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Understanding Dominant Group Resistance to Social Change: The Role of Prototypicality Threat

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Understanding Dominant Group Resistance to Social Change: The Role of Prototypicality Threat

A dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in Psychology

by

Felix Danbold

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ABSTRACT OF THE DISSERTATION

Understanding Dominant Group Resistance to Social Change: The Role of Prototypicality Threat

by

Felix Danbold

Doctor of Philosophy in Psychology

University of California, Los Angeles, 2018

Professor Yuen J. Huo, Chair

Why do so many members of dominant groups (e.g., White Americans, men, etc.) express opposition to diversity? Three papers argue that a primary driver of this resistance is that members of dominant subgroups (e.g., ethnic groups, gender groups, etc.) fear that increasing diversity will threaten their claim to represent their broader social categories (e.g., nations, professions, etc.). We term this concern *prototypicality threat*. As being the dominant subgroup ensures being prototypical (i.e., representative and normative), and being prototypical ensures an unquestioned sense of identity and belonging, members of dominant subgroups will seek to preserve this privilege when social change calls it into question. The antecedents, consequences, and boundary conditions of prototypicality threat are tested across a wide array of contexts: White Americans and White British reacting to projections of changing demographics in their country (Papers 1 and 3), men in STEM reacting to efforts to increase gender diversity in their

field (Paper 2), and non-international undergraduates reacting to an increase in the representation of international students at their university (Paper 3). Across these papers, prototypicality threat emerges as a theoretically novel explanation for why increasing diversity can trigger pushback from members of dominant subgroups, shedding light on possible strategies for reducing intergroup tensions as we transition to a more diverse world.

The dissertation of Felix Danbold is approved.

David O. Sears

Miguel M. Unzueta

Gerardo Ramirez

Yuen J. Huo, Committee Chair

University of California, Los Angeles

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Over the course of my graduate career, I have had the privilege of collaborating with a number of brilliant and inspiring scholars, including Drs. David Sears, Corinne Bendersky, Miguel Unzueta, & Ines Jurcevic. The research projects I have worked on with each of them have been greatly rewarding--expanding my knowledge, skills, and worldview. I am also deeply indebted to the many professors, post-docs, and graduate students who I have attended research labs with over the years, who have tirelessly offered help with each and every one of my endeavors. There are too many names to list here, but it has been a great pleasure to work with all of the past and present members of the Social Relations Lab, Intergroup Relations Lab, and Political Psychology Lab.

I would also like to express my profound gratitude to my mother, Jane, for her constant love and support. To Clarice and Genevieve for building a home with me. To Karl and the many strange and ingenious minds that I have met in Los Angeles and around the world over the past six years. My heart belongs to all of you.

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Personality Science, *6*(2), 210 – 218. Paper 2 was originally published in Danbold, F. & Huo, Y. J. (in press). Men's Defense of Their Prototypicality Undermines the Success of Women in STEM Initiatives. *Journal of Experimental Social Psychology*.

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Danbold, F. & Huo, Y. J. (2015). No Longer "All-American"? Whites' Defensive Reactions to Their Numerical Decline. *Social Psychological and Personality Science*, *6(2)*, 210 – 218.

Sears, D.O., **Danbold, F.**, & Zavala, V. M. (2016). Incorporation of Latino Immigrants into the American Party System. *RSF: The Russell Sage Foundation Journal of the Social Sciences*, *2*(3), 182-204.

Danbold, F. & Bendersky, C. (invitation to revise & resubmit, *Organization Science*). Inverting Professional Prototypes Increases the Valuation of Women in Male-Dominated Fields.

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Huo, Y. J., **Danbold, F.**, Begeny, C. T., Serrano-Careaga, J. (invitation to revise & resubmit, *International Journal of Intercultural Relations*). Do You Value Me or My Ethnic Group? The Asymmetrical Influence of Personal and Subgroup Respect on Community Engagement and Psychological Well-Being.

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Sears, D.O., **Danbold, F.**, & Zavala, V.M. (in prep). A Dual-Process Model of the Acquisition of Partisanship: The Case of Latino Immigrants

Danbold, F., Onyeador, I.N., & Unzueta, M.M. (in prep). The Role of Free Speech Concerns in Opposition to Social Justice Activism.

Danbold, F., Huo, Y.J., Begeny, C.B, Ni, H.W., & Serrano-Careaga, J.A. (in prep). Students' Beliefs About the Relationship Between Diversity and Excellence and Intergroup Attitudes.

Sears, D.O., **Danbold, F.**, & Zavala, V.M. (in prep). Latent Partisanship Precedes Self-Categorization: A Two-Stage Model of the Acquisition of Partisanship Observed Among Latino Immigrants.

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Danbold, F., Sears, D.O., & Zavala, V.M. (2015, April). Latent Partisanship Precedes Self-Categorization: A Two-Stage Model of the Acquisition of Partisanship Observed Among Latino Immigrants. Paper talk at the annual meeting of the International Society for Political Psychology, San Diego, CA.

Danbold, F. & Huo, Y. (2015, May). No Longer "All American?" Whites' Defensive Reactions to their Numerical Decline. Symposium talk at the annual meeting of the Association for Psychological Science, New York, NY.

Danbold, F., Sears, D.O., & Zavala, V.M. (2015, February). Incorporation of Latino Immigrants into the American Party System. Symposium talk at the annual meeting of the Society for Personality and Social Psychology, Long Beach, CA.

Overview

Over the course of three papers, this research seeks to understand how members of dominant subgroups (e.g., White Americans, men, etc.) react to social changes that threaten their standing and privilege. For many years, intergroup researchers from both the social identity (Brown, 2000) and social dominance (Sidanius & Pratto, 2001; Pratto, Sidanius, & Levin, 2006) traditions have characterized dominant subgroups as existing atop relatively stable hierarchies where they function as the source, rather than recipient, of threats to members of non-dominant subgroups. As a result, most of the research on the experience of threat to one's subgroup has looked at the threats experienced by members of non-dominant subgroups (e.g., Branscombe, Ellemers, Spears, & Doosje, 1999; Riek, Mania, & Gaertner, 2006; Stephan & Stephan, 2000) and the coping strategies they have developed in response (e.g. Crocker, Voelkl, Testa, & Major, 1991; Outten, Schmitt, Garcia, & Branscombe, 2009). Although some of the threats identified in this literature are certainly relevant to dominant subgroups, the focus on non-dominant subgroups has led the field to overlook the possibility that there may exist threats that are unique to dominant subgroups.

One unique aspect of belonging to a dominant subgroup is the claim to represent the broader social category in which the subgroup exists, what scholars term *prototypicality*. Building upon foundational theories on how we perceive and evaluate categories and category membership (Rosch, 1978) self-categorization theory highlighted that, just as individuals within a subgroup can vary in the degree to which they represent their subgroup, so can subgroups within a broader "superordinate category" (i.e., in a category that contains multiple subgroups such as a nation or an organization one subgroup may be most representative of the broader category) (Oakes, Haslam, & Turner, 1994; Turner, 1987). Consider, for example, the case of

ethnic subgroups in the superordinate category of the United States. Multiple ethnic groups exist but it is White Americans who are most closely associated with the broader category of American (Devos & Banaji, 2005). More than simply representing the superordinate category, dominant subgroups, by virtue of their prototypicality, serve as the subgroup to which all other subgroups are expected to conform (Mummendey & Wenzel, 1999). Prototypicality, therefore, affords members of dominant subgroups a number of psychological advantages, including a secure sense of belonging within their broader social category. Recognizing the privilege of prototypicality and how social change may call it into question, *prototypicality threat* was developed to define the feeling of concern among members of dominant subgroups that their claim to represent the superordinate category would be threatened.

This dissertation consists of three papers examining the causes and consequences of prototypicality threat. These papers are presented in chronological order of when they were written, representing the incremental refinement of theory and the accumulation of evidence in support of prototypicality threat as an important factor in understanding dominant subgroups' resistance to social change. Paper 1 examines the role of prototypicality threat in White Americans reactions to projections of changing demographics, which suggest that between now and 2050, Whites will no longer be a numerical majority in the United States. Paper 2 examines the role of prototypicality threat in men in STEM (science, technology, engineering, and math) reacting to initiatives aimed to increase the representation of women in these fields. Paper 3 returns to the context of Whites in America, but also looks at Whites in Great Britain, as well as non-international undergraduates responding to increases in the representation of international students at their university. Across all three papers, we examine the antecedents of prototypicality threat, its consequences, and its boundary conditions. In each one, prototypicality

threat emerges as an effective explanation for why members of dominant subgroups push back against diversity. These papers represent a substantial body of evidence in favor of the prediction that concerns about prototypicality are a major driver of dominant subgroup resistance to social change. In addition to broadening of our understanding of group-based threats and the role of hierarchies within them, this research sheds light on impactful intergroup tensions emerging in the real world, and by doing so, points to potential strategies for improving intergroup relations in the future.

Paper 1

No Longer ‘‘All-American’’? Whites’ Defensive Reactions to Their Numerical Decline

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Abstract

We suggest that Whites' declining share of the U.S. population threatens their status as the most prototypical ethnic group in America. This prototypicality threat should lead to growing resistance toward diversity, motivated by the desire to reassert Whites' standing as prototypical Americans. In Study 1, how dramatically Whites perceived their share of the population to decline predicted support for cultural assimilation, mediated by prototypicality threat (controlling for realistic and symbolic threat). This relationship held only among Whites who felt that ethnic groups differ in their prototypicality, not among those who saw all groups representing America equally. Study 2 experimentally manipulated exposure to demographic projections such that Whites who saw their group shrinking showed weaker diversity endorsement relative to those who believed their share to be stable, again mediated by prototypicality threat. These findings reveal Whites' threatened prototypicality as a novel, emerging source of resistance toward diversity in 21st century America.

Keywords: intergroup relations, diversity, Whites, prototypicality, demographic changes, identity threat, intergroup threat, moderated mediation

In the 1930s, the term ‘‘All-American’’ emerged in the American lexicon to describe ‘‘the iconic manifestation of the true American way of life’’ (Norris, 2011). Underlying this term was the assumption that to be ‘‘All-American’’ was to be part of the White majority. Who then will claim this title when Whites are no longer a numerical majority? Between 2015 and 2050, non-Hispanic White Americans will drop from 62% to 47% of the total U.S. population, becoming, for the first time, a numerical minority (U.S. Census Bureau, Population Division, 2012). Some may conclude that for a society that generally regards diversity positively (Bell & Hartmann, 2007) and whose education systems purportedly triumph multiculturalism (Glazer, 1998), Americans should welcome this burgeoning diversity. Such hopeful views, however, should be tempered by evidence showing that Whites actually have little support for multiculturalism (Citrin, Sears, Muste, & Wong, 2001; Plaut, Garnett, Buffardi, & Sanchez-Burks, 2011) and are likely to engage in defensive strategies to pre- serve their dominant standing in American society (Knowles & Marshburn, 2010). Indeed, a declining share of the population may herald for Whites ‘‘the erosion of ‘whiteness’ as the touchstone of what it means to be American’’ (Hsu, 2009).

In the current research, we examine Whites’ perceptions of and reactions to this new vulnerability—that their claim to being prototypical All-Americans may be slipping along with their share of the population. As a result, despite growing declarations of a post-racial America, the portent of a minority–majority nation may loom ominously for Whites, triggering a rejection, rather than embrace, of growing diversity. Echoing media reports (Curry, 2012), recent research has found that reminding Whites of their declining relative group size led to greater bias, anger, and fear toward minorities (Craig & Richeson, 2014a; Outten, Schmitt, Miller, & Garcia, 2012) and endorsement of conservatism among the politically unaffiliated (Craig & Richeson, 2014b).

In this article, we examine White Americans' reactions to becoming a numerical minority and test the hypothesis that concerns about losing their status as prototypical Americans uniquely drive opposition to growing diversity in response to population changes.

The Value of Prototypicality

Group prototypes serve as the norm against which individual members are judged, with those most prototypical being positively valued and awarded access to resources and social standing (Oakes, Haslam, & Turner, 1998). The ingroup projection model (Wenzel, Mummendey, & Waldzus, 2007) argues that just as individuals can be prototypical of groups so can subgroups be prototypical of superordinate categories. Given the benefits of prototypicality, individuals readily project their ingroup attributes onto relevant superordinate categories (Waldzus, Mummendey, Wenzel, & Boettcher, 2004). Although subgroup members are motivated to construe their superordinate category in a way that enhances their subgroup's prototypicality, structural realities allow some subgroups to hold a stronger claim. For instance, Whites, Asian Americans, and African Americans all implicitly perceive the prototypical American to be White (Devos & Banaji, 2005). However, with demographic changes, Whites' declining relative group size may threaten this longstanding and valuable association between being White and American.

We conceptualize prototypicality threat as the potential loss of a subgroup's standing as most representative of a superordinate category. Although well-articulated outlines of intergroup and identity threats exist in the literature (e.g. Branscombe, Ellemers, Spears, & Doosje, 1999; Stephan & Stephan, 2000; Riek, Mania, & Gaertner, 2006; Schmitt & Branscombe, 2001) none directly address threat to prototypicality. Moreover, research that has examined such threat

focused on the prototypicality of *individuals* within a group rather than the relative prototypicality of *subgroups* within a superordinate category (Jetten, Spears, & Manstead, 1997). An intergroup-based conception of prototypicality threat allows for novel predictions about how members of traditionally prototypical subgroups respond to the potential loss of their claim to be most representative of the superordinate category.

Consequences of Prototypicality Threat: Study Predictions

Because perceiving one's subgroup as prototypical is psychologically valuable, individuals under prototypicality threat should respond in two ways to defend against this threat. First, individuals experiencing prototypicality threat can seek to reassert their subgroup's prototypicality by demanding that other groups assimilate to established norms. Assimilation reinforces the notion that norms associated with the prototypical subgroup are the norms to which all others should conform. Alternatively, individuals may devalue the general concept of diversity as doing so directly targets what threatens to dislodge their subgroup's prototypicality.

Additionally, we predict that differences in individuals' beliefs about the exclusivity of Whites' prototypicality may moderate the relationship between perceived demographic change and prototypicality threat. Specifically, how individuals see prototypicality distributed among America's ethnic groups should moderate this relationship such that demographic change should *only* trigger prototypicality threat for those who feel that some ethnic groups (i.e., Whites) represent America more than others. However, for those who believe that different ethnic groups represent America equally, projections of future demographics should not evoke prototypicality threat.

Present Research

In two studies, we tested the prediction that Whites who perceived a decrease in their ethnic group's relative size would oppose this growing diversity, expressed both in increased support for assimilation (Study 1) and decreased endorsement of diversity (Study 2). We further predicted that this relationship would be mediated by prototypicality threat (Study 1 & 2), the concern that Whites' status as the prototypical ethnic group in the U.S. will be lost. Finally, we predicted that this relationship would only hold for those Whites who saw prototypicality as theirs to lose (Study 1).

Study 1 assessed Whites' perceptions of demographic change in the U.S. and examined the relationship between these perceptions and support for assimilation in several ways. First, we tested whether this relationship was mediated by prototypicality threat over and above two other group-based threats, realistic and symbolic threat. Realistic threat emerges from competition over resources (e.g. jobs, political and economic power, Stephan, Ybarra, & Bachman, 1999), and symbolic threat emerges from conflicts over cultural beliefs and values (Stephan et al., 2002). Although these threats are also likely evoked in response to changing demographics, we predicted that prototypicality threat would elicit a distinct response as it specifically captures the unique psychological experience of Whites at risk of losing their status as prototypical Americans.

We then tested whether the indirect effect of perceived demographic change would hold primarily among those who believed that prototypicality is exclusive to, and thus can be lost by, one ethnic group (Whites). To test this possibility, we relied on an individual difference measure, *prototypicality distribution*, developed to gauge the extent to which individuals view America's ethnic groups as varying or equal in their prototypicality. Whites who view America's ethnic groups as equally prototypical should report minimal prototypicality threat when confronted with

their shrinking population share. In contrast, those who view Whites and other ethnic groups as differentially prototypical should report greater prototypicality threat and support for assimilation. Study 2 (an experiment) conceptually replicated Study 1 by exposing individuals to information indicating either demographic changes or stability and examined the role of prototypicality threat in mediating the effect of this information on diversity endorsement.

Study 1

In Study 1, we tested whether White Americans who perceived their group's percentage of the population to be declining would report greater support for assimilation, and whether this relationship would be: 1) mediated by prototypicality threat (controlling for realistic and symbolic threat), and 2) moderated by individual differences in prototypicality distribution.

Methods

Participants and procedures. One hundred and ninety-four White American adults (50% women; M_{age} = 36.90 years, SD = 12.89) were recruited on Amazon Mechanical Turk (Buhrmester, et al, 2011) for a study of "America's Future" and were paid $0.75. Although we had no prior data on Whites' experience with prototypical threat from which to run power analyses, we estimated a targeted sample of 200 participants based on research on Whites' experiences with related forms of identity concerns (see Huo, Binning, Molina, & Funge, 2010). Six participants were recruited into the study but did not complete the survey. Thirty four percent identified as Democrats, 19% as Republicans, and 47% as Independents. Eighty nine percent reported having some college education or higher. Four participants who took longer than 40 minutes to complete the survey (more than twice the average of 20 minutes) were excluded from

analyses. Eight participants later self-identified as an ethnicity other than White (e.g. multiethnic, Arab American, etc.) were also excluded, leaving a final sample size of 182 participants.

Measures.[1]

Perceptions of White American population decrease. Participants indicated the extent to which they expected the number of Whites along with African Americans, Asians, and Latinos, to change between now and 2050 as a percentage of total U.S. population (-5 = rapidly decreasing to 5 = rapidly increasing). Ratings of expected change for White Americans was used as our primary predictor variable and reverse-coded (higher numbers represent more rapid decrease).

Support for assimilation. Support for assimilation was measured with three items, adapted from Hehman et al. (2012): "If people want to succeed in the US, they should adopt the values of my ethnic group," "What makes the US strong is that we are a mix of different racial cultures (reverse-coded)," and "America should be an English-only country" (1 = strongly disagree to 7 = strongly agree; $\propto = .72$).

Prototypicality threat. Three items assessed the extent to which Whites felt that their status as a prototypical American was threatened: "I fear that in 40 years time, it won't be clear what it means to be American," "I believe that there will always be a place for my ethnic group in American society" (reverse-scored), and "I fear that in 40 years time, my ethnic group will not represent the American identity" (1 = strongly disagree to 5 = strongly agree; $\propto = .78$).

Realistic threat. Three items were adapted from Stephan, Ybarra, and Bachman (1999): "The growth of other ethnic groups has increased the tax burden on members of my ethnic

[1] Exploratory measures not relevant to our theoretical framework or study predictions were included but not reported. Abbreviated versions of validated scales were used to accommodate survey length constraints. Readers are welcome to contact the authors for details.

group," "Social services have become less available to members of my ethnic group because of the growth of other ethnic groups," and "Members of other ethnic groups are not displacing members of my ethnic group from their jobs (reverse-coded)" (1 = strongly disagree to 5 = strongly agree; $\propto = .79$).

Symbolic threat. Three items were adapted from Stephan, Ybarra, & Bachman (1999): "The values and beliefs of other ethnic groups regarding moral issues are not compatible with the values and beliefs of my ethnic group," "The growth of other ethnic groups is undermining American culture," and "The values and beliefs of other ethnic groups regarding work are not compatible with the values and beliefs of my ethnic group" (1 = strongly disagree to 5 = strongly agree; $\propto = .89$).

Prototypicality distribution. Participants were asked to rate the extent to which African Americans, Asian Americans, Latino Americans, and White Americans represent the values and ideals of America on a 7-point scale (1 = least representative to 7 = most representative). We conceived of prototypicality distribution as how widely dispersed ratings of the ethnic groups were. Prototypicality distribution was calculated by computing the within-participant statistical variance of these ratings. We relied on within-participant statistical variance, rather than difference scores, because it is a more valid representation of dispersion of ratings. For example, a White/Non-White difference score overlooks variation within ratings of Non-White groups whereas that variation is captured by our measure. Thus, participants who rated each ethnic group as equally prototypical would produce a prototypicality distribution score of 0. Alternatively, participants who gave different ratings to each group would generate positive prototypicality distribution scores with higher scores indicating greater dispersion.

Results

Descriptives and inter-item correlations are presented in Table 1.

Table 1.

Study 1 correlations.

	Mean	SD	White Population Decrease	Pro-Assimilation Attitudes	Proto-typicality Threat	Realistic Threat	Symbolic Threat	Proto-typicality Distribution
White Population Decrease	6.80	1.84	-					
Pro-Assimilation Attitudes	3.38	1.46	.16*	-				
Proto-typicality Threat	3.15	1.49	.25**	.67**	-			
Realistic Threat	3.03	1.08	.16*	.66**	.63**	-		
Symbolic Threat	2.39	1.14	.11	.75**	.71**	.67**	-	
Proto-typicality Distribution	2.25	2.60	.14†	.46**	.47**	.44**	.57**	-

Note: SD = standard deviation; † $p \leq .10$; * $p \leq .05$; ** $p \leq .01$

Perceived population decrease, support for assimilation, and prototypicality threat. We hypothesized that Whites' perceptions of their numerical decline would be positively associated with endorsement of assimilation, and that this relationship would be mediated by concerns about the loss of prototypicality. Correlations shown in Table 1 and preliminary analyses supported this hypothesized model. To directly test our hypothesis, we examined the unique mediational effect of prototypicality threat including realistic and symbolic threat in a multiple-mediation model. We tested whether the indirect effect of perceived White population decrease on assimilation endorsement through prototypicality threat was significant over and above the indirect effects of realistic and symbolic threat (Preacher & Hayes, 2008). Coefficients for the paths tested are shown in Figure 1.

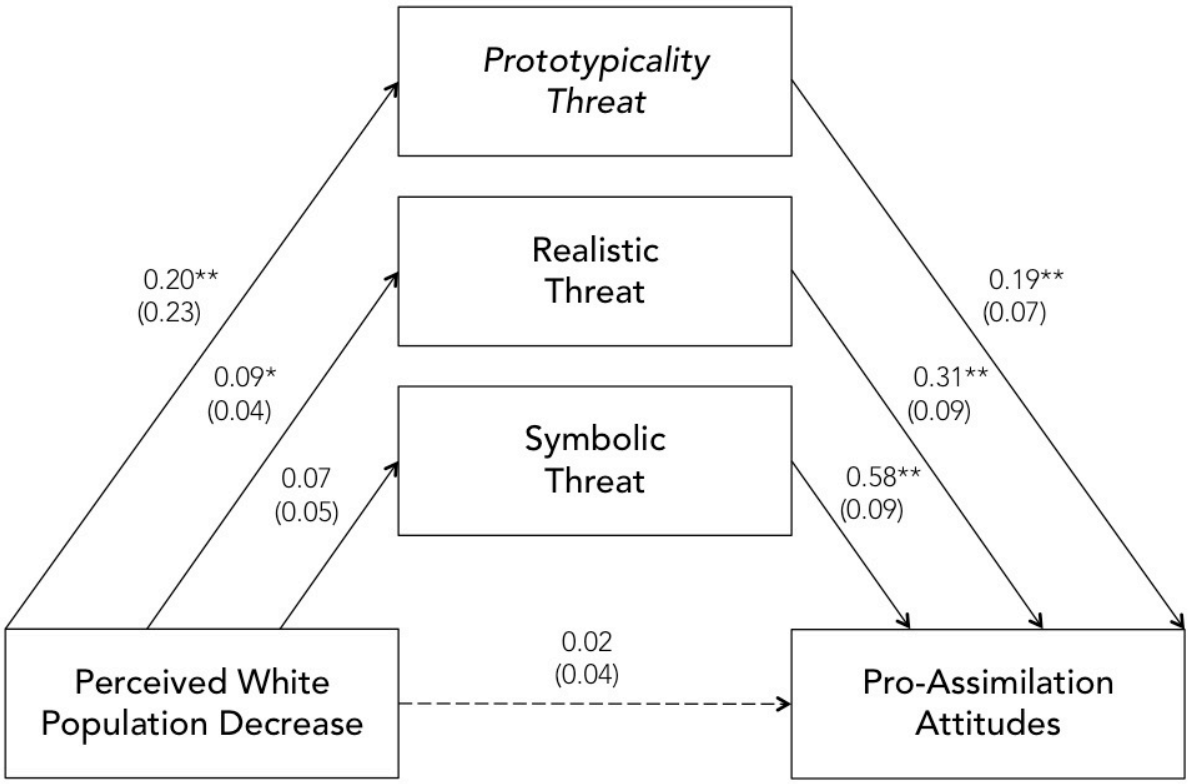


Figure 1. Study 1 multiple mediation model; all coefficients are unstandardized, standard errors are in parentheses; $^{+}$ $p \leq .10$; * $p \leq .05$; ** $p \leq .01$

To determine whether prototypicality threat mediated this relationship above and beyond other intergroup threats, we conducted a nonparametric bootstrap analysis using 5000 resamples. As hypothesized, prototypicality threat significantly mediated the relationship between perceived White population decrease and pro-assimilation attitudes (IE lower 95% CI = .01, upper 95% CI = .09). Because zero is not in the 95% confidence interval, the indirect effect is significantly different from zero. Realistic threat also mediated the relationship between White population decrease and pro-assimilation attitudes (IE lower 95% CI = .00, upper 95% CI = .07), but symbolic threat did not (IE lower 95% CI = -.02, upper 95% CI = .11). Adding prototypicality threat to a model with only realistic and symbolic threat as mediators increased variance

accounted for (adjusted R^2 change = .02). In sum, the indirect effect of population decrease on assimilation endorsement was mediated by prototypicality threat even after controlling for other forms of intergroup threat.

