group members vary in how prototypical they are. While research on uncertainty shows that self-uncertainty causes more extreme attitudes (McGregor et al., 2001) and an attraction to extremist groups (Hogg, 2007), research has not yet tested if self-uncertainty causes group members to adopt a more extreme position within the group—particularly, if self-uncertainty causes individuals to perceive themselves as extremely prototypical group members.

Prototypicality

When a group member is prototypical, they embody the group's norms in a way that clarifies the boundaries between the ingroup and outgroups (Abrams et al., 2000). Therefore, both intra- and intergroup comparisons determine prototypicality—highly prototypical group members express attitudes, feelings, and behavior that strongly represent the ingroup and that strongly contrast the outgroup (Turner et al., 1987; Abrams

& Hogg, 1990; Hogg & Abrams, 1988; Oakes, Haslam, & Turner, 1998). Further, the most prototypical position within the ingroup distribution is contextually dependent, and the prototype shifts depending on the presence and position of relevant outgroups (Hogg, Turner, & Davidson, 1990). When a relevant outgroup becomes salient, the prototype moves toward a more extreme position away from the outgroup (i.e., group polarization; Hogg et al., 1990), and the most prototypical group member will be the one who best represents ingroup norms while contrasting outgroup norms (Hogg et al., 1990). Prototypical group members help define the group norms (Oakes, Haslam, & Turner, 1999; Turner et al., 1987), are evaluated more favorably compared to other group members (Hogg & Hardie, 1991), and are more likely to be group leaders (Eagly, Makhijani, & Klonski, 1992; Hains, Hogg, & Duck, 1997).

The group prototype differs from group stereotypes in that the prototype is the summation of a group's attitudes, traits, and behavior (Turner et al., 1987), while a stereotype is one single attitude, behavior, or trait that is associated with the group. In the current research, the word prototype is used to describe the entire cognitive representation of a group, and the word stereotype is used to describe a specific trait that is attributed to the group (many stereotypes make up the group prototype).

There is also an important distinction between the group prototype and the group mean (Hogg & Turner, 1987). A highly prototypical group member is not the average group member, nor do they possess group traits to an average extent (Hogg & Turner, 1987). Instead, the most prototypical group member is *above average* in the direction *away* from the outgroup (Hogg & Turner, 1987). This is because highly prototypical group members express, represent, and embody the ideal cognitive representation of the

ingroup; they do not merely conform to the average ingroup member's behavior (Hogg & Turner, 1987).

Research shows that deviating from the group norm in a positive way is evaluated favorably. Abrams et al. (2000) made a distinction between pro-norm and anti-norm deviants, such that both deviate from the average group member, but in opposite directions. Pro-norm deviants hold extreme positions that support the group's goals, validate group norms, and uphold a positive social identity, while anti-norm deviants hold extreme positions that threaten the group's goals, reject group norms, or reduce the group's distinctiveness (Abrams et al., 2000). Anti-norm deviants may hold opinions that are similar to an outgroup's attitudes, blurring the boundaries between groups and threatening the ingroup's need for a positive and distinct identity (Abrams et al., 2000). Experiments on ingroup deviants showed that anti-norm deviants were evaluated significantly less positively and less typical than normative and pro-norm deviants (Abrams et al., 2000; Abrams et al., 2002). In another study, Castano, Paladino, Coull, and Yzerbyt (2002) asked psychology students to make typicality evaluations of ingroup members (psychologists) who varied in the extent to which they embodied the group norm empathy. Psychologists that were made to seem lower than average in empathy (anti-norm deviants) were judged as significantly less typical compared to moderately empathic psychologists, and psychologists that were made to seem higher than average in empathy (pro-norm deviants) were judged as significantly more typical compared to moderately empathetic psychologists. In another experiment, when an anti-norm deviant held the same attitude as an outgroup member, the ingroup deviant was evaluated worse than the outgroup member even though they held the exact same attitude (Abrams et al.,

2000). Overall, data suggests that group members who are above average in group traits are seen as highly prototypical and are evaluated more positively (Abrams et al., 2002; Castano et al., 2002; Hogg & Hardie, 1991) because highly prototypical group members express, represent, and embody the cognitive representation of the ingroup (Hogg & Turner, 1987).

The Relationship Between Self-uncertainty and Prototypicality

Group members typically have an accurate idea of how prototypical they are compared to other group members (Hohman et al., 2017), and when a group member does not embody group traits, they are marginalized and are sent to the fringes of the group (Hogg, 2005). There is a relationship between non-prototypicality and self-uncertainty—manipulating group members to feel non-prototypical (in the form of anti-norm deviance) makes them question their identity and causes them to feel significantly more self-uncertain compared to those who are manipulated to feel prototypical (Hohman et al., 2017). Because non-prototypical members are aware of their poor representation of the group, they feel uncertain about who they are and about the security of their group membership (Hohman et al., 2017).

One way group members respond to threatened group membership is to alter the self to be more prototypical (Pickett et al., 2002; Pickett & Brewer, 2005). Self-stereotyping ingroup traits is one method of achieving this goal, because self-stereotyping makes the self feel perceptually closer to the ingroup and more distinct from relevant outgroups (Pickett et al., 2002). In one experiment, Pickett and colleagues (2002) found that threatening sorority girls' group membership caused high-identifiers to self-stereotype both positive and negative qualities that were associated with their group (e.g.,

popular, social, superficial, materialistic; low-identifiers only self-stereotyped positive qualities). Exaggerating the number of ingroup qualities one possesses, regardless of valence, makes high-identifying group members feel more secure in their membership (Pickett et al., 2002). Marginal group members self-stereotype in both public and private contexts, suggesting that self-stereotyping fulfills both self-perceptual and self-presentational goals (Pickett et al., 2002). In this way, self-stereotyping not only psychologically makes one feel more prototypical, but it also publically reinforces one's position within the group (Pickett et al., 2002; Pickett & Brewer, 2005). Overall, feeling non-prototypical arouses a need to clarify one's group membership (Branscombe et al., 1999), and group members do so by distancing themselves from the outgroup and by aligning themselves with stereotypical ingroup traits (Pickett et al., 2002; Pickett & Brewer, 2005).

Uncertainty identity research has not yet tested if self-uncertainty causes similar strategies to feel like a prototypical member of the group. Because non-prototypicality causes feelings of self-uncertainty (Hohman et al., 2017), perceiving the self as extremely prototypical may be an effective method of psychologically alleviating self-uncertainty. Prototypicality draws clear boundaries between the ingroup and outgroup attitudes, behaviors, traits, and norms (Abrams et al., 2000; Turner et al., 1987), and being high in prototypicality should make an individual feel like they know exactly who they are (Hohman et al., 2017). Further, previous research demonstrates that during subjective uncertainty, group members view ingroup norms as valid and correct and they adhere to the cognitive representation of the ingroup prototype (Abrams, Wetherell, Cochrane, Hogg, & Turner, 1990; Hogg & Turner, 1987). Because the cognitive representation of

the ingroup prototype is more extreme than the average ingroup behavior (Hogg & Turner, 1987), it is likely that self-uncertainty motivates group members to perceive themselves as being above average in representing, expressing, and embodying stereotypic ingroup qualities. In other words, self-uncertainty should cause group members to exaggerate self-perceptions of ingroup prototypicality and stereotypic traits.

The Current Research

The current research tested a novel hypothesis that self-uncertainty causes group members to exaggerate their level of prototypicality within the group. There are three reasons why self-uncertainty should enhance perceived prototypicality. First, adopting extreme attitudes (McGregor et al., 2001) and identifying with extreme groups (Hogg, 2007) alleviates self-uncertainty, so self-uncertainty should cause individuals to become extreme group members in the form of enhanced prototypicality. Self-uncertain individuals may exaggerate the extent to which they are distinct from the outgroup and the extent to which they embody clear ingroup norms to feel as if they know exactly who they are. Second, subjective uncertainty causes group members to view the cognitive representation of the group prototype as valid and correct, which is more extreme than the average, observable group member behavior (Hogg & Turner, 1987). Because of this, self-uncertainly should cause group members to judge themselves as the ideal representation of the ingroup instead of simply conforming to average ingroup traits. Finally, because feeling non-prototypical in the direction of the outgroup (anti-norm deviance) causes self-uncertainty (Hohman et al., 2017), perceiving the self as extremely prototypical should prevent feelings of uncertainty surrounding one's position within the group. Placing the self in an extreme position that is above average and far away from the

outgroup (pro-norm deviance) should be the most effective at protecting against membership insecurity.

The current study measured perceived prototypicality in two different ways: by measuring perceptions of general similarity to the group prototype (e.g., Spears et al., 1997; Verkuyten & Nekuee, 1999; Hardie & McMurray, 1992; Jetten, Spears, & Manstead, 1997) and by measuring self-assessments of specific group traits (e.g., Biernat, Vescio, & Green, 1996; Simon & Hamilton, 1994). Measuring group traits (i.e., self-stereotyping) offers more specific information about how group members perceive themselves and to which group norms they align with (Pickett et al., 2002). Moreover, measuring specific group traits allows researchers to test for selective self-stereotyping, such that group members endorse positive stereotypes but not negative stereotypes (Biernat et al., 1996). Selective self-stereotyping occurs when non-prototypical group members are low in group identification (Pickett et al., 2002). If a group member feels insecure in their membership and the group is not important to them, they will identify with the positive but not the negative stereotypes associated with the group (Pickett et al., 2002). Non-prototypical high identifiers, on the other hand, will self-stereotype both positive and negative group qualities because they are committed to the group and derive positive esteem from assimilating with all group stereotypes (Pickett et al., 2002). Because group identification moderates the relationship between non-prototypicality and self-stereotyping (Pickett et al., 2002), I predicted identification would also moderate the relationship between self-uncertainty and self-stereotyping in the current research.

In summary, this experiment tested if self-uncertainty causes exaggerated perceptions of general prototypicality and of specific group traits. Moreover, the current

research tested if high self-uncertainty causes group members to perceive themselves as being *above average* in group traits. This study used a mixed subjects experimental design with time as the within-subjects factor (Time 1 vs. Time 2) and condition as the between-subjects factor (Uncertainty vs. Certainty vs. Negative control). During Time 1 participants reported how prototypical they felt and to what extent they possessed group traits, and two weeks later during Time 2 participants were randomly assigned into a high self-uncertainty, low self-uncertainty, or negative control condition. After the manipulation, participants completed the same prototypicality and group traits measures. This experiment tested the hypothesis that high self-uncertainty causes exaggerations in perceived prototypicality compared to low self-uncertainty and a negative control condition. The specific hypotheses were:

H1: Self-uncertainty will cause greater increases in perceived general prototypicality from Time 1 to Time 2 compared to self-certainty and a negative control. The relationship between self-uncertainty and general prototypicality will be moderated by group identification, such that self-uncertainty will cause the greatest increase in prototypicality for high identifiers.

H2: Self-uncertainty will cause greater increases in self-stereotyping group trait scores from Time 1 to Time 2 compared to self-certainty and a negative control. Group identification will moderate the relationship between self-uncertainty and group trait scores, such that self-uncertainty will cause increases in positive and negative group traits scores for high identifiers, but will only cause increases in positive group trait scores for low identifiers.

H3: Self-uncertainty will cause greater positive deviations from the group average in group traits compared to self-certainty and a negative control. The relationship between self-uncertainty and deviation scores will be moderated by group identification, such that self-uncertainty will cause the greatest positive deviations for high identifiers.

Covariates

The need for closure, global self-esteem, and self-concept clarity (SCC) were measured and treated as covariates in the current study. The need for closure (NFC) can be described as a dispositional desire to reduce uncertainty (Kruglanski, 1990; Webster & Kruglanski, 1994), which is represented through five facets: preference for order, preference for predictability, the need for decisiveness, discomfort with ambiguity, and close-mindedness (Kruglanski, 1990). Many experiments on group processes and intergroup relations have measured the need for closure because it can be predictive of some inter- and intragroup processes (e.g., Shah, Kruglanski, & Thompson, 1998; Brandt & Reyna, 2010; Webster, Kruglanski, & Pattison, 1997). For instance, there is evidence to suggest that those high in NFC rely more on prototypicality as a means of reducing uncertainty (Pierro, Bonaiuto, & Kruglanski, 2005), however, high NFC does not strengthen the effects of uncertainty salience on social judgments (e.g., Brizi, Mannetti, & Kruglanski, 2016). Across three experiments measuring outgroup derogation, Brizi et al. (2016) found that high uncertainty caused both high NFC and low NFC participants to respond in the same way; in other words, high NFC did not alter or strengthen the relationship between uncertainty and outgroup derogation. Because of this, the current study treated NFC as a covariate instead of a moderator. By co-varying NFC, I tested the

effect of experimental condition on a participant's perceptions of prototypicality while adjusting for individual differences in NFC. The current study measured NFC using a brief, 15-item scale that has demonstrated similar psychometric properties of the full 41-item version (Roets & Van Hiel, 2011).