Prototypicality distribution as a moderator. We next tested whether beliefs about the relative prototypicality of America's different ethnic groups would moderate the relationship between perceived White population decrease and prototypicality threat. For those who saw all ethnic groups as relatively equal in prototypicality (low prototypicality distribution), we expected a negligible effect of perceived White population decrease on prototypicality threat. For individuals who rated ethnic groups as differentially prototypical (high prototypicality distribution), we predicted higher levels of prototypicality threat in response to White population decrease.

First, we tested the assumption that Whites perceive their ingroup to be the most prototypical ethnic group in America. As expected, participants reported White Americans as significantly higher in prototypicality ($M = 5.92$, $SD = 1.12$) than African Americans ($M = 4.73$, $SD = 1.54$, $t(181) = 9.75$, $p < .01$), Asians ($M = 4.37$, $SD = 1.66$, $t(181) = 10.70$, $p < .01$), and Latinos ($M = 4.19$, $SD = 1.71$, $t(181) = 11.68$, $p < .01$). These results were in line with prior research showing that Whites see their ingroup as most prototypical of America (Devos & Banaji, 2005). Only seven participants rated non-Whites as slightly more prototypical than Whites. As the exclusion of these participants did not alter our main findings, they were retained in our analyses.

We next investigated whether differences in prototypicality distribution (the within-participant statistical variance of ethnic group prototypicality ratings) moderated the relationship between perceived White population decrease and prototypicality threat. Prototypicality

distribution scores ranged from 0 (no variance in ratings of ethnic groups) to 12 (high variance in ratings of ethnic groups) (M=2.28, SD= 2.63). Prototypicality threat was significantly predicted by both perceived White population decrease (Beta = .15, $p < .05$), and prototypicality distribution (Beta = .44, $p < .01$). In addition, there was a significant interaction between population decrease and prototypicality distribution (Beta = .16, $p < .05$; $\Delta R^2 = .02$, $p < .05$; Figure 2). For participants with low prototypicality distribution scores (i.e. those who rated America's four largest ethnic groups as equally prototypical), low levels of prototypicality threat were reported regardless of perceived decrease in Whites' share of the population. For participants high in prototypicality distribution (i.e. those who reported variance in the prototypicality of America's ethnic groups), prototypicality threat was positively associated with perceived White population decrease. For these participants, more dramatic perceptions of shrinking group size were associated with greater levels of prototypicality threat. In contrast, prototypicality distribution did not moderate the relationship between White population decrease and realistic threat, the only other significant relationship in our earlier test of mediation ($\Delta R^2 = .00$, $p = .67$).

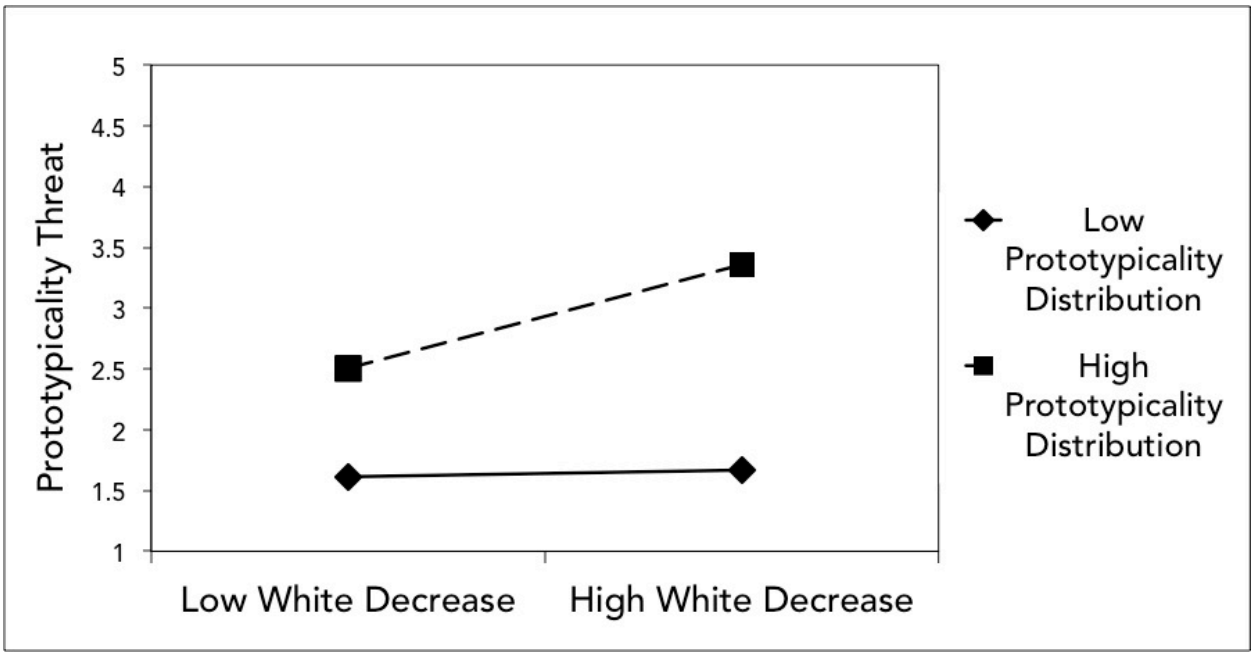


Figure 2. Study 1 moderation analyses demonstrating the interaction between perceived White population decrease and prototypicality distribution on prototypicality threat. Low and high levels of the predictor variables represent one standard deviation below and above the mean.

We next conducted a test of moderated mediation, evaluating whether the indirect effect of population decrease on assimilation endorsement, mediated through prototypicality threat, was moderated by prototypicality distribution. We used Hayes' (2012) MODMED macro (Model 2) for SPSS (see Preacher, Rucker, & Hayes, 2007) to estimate the indirect effect of perceived White population decrease on pro-assimilation attitudes through prototypicality threat at conditional levels of prototypicality distribution using 5,000 bootstrapped resamples. Table 2 shows that the conditional indirect effect of perceived White population decrease on assimilation endorsement through prototypicality threat at varying levels of prototypicality distribution. Whereas the indirect effect of perceived White population decrease on assimilation endorsement through prototypicality threat was reliable for those who were at the mean (prototypicality distribution = 2.25, IE = .07; BC 95 % CI = .01, .13) or one *SD* above the mean of

prototypicality distribution (prototypicality distribution = 4.85, IE = .13; BC 95% CI = .05, .23), the indirect effect was not reliable among participants who were one *SD* below the mean of prototypicality distribution (prototypicality distribution = 0, IE = .01, BC 95% CI = -.08, .09). Thus, the stronger relationship between perceived White population decrease and assimilation endorsement among participants at high (vs. low) levels of prototypicality distribution is explained by the former's perceptions of threat concerning their ingroup's future prototypicality.

Table 2.

Conditional indirect effect of perceived White population decrease on pro-assimilation attitudes through prototypicality threat at low (-1 SD), moderate (Mean), and high (+1 SD) levels of prototypicality distribution.

Conditional Level of Prototypicality Distribution	Indirect Effect	Bootstrapped Standard Error	Bias-Corrected Lower Limit	Bias-Corrected Upper Limit
-1 *SD* *(Low prototypicality distribution)*	.01	.04	-.08	.09
Mean	**.07**	**.03**	**.01**	**.13**
+1 *SD* *(High prototypicality distribution)*	**.13**	**.04**	**.05**	**.23**

Note: Bias-corrected 95% confidence intervals were calculated using 5,000 bootstrap samples (with replacement). Significant conditional indirect effects ($p < .05$) are highlighted in bold.

Discussion

Consistent with predictions, Whites' perceptions of their numerical decline were associated with support for assimilation. Moreover, this relationship was mediated by concerns about retaining Whites' prototypicality, controlling for realistic and symbolic threat. Finally, prototypicality threat's effectiveness as a mediator was moderated by differences in

prototypicality distribution, such that prototypicality threat was a significant mediator only for those who perceived some ethnic groups (i.e. Whites) to represent America better than others. Although these findings are consistent with predictions, correlational data precludes the causal inference that demographic change indeed triggered these defensive reactions. Thus, we conducted an experimental conceptual replication to test the hypothesized causal pathway.

Study 2

Study 2 tested the prediction that exposure to information about changing demographics triggers Whites' concerns about their prototypicality in America, and subsequently, opposition to diversity.

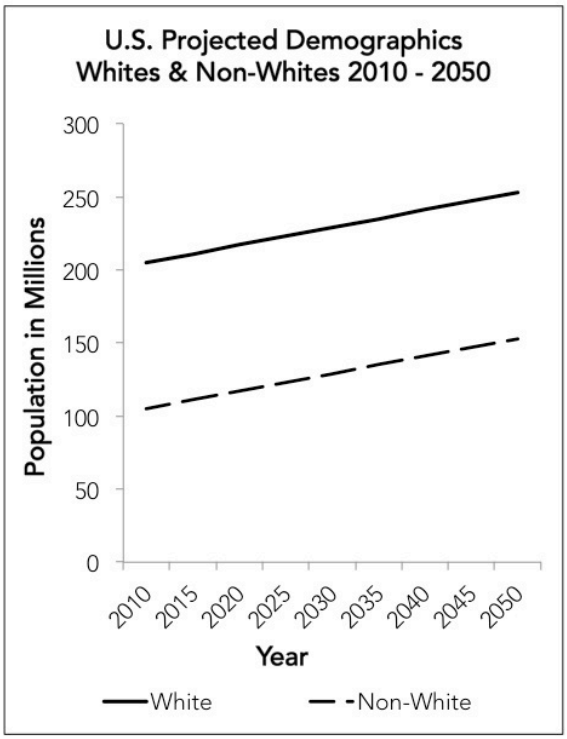
Methods

Participants and procedures. Participants were 98 White American adults (50% women; M_{age} = 37.54 years, SD = 13.13) recruited on Amazon Mechanical Turk to complete a survey about "America's future" in exchange for $0.50 USD. A target sample size of 50 participants per condition was chosen to approximate the sample size of a comparable paradigm (Study 1 in Outten et. al, 2012). Thirty six percent of participants were Democrats, 21% Republican, and 31% Independent. Eighty seven percent of participants reported having some college education or higher.

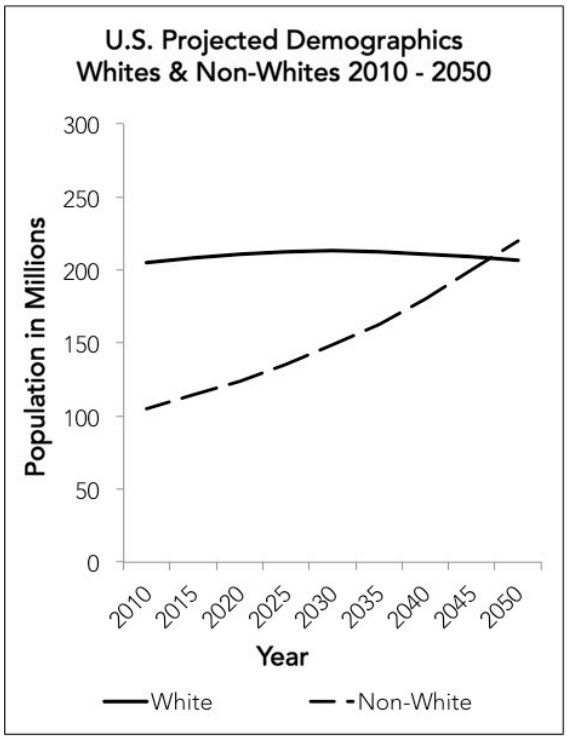
Our sampling strategy preempted the participation of individuals from 10 continuous immigrant gateways (defined as having above-average percentage foreign-born for every decade, 1900-2000). We precluded these individuals from participation because they live in communities of longstanding diversity and were likely to have become immune to the social changes we were interested in examining. During an eligibility screening, we asked participants for their home ZIP

code. Those residing in ZIP codes located in the following metropolitan areas identified by Singer (2004) as continuous immigrant gateways were *not* recruited into the study: Bergen-Passaic, Boston, Chicago, Jersey City, Middlesex-Somerset-Hunterdon, Nassau-Suffolk, New York, Newark, and San Francisco. In analyzing reported ZIP codes of our participants, only two individuals were not recruited into the study because of their location.

White majority status loss/retention manipulation. Participants were recruited into a study ostensibly on data processing and were told that they would be asked to view and summarize "two randomly selected graphs or charts about America". All participants first saw a chart of U.S. Census data showing the gender demographics of America in 2010. Participants were then exposed to one of two figures representing either the "majority loss" or the "majority retention" condition (see Figure 3).



Majority retention condition



Majority loss condition

Figure 3. Study 2 White majority status conditions (condensed and converted to black and white).

Dependent variables. After exposure to the manipulation, participants completed a brief questionnaire on their views about various social issues in the U.S. Filler questions were included.

Prototypicality threat. Three items assessed the extent to which participants felt that their group's status as prototypical Americans was threatened by the demographic changes that were presented in the manipulation. Items began with the stem, "Compared to today, 50 years from now…" followed by "…what it means to be a true American will be less clear", "…the values and beliefs of the typical American will be different from the values and beliefs of people like me", and "…the typical American and people like me will have less in common than in the past" (1 = strongly disagree to 7 = strongly agree; $\propto = .75$).

Diversity endorsement. We adapted Plaut and colleagues' (2011) six-item diversity endorsement scale to measure the extent to which participants thought diversity should be valued and encouraged in America. Sample items included "It is important to have multiple perspectives in America (i.e. from different cultures, races, and ethnicities)", "One of the goals of our country should be to teach people from different racial, ethnic, and cultural backgrounds how to live and work together," and "Americans should understand that differences in backgrounds and experiences can lead to different values and ways of thinking" (1 = strongly disagree to 7 = strongly agree; $\propto = .95$).

Manipulation check. Participants were asked to recall whether the second figure they saw showed either that "Non-Whites are growing much faster than Whites and will be the

majority in 2050" (majority loss condition) or "Whites are expected to grow just as fast as non-Whites and still be the majority in 2050" (majority retention condition).

Results

Manipulation check. Two participants who failed the manipulation check were removed from subsequent analyses. Four participants were also excluded from analyses for taking longer than 30 minutes to complete the survey. At more than twice the mean time of completion (14 minutes), these participants were considered inattentive and unreliable respondents. In addition, four participants who failed to complete the dependent measures were excluded, leaving a final sample size of 88 participants.

To assess the plausibility of our manipulation, participants were asked in an open-ended question at the end of the survey to report whether anything about the study was "surprising or unusual". Mentions of our manipulation in response to the open-ended prompt did not differ across conditions ($p > .05$).

Majority group status, diversity endorsement, and prototypicality threat. Using analysis of variance (ANOVA), we found that participants in the majority loss condition reported significantly higher levels of prototypicality threat ($M = 4.91$, $SD = 1.13$) than those in majority retention condition ($M = 4.26$, $SD = 1.38$), $F(1, 86) = 5.90$, $p = .02$. In contrast, participants in the majority loss condition reported significantly lower diversity endorsement ($M = 5.15$, $SD = 1.12$) than those in the majority retention condition ($M = 5.67$, $SD = 1.31$), $F(1, 86) = 3.91$, $p = .05$.

Replicating the mediation model with experimental data. We used nonparametric bootstrapping analyses with 5000 resamples (Preacher & Hayes, 2004; Preacher, Rucker, & Hayes, 2007) to test a model in which the effect of majority group status on diversity endorsement is mediated by prototypicality threat. Mediation is considered to be significant if the

95% Bias Corrected confidence interval for the indirect effect does not include 0. As predicted, prototypicality threat significantly mediated the relationship between exposure to demographic information and diversity endorsement (IE lower 95% CI = -.60; upper 95% CI = -.08; R^2 = .23, p < .01; see Figure 4).

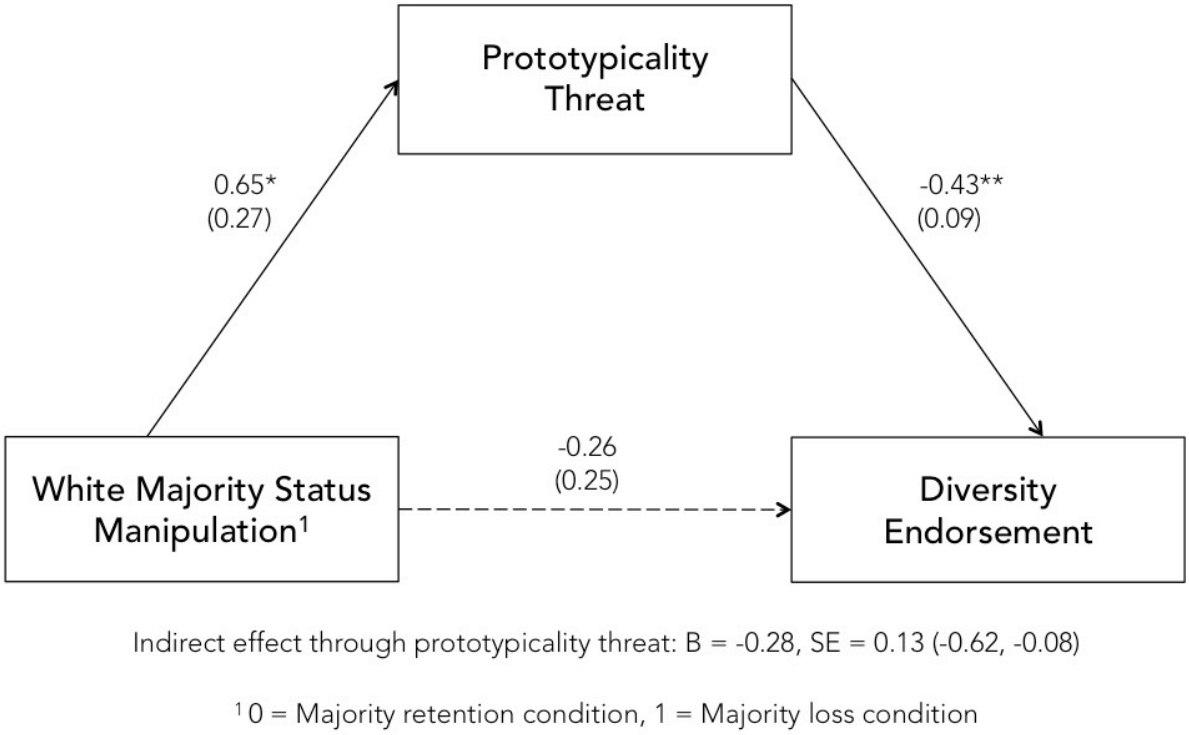


Figure 4. Study 2 mediation model; all coefficients are unstandardized, standard errors are in parentheses; *p < .05; ** p < .01

General Discussion

Prior research shows that individuals are motivated to project their subgroup's attributes onto the superordinate category (Wenzel, Mummendey, & Waldzus, 2007). The current research demonstrates that those who believe that their subgroup already holds this prototypicality will defend it under threat. Findings from two studies demonstrated that for White Americans,

perceptions of the shrinking of their group size predicted greater support for assimilation and lower endorsement of diversity. Several pieces of evidence converge to indicate that these reactions stem from Whites' perceptions of threat to their group's standing as prototypical Americans.

In Study 1, prototypicality threat explained the relationship between perceived loss of majority numerical status and support for assimilation, controlling for other forms of intergroup threat. Furthermore, the relationship between perceived population decrease and prototypicality threat was moderated such that prototypicality threat functioned as a mediator only among those who felt that prototypicality was theirs to lose. This appeared not to be the case for White Americans who felt that no single ethnic group best represents America. Study 2, an experiment, demonstrated that systematic exposure to information about Whites' relative population decrease led to lower endorsement of diversity, again mediated by prototypicality threat.

Our identification of a novel mediator (prototypicality threat) *and* an individual difference moderator (prototypicality distribution) is a step toward understanding majority group members' psychological response to demographic shifts. Beyond views about diversity, a broader array of situations and behaviors could also be explained by prototypicality threat. For example, prototypicality threat may compel individuals to engage in behaviors intended to present themselves and their subgroup as more prototypical of the superordinate category (e.g. displaying American flags). Prototypicality threat may also lead majority group members to deprecate other subgroups' claims to prototypicality or to apply restrictive inclusionary criteria to preclude members of other subgroups from qualifying as "true Americans."

In the research presented, we focused on the experience of Whites Americans. We hope that these findings will motivate future research on other groups that may be similarly

susceptible to prototypicality threat. For example, among men, increasing participation of women in historically male-dominated professions may trigger prototypicality threat and subsequent opposition toward the source of threat (women) in the form of decreased support for inclusionary workplace policies.

By examining the perspective of the majority group, this research complements a vast literature addressing diversity challenges with a focus on minority group members (for reviews see Dovidio, Gaertner, & Saguy, 2009; Huo, Binning, & Begeny, 2015). We show that when majority group members' prototypicality is threatened, they too may challenge social cohesion. However, this research (Study 1) and that of others (Waldzus, et al., 2003) suggests that individuals are less likely to react defensively to prototypicality threat when they believe that prototypicality can be shared across subgroups. As demographic changes compel us to redefine what it means to be "all-American", a more inclusive conception of who fits the prototype of the superordinate group may be a potentially effective strategy for ameliorating Whites' opposition to diversity. In the days following 9/11, the Ad Council aired public service announcements affirming the standing of many different cultural and social groups as equally American (AdCouncil, 2001). The message embodied in such ads exemplifies a route through which we can mitigate Whites' fears about losing their status as prototypical Americans and thus engender their support for diversity amidst the highly anticipated demographic changes ahead.

Conclusion

Findings across a survey and an experiment show that White Americans relate and react to their pending loss of numerical majority group status. They report concerns about the precariousness of their group's longstanding claim of being "all-American" and express subsequent opposition to growing diversity. Just as the focus was once on ethnic minority group

members as a threat to social cohesion, the focus now has shifted to Whites. Understanding the central role prototypicality threat plays in the psychological reactions of Whites to ongoing demographic shifts will be critical to understanding and managing intergroup relations in the "new" America.

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Paper 2

Men's Defense of Their Prototypicality Undermines the Success of Women in STEM Initiatives

In press at the Journal of Experimental Social Psychology

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Abstract

Two studies tested the prediction that men in STEM (Science, Technology, Engineering, & Math; students in Study 1; professionals in Study 2), who believed that initiatives to increase women's representation in these fields were effective would experience prototypicality threat (men's concern that they would no longer be the gender group that best represents what it means to be a member of the STEM community). Among those who believed it is legitimate for men to represent STEM, men's prototypicality threat mediated the relationship between perceptions that more women were entering their field and resistance toward this change (i.e., opposing women in STEM initiatives, wanting women to conform to the field's traditional norms, and expressing exclusionary intentions toward women peers). The opposite pattern was observed among those who rejected the idea that men's claim to represent STEM was legitimate. This work highlights how diversity initiatives in STEM, if successful, can be undermined by triggering prototypicality threat among men.

Keywords: intergroup relations, STEM, diversity, identity threat, men

Significant resources are invested in initiatives to increase diversity within a wide range of professional fields. One such effort is work addressing the underrepresentation of women in STEM (Science, Technology, Engineering, and Math). As this persistent underrepresentation is driven primarily by women leaving STEM, people often invoke a "leaky pipeline" metaphor to characterize the challenge of increasing gender diversity in this domain (Fouad & Singh, 2011; Pawley & Hoegh, 2011; Xu, 2008). Accordingly, most relevant research has focused on understanding how women experience challenges associated with entering and persisting in STEM (e.g., Good, Rattan, & Dweck, 2012; Murphy, Steele, & Gross, 2007; Smith, Lewis, Hawthorne, & Hodges, 2013). Often overlooked, however, is the role men play in creating and enforcing these challenges (Blickenstaff, 2005). As gender diversity initiatives could, if successful, one day make women the majority group in STEM, this research seeks to understand whether or not men will embrace or undermine this change.