Global self-esteem was also included as a covariate because self-esteem partially motivates social identification (Abrams & Hogg, 1988), and research shows that global self-esteem is positively associated with clarity surrounding the self-concept, such that individuals with lower self-esteem tend to feel more uncertainty about the self (Campbell et al., 1996). By co-varying global self-esteem, I tested the causal relationship between self-uncertainty and prototypicality above and beyond what is explained by self-esteem. The current research measured global self-esteem via Rosenberg's (1965) Self-Esteem Scale (RSE). The RSE has been subjected to more psychometric analysis and empirical validation compared to any other self-esteem scale (Byrne, 1996; Gray-Little et al., 1997) and numerous reviews have evaluated the RSE as superior to other self-esteem measures (Crandall, 1973; Demo, 1985; Gray-Little et al., 1997).

State self-esteem was not measured in the current study, because previous research shows that experimentally inducing self-esteem does not erase the relationship between uncertainty and group identification (Hogg & Svensson, 2006; Hogg & Mullin, 1999b; Hogg, 2007). One study manipulated self-uncertainty and measured state self-esteem, and found that self-uncertainty did not cause changes in state self-esteem but did significantly increase uncertainty-reduction behavior (extreme conviction about social issues; McGregor et al., 2001). These findings suggest that state self-esteem does not

explain the relationship between uncertainty and group behavior, so was not included in the current research.

Self-concept clarity was included as a covariate because it is theorized that humans have a fundamental need to define one's self-concept and will engage in self-defining behavior to alleviate the uncertainty surrounding the self (Mullin & Hogg, 1998). An important difference between self-concept clarity and the self-uncertainty described by uncertainty identity theory is that self-concept clarity is considered an individual difference factor, while self-uncertainty is context dependent (Grieve & Hogg, 1999). Dispositional differences such as SCC may play a role in uncertainty-reduction behavior, but are thought to play a relatively minor role and are largely considered to be constrained by social context (Hogg & Mullin, 1999). Nonetheless, SCC was included as a covariate in the current research to adjust for individual differences in self-concept clarity.

Appendix B: General Prototypicality Measure (Jetten, Spears, & Manstead, 1997)

(Measured at Time 1 and Time 2)

Instructions: The following questions relate to you as an American.

1……..not at all
11….the most possible

1. I feel that I am very similar to the typical American.
2. I feel that I am very representative of the typical American.
3. I feel that I resemble the typical American.
4. I feel that I would fit in with the typical American.

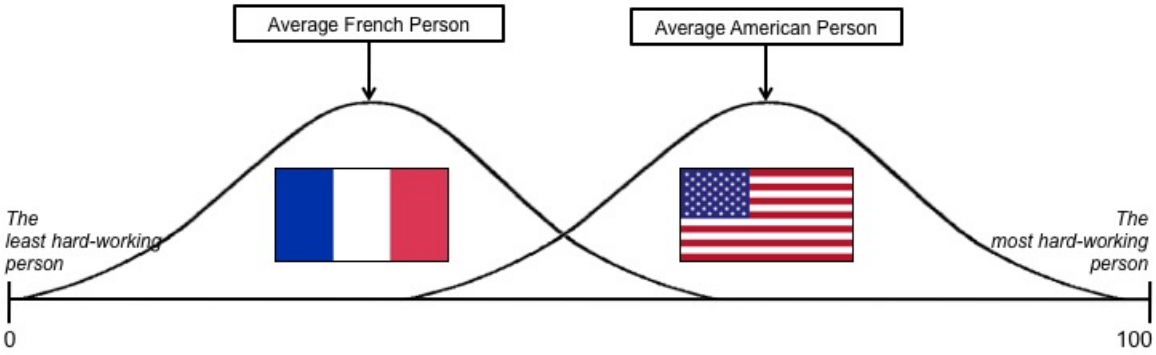
Scoring. Average all items to calculate the general prototypicality score. Higher values indicate higher perceived prototypicality.

Appendix C: Self-stereotyping of Group Traits Measures

(Measured at Time 1 and Time 2)

Instructions: Next you will read traits that are typically used to describe how American people differ from French people. On the following scales, please indicate how much each trait describes you as an American.

Example Item:
"Hard working" is a positive trait typically associated with Americans. American people are described as being more hard-working than French people. Use the slider to indicate how hard-working YOU are as an American.



Positive Traits Used:
More hard-working
More generous
Less rude
Less cowardly

Negative Traits Used:
More ignorant
More aggressive
Less artistic
Less sophisticated

Scoring. Average the four positive trait items to create the composite score for positive group traits. Average the four negative trait items to create the composite score for negative group traits. Higher values indicate higher self-stereotyping for group traits.

Appendix D: Trait Checks

(Measured at Time 1)

Yes or No

1. Compared to French people, do you think "hard-working" is a **positive** trait associated with Americans?
2. Compared to French people, do you think "generous" is a **positive** trait associated with Americans?
3. Compared to French people, do you think "not rude" is a **positive** trait associated with Americans?
4. Compared to French people, do you think "not cowardly" is a **positive** trait associated with Americans?
5. Compared to French people, do you think "ignorant" is a **negative** trait associated with Americans?
6. Compared to French people, do you think "aggressive" is a **negative** trait associated with Americans?
7. Compared to French people, do you think "not artistic" is a **negative** trait associated with Americans?
8. Compared to French people, do you think "not sophisticated" is a **negative** trait associated with Americans?

Appendix E: Group Identification Measure (Hohman & Hogg, 2011)

(Measured at Time 1)

1…….….not favorable at all
11…..…….the most favorable possible

1. What is your overall impression of America?

1…….….not at all
11…..…….the most possible

2. How much would you stand up for America if it were criticized?
3. How strongly do you identify with being an American?
4. How much do you feel you belong as an American?
5. How important to you is it being American?
6. How much do you feel like an American as a whole?
7. How well do you feel you fit in as an American?
8. Overall, how similar do you feel you are to other Americans?

Scoring. Average all items to calculate the group identification score. Higher values indicate higher group identification.

Appendix F: Brief 15-item Need for Closure Scale (Roets & Van Hiel, 2011)

(Measured at Time 1)

Instructions: Read each of the following statements and decide how much you agree with each according to your beliefs and experiences. Please respond according to the following scale.

1.....strongly disagree
2....moderately disagree
3.....slightly disagree
4.....slightly agree
5.....moderately agree
6.....strongly agree

1. I don't like situations that are uncertain.
2. I dislike questions which could be answered in many different ways.
3. I find that a well ordered life with regular hours suits my temperament.
4. I feel uncomfortable when I don't understand the reason why an event occurred in my life.
5. I feel irritated when one person disagrees with what everyone else in a group believes.
6. I don't like to go into a situation without knowing what I can expect from it.
7. When I have made a decision, I feel relieved.
8. When I am confronted with a problem, I'm dying to reach a solution very quickly.
9. I would quickly become impatient and irritated if I would not find a solution to a problem immediately.
10. I don't like to be with people who are capable of unexpected actions.
11. I dislike it when a person's statement could mean many different things.
12. I find that establishing a consistent routine enables me to enjoy life more.
13. I enjoy having a clear and structured mode of life.
14. I do not usually consult many different opinions before forming my own view.
15. I dislike unpredictable situations.