The Cost to Men of Gender Diversity: Losing the Claim to Best Represent STEM

Given a growing embrace of diversity as good for both society and industry (Bell & Hartmann, 2007; Herring, 2009) and institutional arguments that women are necessary to meet growing employment demands in STEM (Olson & Riordan, 2012), men may welcome efforts to increase gender diversity in STEM. However, other evidence suggests that women face structural challenges in STEM that men do not (Ceci & Williams, 2010; Moss-Racusin, Dovidio, Brescoll, Graham, & Handelsman, 2012) and that men reinforce existing gender inequality by denying the existence of these challenges (Handley, Brown, Moss-Racusin, & Smith, 2015). Therefore, it is equally, if not more, likely that rather than responding positively, men will respond negatively to the prospect of more women entering these fields. Thus, men may support women in STEM initiatives in theory, but not in practice. We suggest here, that there is a potentially overlooked

driver of this opposition, men's fear of losing their standing as the prototypical subgroup in STEM – the valued exemplar against which women in STEM are expected to conform.

The value of being the prototypical subgroup. The insight that men may resist the entry of women into STEM because this would challenge their standing as the prototypical subgroup in the field is rooted in work on group norms. Specifically, self-categorization theory argues that group prototypes serve as the norm against which individual members are judged, with those most prototypical evaluated most positively (Oakes, Haslam, & Turner, 1998; Turner, 1987). Extending this insight from within-group processes into the context of intergroup relations, the ingroup projection model (Wenzel, Mummendey, & Waldzus, 2007) articulated that just as individuals differ in the degree to which they represent group norms, *subgroups* (e.g., ethnic groups, gender groups, etc.) differ in the extent to which they represent their broader superordinate categories (e.g. nations, professions, etc.). The ingroup projection model further predicts that within valued superordinate categories people are inclined to maximize the extent to which they see their subgroup as prototypical (Machunsky & Meiser, 2014; Mummendey & Wenzel, 1999). After all, belonging to the prototypical subgroup confers certain benefits, such as exemption from a tension between one's subgroup norms and those of the superordinate category. The potential loss of these benefits is what makes challenges to subgroup prototypicality threatening.

The key phenomenon at hand then, is prototypicality threat, or the concern that one's claim to prototypicality may be lost. Prior research on threats to prototypicality has largely examined this experience in the *intra*group setting, focusing on individuals' standing within their ingroup (Branscombe, Ellemers, Spears, & Doosje, 1999; Hunt, Gonsalkorale, & Murray, 2013; Maass, Cadinu, Guarnieri, & Grasselli, 2003; Schmitt & Branscombe, 2001). Typically, these

studies induced prototypicality threats by informing individuals that they were not representative of their ingroup (e.g., informing men that they are low in masculinity). Here we extend this work into the domain of intergroup relations, and examine concerns about the loss of subgroup prototypicality (e.g., how changes in gender demographics threaten men's belief about their gender group's claim to best represent STEM).

One interesting result of this shift to the intergroup domain is that due to the structural realities of group-based hierarchies, it is generally the dominant subgroup in a given social category (e.g., the largest numerical group and the one that holds the majority share of power and resources) that is viewed as the prototype against which members of all other subgroups are evaluated (Alexandre, Waldzus, & Wenzel, 2016; Waldzus, Mummendey, Wenzel, & Boettcher, 2004). Members of non- dominant subgroups, in contrast, have little claim to prototypicality, and thus cannot experience concern about losing it. This makes prototypicality threat at the group level a phenomenon specific to the dominant subgroup. Therefore, for this paper we focus on prototypicality threat as the concern among members of the dominant subgroup that their standing as the prototypical subgroup will be lost.

Men are the prototypical subgroup in STEM. There is substantial evidence that, although their numbers vary across disciplines, men are the dominant subgroup that lays claim to representing STEM as a whole. For example, when asked to draw a scientist, both children and adults typically portray men (Chambers, 1983; Mead & Metraux, 1957). Similarly, environments in STEM are generally shaped by and reflect the particular norms and culture of the men-majority in those fields (Cheryan, Master, & Meltzoff, 2015; Cheryan, Plaut, Davies, & Steele, 2009). As prototypicality concerns increase during times of social change (Rosa & Waldzus, 2012), men in the modern STEM environment, where gender diversity efforts are commonplace,

are likely to be particularly vigilant to cues of proto- typicality threat. This logic leads us to propose that men in STEM who see gender diversity initiatives as succeeding in bringing women into the field in unprecedented numbers will experience prototypicality threat. This experience of prototypicality threat will then motivate men to challenge both initiatives to bring more women into STEM (i.e., the source of their threat) and these policies' beneficiaries (i.e., women).

Individual Differences in Susceptibility to Prototypicality Threat

When confronted with information signaling the potential loss of their prototypicality in STEM, some men may experience prototypicality threat more strongly than others. For example, prior research has shown that although White Americans as a subgroup are generally viewed as prototypical of the broader superordinate category of all Americans, there are notable individual differences in the extent to which Whites report seeing themselves as such (Danbold & Huo, 2015). In this work, the more Whites viewed their ethnic group as better representing America than other ethnic groups, the more they experienced prototypicality threat in response to information about the rapid growth of non-Whites in the U.S.

Here, we extend this earlier finding by examining whether a new individual difference moderator, belief among members of the dominant subgroup that their standing as the prototype of the superordinate category is legitimate, would shape men's reactions to the entry of women into STEM. This new moderator, prototypicality legitimacy, refers to the endorsement of the belief that it is valid and right for one's subgroup to represent and define the superordinate category (i.e., that men should be prototypical in STEM). Several factors may feed into the endorsement of prototypicality legitimacy beliefs including a sub- group's historical dominance and/or numerical majority status. Most prevalent in STEM however, are biological explanations

of gender differences (e.g., that men are innately superior in STEM) that justify men's prototypicality in these fields (Ceci, Williams, & Barnett, 2009; Halpern et al., 2007).

Beliefs that men's prototypicality in STEM is legitimate are wide- spread. From early age through adulthood, both men and women endorse the belief that men are more naturally gifted in STEM than women (Räty, Vänskä, Kasanen, & Kärkkäinen, 2002). Although some gender differences in mathematical and spatial ability have been observed, the belief that men are inherently more adept in STEM appears to be primarily a social construct (Ceci & Williams, 2010; Leslie, Cimpian, Meyer, & Freeland, 2015; Ortner & Sieverding, 2008), and as such is likely to vary across individuals. Therefore, while we expected that men would experience prototypicality threat when informed that a rapidly growing number of women in STEM might threaten their majority status and therefore their prototypicality, this threat should be strongest among those high in prototypicality legitimacy beliefs.

Responses to Prototypicality Threat

As it is psychologically valuable to perceive one's subgroup as prototypical, those under prototypicality threat should be motivated to defend against this threat. Two key responses to prototypicality threat are theorized and supported by past research (Danbold & Huo, 2015) – the desire to reassert the prototypicality of one's subgroup and the desire to oppose the source of threat. Members of the dominant subgroup under prototypicality threat may try to reassert their claim to represent the superordinate category by demanding that, in spite of social change, members of other subgroups should continue to conform to their norms. In the STEM context, men who experience prototypicality threat are then likely to demand that women conform to men's existing norms in the field. Additionally, members of the dominant group who experience prototypical threat may also attempt to stop or slow the source of the threat. In the STEM

context, we predict that resistance to women entering STEM will be expressed in two ways. First, threatened men may express opposition to initiatives aimed at increasing the representation of women in STEM. Second, they may also express the intention to act in exclusionary ways toward women entering STEM. Through both of these actions, men can potentially curtail the number of women in STEM, thus alleviating their feelings of prototypicality threat.

Present Research

Two studies[1] tested the prediction that at different stages of the STEM "pipeline" (among undergraduate STEM majors in Study 1 and STEM professionals in Study 2), men who believe that their gender's claim to represent STEM is legitimate would experience prototypicality threat when exposed to information that diversity initiatives are successfully bringing more women into STEM. In turn, we predicted that prototypicality threat would motivate men to defend their claim to best represent STEM, expressed in the desire for women to conform to traditional STEM culture, opposition to women in STEM initiatives, and exclusionary intentions toward women peers. These predictions suggest that successful women in STEM initiatives may backfire by triggering exclusionary behaviors among men, fueled by perceived threats to their claim to be the prototypical gender group against which all subgroups in STEM should be evaluated.

Study 1 – Do Successful Women in STEM Initiatives Trigger Prototypicality Threat Among Undergraduate Men?

Method

[1] We report all measures, manipulations, and exclusions in these studies.

Experimental design. Undergraduate men majoring in STEM were randomly assigned to one of two conditions in which they read an article reporting that an initiative at their university was either succeeding or failing to increase the representation of women in STEM majors at their university.

Participants. One hundred and ninety-one male undergraduate students at a large west coast public university participated. A target sample size of 100 participants was based upon past research experimentally inducing threat among members of the dominant group (Craig & Richeson, 2014; Danbold & Huo, 2015). To accommodate for the proposed test of moderated mediation and to account for anticipated exclusion criteria (e.g., ineligible participants, violations of study protocol) once our target had been reached, we extended our data collection stop point until the end of the academic year. No data was examined or analyzed before this stop point. The average age was 21.43 years. Political views were assessed from "extremely liberal" (1) to "extremely conservative" (7), 56.9% placed themselves on the liberal side of the scale, 26.1% at the midpoint, and 17.0% on the conservative side of the spectrum. Because the stimuli involved reactions to demographic changes in STEM undergraduate programs at the university, students who were not undergraduates (n=17) were removed from subsequent analyses. International students (n = 28) were also excluded to reduce error associated with possible language barriers and the introduction of cultural variance in gender norms. Four participants who violated research protocol (e.g., looking at another nearby participants' study materials) were also excluded, resulting in a final sample of 145 participants.

Procedure. Trained research assistants approached individuals in the area of campus where STEM major classes are commonly held and asked them what their major was. Only men who self-identified as STEM majors (e.g., Biology, Engineering, Computer Science, etc.) were

invited to participate. All those who completed the study were entered into a lottery to win one $100 prize.

Across both articles, participants read about what was presented as the "Women in STEM Initiative (WSI)," aimed at increasing the representation of women in STEM majors on campus (available in Appendix A). In the "majority loss" condition, participants were told that this initiative was successful and saw a graph and accompanying text showing that as a result, women are projected to meet or even surpass men as a percentage of science and engineering majors at the university within the next five years. In contrast, participants in the "majority retention" condition were told that the WSI was not expected to lead to a dramatic change in the gender demographics of STEM at the university, and that men would retain their majority status over the coming five years.

To ensure that neither condition seemed especially unusual to participants, and to add to our cover story that we were interested in students' reactions to a recent article from the university's newspaper, after reading the article participants were asked to indicate the extent to which they felt it was interesting and relevant to them, their familiarity with the WSI and whether or not they had read similar articles in the past. There were no significant differences between conditions on perceived interest, relevance, familiarity with the WSI, or experience with similar articles (all $ps > 0.050$). Participants then completed items assessing the main outcome variables: prototypicality threat, opposition to women in STEM initiatives, and desire for women to conform to masculine norms in STEM. This was followed by a measure of our moderator, prototypicality legitimacy. Finally, participants completed demographic items and were thanked and debriefed by the research assistant.

Measures.[2] Prototypicality threat and assimilation items were adapted from items previously used in the context of Whites' reactions to demographic changes in the U.S. (Danbold & Huo, 2015). All other items were developed specifically for this study.

Prototypicality threat. Two items assessed the extent to which men felt that their prototypicality in STEM would be threatened in the future: "I'm concerned that in the future, men will no longer best represent my major.", and "I worry that in the future it won't be clear what it means to be a member of my major." (1 = strongly disagree to 7 = strongly agree; $r = 0.33$, $p < 0.001$).

Desire for women to conform to dominant STEM norms. Two items measured participants' endorsement of the assimilation of women to men in STEM: "If women want to do well in my major, they should copy what men do in my major.", and "Women in my major should adapt to the values and practices of men in my major." (1 = strongly disagree to 7 = strongly agree; $r = 0.72$, $p < 0.001$).

Opposition to women in STEM initiatives. Three items assessed participants' opposition to the Women in STEM Initiative (WSI), described identically for all participants as aiming to increase the representation of women in STEM: "I think efforts like the Women in STEM Initiative are a poor use of resources.", "I think the Women in STEM Initiative is a good thing."

[2] As is common practice in our field, our post-experimental questionnaire included additional exploratory measures intended to aid in the development of future studies. These measures were neither central to the study's predictions nor tested in the study's analyses. These included measures of past experience with women in STEM, degree of identification with STEM and man identities, attitudes toward women in STEM, concerns about jobs in the STEM field, estimates of current and desired representation of women in STEM, beliefs about dating prospects, single items of hostile and benevolent sexism, and thoughts on the survey. Also collected were demographic items measuring year in school, major, gender identity, sexual orientation, and ethnicity.

(reverse coded), and "If the Women in STEM Initiative were up for a vote, I would vote in support of it." (reverse coded) (1 = strongly α = 0.88).

Prototypicality legitimacy. Two items assessed perceptions of the legitimacy of men's proto- typicality in STEM: "Men are naturally better at my major than women", and "There's good reason why men are the majority in my major." (1 = strongly disagree to 7 = strongly agree; r = 0.57, p < 0.001). Although these items were asked after, rather than prior to the manipulation, there was no effect of the manipulation (p = 0.966) suggesting that prototypical legitimacy is a stable attitude.

Results

All the following analyses use mean scores of the scales described above. Descriptives and inter-item correlations are shown in Table 1. Given relatively low scale means, we checked our data for outliers found none.

Table 1

Study 1 Descriptives and Correlations

	M	SD	Proto-typicality Legitimacy	Proto-typicality Threat	Desire for Women to Conform	WSI Opposition
Proto-typicality Legitimacy	2.35	1.28				
Proto-typicality Threat	2.20	1.10	.26**			
Desire for Women to Conform	2.46	1.19	.56**	.20*		
WSI Opposition	2.56	1.20	.42**	.23**	.39**	

Note. M = mean. SD = standard deviation. WSI = Women in STEM Initiatives. $^{\prime}p < .10$; $^{*}p < .05$, $^{**}p < .01$.

Prototypicality legitimacy as a moderator. We used multiple regression to test the prediction that successful women in STEM initiatives would increase reports of prototypicality threat, especially among those who believed that it is legitimate for men to be prototypical in STEM. There was no significant main effect of condition on prototypicality threat (β = 0.09, 95% CI = [−0.25–0.43], standardized Beta = 0.04, p = 0.611), nor was there a significant main effect of prototypicality legitimacy (β = 0.04, 95% CI = [−0.21–0.28], standardized Beta = 0.03, p = 0.765). More importantly, as predicted, there was a significant interaction between our manipulation and prototypicality legitimacy (β =0.48, 95% CI= [0.14–0.83], standardized Beta = 0.32, $p < 0.01$, Δ R2 = 0.05, p = 0.006). As seen in Fig. 1, for participants high in prototypicality legitimacy, being exposed to information about the loss of men's majority status in STEM resulted in higher levels of prototypicality threat. Simple slopes analysis revealed a significant positive slope for individuals relatively high (+1 SD) in prototypicality legitimacy (gradient = 0.57, p = 0.021). For participants who were low (−1 SD) in expressing agreement with men's prototypicality legitimacy in STEM, an opposite pattern was observed. Learning that men's share of the field would be shrinking was associated with less prototypicality threat than when they were told men in STEM would retain their majority status. However, in simple slopes analysis, this effect was not significant (gradient = −0.39, p = 0.110).

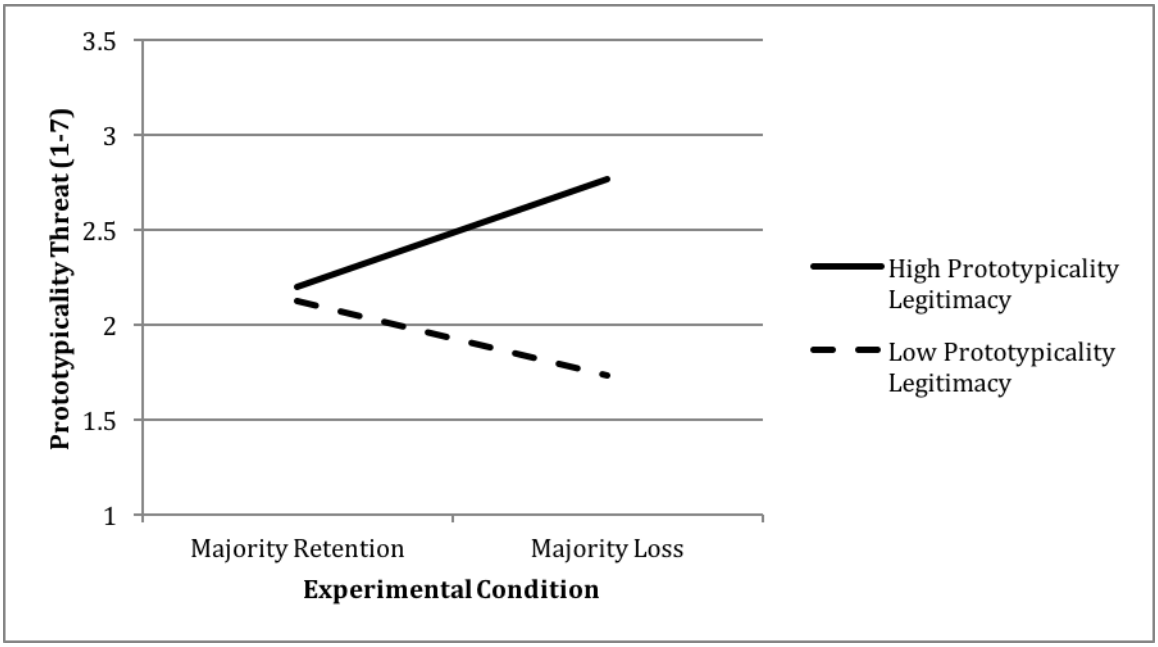

Figure 1. Study 1 interaction of condition by prototypicality legitimacy on prototypicality threat. High and low values of prototypicality legitimacy are +1SD and -1SD from the mean.

Moderated mediation. Next, we conducted moderated mediation to test whether the indirect effect of our manipulation of men's numerical representation in STEM on desire for women to conform and opposition to women in STEM initiatives through prototypicality threat, was moderated by prototypicality legitimacy.[3] This was tested using Hayes' PROCESS Macro (Hayes, 2013) Model 7 (Fig. 2).

[3] As it was not necessary to demonstrate evidence of mediation (Rucker, Preacher, Tormala, & Petty, 2011), we made no a priori predictions about the effect of our manipulation and prototypicality legitimacy on our outcome variables. Post hoc analyses, however, revealed patterns of results that mirrored the effect shown in Fig. 1 (i.e., men highest in prototypicality legitimacy who saw that their majority would be lost showed the highest scores on these measures). The interaction between our manipulation and prototypicality legitimacy on desire for women to conform was statistically significant ($p = 0.017$) and the interaction between our manipulation and prototypicality legitimacy on opposition to women in STEM initiatives was marginally significant ($p = 0.082$).

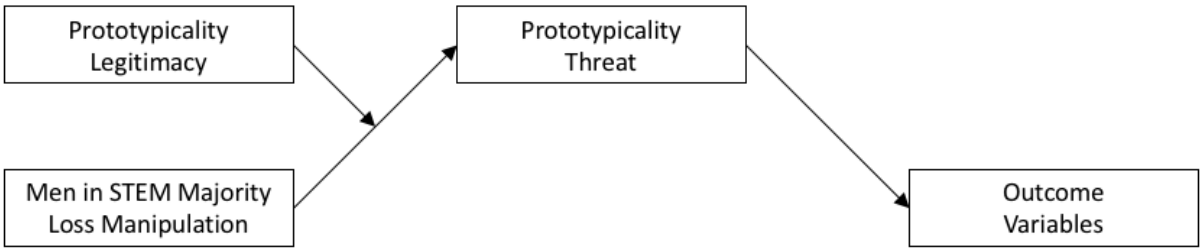

Figure 2. Study 1 and Study 2 Moderated Mediation. Men in STEM Majority Loss Manipulation is coded such that 0 = Men's Majority Retention condition, 1 = Men's Majority Loss condition. Study 1 outcome variables are Desire for Women to Conform and Opposition to Women in STEM Initiatives. Study 2 outcome variables are Desire for Women to Conform, Opposition to Women in STEM Initiatives, and Exclusionary Intentions Toward Women.

Table 2 shows the conditional indirect effect of our men in STEM majority loss manipulation on desire for women to conform and opposition to the Women in STEM Initiative through prototypicality threat at conditional levels of prototypicality legitimacy using 50,000 bootstrapped resamples.

The indirect effect of our manipulation on desire for women to conform through prototypicality threat was not reliable for participants who were at the mean in prototypicality legitimacy (prototypicality legitimacy = 2.35, roughly "disagree" on our 1–7 scale), IE = 0.02; bias-corrected 95% Confidence Interval = [−0.05, 0.13]. For those one standard deviation above the mean (prototypicality legitimacy = 3.63, under half a scale point below "neither agree nor disagree"), there was a reliable and positive indirect effect, IE = 0.13; BC 95% CI = [0.02, 0.33]. This pattern reversed, and there was a negative indirect effect for individuals who were one standard deviation below the midpoint (prototypicality legitimacy = 1.06, roughly "strongly disagree"); IE = −0.09, BC 95% CI = [−0.27, 0.00]. Although this indirect effect (for men low in prototypicality legitimacy) was not significant (the confidence interval here does contain zero),

the upper limit of the confidence interval indicated this effect approached significance (ULCI = 0.0007).

Table 2

Study 1 Conditional Indirect Effect of Perceived Men in STEM Majors Majority Loss on Desire for Women to Conform and Opposition to Women in STEM Initiatives Through Prototypicality Threat at Low (-1 SD), Moderate (Mean), and High (+1 SD) Levels of Prototypicality Legitimacy.

Conditional Level of Prototypicality Legitimacy	Indirect Effect	Bootstrapped Standard Error	Bias-Corrected Lower Limit	Bias-Corrected Upper Limit
Outcome = Desire for Women to Conform				
-1 SD (1.06)	-.09	.06	-.27	.00
Mean (2.35)	.02	.04	-.05	.13
+1 SD (3.63)	**.13**	**.08**	**.02**	**.33**
Outcome = Opposition to Women in STEM Initiatives				
-1 SD (1.06)	-.10	.07	-.28	.00
Mean (2.35)	.02	.05	-.06	.13
+1 SD (3.63)	**.14**	**.08**	**.03**	**.34**

Note. SD = standard deviation. Bias-corrected 95% confidence intervals were calculated using 50,000 bootstrap samples (with replacement). Significant conditional indirect effects ($p < .05$) are highlighted in boldface.

When evaluating our predictions on men's opposition to women in STEM initiatives, we found similar patterns of effects. As before, there was no reliable indirect effect for participants at the mean (prototypicality legitimacy = 2.35), IE = 0.02; BC 95% CI = [−0.06, 0.13], but there was a significant positive indirect effect for participants one standard deviation above the mean (prototypicality legitimacy=3.63), IE = 0.14, BC 95% CI = [0.03, 0.34]. This pattern again was reversed such that there was a negative indirect effect for participants one standard deviation below the mean (prototypicality legitimacy = 1.06), IE = −0.10; BC 95% CI = [−0.28, 0.00]. Again, although the indirect effect for men low in prototypicality legitimacy was not significant

(the confidence interval here also contains zero), the upper limit of the confidence interval indicated this effect approached significance (ULCI = 0.0004).

Discussion

As predicted, when men who believed that their prototypicality in STEM was legitimate were told that an initiative to increase the representation of women in STEM was successful (compared to failing), they experienced greater levels of prototypicality threat. This threat led to increased demands for women to conform to men's norms and increased opposition to the initiative they saw.

An unexpected finding from this study was the pattern that men low in prototypicality legitimacy (i.e., those who strongly rejected the notion that men should be prototypical in STEM) reported lower levels of prototypicality threat when they thought women in STEM initiatives were successful than when these initiatives were stalling. This suggests that men low in prototypicality legitimacy, relative to those who are high, may be more willing to embrace the prospect of more women entering their professional domains. Although this pattern of finding suggested a silver lining by highlighting a group of men who may serve as allies (Drury & Kaiser, 2014) in the effort to create greater gender diversity in STEM, this pattern did not reach conventional thresholds of significance. In Study 2, we examined whether this unexpected pattern of finding among men low in prototypical legitimacy beliefs would replicate.

A key limitation of this study is the focus on undergraduate men. Because women are entering STEM majors at much higher rates than they are STEM professions (National Science Foundation, 2012), undergraduate men may already be vigilant to the effects of demographic change, and therefore more likely to experience prototypicality threat. In Study 2, we sought to provide a harder test of our predictions by looking down the pipeline to examine whether Study 1

findings could be replicated among men employed in STEM, where men's prototypicality is currently more secure. Study 2 also added a new outcome measure of exclusionary behavioral intentions toward women in STEM. Finally, we included an individual difference measure of masculinity insecurity (i.e., men's concern about not being able to meet traditional gender roles; Eisler & Skidmore, 1987). We included this in our models to see if our predicted pattern of results held over and above more general insecurity about their masculinity across domains.