Scoring. Sum all items to calculate the need for closure score. Higher scores indicate higher need for closure. If factors are required:

Order: 3, 12, 13
Predictability: 6, 10, 15
Decisiveness (revised scale): 7, 8, 9
Ambiguity: 1, 4, 11
Close-mindedness: 2, 5, 14

Appendix G: Rosenberg Self-Esteem Scale (Rosenberg, 1965)

(Measured at Time 1)

Instructions: Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

0.....strongly disagree
1..... disagree
2.....agree
3.....strongly agree

1. I feel that I am a person of worth, at least on an equal plane with others.
2. I feel that I have a number of good qualities.
3. All in all, I am inclined to feel that I am a failure. (R)
4. I am able to do things as well as most people.
5. I feel I do not have much to be proud of. (R)
6. I take a positive attitude toward myself.
7. On the whole, I am satisfied with myself.
8. I wish I could have more respect for myself. (R)
9. I certainly feel useless at times. (R)
10. At times I think that I am no good at all. (R)

Scoring. For the items marked with an (R), reverse the scoring (0 = 3, 1 = 2, 2 = 1, 3 = 0). For those items without an (R) next to them, simply add the score. Add the scores. Typical scores on the Rosenberg scale are around 22, with most people scoring between 15 and 25.

Appendix H: Self-Concept Clarity Scale (Campbell, 1966)

(Measured at Time 1)

1.....strongly disagree
5..... strongly agree

1. My beliefs about myself often conflict with one another. R
2. On one day I might have one opinion of myself and on another day I might have a different opinion. R
3. I spend a lot of time wondering about what kind of person I really am. R
4. Sometimes I feel that I am not really the person that I appear to be. R
5. When I think about the kind of person I have been in the past, I'm not sure what I was really like. R
6. I seldom experience conflict between the different aspects of my personality.
7. Sometimes I think I know other people better than I know myself. R
8. My beliefs about myself seem to change very frequently. R
9. If I were asked to describe my personality, my description might end up being different from one day to another day. R
10. Even if I wanted to, I don't think I would tell someone what I'm really like. R
11. In general, I have a clear sense of who I am and what I am.
12. It is often hard for me to make up my mind about things because I don't really know what I want. R

Scoring. Reverse items marked with an (R).

Appendix I: Demographics

(Measured at Time 1)

1. Please enter your age.

2. Which of the following do you identify as?
   - Male
   - Female
   - Transgender
   - Other
   - Prefer Not to Disclose

3. How would you identify yourself ethnically?
   - Black/African American
   - Asian/Pacific Islander
   - White/European American/Caucasian
   - Hispanic/Latino
   - Native American/Alaska Native
   - Multi-racial (please specify)
   - Other (please specify)

4. How many years have you been an American?

5. Where were you born? Please include country and state (if applicable).

6. Do you have any meaningful personal connections to France or to French people (e.g., Your ancestry is French; You lived in France for a significant amount of time; You have family in France, etc.)?
   - No
   - Yes (please explain)

7. Currently, how would you describe your political views?
   1 (*very liberal*) to 7 (*very conservative*)

8. Currently, what political party do you most strongly identify yourself with?
   - Democrat
   - Republican
   - Moderate/Do not identify with a party
   - Other (please specify)

Appendix J: Tables and Figures

Table 1

Bivariate Correlations Between Variables of Interest

	1	2	3	4	5	6	7	8	9	10
1. Proto. T1	---									
2. Proto. T2	.838*	---								
3. Pos. Traits T1	.293*	.304*	---							
4. Pos. Traits T2	.276*	.341*	.429*	---						
5. Neg. Traits T1	.211*	.176*	.114	-.033	---					
6. Neg. Traits T2	.297*	.228*	-.023	-.035	.482*	---				
7. Ident. T1	.833*	.794*	.363*	.320*	.151	.227*	---			
8. NFC T1	.205*	.162*	-.086	.050	-.155	.001	.253*	---		
9. SE T1	.300*	.271*	.203*	.182*	.021	-.056	.257*	-.030	---	
10. SCC T1	.078	.089	.234*	.085	-.107	-.055	.055	-.159	.445*	---

Note. * $p < .05$

Table 2

General Prototypicality Between Conditions Across Time

Condition	Time 1	Time 2
Uncertainty	6.95_{a} (.213)	6.67_{a} (.239)
Certainty	7.32_{a} (.212)	6.98_{a} (.237)
Negative control	6.92_{a} (.225)	6.97_{a} (.252)

Note. Means not sharing the same letter differ at $p < .05$. Standard error in parentheses.

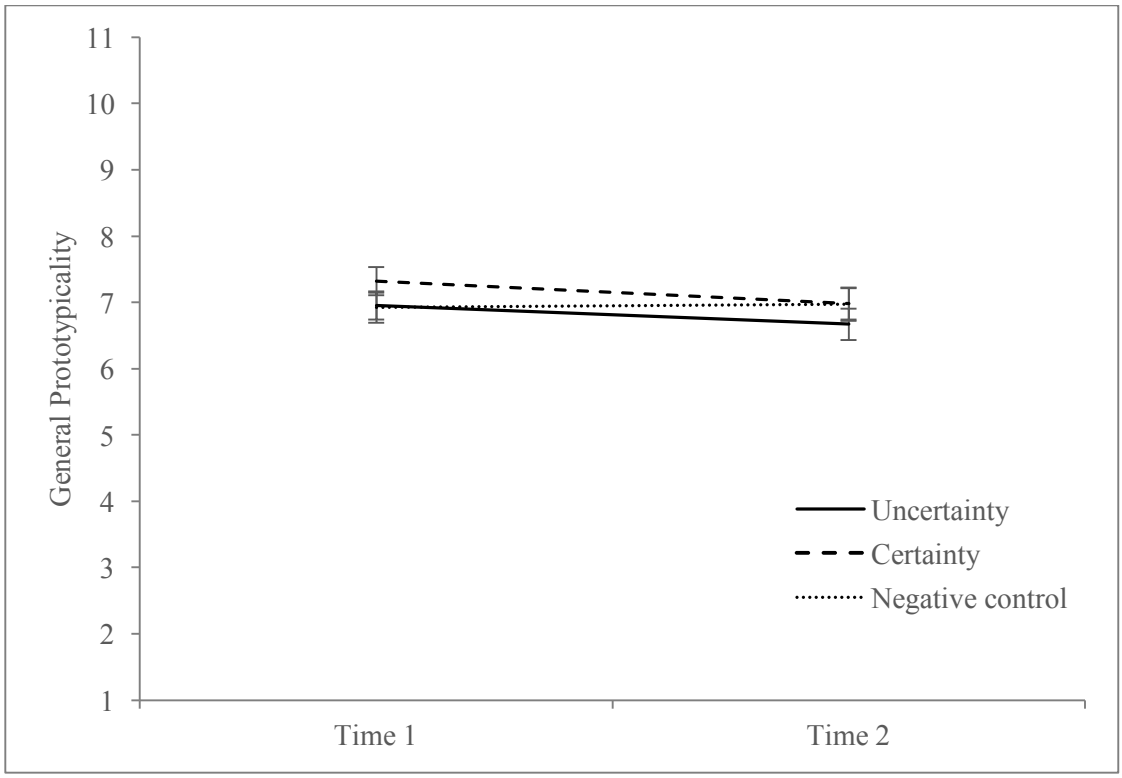


Figure 1. General prototypicality between conditions across time. Error bars are standard error.

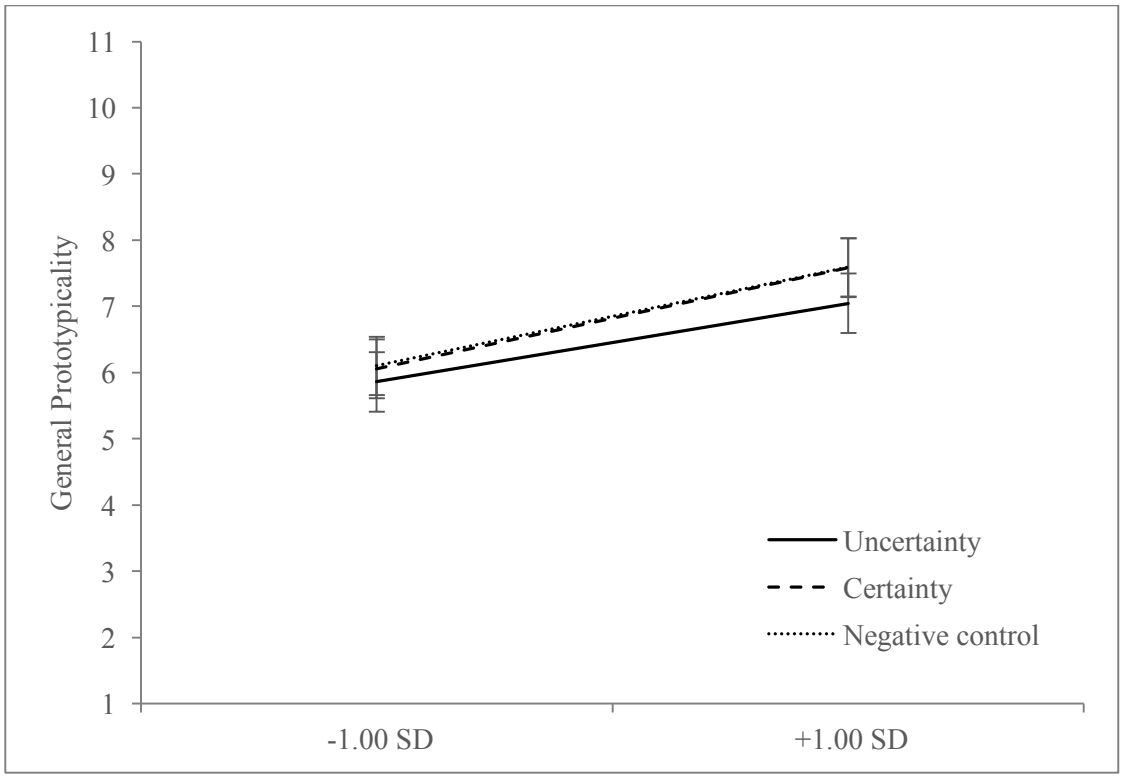


Figure 2. Moderating effect of identification on prototypicality by condition. Error bars are standard error.

Table 3

Self-Stereotyping Group Traits Between Conditions Across Time

	Positive Traits	
Condition	Time 1	Time 2
Uncertainty	67.32_{b} (1.62)	66.92_{b} (1.78)
Certainty	73.35_{a} (1.61)	73.53_{a} (1.77)
Negative control	68.06_{b} (1.71)	67.63_{b} (1.88)
	Negative Traits	
Condition	Time 1	Time 2
Uncertainty	47.63_{c} (2.26)	48.64_{c} (2.24)
Certainty	47.24_{c} (2.25)	46.51_{c} (2.23)
Negative Control	49.38_{c} (2.39)	49.28_{c} (2.36)

Note. Means not sharing the same letter differ at $p < .05$. Standard error in parentheses.