Study 2 – Looking Down the Pipeline - Do Successful Women in STEM Initiatives Trigger Prototypicality Threat Among Men Professionals?

Method

Experimental design. Men professionals working in STEM fields were randomly assigned to one of two conditions in which they read an article reporting that federal initiatives to increase representation of women in STEM careers were either succeeding or failing to increase the representation of women in STEM careers in the U.S.

Participants. One hundred and fifty-five professional men working in STEM fields were recruited from Amazon Mechanical Turk to participate in a study titled, "Changes in Your Profession" and were paid $1.00. As in Study 1, we drew upon previous research (Craig & Richeson, 2014; Danbold & Huo, 2015) to set a target sample size of 100 and increased this to 150 to account for anticipated exclusion criteria (e.g., failure of manipulation checks). We posted this total number of HITs to Mechanical Turk and stopped data collection when all had been completed. Average age was 32.61 years. Political views were assessed on 7-point scale from "extremely liberal" (1) to "extremely conservative" (7): 56.1% placed themselves on the liberal

side of the scale, 23.0% at the midpoint, and 21.0% on the conservative side. Participants were asked to self-identify their professional field.

Procedure. Potential participants completed a brief eligibility survey. Only men who said that they were full-time or part-time employed in a STEM field (defined as teaching or conducting research in science, technology, engineering, or math) were recruited into the study. Thirty-two participants whose self-described professional fields were not clearly in STEM (e.g., military, business management, non-specific education, etc.) were removed from subsequent analyses.

To ensure no effect of our manipulation on our predicted moderator, participants first responded to questions assessing prototypicality legitimacy, operationalized as the extent to which they believed men to be inherently better at STEM than women. Participants were then randomly assigned to read one of two articles (available in Appendix A) about the outcome of a federal STEM initiative on diversifying the gender distribution of professionals in STEM fields. Across conditions, participants were told they would be reading an excerpt from an ostensibly real newspaper article which indicated that 2014 marked the eighth anniversary of the National Science Foundation's Women in STEM Initiative (WSI) designed to increase the number of women in STEM careers in the U.S. The information in the two conditions then diverged on whether the program was succeeding or failing. In the "majority loss" condition, participants were told that the WSI was successful and that the percentage of women in STEM would be "reaching, and perhaps surpassing equal representation with men around 2050." In the "majority retention" condition, participants were told that the WSI had resulted in "no significant increase in the percentage of women" in STEM and that women would remain a "far smaller percentage than men through 2050." The timescale of the predicted demographic change was extended here

from the timescale used for the undergraduate student sample in Study 1. For undergraduates who are enrolled in their program for typically four years, we set a relatively short timeframe for demographic change to ensure that the predicted changes would be relevant to our participants. For professionals, a longer timeframe is more realistic for significant changes in gender distribution in STEM to take place. In addition, because slower changes are less threatening than rapid ones, the longer time frame used in Study 2 also served as a stronger test of our theory. Participants next completed a stimuli recall check, followed by items measuring proto- typicality threat and the dependent variables (desire for women to conform to men in STEM, opposition to women in STEM initiatives, and exclusionary intentions toward women peers), and an individual difference measure of masculinity insecurity. Finally, participants completed a manipulation check and demographics items, and were debriefed and thanked.

Measures.[4]

As in Study 1, prototypicality threat and assimilation items were adapted from measures described in Danbold & Huo, 2015. In addition, masculinity insecurity was measured with items from an existing scale (Eisler & Skidmore, 1987). All other measures were developed for the purpose of this study.

Prototypicality threat. Three items assessed the extent to which participants felt that their prototypicality in STEM would be threatened in the future: "I worry that by 2050, it won't be

[4] Similar to Study 1, exploratory measures not central to our main research questions or analyses were collected. These included perceived ingroup prototypicality, realistic and symbolic threat, measures of support for women in STEM initiatives to a point, affirmative action support, beliefs about dating prospects, identification with professional field, ambivalent sexism, sexism stereotype threat, and social dominance orientation. Demographic measures of specific professional field, ethnicity, self and parents' countries of origin, level of education, duration at current profession, income, political party identification, relationship status, sexual orientation, and gender identity were also collected.

clear what my professional field stands for.", "I am concerned that by 2050, men will no longer represent my field's professional identity.", and "I believe there will always be a place for men like me in my professional field." (reverse coded) (1 = strongly disagree to 7 = strongly agree; α = 0.73).

Desire for women to conform to dominant STEM norms. Five items measured participant's endorsement that women should conform to the norms set by men in STEM: "If women want to do well in my professional field, they should adopt the values and practices of men.", "Women could learn a lot from men in my professional field.", "My professional field would be stronger if women conformed to the standards set by men.", "My professional field would be more respected if women conformed to standards set by men.", and "That men and women both contribute is a strength of my professional field." (reverse coded) (1 = strongly disagree to 7 = strongly agree; α = 0.84).

Opposition to women in STEM initiatives. Three items assessed participants' opposition to the Women in STEM Initiative (WSI), described as aiming to increase the representation of women in STEM: "I oppose this initiative.", "I think it's a good idea to increase the percentage of women in my professional field to at least 50%." (reverse coded), and "If this initiative were up for a vote, I would vote in support of it." (reverse coded) (1 = strongly disagree to 7 = strongly agree; α = 0.82).

Exclusionary intentions toward women in STEM. Five items measured participants' intention to behave in an exclusionary way toward women STEM professionals: "It is not my responsibility to make women feel included in my professional field.", "It is unlikely that most women could ever feel like they belong in my professional field.", "Women need thick skin to feel at home in my professional field.", "I go out of my way to make women in my professional

field feel welcome." (reverse coded), and "I like to ensure that all individuals feel welcome in my professional field regardless of gender." (reverse coded) (1 = strongly disagree to 7 = strongly agree; α = 0.63). Higher scores indicate more exclusionary behavioral intentions.

Prototypicality legitimacy. In contrast to Study 1, in Study 2, prototypicality legitimacy measures were developed to more directly and explicitly tap into the idea that men are more innately capable in STEM than women. Three items, measured prior to the manipulation, assessed the extent to which participants felt that innate ability legitimized their group's prototypicality in STEM: "There is something innate about being a man that makes someone better at working in my professional field.", "There is a biological basis for why men do better at my professional field than women.", and "Biology has nothing to do with men or women succeeding in my professional field." (reverse coded) (1=strongly disagree to 7 = strongly agree; α = 0.81).

Masculinity insecurity. A subset of items from the 40-item Masculine Gender Role Stress Inventory (Eisler & Skidmore, 1987) were assessed to examine whether or not the pattern of results observed in Study 1 would hold over and above men's general sense of insecurity around their individual masculinity across domains. Fourteen items were drawn from the three most theoretically relevant subscales: subordination to women, intellectual inferiority, and performance failure, and measured the degree of perceived stress (1 = not at all stressful, 7 = extremely stressful) elicited by situations such as "Being outperformed at work by a woman.", "Talking with a 'feminist'", and "Being unemployed" (α = 0.85).

Stimuli recall and manipulation check. A stimuli recall check followed the display of the experimental manipulations to ensure that participants understood the intention of the

initiative they read about: “Recall the initiative you just read about. Did that initiative aim to make the percentage of women in STEM increase, decrease, or stay the same?”

To evaluate the effectiveness of our manipulation participants were asked to respond to two manipulation check items. The first item asked “Relative to today, to what extent do you think the percentage of women in STEM will increase, decrease, or stay the same?” (1 = decrease dramatically to 7 = increase dramatically). The second asked, “To what extent did you believe that the initiative would successfully do what it intended to do?” (1 = not at all to 7 = extremely).

Additional checks. Finally, participants responded to two additional measures which were intended to ensure that our two conditions were perceived by participants as comparable on important dimensions that are unrelated to the manipulation: that the STEM Initiative regardless of its effectiveness was perceived as a good idea and that the information presented in the two articles were considered equally valid. We asked participants, “To what extent did you believe that the initiative is a good idea?” (1 = not at all to 7 = extremely), and “To what extent do you believe that the findings from the article you read were valid?” (1 = not at all to 7 = extremely).

Results

All the following analyses use mean scores of the scales described above. Descriptives and inter-item correlations are shown in Table 3. Given relatively low scale means, we checked our data for outliers found none.

Stimuli recall and manipulation check. Twelve participants across conditions did not correctly recall that the WSI aimed to increase the percentage of women in STEM and were dropped from subsequent analyses. Four additional participants who did not complete the outcome measures were dropped from analyses, leaving a final sample size of 107 participants.

Participants in the majority loss condition reported significantly higher expectations that the percentage of women in STEM would increase ($M = 5.45$, $SD = 0.81$) than participants in the majority retention condition ($M = 5.02$, $SD = 0.67$), F (1, 105) = 9.13, $p = 0.003$. Participants in the majority loss condition were also significantly more likely to report that the Women in STEM Initiative was successful ($M = 4.43$, $SD = 1.32$) than did participants in the majority retention condition ($M = 3.74$, $SD = 1.38$), F (1, 104) = 6.90, $p = 0.010$.

Table 3

Study 2 Descriptives and Correlations

	M	SD	Proto-typicality Legitimacy	Proto-typicality Threat	Desire for Women to Conform	WSI Opposition	Exclusionary Intentions Toward Women	Masculinity Insecurity
Proto-typicality Legitimacy	2.92	1.45	-					
Proto-typicality Threat	2.21	1.05	.39**	-				
Desire for Women to Conform	3.37	1.21	.63**	.40**	-			
WSI Opposition	2.83	1.35	.44**	.32**	.51**	-		
Exclusionary Intentions Toward Women	3.16	.99	.47**	.42**	.62**	.49**	-	
Masculinity Insecurity	3.50	.94	.47**	.31**	.44**	.38**	.37**	-

Note. M = mean. SD = standard deviation. WSI = Women in STEM Initiatives. $^{\dagger}p < .10$; $*p < .05$, $**p < .01$.

Additional checks. There was no significant difference regarding perceptions about the extent to which the WSI was a good idea between the majority loss condition ($M = 4.76$, $SD =$

1.62) and the majority retention condition (M = 5.07, SD = 1.57), F (1, 104) = 0.99, p = 0.323. There was also no significant difference in the perceived validity of the findings presented in the article between participants in the majority loss condition (M = 4.25, SD = 1.48) and the majority retention condition (M = 4.50, SD = 1.46), F (1, 103) = 0.73, p = 0.395, indicating that participants perceived the information in both conditions to be equally believable. These patterns of findings provide assurance that any mean differences we observe in our dependent variables can be attributed to the experimental manipulation and not to differences in global evaluations of the initiatives or the validity of the information presented in the article.

Prototypicality legitimacy as moderator. Using multiple regression, we tested the prediction that, consistent with Study 1, men led to believe that the WSI would be successful in bringing more women into the field would experience greater prototypicality threat, but only among those who are high in prototypicality legitimacy beliefs (i.e., the belief that men are naturally better suited to STEM than women). We did so controlling for masculinity insecurity (although patterns of result are consistent with or without the inclusion of this covariate[5]). There was no significant main effect of condition (β = 0.06, 95% CI = [−0.30–0.42], standardized Beta = 0.03, p = 0.744), nor was there a significant main effect of prototypicality legitimacy on prototypicality threat (β =0.10, 95% CI = [−0.14–0.36], standardized Beta = 0.10, p = 0.416). Consistent with predictions, there was a significant interaction between our experimental manipulation and prototypicality legitimacy (β = 0.56, 95% CI = [0.20–0.93], standardized Beta

[5] Without the inclusion of masculinity insecurity as a covariate, there was again no significant main effect of condition (β = 0.05, p = 0.776), no significant main effect of prototypicality legitimacy on prototypicality threat (β = 0.15, p = 0.213), and a significant interaction between our experimental manipulation and prototypicality legitimacy (β = 0.59, p = 0.002).

= 0.35, $p = 0.003$).[6] As seen in Fig. 3, for participants high in prototypicality legitimacy, being told about the pending loss of men's majority status in STEM produced higher levels of prototypicality threat. Similar to Study 1, the opposite pattern was found for men low in prototypicality legitimacy. For these participants low in prototypicality legitimacy, who believed there was no legitimate reason why men are proto- typical in STEM, being told about the pending loss of men's majority status in STEM led to lower levels of prototypicality threat. Simple slopes analyses revealed a significant positive slope for individuals high (+ 1 SD) in prototypicality legitimacy (gradient = 0.62, $p = 0.018$). The negative slope for individuals low in prototypicality legitimacy was marginally significant (gradient=−0.50, $p = 0.054$). That men low in prototypicality legitimacy showed the opposite reaction to our manipulation as men high in prototypicality was not among our original predictions, but closely replicated the results seen in Study 1.

[6] To lay the foundation for future studies, we collected measures of realistic threat (e.g., concern that in the future "women will have made it more difficult for men to get jobs in my professional field") and symbolic threat (e.g., concern that in the future "the values and beliefs of women regarding work will not be compatible with the values and beliefs of men in my professional field."; both adapted from Stephan, Ybarra, & Bachman, 1999). These measures were being piloted tested and were not part of the a priori predictions for Study 2. In post hoc analyses, with these threats included in the model shown in Fig. 3, the general pattern of results held, but the interaction between our manipulation and prototypicality legitimacy on prototypicality threat dropped to margin- al significance. Although we are hesitant to interpret significance values in exploratory analyses, the weakening of this effect may owe to the fact that, despite clear conceptual distinctions between these forms of threat, disentangling them empirically has been a persistent challenge in the literature (e.g., Riek et al., 2006). Our goal in future work is to develop more precise measures of other forms of group-threat that can be more clearly empirically distinguished from prototypicality threat.

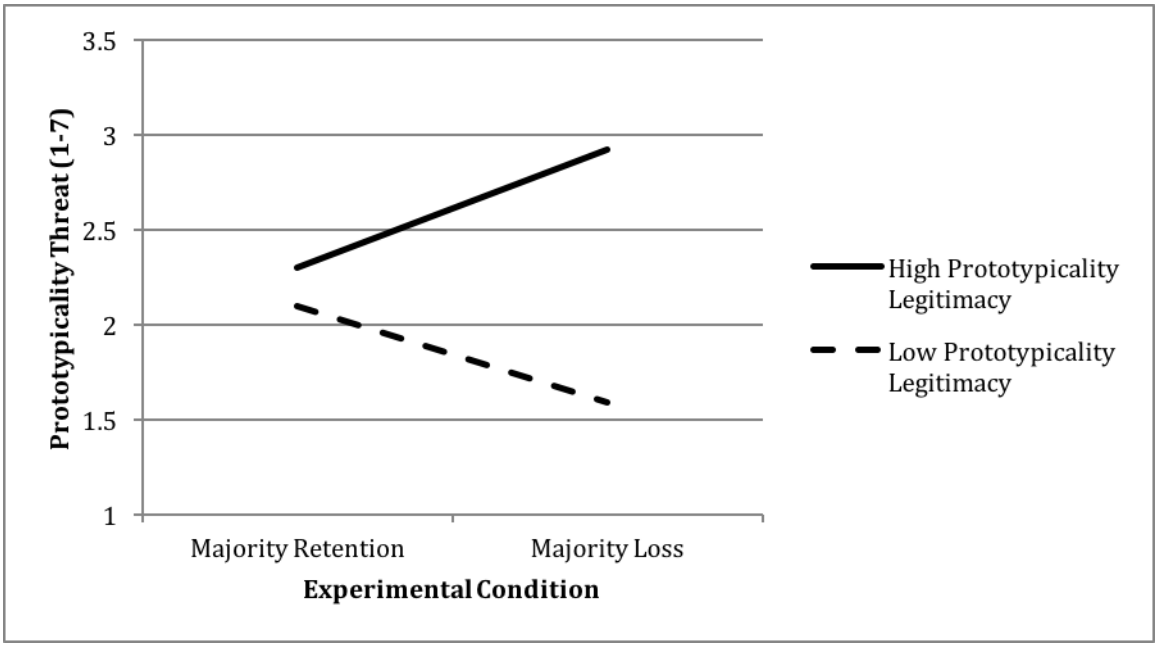

Figure 3. Study 2 interaction of condition by prototypicality legitimacy on prototypicality threat. High and low values of prototypicality legitimacy are +1SD and -1SD from the mean.

Moderated mediation. We conducted moderated mediation, testing whether the indirect effect of the experimental manipulation on desire for women to conform to dominant STEM norms, opposition to women in STEM initiative, and exclusionary intentions toward women through proto- typicality threat, was moderated by prototypicality legitimacy using Hayes' PROCESS Macro (Hayes, 2013) Model 7 (Fig. 2).[7] We did so again controlling for masculinity insecurity. As masculinity insecurity was significantly correlated with each of our outcome variables (see Table 3), its inclusion in our model served as a stronger test of the predictive value of prototypicality threat. Table 4 shows the conditional indirect effect of our manipulation on

[7] As in Study 1, we had no a priori predictions about the relationship between our manipulation and prototypicality legitimacy on our outcome variables without the inclusion prototypicality threat in our model. Mirroring patterns of results shown in Fig. 3, post hoc analyses revealed a significant interaction between our manipulation and prototypicality legitimacy on desire for women to conform ($p = 0.041$), a marginal interaction on opposition to women in STEM initiatives ($p = 0.066$), and a significant interaction on exclusionary intentions toward women ($p = 0.019$).

each of the three outcome variables through prototypicality threat at conditional levels of prototypicality legitimacy using 50,000 bootstrapped resamples and including masculinity insecurity as a covariate.

The indirect effect of our manipulation on desire for women to conform through prototypicality threat was not reliable for participants who were at the mean in prototypicality legitimacy (prototypicality legitimacy = 2.92, roughly "somewhat disagree" on our 1–7 scale), IE = 0.02; bias-corrected 95% Confidence Interval = [−0.09, 0.16]. For those one standard deviation above the mean (prototypicality legitimacy = 4.38, above "neither agree nor disagree"), there was a reliable and positive indirect effect, IE = 0.21; BC 95% CI = [0.01, 0.53]. There was a significant negative indirect effect for individuals one standard deviation below the midpoint (prototypicality legitimacy = 1.47, roughly "disagree"); IE = −0.17, BC 95% CI = [−0.37, −0.04].

Similar patterns were found looking at the indirect effect of our manipulation on opposition to women in STEM initiative mediated by prototypicality threat and moderated by prototypicality legitimacy. There was no reliable indirect effect for participants at the mean (prototypicality legitimacy = 2.92), IE = 0.02; BC 95% CI = [−0.08, 0.15]. There was a significant positive indirect effect for participants one standard deviation above the mean (prototypicality legitimacy = 4.38), IE = 0.18, BC 95% CI = [0.00, 0.50]. Again, this was reversed such that there was a significant negative indirect effect for participants one standard deviation below the mean (prototypicality legitimacy = 1.47), IE = −0.14; BC 95% CI = [−0.37, −0.02].

Finally, the observed patterns also held for exclusionary intentions toward women in STEM. Again, there was no reliable indirect effect for participants at the mean (prototypicality

legitimacy = 2.92), IE = 0.02; BC 95% CI = [−0.09, 0.15]. There was a significant positive indirect effect for participants one standard deviation above the mean (prototypicality legitimacy=4.38), IE=0.20, BC 95% CI = [0.01, 0.49]. Again, this was reversed such that there was a significant negative indirect effect for participants one standard deviation below the mean (prototypicality legitimacy = 1.47), IE = −0.16; BC 95% CI = [−0.35, −0.04].

Table 4

Study 2 Conditional Indirect Effect of Perceived Men in STEM Careers Majority Loss on Desire for Women to Conform, Opposition to Women in STEM Initiative, and Exclusionary Intentions Toward Women in STEM Through Prototypicality Threat at Low (-1 SD), Moderate (Mean), and High (+1 SD) Levels of Prototypicality Legitimacy

Conditional Level of Prototypicality Legitimacy	Indirect Effect	Bootstrapped Standard Error	Bias-Corrected Lower Limit	Bias-Corrected Upper Limit
Outcome = Desire for Women to Conform				
-1 SD (1.47)	**-.17**	**.08**	**-.37**	**-.04**
Mean (2.92)	.02	.06	-.09	.16
+1 SD (4.38)	**.21**	**.13**	**.01**	**.53**
Outcome = Opposition to Women in STEM Initiatives				
-1 SD (1.47)	**-.14**	**.09**	**-.37**	**-.02**
Mean (2.92)	.02	.05	-.08	.15
+1 SD (4.38)	**.18**	**.12**	**.00**	**.50**
Outcome = Exclusionary Intentions Toward Women				
-1 SD (1.47)	**-.16**	**.08**	**-.35**	**-.04**
Mean (2.92)	.02	.06	-.09	.15
+1 SD (4.38)	**.20**	**.12**	**.01**	**.49**

Note. SD = standard deviation. Bias-corrected 95% confidence intervals were calculated using 50,000 bootstrap samples (with replacement). Significant conditional indirect effects ($p < .05$) are highlighted in boldface. Masculinity insecurity is included as a covariate.

Discussion

Study 2 replicated and extended the findings from Study 1. Men professionally employed in STEM who felt that their subgroup's prototypicality in their career was legitimate showed greater proto- typicality threat when they were led to believe that women in STEM initiatives would be successful than when they thought such initiatives would fail. Prototypicality threat was, in turn, associated with stronger demands for women to conform to men's norms in STEM, greater opposition to women in STEM initiatives, and more exclusionary intentions toward potential women coworkers. These effects held even controlling for individual differences in concerns about masculinity.

Interestingly, Study 2 replicated the unexpected finding in Study 1 that men low in prototypicality legitimacy reported lower levels of prototypicality threat when told that the number of women in STEM would increase, rather than remain the same. Although not predicted a priori, the replication of this pattern of findings across the two studies suggests that the utility of future research that focuses on which men may be welcoming of, rather than threatened by, gender diversity efforts.

General Discussion

Across two experiments, men who believed that their prototypicality in STEM (as a field of study in Study 1 and as a profession in Study 2) was legitimate reported greater prototypicality threat when informed that women in STEM initiatives were successful in bringing more women into STEM than when these initiatives were stalling. In turn, experiences of prototypicality threat predicted the desire for women to conform to STEM standards as defined by men, opposition to gender diversity initiatives in STEM, and exclusionary intentions toward women. This pattern of findings was demonstrated among men both studying and working in STEM, and held even

controlling for masculinity insecurity in the second group. This demonstrates that prototypicality threat induced by social change has unique explanatory significance, above and beyond individual differences in concerns about masculinity. As women commonly cite hostile climates as their impetus for leaving STEM fields (Cheryan et al., 2009), this research illuminates how successful gender diversity efforts may threaten men's sense of ownership over the STEM identity, causing them to create even less hospitable climates for women successfully recruited into STEM.

Limitations and Future Directions

Our goal in this paper was to test a new, theoretically derived psychological mechanism (i.e., prototypicality threat) underlying men's responses to efforts to increase gender diversity in STEM, and to examine whether beliefs that men should define the norms of this field (i.e., prototypicality legitimacy) would moderate susceptibility to this threat. Across two experiments with different operationalizations of the theoretical constructs and two samples of men representing different aspects of the STEM pipeline, we found consistent support for our key predictions.

Despite these consistent findings, our understanding of prototypicality threat will benefit from further empirical exploration. Although it was not a goal of the present research, it will be valuable to conduct a more systematic examination of the relationship between prototypicality threat and other forms of group-based threat (e.g., Branscombe et al., 1999; Riek, Mania, & Gaertner, 2006; Stephan & Stephan, 2000). Although it is possible, even likely, that the context of increasing diversity will trigger multiple forms of conceptually distinct threats, it will be important to take each into account. If we wish to manage intergroup tensions, different forms of threat call for different interventions. For example, concerns among both men and women about

competition over resources may be naturally attenuated by the anticipated growth of jobs and investments in STEM (Olson & Riordan, 2012). Concerns specific to men about the potential loss their prototypicality, on the other hand, may be harder to mitigate. One potential approach may be to capitalize on past work showing that efforts to portray superordinate categories in a way that is characterized by complexity (e.g., making diversity a defining characteristic of STEM) inhibits subgroups' ability to claim prototypicality in those domains (Ehrke, Berthold, & Steffens, 2014; Waldzus, Mummendey, Wenzel, & Weber, 2003). By reducing men's perceived claims to represent STEM in this way, we may also reduce their susceptibility to prototypicality threat.