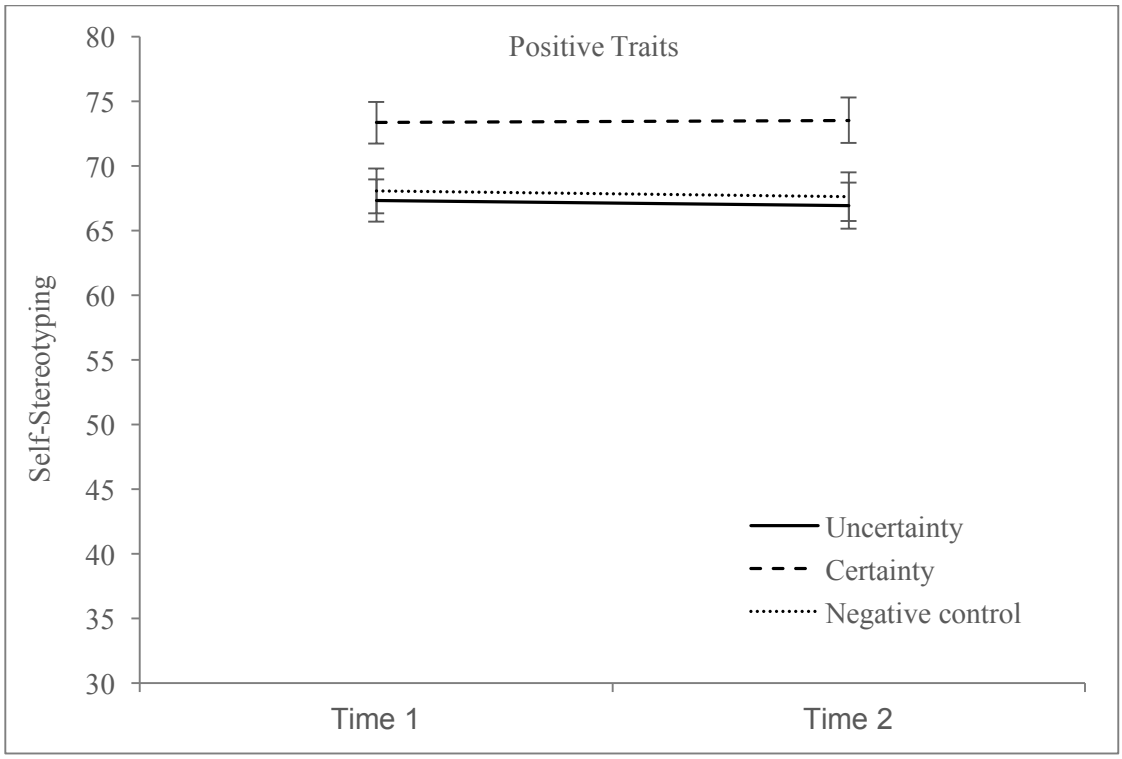


Figure 3. Self-stereotyping positive traits between conditions across time. Error bars are standard error.

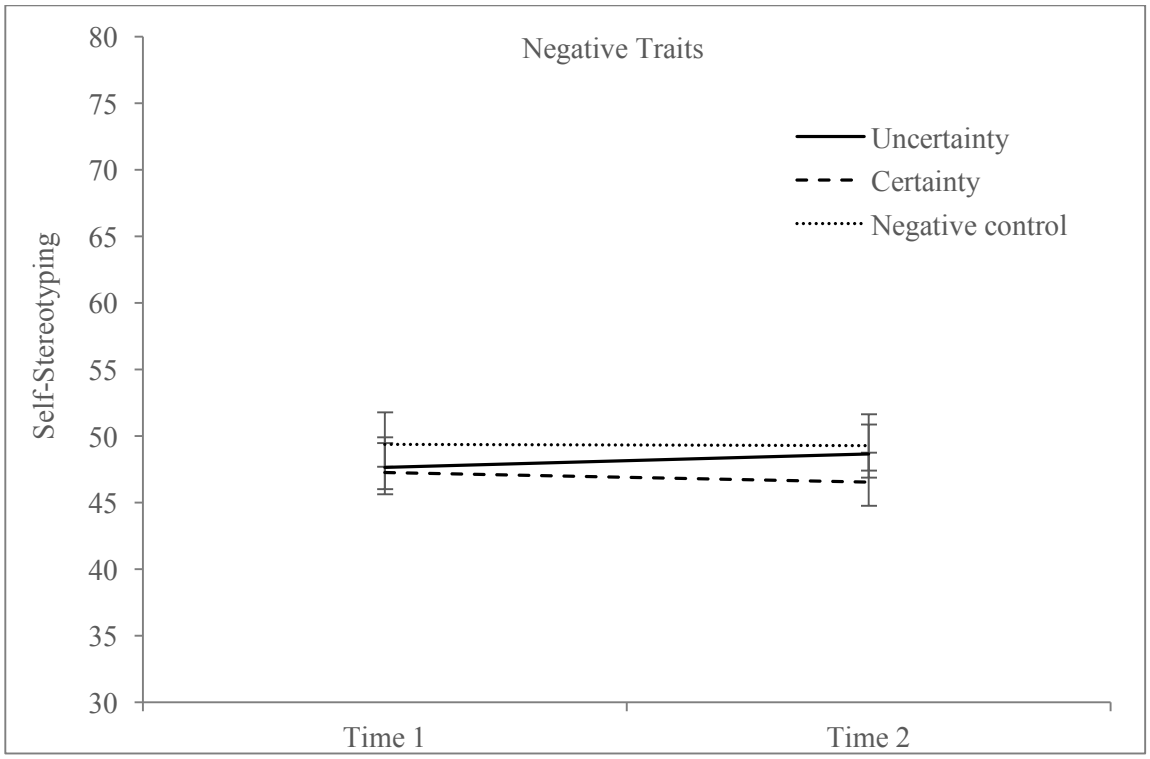


Figure 4. Self-stereotyping negative traits between conditions across time. Error bars are standard error.

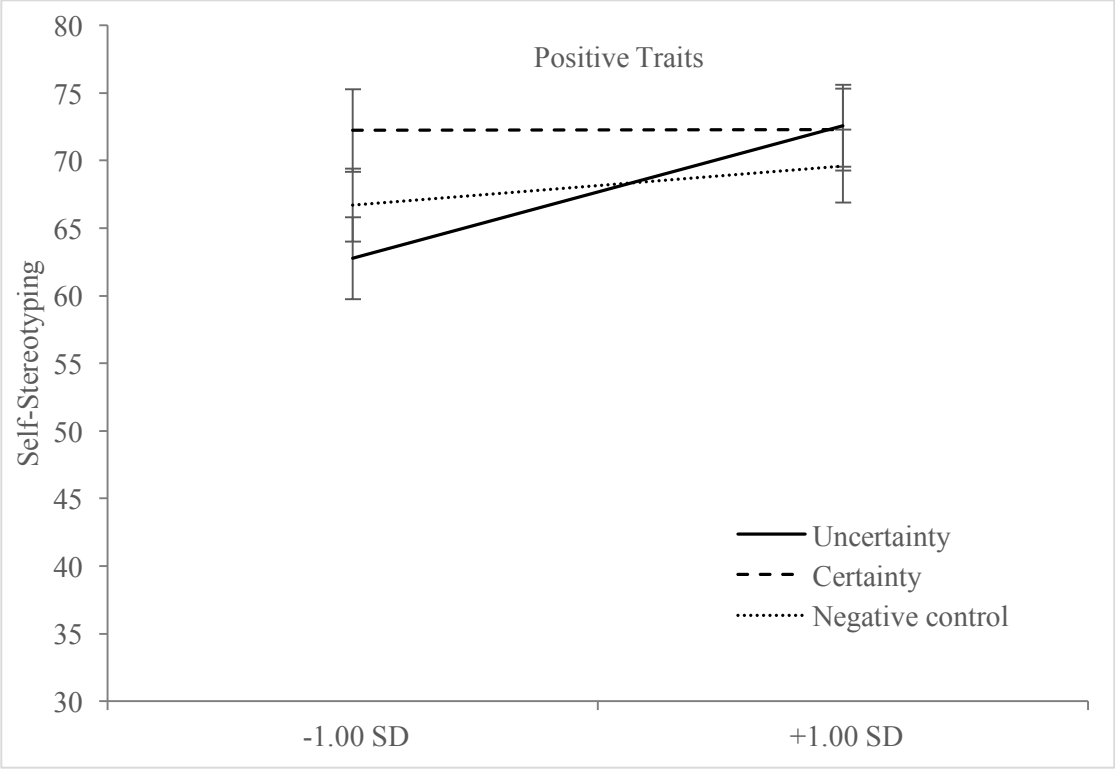


Figure 5. Moderating effect of identification on positive self-stereotyping by condition. Error bars are standard error.

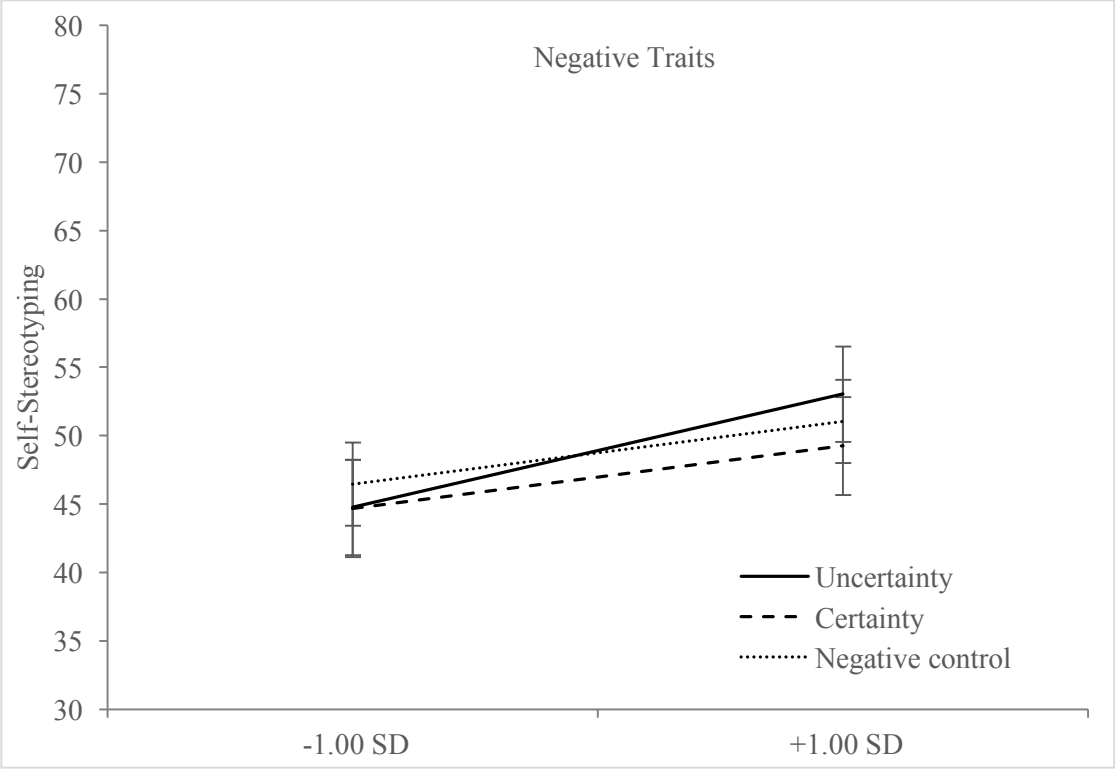


Figure 6. Moderating effect of identification on negative self-stereotyping. Error bars are standard error.

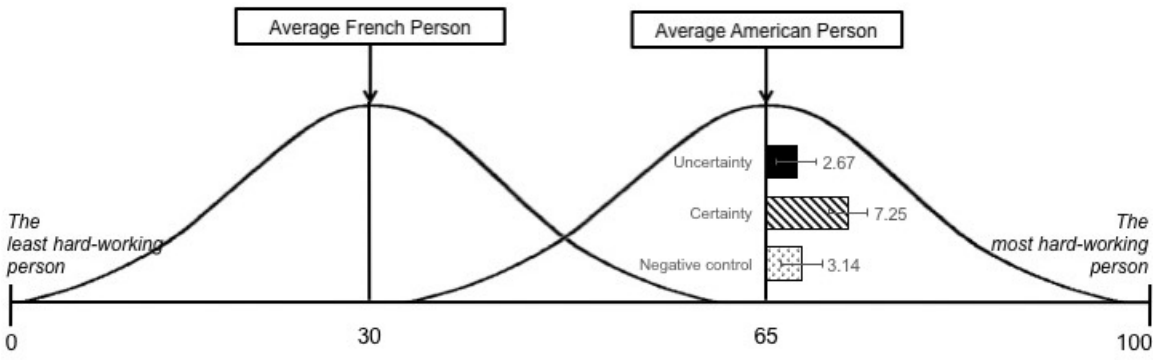


Figure 7. Difference scores for positive traits overlaid on bell curves. Scores are from Time 2 after co-varying Time 1 scores. Error bars are standard error.

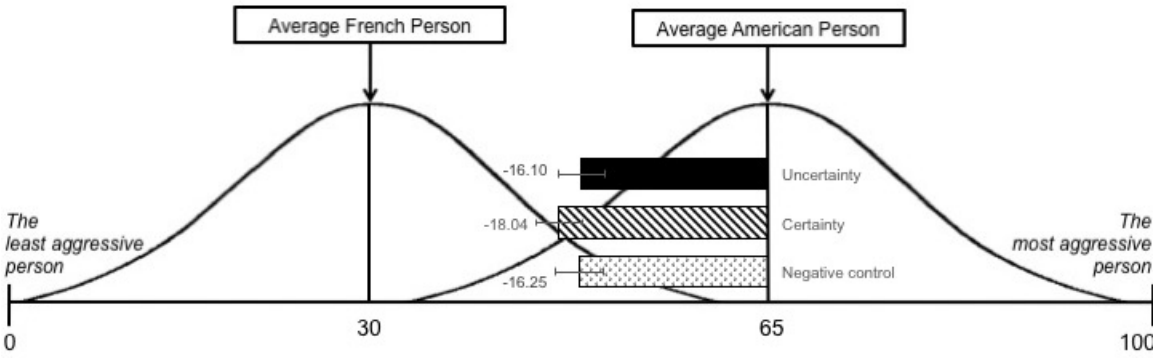


Figure 8. Difference scores for negative traits overlaid on bell curves. Scores are from Time 2 after co-varying Time 1 scores. Error bars are standard error.