It is also worth discussing the unexpected finding that men low in prototypicality legitimacy (i.e., those who strongly disagreed with the notion that men should represent what it means to be in STEM) showed the opposite effect of men high in prototypicality legitimacy in response to our manipulation (i.e., they showed a decrease rather than an increase in prototypicality threat in response to information that women in STEM initiatives were succeeding versus stalling). Despite the fact that this finding was not predicted, it represents a valuable silver lining to our research – the possibility that some men may embrace, rather than reject, the prospect of more women entering STEM. This finding underscores prototypicality legitimacy's role as a novel and influential individual difference moderator determining susceptibility to prototypicality threat. Additionally, further study of the origins and malleability of prototypicality legitimacy may highlight new strategies for averting or reducing the activation of prototypicality threat among dominant group members and the negative consequences associated with this threat. In particular, interventions designed to dispel beliefs about innate gender differences (Dar-Nimrod & Heine, 2011; Keller, 2005) may be an effective strategy to

reduce men's apprehensions about more women entering STEM, and convert some into active allies in support of this change (Drury & Kaiser, 2014).

Another potential critique of our studies is the relatively liberal leaning of our samples. We suggest, however, that samples that lean left have the benefit of providing a more robust test of our predictions. Specifically, more conservative samples might show greater willingness to express negative attitudes toward women in STEM, resulting in stronger effects overall. In contrast, our findings show that even men who self-identify as liberal in their political beliefs, and who may explicitly express support for gender diversity programs, are susceptible to concerns that the strong association between men and STEM may be threatened by the influx of more women into the field.

Finally, it is important to acknowledge the limitations regarding the use of mediation analyses in this paper. Although our findings were consistent with the causal chain suggested by our theoretical approach, our reliance on self-report attitudinal measures for both our mediating mechanism and our outcome variables suggest that we must be cautious about over interpreting the causal links in our mediational pathway (Spencer, Zanna, & Fong, 2005). More definitive evidence of prototypicality threat as the cause of defensive reactions may be derived from alternative methodologies such as the inclusion of behavioral outcome measures and/or longitudinal designs.

Implications for the Future of Women in STEM Initiatives

Our findings highlight the need for research on gender diversification in STEM to consider the specific motivations men may have for curtailing women's representation in these fields. As men are gate- keepers in the STEM domain (Moss-Racusin et al., 2012), their defense of their gender's prototypicality may profoundly limit the long-term effectiveness of women in

STEM initiatives. Recall, it was not the actual presence of more women in STEM, but merely the expectation of this, that threatened men to the point of expressing exclusionary intentions toward women peers. Despite great investment in recruitment strategies, men may undermine these efforts by driving women out of STEM. A missing piece of the leaky pipeline metaphor may be that when men see more women entering the pipeline, they create more leaks. It is important to highlight again, however, that this reaction was only true for a subset of the men we studied, those who felt that their gender's claim to represent what it means to be in STEM was legitimate. Although only a subset, a single hostile team member or supervisor is often enough to sour a professional or educational climate.

Beyond the context of women in STEM, efforts to increase other forms of diversity such as ethnicity and sexual orientation stand to benefit from the approach and findings of this research. Only by understanding and accounting for the precise triggers and conditions of the dominant group's sense of threat, especially those previously overlooked (e.g., prototypicality threat), can we ensure our efforts to increase diversity will be embraced, rather than challenged, by those whose support is needed most.

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Paper 3

Who Gets to Represent Us?: Defense of Prototypicality Explains Dominant Group Resistance to Diversity

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Abstract

Five multi-part studies tested the prediction that members of dominant subgroups (e.g., White Americans) feel threatened by increasing diversity because it challenges their claim to best represent their broader social categories (e.g., their nation). This prototypicality threat led members of dominant subgroups to want to slow increasing diversity, promote their subgroup norms, and show an aversion the norms of other subgroups. Importantly, changing diversity only triggered prototypicality threat among those who did not believe that other subgroups would readily conform to the norms of the dominant subgroup. These effects were replicated in three contexts: White Americans in the United States, White British in the United Kingdom, and non-international undergraduates at a large public university. In addition to testing a number of theoretically-derived predictions about prototypicality threat, this research sheds new light on our understanding of why so many members of dominant subgroups oppose diversity.

Keywords: intergroup relations, diversity, prototypicality threat, identity threat, intergroup threat

In recent years, growing empirical evidence has highlighted the many ways in which diversity, by increasing equality, productivity, and profitability, can be beneficial for societies and the organizations and institutions within them, (e.g., Galinsky, Todd, Homan, Phillips, Apfelbaum, Sasaki, Richeson, Olayon, & Maddux, 2015; Herring, 2009). Accordingly, messages in support of diversity have become increasingly commonplace in the promotional materials for businesses, universities, political parties, and the like. In the United States, opinion polls show that the notion that diversity is beneficial appears to be largely shared by the general public (Drake & Poushter, 2016). In interviews, people also express generally positive views of diversity (Bell & Hartmann, 2007). However, these endorsements rarely go beyond vague platitudes, suggesting that underneath a superficial embrace of diversity, many may actually oppose diversity.

The most potent examples of opposition to diversity can be seen in the recent surge of populist nativism in many Western countries, most notably the passage of Brexit in the United Kingdom and the election of Donald J. Trump to the presidency of the United States in 2016. Many were stunned that politicians who spoke so openly against immigration and multiculturalism would find so much support and success, calling into question how genuinely people's support for diversity was. Pre- and post-election analyses have confirmed that, at least for the election of Trump, concerns about growing diversity did play an influential role (Major, Blodorn, & Major Blascovich, 2016; McDaniel & McElwee, 2017).

Even among those who appear to speak and act in favor of diversity, there is evidence of resistance. Research shows that a majority of the pro-diversity initiatives put forth by businesses and universities fail to meaningfully redress the issues of systematic underrepresentation and disadvantage facing women and ethnic minorities (Dobbin & Kalev, 2016). Although effectively

changing institutional barriers to inclusion is a challenging task, the rate of failure is noteworthy given the amount of resources invested in these efforts. One possibility is that many diversity initiatives exist to promote a positive image of the institution or organization, and serve first and foremost to deflect accusations of bias (Kaiser, Major, Jurcevic, Dover, Brady, & Shapiro, 2013). However, recent work suggests that efforts to increase diversity can also elicit opposition and resistance among those who feel threatened by the demographic and social changes associated with greater diversity (Danbold & Huo, 2017; Dover, Major, & Kaiser, 2016). This threat could lead people to play an active role in undermining the success of diversity initiatives within their organizations.

The disconnect between the seemingly widespread embrace of diversity and evidence of opposition to it begs the question of who is most opposed diversity and why? The answer to who is most resistant to diversity seems quite clear – it is dominant subgroups (e.g., men, White Americans, etc.). A recent poll in the U.S. revealed that men and White Americans score below the national average in their openness to diversity (i.e., the extent to which they think diversity is beneficial to the American economy and society) (Teixeira, Hapin, Barreto, & Pantoja, 2013). Similarly, the Brexit vote and the election of Donald Trump can be attributed in large part to their support from members of dominant subgroups (Lambert, 2016; Nteta & Schaffner, 2016; Tyson & Maniam, 2016). These findings coincide with recent work showing that members of dominant subgroups no longer see themselves as members of a privileged group in a stable hierarchy, but rather as increasingly disadvantaged (e.g., Knowles, Lowery, Chow, & Unzueta, 2014; Norton & Sommers, 2011; Wilkins & Kaiser, 2014). The situation thus appears to be that under a thin veneer of lukewarm support for diversity, many members of dominant subgroups may feel a sense of threat when faced with the changes greater diversity will bring.

The question as to *why* members of dominant subgroups feel threatened by growing diversity has a more complex answer. As the prospect of rapid demographic change threatens to destabilize existing hierarchies, many members of dominant subgroups may see growing diversity as coming at a cost to the many advantages that their high standing affords them. For example, one common fear members of dominant subgroups express about increasing diversity is that an influx of newcomers will put a strain on their access to limited resources like jobs, money, and government services. While a reasonable concern (so long as one doesn't take into consideration research showing that increasing diversity can increase the amount of resources available to everyone; Herring, 2009), social psychological research suggests that people are less motivated by resource concerns than they think (Miller & Ratner, 1998; Sears & Funk, 1991; Tyler, Huo, & Lind, 1999). As a case in point, many have argued that a major factor in Donald Trump's electoral success was the fact that he spoke to people who were struggling economically and who believed that by that restricting immigration and reducing foreign investment, Trump would bring them jobs. Although it would be wrong to rule out economic motivations entirely, Trump's economic appeal may be overstated, given that the average Trump supporter was better off financially than those who did not support him (mean household income for Trump supporters was $81,898 versus $77,046 for those who did not support him; Rothwell & Diego-Rosell, 2016). If not worries about money and resources, then what might explain dominant subgroup concerns about diversity?

We suggest that concerns about social identity and belonging play a major role in understanding dominant subgroup resistance to diversity. Specifically, we argue that, when faced with an influx of newcomers, members of dominant subgroups will feel concern about whether or not they will continue to represent the identity and norms of their broader collective identity

(e.g., the nation, profession, etc. in which the change is taking place). An illustration of this link between the dominant subgroup and their broader social category can be seen when considering the social category "Americans". Although multiple ethnic subgroups exist within the category of Americans, White Americans (the dominant ethnic subgroup) are most closely associated with being American, and set the norms to which other ethnic subgroups are evaluated against and expected to conform (Devos & Banaji, 2005; Devos, Gavin, & Quintana, 2010; Devos & Ma, 2008; Hsu, 2009). Similarly, consider the profession of "scientist". Although there are both men and women scientists, men (the dominant gender group in science) are seen as much more representative of what it means to be a scientist than women and set the norms against which scientists are evaluated (Chambers, 1983; Cheryan, Plaut, Davies, & Steele, 2009; Mead & Metraux, 1957). In the language of self-categorization theory (Turner, 1987), Whites in America and men in science would be described as the most *prototypical* subgroups in their broader *superordinate* category, representing both what members of their broader social category are and should be like (Mummendey & Wenzel, 1999).

Dominant subgroups enjoy multiple psychological benefits as a function of their prototypicality, primarily a secure sense of who they are and whether or not they belong within the superordinate category. For example, Whites in the United States can see themselves as true Americans and don't have to question whether or not, because of their ethnicity, they belong in their country. As a result, we predict that members of dominant subgroups, when confronted with the prospect of growing diversity, will experience *prototypicality threat*, the concern that the association between their subgroup and the broader superordinate category will be lost. We argue below that prototypicality threat represents a threat that is experienced uniquely by members of dominant subgroups. Through the study of prototypicality threat, we introduce a

new form of group-based threat to the literature and add to our understanding of why dominant subgroups push back against growing diversity and reveal the implications this has for contexts in which diversity is increasing.

Dominant Subgroups Best Represent (are Prototypical of) their Broader Social Categories

Work on self-categorization processes in intergroup relations (Mummendey & Wenzel, 1999; Oakes, Haslam, & Turner, 1994; Rosch, 1978; Turner, 1987) proposes that subgroups within a superordinate category (e.g., ethnic groups within a nation, men and women within a profession, etc.) differ in the extent to which they are seen as representing the identity and norms of the broader superordinate category. Whites as the prototypical ethnic group in America and men as the prototypical gender group in science are clear and timely illustrations of this broader phenomenon inherent to all social contexts in which multiple subgroups existing within a superordinate category. For example, in the superordinate category of "business leaders", men (Koenig, Eagly, Mitchell, & Risitkari, 2011) are the prototypical gender group such that when someone thinks of a business leader, they typically think of a man. In many countries, one subgroup is also the most salient and normative when thinking of the country as a whole (e.g., Jewish people in Israel, Han Chinese in China, etc.). It is noteworthy, however, that in all of these examples, the dominant subgroup (i.e., the subgroup that has the greatest access to power and resources) is prototypical (Rubin, 2012).

Dominant subgroups are prototypical of their superordinate categories for several reasons. One is their numerical size. With few exceptions, it is generally the case that the dominant subgroup within a superordinate category is also the largest subgroup (e.g., Whites are the majority in America, men are the majority in science, etc.). The sheer number of individuals within the largest subgroup makes that group more cognitively available when thinking about the

superordinate category (Tversky & Kahneman, 1974). Second, the power wielded by dominant subgroups allows them to shape public portrayals of their broader superordinate category in ways that feature their ingroup more prominently than other subgroups. For example, the majority of media outlets in the United States are owned by White Americans, and accordingly, Whites are shown both more frequently and portrayed more favorably in American media than other ethnic groups (Tukachinsky, Mastro, & Yarchi, 2015). Thus, it is not surprising that research has consistently demonstrated that people hold strong associations between dominant subgroups and their relevant superordinate categories, whether assessed explicitly in self-reports or through more implicit measures (Devos & Banaji, 2005; Devos, Gavin, & Quintana, 2010; Rubin, 2012; Waldzus, Mummendey, Wenzel, & Boettcher, 2004). Importantly, this body of work found that it is not only the members of the dominant subgroup who hold these associations, but members of non-dominant subgroups as well. Given that they hold prototypicality, why might dominant subgroups be concerned about losing it?

The value of prototypicality (and the costs of losing it). When the dominant subgroup is prototypical of its superordinate category, it not only serves as a representation of what members of the superordinate category *are* like, but also what members of the superordinate category *should be* like (Mummendey & Wenzel, 1999; Wenzel, Mummendey, & Waldzus, 2007). Consider again the case of White Americans in the United States. When newcomers arrive to the United States, there is an expectation that they should conform to the traditional American way of life. In cultural practices, values, language, and dress, these norms (e.g., speaking English, wearing blue jeans, playing baseball, etc.) are in fact the norms of White Americans (Hsu, 2009). The benefit to White Americans is that unlike other ethnic groups they do not have to be concerned, on the basis of their ethnicity, about fitting into American society.

Nor are Whites generally faced with the choice between adapting to broader superordinate norms or retaining the norms of their ethnic group. Furthermore, because their ethnic (subgroup) identity overlaps to such a great extent with their national (superordinate category) identity, the prototypical subgroup is not "marked" or otherwise stigmatized (Goffman, 2009). White Americans are often viewed simply as Americans and not subject to a "hyphenated" identity (e.g., "African-American" or "Asian-American") (Knowles & Peng, 2005; Phinney, 1990). Again, although Whites in America is a clear example, one can see how other dominant subgroups in a variety of contexts similarly benefit from their prototypicality. For example, men in science do not have to wonder, because of their gender, if they belong in the profession (Cheryan, Master, & Meltzoff, 2015). The loss of prototypicality would force members of the dominant subgroup to question both who they are and whether or not they belong in the superordinate identity they once claimed as their own.

Antecedents of Prototypicality Threat

In the absence of social change, because of their "unmarked" status (Knowles, Lowery, Chow, & Unzueta, 2014; Knowles & Peng, 2006), dominant subgroups likely won't be very aware of their prototypicality, let alone concerned about losing it. Given their primary control of media and governance, the dominant subgroup can usually reinforce their prototypicality by configuring representations of the superordinate category to their advantage, and compelling members of non-dominant subgroups to conform to their norms. However, given how much they have to lose, members of dominant subgroups are generally loss averse (Eibach & Keegan, 2006) and any social change that might signal the potential loss of their prototypicality may set off alarms. One potential source of prototypicality threat, and the one we focus on for much of this paper, is increasing diversity via the rapid influx of non-dominant subgroup members into the

shared superordinate category (e.g., via immigration or orchestrated desegregation). Given that dominant subgroups are generally the largest, if not the majority, subgroup in their superordinate category, members of these subgroups may see their claim to represent their superordinate category as challenged when prompted to consider the possibility that in the future they will diminish in size.

Consequences of Prototypicality Threat

We argue that prototypicality threat elicits an aversive emotional state that individuals are motivated to reduce. Although one route to assuage a sense of threat is to deny or repress it, we predict that prototypicality threat will be positively associated with the desire to engage in behaviors that will preserve the dominant subgroup's claim to represent their broader social identity. One way in which individuals may react to prototypicality threat is by stopping or slowing down the social change that is the source of the threat. For example, members of a dominant ethnic group may observe an influx in immigrants into their country, and fear that, by virtue of their shrinking relative group size, their prototypicality may be lost. To alleviate the threat they feel, these individuals may endorse restrictions placed on immigration or even the deportation of immigrants within their country. Alternatively, men within a profession in which they have long been the majority (e.g., science, firefighting, etc.) may feel threatened by initiatives aiming to increase the representation of women in their field, and in response may oppose or seek to undermine these efforts.

An alternate way in which members of dominant subgroups may seek to reduce the unease brought on by prototypicality threat may be to reassert or shore up their prototypicality by promoting their subgroup norms above the norms of other subgroups. One way of doing this may be to argue that the dominant subgroup norms are indeed the norms to which all other subgroups

should conform. Especially if the threatening social change appears to be inevitable (e.g., if changing demographics are due to birth rates rather than immigration, making them more challenging to restrict), members of the dominant subgroup may argue that the best path forward is for members of non-dominant subgroups to continue to treat dominant subgroup norms as the standard to assimilate to, and not the other way around.

Moderators of Prototypicality Threat

Although we predict that prototypicality threat will be experienced only by members of dominant subgroups, we do not predict that all members of dominant subgroups will be equally susceptible to it. A number of individual difference beliefs should shape both the perceived legitimacy and security of the dominant subgroup's standing as prototypical. For example, members of dominant subgroups may not all recognize their subgroup as prototypical of their superordinate category, and those who do not likely won't experience prototypicality threat. Alternately, members of prototypical subgroups could be confident that regardless of social change, other subgroups will continue to treat them as prototypical, buffering them against any potential threat. Understanding susceptibility to prototypicality threat provides valuable insights into why some members of dominant subgroups are more resistant to diversity than others.

Current Research

Across five multi-component studies we examine the phenomenon of dominant subgroup opposition to diversity, focusing on the role of prototypicality threat. In doing so, we examine six sets of predictions previously untested in the literature.

Understanding the role of affect in prototypicality threat. A key prediction in the theorizing of prototypicality threat is that it generates an aversive emotional state. However, this is a prediction that hasn't been thoroughly tested in what little prior work on prototypicality

threat exists. Another contribution of this work, therefore, is examining the role of emotions in prototypicality threat. In Study 1, we test the prediction that not all members of dominant subgroups will feel equally affected emotionally by the potential loss of prototypicality, and that as a predictor of negative attitudes about diversity, it is the worry about losing prototypicality that really matters. In Study 4, we test this prediction further by examining how support for political movements that promised to stop growing diversity (Donald Trump and Brexit), could function to reduce negative emotions among those experiencing prototypicality threat.

Unpacking the antecedents of prototypicality threat. Consistent with theory, prior research has shown that increasing diversity within a nation (Danbold & Huo, 2015) or profession (Danbold & Huo, 2017) can elicit prototypicality threat among members of the relevant dominant subgroup. More recent research has found that telling White Americans that their norms will be preserved in the future softened concerns they had about facing disadvantage in an increasingly diverse America (Craig & Richeson, in prep). In Studies 1, 2, and 5 we seek to replicate these findings to show that growing diversity (and the accompanying decrease in the relative size of the dominant subgroup) is a source of prototypicality threat. In Study 3, we test the assumption underlying these earlier findings that the reason increasing diversity triggers prototypicality threat is that it signals the potential loss of dominant subgroup prototypicality. In this study, we hold demographic change constant across conditions but only manipulate whether or not the association between the dominant subgroup and the superordinate category will be lost or retained. We predict that demographic change will only be threatening when it's accompanied by the loss of prototypicality, clarifying previous findings in the literature and highlighting the importance of prototypicality to the dominant subgroup.

Testing novel consequences of prototypicality threat. Past research has shown that prototypicality threat is associated with both the desire to limit growing diversity and the desire to preserve dominant subgroup prototypicality by endorsing the continued assimilation of all non-dominant subgroups to dominant subgroup norms (Danbold & Huo, 2015; Danbold & Huo, 2017). In this paper, we seek to replicate these effects, showing that prototypicality threat leads to both the desire to restrict the growth of non-dominant subgroups (Studies 1, 2, 4, and 5) and the stronger endorsement of non-dominant subgroup assimilation to dominant subgroup norms (Studies 1, 2, 3, and 5). We also expand upon these past findings by examining unexplored but theoretically consistent consequences of prototypicality threat. As individuals under prototypicality threat are motivated to continue prioritizing their groups norms over other groups, we predict that prototypicality threat will be associated with an increased aversion to, or intolerance of, the cultures and norms of other groups, such as being unwilling to experience foods or customs outside of the dominant subgroup (Studies 2, 3, and 5). Another way members of dominant subgroups may seek to preserve their prototypicality is by aiming to preserve the overrepresentation of the dominant subgroup in media portrayals of the superordinate category and opposing efforts to bring more diverse representations into the mainstream media (Study 3). A final way in which dominant subgroups may seek to reassert their prototypicality is by preserving their status as the "unmarked" subgroup (i.e., the subgroup synonymous with the superordinate category and not requiring a qualifying identifier). For example, at universities where international students attend, international students are regularly marked as a subgroup, but students who are not from other countries are simply referred to as "undergraduates." In Study 5, we test the prediction that under prototypicality threat, non-international students may push back against being labeled as "domestic students," preferring to keep their unmarked group

title so that they can feel one and the same with the broader collective category of "undergraduate students."

Examining outgroup assimilation expectation as a novel moderator. In past research beliefs about the ingroup, both the belief that one's subgroup is most prototypical (Danbold & Huo, 2015) and that this prototypicality is legitimate (Danbold & Huo, 2017), led to greater susceptibility to prototypicality threat in contexts of increasing diversity. In this paper, we shift our focus from beliefs about the ingroup to beliefs about outgroups, namely whether or not such outgroups are expected to willingly conform to dominant subgroup norms.

It follows from our discussion of the nature and value of prototypicality, that a rise in the relative size of non-dominant outgroups may not actually threaten dominant subgroup prototypicality so long as those non-dominant subgroups continue to conform to dominant subgroup norms. In fact, the prospect of a greater number of non-dominant subgroup members conforming to the norms of the dominant subgroup may be seen as flattering or evincing dominant subgroup prototypicality. Therefore, only when non-dominant outgroups are expected *not* to assimilate should their influx signal the imminent loss of dominant subgroup prototypicality. To test this prediction, we introduce and test (Studies 1, 2, 3, and 5) the concept of outgroup assimilation expectation, the degree to which people believe that outgroups will or will not assimilate to the existing dominant subgroup prototype. If our theorizing about prototypicality threat is correct, outgroup assimilation expectation should function as an influential individual difference moderator in susceptibility to prototypicality threat.

Distinguishing prototypicality threat from other related concerns. A final important consideration in our investigation of prototypicality threat is the contribution it makes to a research literature that already identifies a variety of group-based threats (e.g., Branscombe,

Ellemers, Spears, & Doosje, 1999; Riek, Mania, & Gaertner, 2006; Stephan & Stephan, 2000). The primary distinction is that, whereas concerns like realistic threat (concern about access to jobs and resources) or categorization threat (concern about one's group identity being accurately recognized) focus on the relationship between one subgroup and another, prototypicality threat focuses specifically on the relationship between the dominant subgroup and the superordinate category. The fact that members of dominant subgroups are predicted to be the unique recipients of prototypicality threat (a prediction we test in Study 2), is one of the reasons this work represents a meaningful addition to a literature that has almost exclusively examined threat in contexts where non-dominant subgroups are the recipients and dominant subgroups are the source.

Despite the clear theoretical distinctions, it is worthwhile to examine the extent to which prototypicality threat predicts opposition to diversity among members of dominant subgroups over and above more traditionally studied forms of threat. Although this is not the central focus of this paper, we use this research as an opportunity to test the predictive power of prototypicality threat over and above realistic threat (competition over jobs and resources), arguably the most common threat invoked when expressing concerns about diversity (Studies 3, 4, and 5)

Testing the generalizability of prototypicality threat. To show that prototypicality threat as a phenomenon relevant to members of dominant subgroups at large, we test the predictions listed above across three distinct contexts. The first looks at White Americans, examining their reactions to changing demographics and support for Trump as a method of addressing their prototypicality threat (Studies 1 through 4a). We then replicate some of these findings in the context of White British people in the United Kingdom, demonstrating how

support for Brexit addresses the concerns of prototypicality threat in ways that parallel White Americans' support for Trump (Study 4b). Finally, we examine how non-international undergraduates at a public university react to an increase in the representation of international students on their campus (Study 5). Together, these five studies enhance our understanding of the role of prototypicality in intergroup relations and provide novel explanations for resistance to diversity in the real world.

Study 1 – Evidence of Prototypicality Threat Among White Americans

The initial aim of Study 1 was to replicate the finding that, even without experimentally inducing it, White Americans report non-zero levels of prototypicality threat and that this threat predicts anti-diversity attitudes (Danbold & Huo, 2015). In addition to this, Study 1 aimed to refine our understanding of the expression and measurement of prototypicality threat by examining the importance of negative affect (i.e., worry, concern, fear, etc.). It was predicted that some White Americans may recognize that their claim to represent the American identity is fading, but don't experience negative emotions about it. Furthermore, it was predicted that only a measure of prototypicality threat that includes an affective component would be effective in predicting negative attitudes about diversity. The final prediction that Study 1 aimed to test was that only those who did not expect non-dominant subgroup members to readily assimilate to their norms (i.e., those low in outgroup assimilation expectation) would be susceptible to prototypicality threat. Although conceptualized as a moderator in explaining the link between perceptions of increasing diversity and prototypicality threat, here we looked at the simple bivariate relationship between outgroup assimilation expectation and prototypicality threat,

predicting that those with overall lower expectations about others conforming to their norms would also be those most concerned about losing prototypicality.