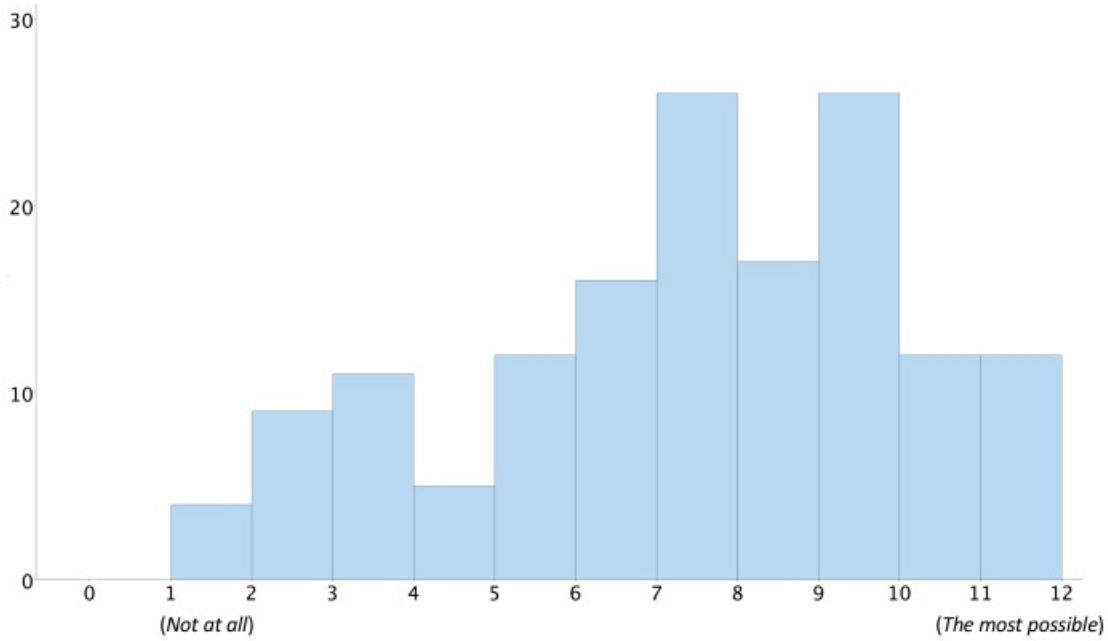


Figure 9. Histogram of general prototypicality responses at Time 1 (M = 7.07, SD = 2.67).

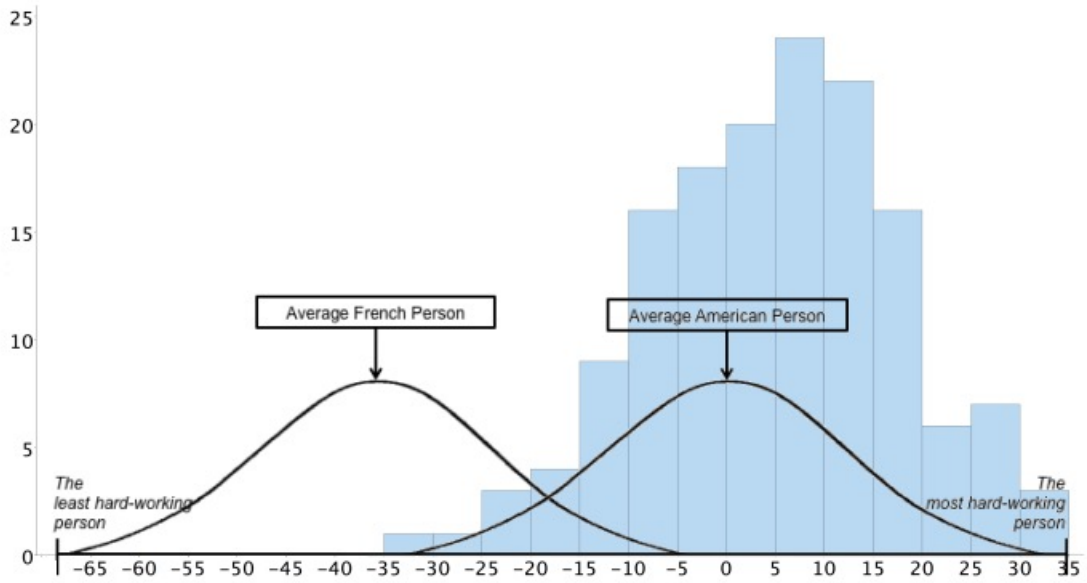


Figure 10. Histogram of positive self-stereotyping difference scores at Time 1 (M_{Diff} = 4.71, SD_{Diff} = 12.66).

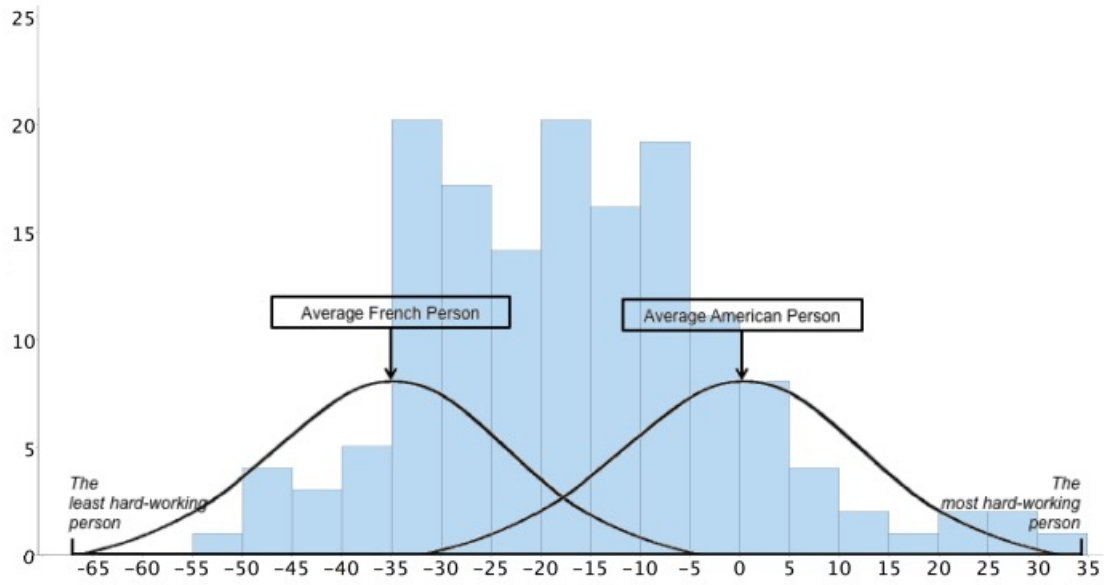


Figure 11. Histogram of negative self-stereotyping difference scores at Time 1 (M_{Diff} = -16.85, SD_{Diff} = 16.00).