Method

Procedures. Participants first filled out a brief eligibility survey (across all studies, eligibility criteria were not known by prospective participants). Only those who self-identified as White Americans were recruited into the study. Participants then completed our measures and were thanked and paid.

Participants. In June of 2015, 104 White American workers on Amazon Mechanical Turk participated in our study titled, "Your Thoughts on America Today" and were paid $0.50. We set a target sample size of 100 participants based upon prior research on prototypicality threat (Danbold & Huo, 2015; Danbold & Huo, 2017). Average age was 36.71 years and 41.35% of the sample was men.

Measures.

Prototypicality threat (without affect). To better understand the nature of prototypicality threat, we first asked participants to express the extent to which they anticipated the loss of their prototypicality in America, without asking about affect. We asked participants to, "Please consider what you see to be the relationship between your ethnic identity and the American identity in the future," and then reminded them that they identified their ethnicity as "White American". Participants then indicated their level of agreement with six statements about the loss of prototypicality which were collapsed into a single scale of prototypicality threat without affect: "In the future, my ethnic group will no longer represent what it means to be American," "In the future, it won't be clear what it means to be American," "In the future, when people think about what it means to be American, they won't think about my ethnic group," "In the future,

other groups will represent American more so than my ethnic group," "In the future, my ethnic group will represent America less than it does now," and "In the future, people will still think about my ethnic group when thinking about what it means to be American." (reverse-coded) (1 = strongly disagree to 7 = strongly agree; $\alpha = 0.74$).

Prototypicality threat (with affect). We next asked participants the extent to which they agreed or disagreed with statements regarding their concern about the potential loss of their group's prototypicality. Six items were adapted from prior research (Danbold & Huo, 2015; Danbold & Huo, 2017) and built directly upon the prototypicality loss items asked prior: "I worry that in the future, my ethnic group will no longer represent what it means to be American," "I am concerned that in the future, it won't be clear what it means to be American," "It troubles me that in the future, when people think about what it means to be American, they won't think about my ethnic group," "It makes me uneasy that in the future, other groups will represent American more so than my ethnic group," "I don't like to think that in the future, my ethnic group will represent America less than it does now," and "I am confident that in the future, people will still think about my ethnic group when thinking about what it means to be American." (reverse-coded) (1 = strongly disagree to 7 = strongly agree; $\alpha = 0.87$).

Outgroup assimilation expectation. To measure outgroup assimilation expectation, we asked participants to consider the extent to which they thought "the typical immigrant from each of the following world regions cares about successfully assimilating to (i.e. conforming to and fitting in with) traditional American culture and values?" Participants evaluated seven world regions: Africa (e.g. Nigeria, Ethiopia), East Asia (e.g. China, Korea), Europe (e.g. England, France), Latin America (e.g. Mexico, Guatemala), Caribbean (e.g. Haiti, Jamaica), South Asia (e.g. India, Bangladesh), and Southeast Asia (e.g. Vietnam, The Philippines). (1 = Not at all

interested in assimilating, 7 = Extremely interested in assimilating). Although outgroup assimilation expectation was significantly higher for European immigrants (M = 4.92, SD = 1.60) than for other immigrant groups (M = 4.16 – 4.42, SD = 1.45 – 1.67), reliability was high when looking at all seven groups (α = 0.89) and not dramatically improved when European immigrants were excluded (α = 0.91). Most importantly, however, throughout this study and the next, results do not change whether or not European immigrants are included in our composite of outgroup assimilation expectation or not. Therefore, we concluded that outgroup assimilation is a measure of the broad assumption people hold about the degree to which other subgroups in their superordinate category will readily conform to the dominant subgroup norms.

Support for immigration quotas. To test the prediction that prototypicality threat would lead White Americans to want to limit the influx of non-White immigrants into the United States, participants were given the following instructions and asked to rate the same seven immigrant groups they evaluated in our measure of outgroup assimilation expectation, "America has immigration policies limiting the number of individuals coming to America from different regions of the world. Please indicate the extent to which you think the number of immigrants coming to America from each of the following world regions should increase or decrease." (1 = decrease dramatically to 7 = increase dramatically). Items were reverse coded such that higher scores indicated a greater desire for restrictions on immigration. Similar to the patterns we observed with outgroup assimilation expectation, participants on average wanted less restriction of European immigrants (M = 3.73, SD = 1.39) than non-European immigrants (M = 4.09 – 4.43, SD = 1.15 – 1.55). However, also consistent with outgroup assimilation expectation, reliability was high when all seven outgroups were looked at together (α = 0.88), and the inclusion or

exclusion of European immigrants from our composite of support for immigration quotas did not dramatically change any of our results.

Assimilation endorsement. To measure support for the assimilation of non-dominant subgroups to dominant subgroup norms, we asked participants to indicate the extent to which they agreed or disagreed with the following nine statements, adapted from prior research (Danbold & Huo, 2015; Danbold & Huo, 2017): "If people want to succeed in the US, they should adopt traditional American values," "It is best if everyone in the US conforms to existing cultural norms," "What makes the US strong is that we are a mix of different racial cultures," (reverse-coded), "It would be better if America were an English-only country," "I think it's a good thing to teach all children a foreign language," (reverse-coded), "I think it is important for children to learn about the cultures and traditions of other societies," (reverse-coded), "I think not enough attention is given to teaching children traditional American values and traditions," and "All Americans should start their school or work day by reciting the Pledge of Allegiance." (1 = strongly disagree to 7 = strongly agree; $\alpha = 0.90$).

Results

Means, standard deviations, and inter-item correlations for our key dependent variables are shown in Table 1.

Table 1
Study 1 Descriptives and Correlations

	M	*SD*	Prototypicality Threat (w/o affect)	Prototypicality Threat (w/ affect)	Outgroup Assimilation Expectation	Support for Immigration Quotas	Assimilation Endorsement
Prototypicality Threat (w/o affect)	4.10	1.02	-				
Prototypicality Threat (w/ affect)	3.20	1.31	.45**	-			
Outgroup Assimilation Expectation	4.38	1.22	-.11	-.35**	-		
Support for Immigration Quotas	3.82	1.03	-.08	.27**	-.39**	-	
Assimilation Endorsement	3.08	1.28	.16	.66**	-.26**	.34**	-

Note: **$p < .01$

Prototypicality threat with and without affect. Looking at the descriptive statistics of prototypicality threat without affect ($M = 4.10$, $SD = 1.02$) and prototypicality threat with affect ($M = 3.20$, $SD = 1.21$), two things stand out. The first is that the mean of prototypicality threat without affect was significantly higher than the mean of prototypicality threat with affect, $t(103) = 7.32$, $p < .001$. This is unsurprising as reporting threat or concern may be aversive to people. Nevertheless, it is also important to note that prototypicality threat (with affect) is not at floor for this sample, suggesting that, as predicted, White Americans do report prototypicality threat even without it being experimentally induced. Looking at the bivariate correlation between prototypicality threat without affect and prototypicality threat with affect, there is a significant, but imperfect, positive relationship between these two constructs ($r = .45$, $p < .001$). Scatterplots

revealed that this was primarily driven by a handful of individuals who reported prototypicality threat without affect, but did not report negative emotions associated as well.

Predicting anti-diversity attitudes. Given that a primary goal of this research is the desire to understand what drives anti-diversity attitudes among members of dominant subgroups, we next looked at how prototypicality threat without affect and prototypicality threat with affect both predicted our two outcome variables: assimilation endorsement and support for immigration quotas. As seen in Table 1, prototypicality threat without affect was not significantly correlated with support for immigration quotas (r = -.08, p = .424), but there was a strong positive relationship between prototypicality threat with affect and support for immigration quotas (r = .27, p = .006). Similarly, prototypicality threat without affect was not significantly correlated with assimilation endorsement (r = .16, p = .110), but there was a strong positive relationship between prototypicality threat with affect and assimilation endorsement (r = .66, p < .001). These findings suggest that it is the expression of concern about losing prototypicality, not merely the potential loss of prototypicality itself, that drives negative attitudes about diversity. This also supports the operationalization of prototypicality threat in this and prior research which forefronts the affective experience of threat.

Prototypicality threat and outgroup assimilation expectation. Having demonstrated the relationship between prototypicality threat and our outcome variables of interest, we also aimed to examine the relationship between prototypicality threat and outgroup assimilation expectation. In our theorizing, we had conceptualized outgroup assimilation expectation as an individual difference moderator, such that those who did not expect outgroups to readily assimilate to dominant subgroup norms would be most susceptible to prototypicality threat when confronted with the prospect of increasing diversity. Nevertheless, we used this study to develop

a measure of outgroup assimilation expectation and test the bivariate relationship between it and prototypicality threat, anticipating that those highest in prototypicality threat would also be those lowest in outgroup assimilation expectation. We indeed found this predicted negative correlation between outgroup assimilation expectation and prototypicality threat ($r = -.35$, $p < .001$) such that those who did not expect immigrants to conform to traditional American norms felt greater prototypicality threat. Participants high in outgroup assimilation expectation, presumably seeing their prototypicality secured by the belief that immigrants would keep conforming to their norms, felt very little threat.

Discussion

Study 1 confirmed three important predictions and laid the groundwork for future studies. The first finding was that, consistent with past research (Danbold & Huo, 2015), White Americans spontaneously report prototypicality threat, even without us experimentally inducing it. The second finding was that, in terms of predicting negative attitudes about diversity, it is important to measure prototypicality threat including an affective component (i.e., capturing the concern or fear participants feel about the potential loss of their prototypicality). The third finding was that prototypicality threat was negatively related to outgroup assimilation expectation, such that those who do not expect immigrants to conform to their norms also reported the greatest prototypicality threat. However, this study did not test outgroup assimilation in the way we had originally conceived of it, as an individual difference moderator explaining susceptibility to prototypicality threat. In addition, all the tests done here examined purely correlational analyses, restricting our ability to make any claims about causality in the relationships we observed. Study 2 aimed to address both these limitations by examining the role

of outgroup assimilation expectation in moderating the activation of prototypicality threat (with affect) in response to reminding White Americans of increasing diversity in the United States.

Study 2a – Reminding White Americans of Changing Demographics Triggers Prototypicality Threat Among Those Low in Outgroup Assimilation Expectation

Whereas Study 1 showed a significant negative relationship between outgroup assimilation expectation and prototypicality threat (i.e., those most skeptical about the idea that immigrants would assimilate showed the greatest concern about the potential loss of their prototypicality), Study 2 aimed to see how outgroup assimilation would function as a moderator, influencing prototypicality threat among White Americans in response to information reminding them of their declining share of the U.S. population. We predicted that only White Americans low in outgroup assimilation expectation (i.e., those who lacked the reassuring belief that outgroups would continue to conform to their norms) would report prototypicality threat when exposed to information about their declining share of the U.S. population. In addition, this study aimed to test a new outcome variable that we expected would be positively associated with prototypicality threat: aversion to the culture and norms of other ethnic groups. One of the primary predictions of prototypicality threat is that individuals who experience this threat will seek to reassert their prototypicality. Study 1 showed how, consistent with prior research (Danbold & Huo, 2015; Danbold & Huo, 2017) promoting dominant subgroup norms through endorsing assimilation is one way in which members of dominant subgroups under prototypicality threat can shore up their standing as the reference subgroup to which other subgroups are expected to conform. We predicted that this promotion of dominant subgroup norms would also be accompanied by an aversion to, or disparagement of, non-dominant

subgroup norms, expressed in a disinterest in the food, culture, and communities, of members of non-dominant subgroups. Finally, as research has shown that negative attitudes about diversity are highest among both older and more conservative Whites (Teixeira, Hapin, Barreto, & Pantoja, 2013), this study aimed to demonstrate that these predicted effects would hold over and above the effects of both ideology and age.

Method

Experimental design. Participants first filled out the same brief eligibility survey used in Study 1 to select for self-identified White American participants. Participants were then asked to interpret two graphs they were told were reproductions of graphs that had appeared in recent news articles. All participants first viewed a zero-sum stacked column bar graph showing the percentage of pet owners in the U.S. from 1995 to 2015, where there was minimal fluctuation in totals over the years. Participants were then randomly assigned to view one of two graphs constituting our experimental manipulation. The first condition was our "Majority Loss" condition, in which participants saw a zero-sum stacked column bar graph showing actual census estimates and projections for the percentage of White and Non-White people in the U.S. from 1970 (approximately 83% White) to 2050 (approximately 47% White). The second condition was our "Control" condition, in which they exact same figure was shown, but the data was described as representing estimates and projections for the percentage of the U.S. population who read daily newspapers versus all other news sources (see Appendix B for experimental stimuli). After completion of our experimental manipulation, participants completed our measures and were thanked, debriefed, and paid.

Participants. In October of 2015, 155 White American workers on Amazon Mechanical Turk participated in our study titled, "10 Minute Survey: Data in the News" and were paid $0.50.

We set a target sample size of 150 participants based upon prior research on prototypicality threat (Danbold & Huo, 2015; Danbold & Huo, 2017). Average age was 36.85 years and 47.10% of the sample was men.

Measures.

Prototypicality threat. The same six items used to measure prototypicality threat with affect in Study 1 were used to measure prototypicality threat ($\alpha = 0.85$).

Outgroup assimilation expectation. The same seven items from Study 1 were used to measure outgroup assimilation expectation ($\alpha = 0.91$).

Support for immigration quotas. The same seven items from Study 1 were used to measure support for immigration quotas ($\alpha = 0.91$).

Assimilation endorsement. The same nine items from Study 1 were used to measure assimilation endorsement ($\alpha = 0.89$).

Aversion to diversity. Five items were used to measure aversion to diversity, the degree to which participants disliked and sought to avoid the cultures and norms of non-dominant ethnic groups: "I get uncomfortable going to restaurants where the menus aren't in English," "Some ethnic food is too strange for me to try," "I like American food (e.g., burgers and hot dogs) better than other foods," "It bothers me when I call somewhere and am told to 'Press 1 for English'," and "I think it's fun and exciting to explore different ethnic neighborhoods." (reverse-coded) (1 = strongly disagree to 7 = strongly agree; $\alpha = 0.71$).

Manipulation check. To assess the extent to which participants successfully internalized the message of our manipulation, we asked participants two questions: "How likely do you think it is that Whites in America will fall below 50% of the total U.S. population by 2050?" (1 = Not

at all likely, 5 = Extremely likely), and "How confident do you feel in your answer to the question above?" (1 = Not at all confident, 5 = Extremely confident).

Recall check. To assess the extent to which participants were paying attention to our manipulation and retaining the knowledge it contained throughout the duration of the survey, we asked participants a series of recall check items. Participants were asked to select "Decrease, Remain the Same, or Increase" for the following two items: "Relative to non-whites, will the population of whites in America decrease, remain the same, or increase?" and "Relative to a preference for all other news sources, will the preference for daily newspapers decrease, remain the same, or increase?" Then, for each of the above items, participants were asked how they answered the question, either "Based on information that I saw at the beginning of this survey," or "I saw nothing at the beginning of this survey about this question, and answered based on my own intuition or past knowledge." Participants were coded as failing the recall check if they did not successfully answer "Decrease" to the recall question relevant to their experimental condition, or if they incorrectly identified which information they were shown at the beginning of the survey.

Results

Means, standard deviations, and inter-item correlations for our key dependent variables are shown in Table 2.

Table 2
Study 2a Descriptives and Correlations

	M	*SD*	Prototypicality Threat	Outgroup Assimilation Expectation	Support for Immigration Quotas	Assimilation Endorsement	Aversion to Diversity
Prototypicality Threat	3.30	1.27	-				
Outgroup Assimilation Expectation	4.31	1.16	-.23**	-			
Support for Immigration Quotas	3.76	1.03	.50**	-.32**	-		
Assimilation Endorsement	3.19	1.21	.76**	-.18**	.50**	-	
Aversion to Diversity	3.55	1.20	.52**	-.25**	.38**	.62**	-

Note: **$p < .01$

Recall check. Seventeen participants who failed one or more of the recall checks about our graphs, or who incorrectly recalled which graph they saw, were excluded from the subsequent analyses. Given that our dependent variables referred in various ways to immigrants to the United States as an outgroup, an additional six participants were excluded from analyses on the basis of not being born in the United States. These exclusions left us with a final sample of 132 participants.

Manipulation check. Participants in our Majority Loss condition ($M = 3.66$, $SD = .82$) scored significantly higher in the extent to which they thought it was likely that Whites would fall below 50% of the US population by 2050 than participants in the Control condition ($M = 3.35$, $SD = .87$), $t(128) = -2.08$, $p = .040$. Participants in our Majority Loss condition ($M = 3.51$, $SD = .90$) were also significantly more confident in their answers to the preceding question than participants in the Control condition ($M = 3.18$, $SD = .83$), $t(130) = -2.17$, $p = .032$. It is worth noting that participants in our control condition still were above the midpoint in their expectations about White population decrease and their confidence in this phenomenon. Our

manipulation can therefore be thought of as reminding, rather than informing, participants of this phenomenon, and thus a more conservative test of our predictions.

Interaction between White majority loss manipulation and outgroup assimilation expectation. We tested our primary prediction that participants low in outgroup assimilation expectation would show the greatest prototypicality threat in response to being told that their numerical majority would be lost. We first noted that, in terms of outgroup assimilation expectation, there was no significant difference between participants in our Control condition (M = 4.33, SD = 1.15) and participants in our Majority Loss condition (M = 4.29, SD = 1.18) $t(130) = .20$, $p = .846$. We tested whether or not there was a significant interaction between our manipulation and immigrant assimilation expectations in predicting prototypicality threat. Given research suggesting that those most resistant to diversity are both older and more politically conservative (Teixeira, Hapin, Barreto, & Pantoja, 2013), we ran our analyses controlling for both age and political ideology (1 = extremely liberal, 7 = extremely conservative). We saw no significant main effect for condition ($\beta = .16$, $p = .400$), nor a significant negative main effect for outgroup assimilation expectation ($\beta = -.10$, $p = .442$). As predicted, however, there was a significant interaction between condition and immigrant assimilation expectations ($\beta = -.48$, $p = .009$) such that individuals who did not expect immigrants to successfully assimilate showed greater levels of prototypicality threat when exposed to the threat condition compared to the control condition (Figure 1). Simple slopes analyses revealed that the unstandardized simple slope for participants 1 SD below the mean on immigrant assimilation expectation was .64, $p = .015$. For those high (1 SD above the mean) in immigrant assimilation expectation, our manipulation had a more subtle but reversed effect on their already low levels of prototypicality threat, producing a non-significant gradient of -.33, $p = .21$.

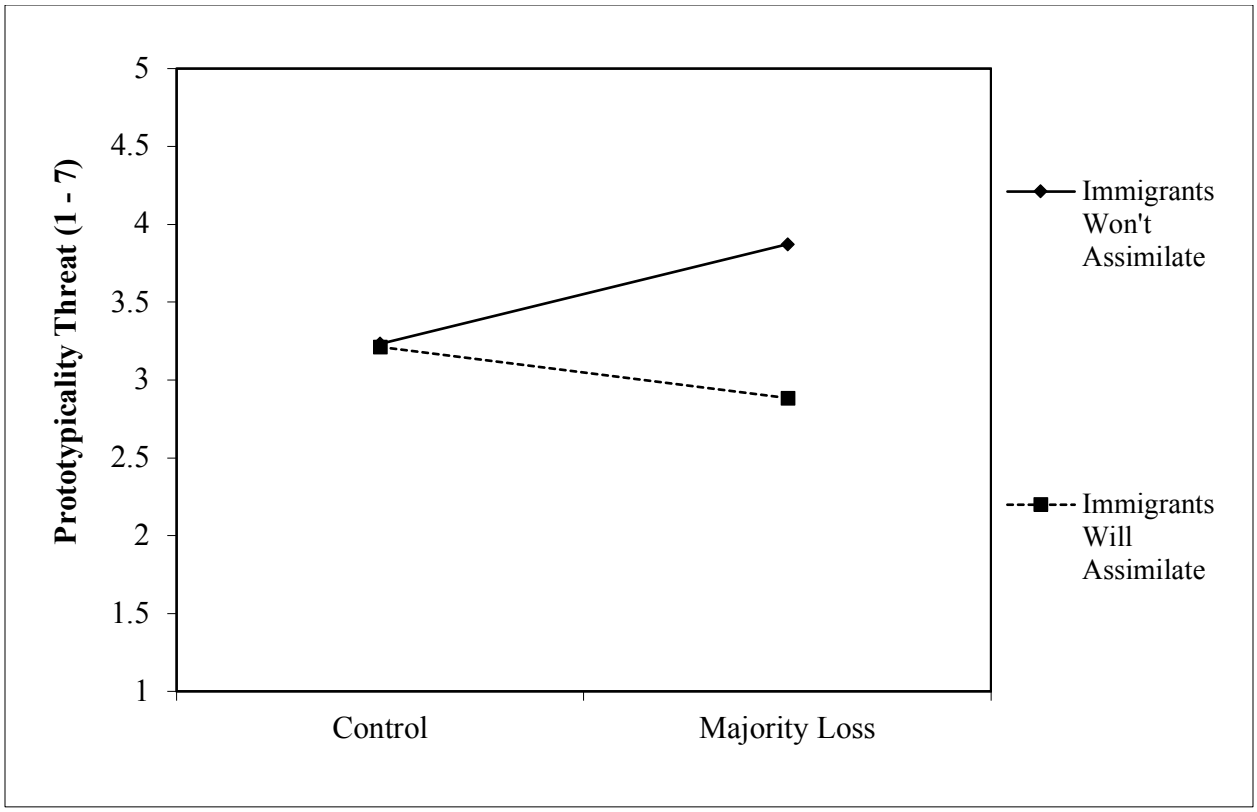

Figure 1. Study 2a interaction of condition by outgroup (immigrant) assimilation expectation on prototypicality threat. High (immigrants will assimilate) and low (immigrants won't assimilate) are +1SD and -1SD from the mean.

Moderated mediation – effects of prototypicality threat on outcome variables. After demonstrating the predicted interaction reported above, we sought to understand the relationship between prototypicality threat and three outcome variables: assimilation endorsement, desired quotas for immigrants, and aversion to diversity. We tested this using Hayes' PROCESS Macro (Hayes, 2013) Model 7 (see Figure 2), controlling again for ideology and age. As seen in Table 3, we observed a significant indirect effect of our manipulation on each of our outcome variables through prototypicality, but only among participants low (-1 SD) in outgroup assimilation expectation. In other words, participants who did not think immigrants to the U.S. would readily conform to existing norms, reported greater prototypicality threat when exposed to information

about their impending loss of numerical majority status than those exposed to a control article, which in turn predicted less favorable attitudes toward diversity. Those higher in outgroup assimilation expectation, likely reassured by the belief that their prototypicality would be preserved, did not show this same pattern of results.

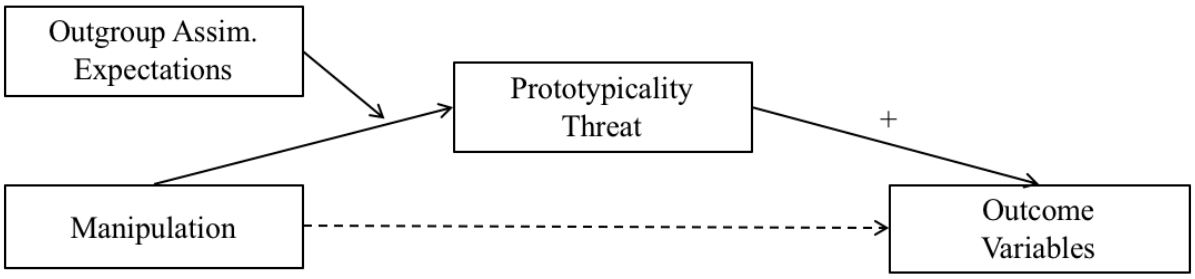

Figure 2. Studies 2a, 3, and 5b moderated mediation. In Study 2a, manipulation is coded such that 0 = Control, 1 = Majority Loss. Outgroup Assimilation Expectation is measured expectations about immigrants. In Study 3, manipulation is coded such that 0 = Prototypicality Retention, 1 = Prototypicality Loss. Outgroup Assimilation Expectation is measure expectations about ethnic outgroups. In Study 5b, manipulation is coded such that 0 = International Students Decreasing, 1 = International Students Increasing. Outgroup Assimilation expectation is International Students Assimilation Manipulation, coded 0 = International Students Assimilating, 1 = International Students Not Assimilating.

Table 3

Study 2a Conditional Indirect Effect of Majority Loss on Support for Immigration Quotas, Assimilation Endorsement, and Aversion to Diversity Through Prototypicality Threat at Low (-1 SD), Moderate (Mean), and High (+1 SD) Levels of Outgroup (Immigrant) Assimilation Expectation.

Conditional Level of Outgroup Assim. Expectation	Indirect Effect	Bootstrapped Standard Error	Bias-Corrected Lower Limit	Bias-Corrected Upper Limit
Outcome = Support for Immigration Quotas				
-1 SD (3.15)	**-.25**	**.13**	**-.57**	**-.03**
Mean (4.31)	-.06	.07	-.22	.07
+1 SD (5.47)	.13	.10	-.04	.36
Outcome = Assimilation Endorsement				
-1 SD (3.15)	**.36**	**.18**	**.03**	**.73**
Mean (4.31)	.09	.10	-.10	.30
+1 SD (5.47)	-.18	.14	-.46	.08
Outcome = Aversion to Diversity				
-1 SD (3.15)	**.27**	**.13**	**.03**	**.56**
Mean (4.31)	.07	.08	-.08	.24
+1 SD (5.47)	-.14	.10	-.35	.06

Note. SD = standard deviation. Bias-corrected 95% confidence intervals were calculated using 50,000 bootstrap samples (with replacement). Significant conditional indirect effects ($p < .05$) are highlighted in boldface. Ideology & age are included as covariates.

Discussion

Study 2a showed that reminding White Americans that their numerical majority standing in the United States would be lost in the coming decades increased prototypicality threat, but only among those who did not think that immigrants to the United States would continue to conform to their norms. Prototypicality threat, in turn, predicted a range of anti-diversity attitudes: assimilation endorsement, support for restrictions on immigration, and a novel measure of aversion to diversity (i.e., a discomfort with the culture and contexts of other ethnic groups). These effects were shown in a moderated mediation model which will serve as the template

model for future studies. These effects were also shown controlling for both age and ideology, a stronger test of our predictions which confirmed that prototypicality threat is not solely a phenomenon of older, more conservative White Americans.

One assumption that this study rested on, however, not yet tested in the prototypicality threat literature, was that this is indeed a phenomenon of the dominant subgroup (i.e., White Americans). Although there is strong theoretical evidence to believe that prototypicality threat should only be relevant to members of dominant subgroups, we sought to run a replication of Study 2a with non-White Americans to verify this.

Study 2b – Reminding Non-White Americans of Changing Demographics Does Not Trigger Prototypicality Threat

Study 2b used an identical manipulation and measures to Study 2a to test the prediction that our results would not replicate with non-White participants (i.e., members of non-dominant subgroups).

Method

Experimental design. Participants first filled out the same brief eligibility survey used in prior studies. Only those who did *not* self-identify as White Americans were recruited into the study. Individuals who reported that their ethnicity was not listed or who specified that they were multi-ethnic (including partially White individuals) were included in our sample. Participants then completed the same study procedures as in Study 2a.

Participants. In October of 2015, 162 Non-White American workers on Amazon Mechanical Turk participated in a study titled, "10 Minute Survey: Data in the News" and were

paid $0.50. As in Study 2a, we set a target sample size of 150 participants. Average age was 31.90 years and 49.00% of the sample was men.

Measures. Identical measures were used as in Study 2a with comparable reliability for each scale.

Results

Recall check. One hundred and twenty-two participants successfully passed our recall check. Because of a greater percentage of non-U.S. born participants, we included non-U.S. born participants in the following analyses, although patterns of results do not change with them excluded. Our final sample was 122 participants.

Interaction between White majority loss manipulation and outgroup assimilation expectation. To parallel Study 2a, we tested the effect of the interaction between our manipulation and outgroup assimilation expectation on prototypicality threat, controlling for ideology and age. In contrast to Study 2a, we saw no main effect of condition ($\beta = -.28$, $p = .248$) or outgroup assimilation expectation ($\beta = -.07$, $p = .578$) alone, nor a significant interaction between the two ($\beta = .18$, $p = .473$). Across both conditions, and regardless of outgroup assimilation expectation, prototypicality threat was low for all non-White participants.

Discussion

Study 2a showed that White American participants who do not believe that immigrants will readily conform to existing norms report prototypicality threat when exposed to information about changing demographics. Study 2b showed that this effect did not replicate among non-White participants, confirming the prediction that prototypicality threat is indeed relevant to

members of dominant subgroups only, in this instance, White Americans.

Study 3 – Loss of Association with the American Identity Triggers Prototypicality Threat Among White Americans Low in Outgroup Assimilation Expectation

Study 2 tested the prediction that reminding White Americans of increasing national diversity increased prototypicality threat among those who did not expect immigrants to assimilate to their norms. An untested element in the model, however, was the assumption that a loss of numerical majority for White Americans implied the loss of prototypicality for White Americans. Study 3, therefore, aimed to manipulate the loss of prototypicality directly controlling for projections of changing demographics. It was predicted that White Americans would not report prototypicality threat in response to changing demographics unless it was also accompanied by the loss of the association between their subgroup identity and the broader American identity. Building off the prior study, we again expected outgroup assimilation expectation to be an individual difference factor that would either increase susceptibility to prototypicality threat, or protect White Americans against it. Testing the robustness of this moderator, we introduced a new measure, examining the extent to which participants thought US-born ethnic outgroups, rather than immigrants, would assimilate to dominant subgroup norms.

In addition, Study 3 aimed to test the relationship between prototypicality threat and two new outcome variables. The first was attitudes about diversity in the media. As prototypicality threat leads members of dominant subgroups to want to reassert their standing as the representative and normative subgroup within their superordinate category, we predicted that

White Americans under prototypicality threat would seek to preserve their overrepresentation in the media and push back against a growing representation of people of color in the mainstream media. The second new outcome variable we examined was support for candidates in the 2016 presidential election. In particular, we were interested in the relationship between prototypicality threat and support for Donald Trump, who at the time of the study had emerged as a relatively new candidate in the Republican party and a strong advocate for a border wall and restrictions on immigration. As both Studies 1 and 2 showed a relationship between prototypicality threat and the desire to reduce immigration into the United States (i.e., the desire to stop the social change causing prototypicality threat), we predicted a strong positive relationship between prototypicality threat and support for Trump.

A final contribution of this study was comparing the relative strength of prototypicality threat and realistic threat (concerns over jobs and resources) in predicting our various measures of anti-diversity attitudes. Although the theoretical distinctions between these threats are clear, and past research has shown that prototypicality threat has explanatory power over and above realistic threat (Danbold & Huo, 2015), here we aimed to replicate this finding with our new manipulations and new outcome variables, demonstrating again the unique contribution of prototypicality threat.

Method

Experimental design. Participants first filled out the same brief eligibility survey from prior studies and only those who self-identified as White Americans were recruited into the study. Participants were then instructed to read, interpret, and summarize data randomly selected from a large set of "recent scientific articles." In both conditions, participants read an article

about the relationship between being American and being White. Participants were told that researchers had been studying the relationship between "being American and being White," (e.g., as had been done in Devos & Banaji, 2005 although this specific research was never mentioned) and that these researchers had been tracking this association over time. In our Prototypicality Retention condition, participants were told that "although changing demographics are causing Whites' share of the population in the U.S. to shrink," this was not changing the association between being American and being White, which in a graph was shown to be consistently high for over a decade (see Appendix B for experimental stimuli). In our Prototypicality Loss conditions, participants were told that changing demographics were leading the association in people's minds between being American and being White to weaken, a pattern of decline that was also shown in a graph. Therefore, in both conditions, participants were made aware of changing demographics, but only in one were they informed that their prototypicality would be lost as a result.

Participants. In October of 2015, 106 White American workers on Amazon Mechanical Turk participated in a study titled, "10 Minute Survey: Data in the News" and were paid $0.50. Given the effects observed in prior studies, we set a target sample size of 100 participants. Average age was 36.84 years and 55.66% of the sample was men.

Measures.

Prototypicality threat. The same six items from Studies 1 and 2 were used to measure prototypicality threat ($\alpha = 0.90$).

Realistic threat. Four items were adapted from past research on realistic threat (Stephan, et al., 1999) and were presented with a similar frame to prototypicality threat measures (i.e., asking participants to think about the relationship between their ethnic group and other ethnic

groups in America, reminding them that they identified themselves as White American). "…Other groups will get more from this country than they contribute," "The growth of other groups will increase the tax burden on members of my ethnic group," Other groups will displace members of my ethnic group from our jobs," and "Social services will become less available to my ethnic group because of the growth of other groups." (1 = strongly disagree to 7 = strongly agree; $\alpha = 0.94$).

Outgroup assimilation expectation. In contrast to Studies 1 and 2, which conceptualized outgroup assimilation expectation regarding immigrants, Study 3 measured outgroup assimilation expectation regarding U.S. born individuals. We asked participants the extent to which they thought "individuals from each of the following ethnic groups care about successfully conforming to and fitting in with traditional American culture and values,": African Americans, Asian Americans, Latino / Hispanic Americans, and White Americans. As our measure only regarding outgroup assimilation expectation, we created a composite of expectations for African Americans, Asian Americans, and Latino / Hispanic Americans only (1 = strongly disagree to 7 = strongly agree; $\alpha = 0.83$).

Assimilation endorsement. The same nine items from Studies 1 and 2 were used to measure assimilation endorsement ($\alpha = 0.91$).

Aversion to diversity. The same five items from Study 2 were used to measure aversion to diversity ($\alpha = 0.79$).

Opposition to diversity in the media. Participants were asked to express their agreement with three statements regarding diversity in the media: "The media tries too hard to make film and television appear diverse," "Efforts to diversify mainstream media have gone too far," and

"White people are overrepresented in the media." (reverse-coded). (1 = strongly disagree to 7 = strongly agree; $\alpha = 0.84$).

Candidate support. Participants were asked to express the extent to which they thought the current frontrunners for the 2016 presidential election would be good leaders for America. Participants were shown a photograph of and reminded of the party affiliation of the following seven candidates: Hilary Clinton, Bernie Sanders, Donald Trump, Jeb Bush, Ben Carson, Marco Rubio, and Carly Fiorina. (1 = strongly disagree [this candidate would be a bad leader for America] to 7 = strongly agree [this candidate would be a good leader for America]).

Recall check. Participants were asked to respond to a multiple-choice question asking whether or not the article they read at the beginning of the survey stated that the association between being American and being White had "weakened" or "stayed strong." They were also given the option to select "neither of the above describe the article I read." Or "I don't recall anything about the article I read."

Results

Study 3 means, standard deviations, and inter-item correlations for our key dependent variables are shown in Table 4.

Table 4
Study 3 Descriptives and Correlations

	M	*SD*	Prototypicality Threat	Outgroup Assimilation Expectation	Assimilation Endorsement	Aversion to Diversity	Opposition to Diversity in the Media	Realistic Threat
Prototypicality Threat	3.25	1.41	-					
Outgroup Assimilation Expectation	4.78	1.26	-.43**	-				
Assimilation Endorsement	3.38	1.25	.72**	-.36**	-			
Aversion to Diversity	3.52	1.34	.65**	-.29**	.72**	-		
Opposition to Diversity in the Media	3.62	1.57	.63**	-.41**	.74**	.57**	-	
Realistic Threat	3.64	1.78	.69**	-.39**	.75**	.67**	.61**	-

Note: $^{**}p < .01$

Recall check and exclusion criteria. Seven participants failed our manipulation check and were excluded from subsequent analyses. Consistent with prior studies, one participant was born outside of the United States and was also removed. Given that we had recently ran a similar study with a full debriefing, and were aware of other researchers conducting similar research on Amazon Mechanical Turk at the same time, we were concerned about recruiting non-naïve participants, so we included a pre-determined eligibility criteria in which we asked participants, "In the past, have you completed any surveys on Mechanical Turk that have been very similar in content to this one?" (Yes/No). Affirming our concerns, 15 participants had participated in similar studies and were excluded from our analyses. Finally, a single participant, whose responses indicated a lack of attention (i.e., consistently entering 1s and 7s on scales regardless

of reverse-coded items) was noted as an outlier using the outlier labeling rule (Tukey, 1977) and also removed. These exclusion criteria left us with a final sample size of 81 participants.

Interaction between White majority loss manipulation and outgroup assimilation expectation. Paralleling Study 2, we tested our primary prediction that participants low in outgroup assimilation expectation (now concerning U.S.-born outgroups) would show the greatest prototypicality threat in responses to our prototypicality loss manipulation. We did so again controlling for age and ideology. There was no significant main effect of condition on prototypicality threat ($\beta = .18$, $p = .483$), nor was there a significant main effect of outgroup assimilation expectation ($\beta = .00$, $p = .997$). As predicted, and consistent with Study 2a, we did observe a significant interaction between our prototypicality loss manipulation and outgroup assimilation expectation ($\beta = -.65$, $p = .019$). As seen in Figure 3, consistent with the findings from Study 2a, participants low in outgroup assimilation reported greater prototypicality threat when they were told they would lose, rather than retain, their prototypicality. Simple slopes analyses confirmed that this pattern was significant (gradient = .82, $p = .028$). Also, consistent with prior findings, we saw a reversed trend for those high in outgroup assimilation expectation, who reported less prototypicality threat in the prototypicality loss condition compared to the prototypicality retention condition. However, this pattern was not significant (gradient = -.47, $p = .208$).

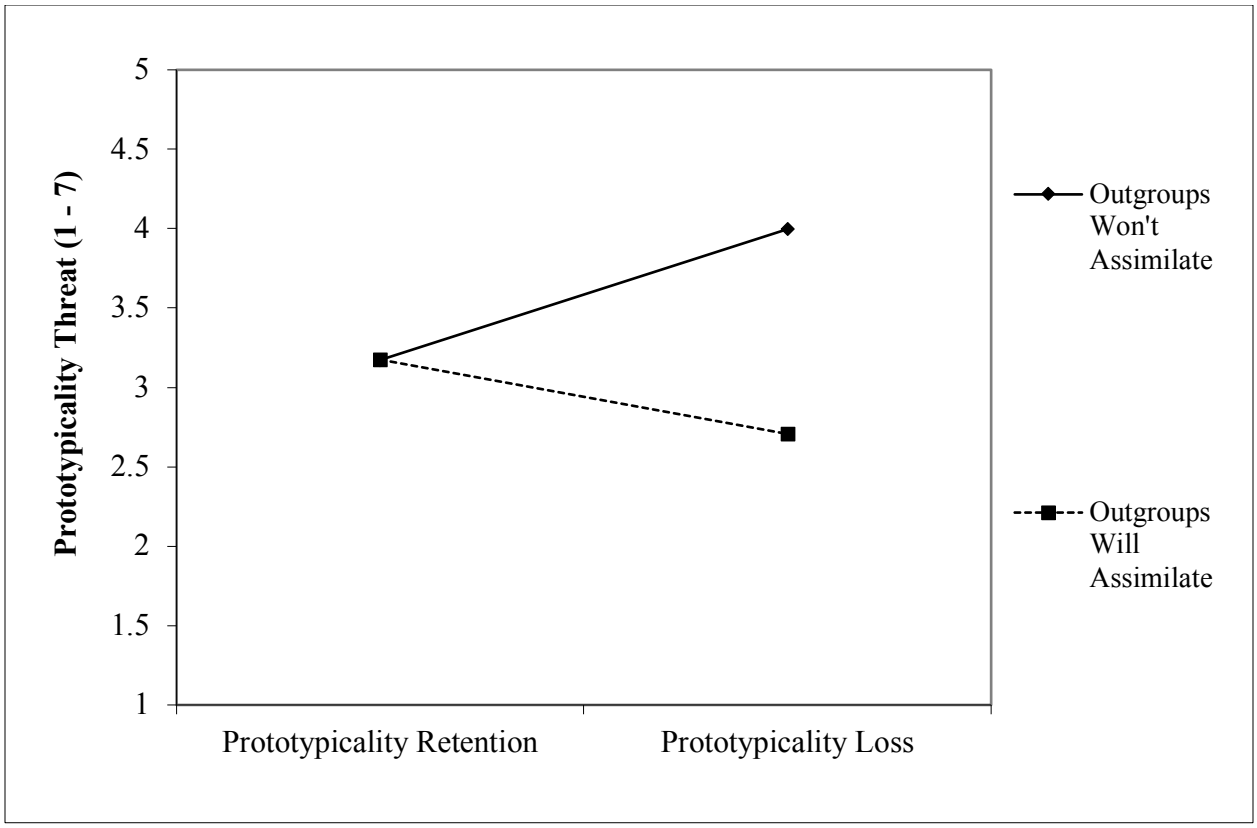

Figure 3. Study 3 interaction of condition by outgroup assimilation expectation on prototypicality threat. High (outgroups will assimilate) and low (outgroups won't assimilate) are +1SD and -1SD from the mean.

Moderated mediation – effects of prototypicality threat on outcome variables. After replicating the predicted interaction between prototypicality loss and outgroup assimilation expectation, we again tested our full moderated mediation model (Figure 2) to examine the consequences of prototypicality threat on our outcome variables. Improving upon Study 2a, we did so here controlling for realistic threat as a parallel mediator in our model. Table 5 reports the indirect effects through prototypicality threat and realistic threat of our main interaction on assimilation endorsement, aversion to diversity, and opposition to greater diversity in the media. For individuals low in outgroup assimilation expectation, we noted a significant indirect effect through prototypicality threat for all three outcome variables, over and above the mediating

effect of realistic threat. Although realistic threat also showed a significant indirect effect when assimilation endorsement was the outcome variable, this was not the case for aversion to diversity or opposition to diversity in the media.

Relationship between prototypicality threat and candidate support. We next examined the relationship between prototypicality threat and support for the preliminary round of candidates in the 2016 presidential election. Overall, prototypicality threat was negatively correlated with support for Democratic candidates and positively correlated with support for Republican candidates. Among the two leading Democrats at the time, the negative correlation with prototypicality threat was stronger for Bernie Sanders (r = -.45, p < .001) than for Hilary Clinton (r = -.32, p = .004). Among the Republican candidates, correlations were relatively weak for Jeb Bush (r = .17, p = .131), Ben Carson (r = .20, p = .078), Marco Rubio (r = .23, p = .040), and Carly Fiorina (r = .18, p = .099). Donald Trump was the exception among these Republican candidates, whose relationship with prototypicality threat was stronger than any other candidate (r = .46, p < .001). Given Trump's rhetoric at the time, promising various forms of restrictions on immigration, and implicit in this a slowing down of the decrease of White Americans' share of the population, this finding was consistent with our theory and prior studies.

Table 5

Study 3 Conditional Indirect Effect of Prototypicality Loss on Assimilation Endorsement, Aversion to Diversity, and Opposition to Diversity in the Media Through Prototypicality Threat and Realistic Threat at Low (-1 SD), Moderate (Mean), and High (+1 SD) Levels of Outgroup (Immigrant) Assimilation Expectation.

Conditional Level of Outgroup Assim. Expectations	Indirect Effect	Bootstrapped Standard Error	Bias-Corrected Lower Limit	Bias-Corrected Upper Limit
DV = Assimilation Endorsement / Mediator = Prototypicality Threat				
-1 SD (3.52)	**.21**	**.13**	**.02**	**.57**
Mean (4.78)	.05	.07	-.07	.22
+1 SD (6.04)	-.12	.12	-.44	.03
DV = Assimilation Endorsement / Mediator = Realistic Threat				
-1 SD (3.52)	**.21**	**.14**	**.00**	**.55**
Mean (4.78)	.09	.10	-.07	.33
+1 SD (6.04)	-.03	.15	-.41	.22
DV = Aversion to Diversity / Mediator = Prototypicality Threat				
-1 SD (3.52)	**.24**	**.18**	**.01**	**.73**
Mean (4.78)	.05	.09	-.08	.30
+1 SD (6.04)	-.14	.14	-.53	.03
DV = Aversion to Diversity / Mediator = Realistic Threat				
-1 SD (3.52)	.19	.14	-.00	.55
Mean (4.78)	.08	.09	-.04	.32
+1 SD (6.04)	-.03	.15	.43	.17
DV = Opposition to Diversity in the Media / Mediator = Prototypicality Threat				
-1 SD (3.52)	**.23**	**.14**	**.02**	**.60**
Mean (4.78)	.05	.08	-.06	.27
+1 SD (6.04)	-.13	.11	-.44	.02
DV = Opposition to Diversity in the Media / Mediator = Realistic Threat				
-1 SD (3.52)	.13	.11	-.01	.44
Mean (4.78)	.05	.07	-.04	.29
+1 SD (6.04)	-.02	.10	-.26	.16

Note. SD = standard deviation. Bias-corrected 95% confidence intervals were calculated using 50,000 bootstrap samples (with replacement). Significant conditional indirect effects ($p < .05$) are highlighted in boldface. Ideology & age are included as covariates.

Discussion

Study 3 replicated the finding that White Americans who do not expect outgroup members to assimilate to their norms experience prototypicality threat when told that their prototypicality will be lost. In contrast to prior studies, here we separated the loss of numerical majority status from the loss of prototypicality, holding the first constant and manipulating the second. We observed that, regardless of outgroup assimilation expectation, participants didn't report prototypicality threat when told that their numerical majority status would be lost, so long as the association between the White identity and the American identity would remain strong. It was only those who were told that this association would be lost, who also believed that outgroups would not readily conform to their norms, who experienced prototypicality threat.

In addition to replicating the finding that prototypicality threat was a significant predictor of assimilation endorsement and aversion to diversity, this study showed opposition to increased diversity in the media as another way in which White Americans would seek to reassert their prototypicality. This relationship held in our full moderated mediation model (Figure 2), controlling for ideology, age, and now realistic threat as well.

Study 3 also expanded upon previous studies by looking at political outcomes. Of all the presidential candidates at the time of the study, Donald Trump was the one for whom support was most strongly associated with prototypicality threat. This was theoretically consistent in that many of the early pledges made by Donald Trump (e.g., restricting immigration, building a border wall, etc.) spoke to White Americans' concerns about a growing non-White population in their country. This finding revealed how members of dominant subgroups could engage with politics to address the negative emotions they felt when considering the potential loss of their

prototypicality.

Study 4a – Prototypicality Threat and Support for Donald Trump Post-Election

Study 4a aimed to replicate and expand upon the finding in Study 3 that prototypicality threat was strongly associated with support for Donald Trump in a post-election correlational survey. Not only did we predict that this relationship would replicate, but we predicted that support for Donald Trump would function as a way for individuals under prototypicality threat to address the negative emotions this threat generated, resulting in them feeling relief following his electoral success.

Method

Participants. In December of 2016, 256 White American workers on Amazon Mechanical Turk participated in a survey titled, "Your Thoughts on America Today" and were paid $0.50. Average age was 39.53 and 45.70% of the sample was men.

Measures.

Prototypicality threat. Five items from Studies 1 through 3 were used to measure prototypicality threat ($\alpha = 0.85$).

Realistic threat. The same four items from Study 3 were used to measure realistic threat ($\alpha = 0.95$).

Vote for Trump. Participants were asked "Thinking now about the 2016 US Presidential

Election, who did you vote for?" and were given the options: Hilary Clinton, Donald Trump, Other (please specify), and Didn't vote. We coded this item dichotomously (0 = voted for Clinton, other candidate, or no vote, 1 = voted for Trump).

Support for Trump. Participants were asked to indicate "the extent to which you supported or opposed Donald Trump in the 2016 US Presidential Election." (1 = strongly opposed to 7 = strongly supported).

Party identification. Participants completed the standard ANES measure of party identification. All participants were first asked "Generally speaking, do you think of yourself as a Republican, a Democrat, an Independent, or other?". Participants who responded with Democrat or Republican were asked a follow-up question asking whether or not they called themselves "strong" or "not very strong" Democrats or Republicans. Participants who responded to the first question by indicating that they were "Independent," "Other," "No preference," or "Don't know" were subsequently asked if they thought of themselves as "closer to the Republican party," "close to neither party," or "closer to the Democratic party." A composite item was calculated using these items ranging from "Strong Republican" to "Strong Democrat" with "close to neither party" at the midpoint.

Post-election negative emotions. Participants were asked to indicate the extent to which, "compared to before the election," they felt more or less of a series of eight emotions (1 = much less to 7 = much more). Our focus was on five negative emotions, fearful, anxious, sad, angry, and resentful, which we collapsed onto a single scale ($\alpha = 0.96$). We also asked about two positive emotions (optimistic and grateful) and one neutral emotion (ambivalent).

Results

Prototypicality threat and voting and support for Trump. Prototypicality threat was positively and significantly correlated with voting for Trump ($r = .47$, $p < .001$) and support for Trump ($r = .57$, $p < .001$). To test the strength of this relationship we ran a binary logistic regression controlling for both party identification and realistic threat. Although party identification was a predictably strong predictor of voting for Trump ($\beta = 1.01$, $p < .001$), prototypicality threat remained a significant predictor ($\beta = .48$, $p = .041$). Although it was also positively correlated with voting for Trump ($r = .49$, $p < .001$), in our full model, realistic threat was not a significant predictor ($\beta = .06$, $p = .758$). We found comparable findings running a linear regression predicting our continuous measure of Trump support. Controlling for both party ID and realistic threat (both also significant in our model), prototypicality threat was a significant predictor of support for Trump ($\beta = .28$, $p = .003$).

Prototypicality threat, support for Trump, and post-election emotions. Given that prototypicality threat made Trump more attractive to voters, we predicted that his win would have a palliative effect on their negative emotions (i.e., that those who felt the greatest prototypicality threat and supported Trump as a result, felt the negative emotions associated with their threat decrease after the election). We tested a mediation model in which prototypicality threat was our predictor, support for Trump was our mediator and negative emotions was our outcome variable. We tested this using Hayes' PROCESS Macro (Hayes, 2013) Model 4, controlling again for party identification and realistic threat. As seen in the prior analyses, prototypicality threat was a significant predictor of Trump support ($\beta = .28$, $p = .003$). Trump support was a strong predictor of decreased negative emotions post-election over and above all

the other predictors in our model (β = -.40, $p < .001$). This indirect effect was significant (IE = -.11; bias-corrected 95% Confidence Interval = [−0.21, -0.05]).

Study 4b – Prototypicality Threat and Support for Brexit Post-Election

Study 4b aimed to replicate the finding that members of dominant subgroups under prototypicality threat pursue political actions that would stand to reduce the concern they feel about no longer representing their superordinate category. In the wake of the election of Donald Trump, many drew parallels to the recent passage of Brexit (the referendum for the United Kingdom to leave the European Union), both for the fact that these political victories violated predicted outcomes, and that both campaigns played upon concerns about growing diversity in their respective countries. Although not explicitly about reducing immigration or diversity, a large contingent of those who voted to Leave, and much of the rhetoric on their side, expressed concern over the recent influx of migrants to the United Kingdom and the European Union. Additionally, many saw Brexit as an opportunity to distinguish and preserve the "traditional" British identity. Therefore, we predicted that the relationships we observed between prototypicality threat and support for Donald Trump would be replicated in the context of Brexit.

Method

Participants. In April of 2017, 212 White British workers on Prolific Academic (Peer, Brandimarte, Samat, & Acquisti, 2017) participated in a survey titled, "Britain's Future" and were paid £1.25. Average age was 39.50 and 40.57% of the sample was men.

Measures.

Prototypicality threat. Five items were adapted from the prior studies to measure prototypicality threat for White British participants. Participants were asked to "Please consider what you see to be the relationship between your ethnic identity and the British identity in the future," and then were reminded them that in an earlier part of the survey they identified their ethnicity as "White British". Participants then indicated their level of agreement with the following statements: "I worry that in the future, my ethnic group may no longer represent what it means to be American," "I am concerned that in the future, it won't be clear what it means to be British," "It troubles me that in the future, when people think about what it means to be British, they may not think about my ethnic group," "It makes me uneasy that in the future, other groups may represent Britain more so than my ethnic group," and "I am confident that in the future, people will still think about my ethnic group when thinking about what it means to be British." (reverse-coded) (1 = strongly disagree to 7 = strongly agree; $\alpha = 0.88$).

Realistic threat. The same four items used in Study 3 were used to measure realistic threat for White British participants. Two minor changes were made. First, participants were asked to "Please consider what you see to be the relationship between your ethnic group s and other ethnic groups in the U.K. in the future," and then were reminded that they identified their ethnicity as "White British". Additionally, "social services" was changed to "public services" to be more consistent with British terminology.

Vote for Brexit. Participants were asked "Thinking now about the 2016 EU Referendum, commonly referred to as Brexit, how did you vote?" and were given the options: Leave, Remain, or Didn't vote. We coded this item dichotomously (0 = voted Remain or didn't vote, 1 = voted Leave).

Support for Brexit. Participants were asked to indicate "the extent to which you supported or opposed the U.K. leaving the European union." (1 = strongly opposed to 7 = strongly supported).

Post-election negative emotions. Participants were asked "Compared to before the passage of Brexit please indicate the extent to which you feel more or less of the following emotions." About the same eight emotions measured in Study 4a. Again, we created an index of post-Brexit negative emotions using the five negative emotions we measured ($\alpha = 0.91$).

Results

Prototypicality threat and voting and support for Brexit. Prototypicality threat was positively and significantly correlated with voting for Brexit ($r = .45$, $p < .001$) and support for Brexit ($r = .53$, $p < .001$). As in Study 4a, to test the strength of this relationship we ran a binary logistic regression using prototypicality threat to predict voting for Brexit. To parallel prior analyses we controlled for realistic threat. However, given that voting for Brexit did not run along clean partisan lines as the U.S. 2016 presidential election did, rather than controlling for party identification, we controlled for political attitudes with a broader measure of political ideology (1 = extremely liberal to 7 = extremely conservative). In contrast to Study 4a, prototypicality threat was only a marginally significant predictor of voting for Brexit ($\beta = .33$, $p = .086$) over and above realistic threat (also marginal, $\beta = .31$, $p = .060$) and ideology ($\beta = .62$, $p < .001$). Patterns were stronger when predicting our continuous measure of support for Brexit. Controlling for both political ideology and realistic threat (both also significant in our model), prototypicality threat was a significant predictor of support for Brexit ($\beta = .35$, $p = .010$).

Prototypicality threat, support for Brexit, and post-election emotions. Paralleling the analyses presented in Study 4a, we sought to test if, given that threat drove support for Brexit, the success of Brexit would be associated with decreased negative emotions after the election. We tested the same mediation model run in Study 4a where prototypicality threat predicted support for Brexit, which in turn predicted negative emotions, controlling for both ideology and realistic threat. As seen in the prior analyses, prototypicality threat was a significant predictor of Brexit support ($\beta = .35$, $p = .010$). Support for Brexit was a strong predictor of negative decreased emotions post-election over and above all other predictors in our model ($\beta = -.20$, $p < .001$). This indirect effect was significant (IE = - .07; bias-corrected 95% Confidence Interval = [−0.14, -0.02].

Discussion

Across two studies in two distinct contexts (the United States and the United Kingdom) the more members of the dominant ethnic group felt concern about losing their claim to represent their nation, the more they supported political movements that promised to reduce immigration to their country and preserve a traditional national identity (Donald Trump and Brexit respectively). Furthermore, supporting these political movements appeared to reduce some of the threat these individuals felt, as they reported significantly fewer negative emotions after their sides won in elections. Importantly, these effects held controlling for political and ideological attitudes and concerns about access to jobs and resources (realistic threat). An obvious limitation of these studies is their correlational nature, which restricts us from making any definitive claims about causality. Nevertheless, these findings underscore the pattern consistent throughout these studies that prototypicality threat is significantly associated with negative attitudes about

growing diversity and the desire to stop it.

Study 5a – Evidence of Prototypicality Threat Among Undergraduate Students at a Public University

To demonstrate the generalizability of prototypicality threat beyond the context of ethnicity, we next examined it in a new context, undergraduate students responding to an increase in international students at their university. In recent years, many universities have seen a strong financial incentive in increasing the number of international students they admit, as they can charge them higher fees than they can for domestic students. At the same time, we noted on separate surveys of student attitudes about different groups at our campus, that international students were rated less positively than other groups on campus (e.g., transfer students, different ethnic groups, etc.). We predicted that an influx of international students, who many characterize as being unwilling or unable to integrate into the mainstream campus culture, may be a source of prototypicality threat for international students who see themselves as representing the identity of an undergraduate at their institution. As international students pay higher fees than non-international students, thus increasing the resources available to non-international students, we also tested the prediction that realistic threat would be less relevant in explaining negative attitudes to international students than prototypicality threat.

Method

Procedure. To test whether or not prototypicality threat would be relevant or even measurable in this new context, we first ran a correlational study looking at the relationship between beliefs about the changing relative representation of international students, the degree to which international students were expected to assimilate, and prototypicality threat.

Participants. In October and November of 2016, 109 non-international undergraduate students at a large west coast research university participated in a survey titled "Your thoughts on [University Name]" in exchange for one research credit. We set a target sample size of 100 students but did not limit the number of students who could participant. Average age was 18.68 and 25.69% of our sample was men. In contrast to our prior studies, as our focus was on international versus non-international student identity, and not ethnicity, we collected participants from a range of ethnicities, such that 26.61% of our sample were White, 32.11% were Asian American, 24.77% were Latino/Hispanic American, and the remainder were African American or selected "not listed, please specify". Given that the majority of international students at the university are non-White, we coded participant ethnicity as a White/Non-White binary variable.

Measures.

International student increase. We measured the extent to which participants thought that the percentage of international students at their university would increase or decrease over the following three years. (1 = rapidly decreasing, 11 = rapidly increasing).

International student assimilation expectation. We developed a short measure of outgroup assimilation expectation focused on international students. Participants were asked to indicate the extent to which they agreed with two statements: "International students at [university name] successfully conform to existing campus culture," and "International students at [university name] prefer to keep to themselves and not integrate into the broader campus community." (reverse-coded) (1 = strongly disagree to 7 = strongly agree; $r = 0.37$, $p < .001$).

Prototypicality threat. Five items were adapted from the previous studies to capture the extent to which participants felt their prototypicality was threatened. To refer to the broader

superordinate student identity, we used the university nickname (i.e., the term students at the university are referred to as and commonly refer to themselves by). “I worry that in the future, students like me will no longer represent what it means to be a [university nickname],” “It troubles me that in the future, when people think about what it means to be a [university nickname], they won't think about students like me,” “I don't like to think that in the future, students like me will represent [university name] less than they do now,” “I am concerned that in the future, it won't be clear what it means to be a [university nickname].,” and “I am confident that in the future, people will still think about people like me when thinking about what it means to be a [university nickname].” (reverse-coded) (1 = strongly disagree to 7 = strongly agree; α = 0.71).

Realistic threat. One item was adapted from past research (Stephan, et al., 1999) to measure realistic threat. “International students at [university name] consume more student funding than they contribute through their tuition and fees.” (1 = strongly disagree to 7 = strongly agree)

Results

Means, standard deviations, and inter-item correlations for our key dependent variables are shown in Table 6.

Table 6
Study 5a Descriptives and Correlations

	M	*SD*	Prototypicality Threat	International Student Increase	Int'l Student Assimilation Expectation	Realistic Threat
Prototypicality Threat	3.57	1.08	-			
International Student Increase	7.86	1.78	.11	-		
Int'l Student Assimilation Expectation	3.99	1.12	-.11	-.03	-	
Realistic Threat	3.18	1.12	.09	.05	-.21*	-

Note: *$p < .05$

Following the logic of our prior studies, 12 participants were excluded from analyses based on the fact that they were not born in the U.S., and therefore might identify with international students. This left us with a final sample of 97 participants.

Interaction between manipulation and outgroup assimilation expectation. Paralleling our earlier analyses, we tested the prediction that participants who predicted the greatest increase of international students at their university who were also lowest in outgroup assimilation expectation would report the greatest prototypicality threat. We did so controlling for both ideology, year in school (longer tenure at the university could be associated with greater attachment to the traditional university identity) and ethnicity (coded White/non-White). In our full model, we observed no significant main effect of perceived international student increase ($\beta = .09$, $p = .394$) and no significant main effect outgroup assimilation expectation ($\beta = -.14$, $p = .215$). However, as predicted, we did observe a significant interaction between perceived international student increase and outgroup assimilation expectation ($\beta = -.25$, $p = .020$). As seen in Figure 4, individuals low in outgroup assimilation expectation (-1 SD) showed greater

prototypicality threat the more they thought international students would increase as a percentage of the undergraduate population. Simple sloes analyses confirmed that this was significant (gradient = .34, p = .017). For individuals high in outgroup assimilation expectation, the opposite pattern was observed, such that they reported less prototypicality threat the more they saw international students increasing as a percentage of their universities population. Simple slopes analyses, however, revealed that this trend was not significant (gradient = -.16, p = .307).

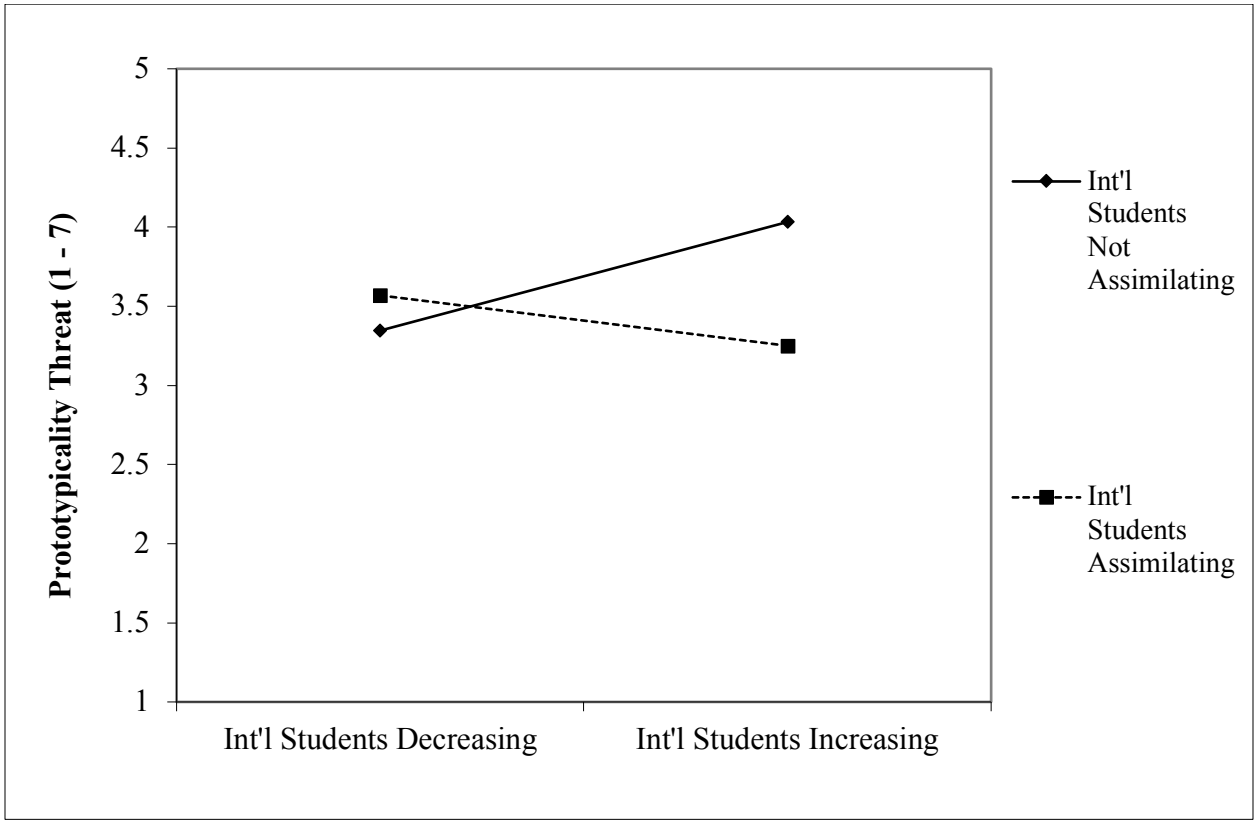

Figure 4. Study 5a interaction of perceptions of international student increase by outgroup (international student) assimilation expectation on prototypicality threat. High (international students will assimilate) and low (international students won't assimilate) are +1SD and -1SD from the mean.

These effects held even controlling for realistic threat. In contrast to the American context of Studies 1 through 4, here we observed no significant correlation between prototypicality threat and realistic threat (r = .09, p = .397). This was likely due to the fact that international students increase the resources available to non-international students given the relatively higher fees they are required to pay. When included in our full moderation model, realistic threat was not a significant predictor of prototypicality threat (β = .10, p = .313), and including it strengthened the significance of our key interaction between perceived international student increase and international student assimilation expectation (β = -.28, p = .013).

Discussion

Consistent with prior studies, non-international undergraduate participants in Study 5a who saw the greatest increase in international students at their university showed the greatest prototypicality threat, but only when they assumed that these international students wouldn't readily conform to their norms. This further supported the prediction that prototypicality threat is a phenomenon that could generalize to dominant subgroups across a wide variety of contexts.

Study 5b – Telling Non-International Undergraduates that International Students at their University are Increasing and Not Assimilating Triggers Prototypicality Threat

As Study 5a demonstrated the relevance of prototypicality threat to the context of non-international undergraduates reacting to perceived increases in international students, Study 5b aimed to replicate these findings experimentally. In contrast to our prior studies, here we aimed to manipulate both perceptions of changing outgroup size and outgroup assimilation expectation. In addition, we aimed to test the consequences of prototypicality threat in this context, including

a new theoretically derived outcome variable, aversion to marking. One benefit of prototypicality is seeing one's subgroup as synonymous with the broader superordinate category. As a result, dominant subgroups, such as non-international undergraduates, rarely have their identity qualified (i.e., these students are rarely classified as "non-international," or "domestic"). We predicted that those most concerned about losing their prototypicality would also be those most averse to this marking of their subgroup.

Method

Experimental design. Participants were told that the purpose of our study was to examine how students interpreted data as it is presented in the news. We asked participants to read and interpret an article, which we told them was randomly selected from a larger set of articles describing findings from recent polls and surveys at the university. They were asked to read and remember the information provided in the article for a recall task later in the survey. Participants were assigned to read one of four articles, representative of our 2 x 2 experimental design (see Appendix B for examples of experimental stimuli). All articles purported to be presenting recent data from a report about international students at the university. Two "key findings" were presented representing each of our experimental manipulations. The first piece of manipulated information told participants that the number of international students at their university had increased in recent years to around 13%. We then varied whether or not this was projected to either decrease down to around 6% (International Students Decreasing condition), or increase to around 45% (International Students Increasing condition) over the next four years. The second piece of manipulated information (our International Student Assimilation manipulation) concerned the extent to which international students were assimilating at their university. Participants told that the university had been tracking the extent to which

international students were interested in integrating into campus culture (i.e., knowing university rituals, attending student organized and athletic events, living in the dorms, knowing campus trivia, etc.). We then varied whether over the course of the past 6 years, rates of integration had remained low (decreasing from around 22% to around 18%, our International Students Not Assimilating condition), or had been steadily on the rise (increasing from around 22% to around 63%, our International Students Assimilating condition). We predicted that, consistent with our prior studies, that prototypicality threat would be highest for those participants who were told that the number of international students at their university was increasing, and that these students were not assimilating with traditional campus norms.

Participants. In November of 2016, 718 non-international undergraduate students at a large west coast research university participated in a survey titled "Data in the News" and were entered into a lottery for a chance to win one of two $100 gift cards. We set a target sample size of 400 students but did not limit the number of students who could participate. Average age was 20.01 and 33.67% of our sample was men. As in Study 5a, we collected participants from multiple ethnicities (71.61% White American, 11.82% Latino / Hispanic Americans, 5.33% Asian Americans), and coded participant ethnicity as a White/Non-White binary variable.

Measures.

Prototypicality threat. Prototypicality threat was measured using identical items to those in Study 5a ($\alpha = 0.72$).

Desired decrease in international students. To parallel the findings from Studies 1 and 2 that individuals try to reduce prototypicality threat by stopping the social change that is its source (e.g., immigration, diversity initiatives), participants were asked how much more or less of a series of groups: international students, transfer students, and out of state students. (1 = much

less to 7 = much more). It was predicted that, as an influx of non-assimilating international students would be seen as threatening the prototypicality of domestic undergraduates, students under this threat would seek to preserve their prototypicality by reducing the number of international students at their university.

Assimilation endorsement. Assimilation endorsement was measured using two items adapted from prior studies: "If international students want to succeed at [university name], they should adhere to existing [university nickname] values and traditions," and "It is best if everyone at [university name] conforms to existing [university nickname] values and traditions." (1 = strongly disagree to 7 = strongly agree; $r = 0.67$, $p < .001$).

Aversion to diversity. Paralleling earlier studies, three items measured aversion to diversity: "It bothers me when I walk around campus and hear students speaking languages other than English," "I get uncomfortable sitting in classrooms or other places in campus surrounded by students speaking in languages that aren't English," and "Some of the food that international students at [university name] eat is too strange for me to try." (1 = strongly disagree to 7 = strongly agree, $\alpha = 0.71$).

Anti-international student attitudes. Consistent with the dislike of the culture and norms of the non-dominant subgroup, six items measured the extent to which participants expressed a dislike of international students at their university: "I don't like international students at [university name]," "I rarely try to befriend international students at [university name]," "The number of international students at [university name] bothers me," "I appreciate the new perspectives that international students bring to [university name]," (reverse-coded) "I try to get to know international students at [university name]," and "I like to attend cultural events put on

by international students at [university name]." (1 = strongly disagree to 7 = strongly agree, α = 0.83).

Aversion to marking. Participants were told that given the presence of international students at their university, there had been a proposal to officially label students from the United States as "domestic students". Participants were then asked the extent to which they agreed or disagreed with the following four statements: "I am opposed to labeling non-International students 'domestic students'," "[University name] students from the U.S. should just be called students, not 'domestic students'," "I like the label 'domestic student' to describe non-International students at [university name]," (reverse-coded), and "I wouldn't mind being labeled a 'domestic student'." (reverse-coded) (1 = strongly disagree to 7 = strongly agree, α = 0.87).

Manipulation checks. Participants responded to two manipulation checks about the article that they read at the beginning of the study. To assess the effectiveness of our first manipulation (international student decrease/increase), we asked participants the extent to respond to our predictor from Study 5a, measuring their perceptions of how "the percentage of international and non-international students at [university name] will increase or decrease between now and 2020." (1 = rapidly decrease, 11 = rapidly increase. To assess the effectiveness of our second manipulation (international student assimilation expectation), we asked participants to indicate the extent to which they agreed or disagreed with two statements: "International students at [university name] successfully conform to existing campus culture," and "International students at [university name] prefer to keep to themselves and not integrate into the broader campus community." (reverse-coded) (1 = strongly disagree to 7 = strongly agree; $r = 0.68$, $p < .001$).

Results

Means, standard deviations, and inter-item correlations for our key dependent variables are shown in Table 7.

Table 7
Study 5b Descriptives and Correlations

	M	*SD*	Prototypicality Threat	Desired Decrease in Int'l Students	Assimilation Endorsement	Aversion to Diversity	Anti-Int'l Student Attitudes	Aversion to Marking
Prototypicality Threat	3.26	1.09	-					
Desired Decrease in Int'l Students	3.84	1.18	.17**	-				
Assimilation Endorsement	3.72	1.41	.11**	.23**	-			
Aversion to Diversity	2.35	1.04	.23**	.43**	.28**	-		
Anti-Int'l Student Attitudes	2.68	1.00	.21**	.58**	.23**	.59**	-	
Aversion to Marking	4.27	1.33	.15**	.14**	.11**	.17**	.15**	-

Note: $^{**}p < .01$

Consistent with Study 5a, we excluded five international students and 62 non-US born participants for a final sample of 651 US born domestic undergraduates.

Manipulation checks. We tested the effect of our two experimental manipulations on the perceived growth in international students at the university. There was a significant main effect of our International Student Change manipulation ($F(1, 646) = 1186.72, p < .001$) such that participants in the International Student Increase anticipated a significantly greater proportion of international students ($M = 8.88$, SE = .10) than participants in the International Student Decrease condition ($M = 3.86$, SE = .10). There was no significant main effect of our International Student Assimilation manipulation, nor was there an interaction between the two manipulations. We then tested the effect of our manipulations on the extent to which participants

thought international students were successfully assimilating on campus. There was a significant main effect of our International Student Assimilation manipulation ($F(1, 647) = 227.35$, $p < .001$) such that participants in the International Students Assimilating condition perceived a greater degree of international student assimilation ($M = 4.64$, SE = .07) than participants in the International Students Not Assimilating condition ($M = 3.15$, SE = .07). There was no significant main effect of our International Student Change manipulation nor a significant interaction between the two manipulations. These checks confirmed that our two manipulations successfully changed student attitudes in the manner they were intended to.

Interaction between international student change and international student assimilation. Paralleling Study 5a and the conceptual model laid forth in prior studies, we looked at the interaction between our International Student Change manipulation and our International Student Assimilation manipulation on prototypicality threat. Consistent with the prior study, we did so controlling for ideology, year in school, and ethnicity (coded White/non-White). There was no significant main effect of our International Student Change manipulation ($F(1, 642) = .19$, $p = .67$). There was, in contrast to prior studies, a significant main effect of outgroup assimilation expectation ($F(1, 642) = 6.67$, $p = .01$) such that participants in the International Students Assimilating condition ($M = 3.15$, SE = .06) of our International Student Assimilation Manipulation reported less prototypicality threat than those in the International Students Not Assimilating condition ($M = 3.37$, SE = .06). Consistent with prior studies, there was a significant interaction between our two manipulations ($F(1, 642) = 6.99$, $p = .008$) such that participants in the International Student Increase and International Students Not Assimilating conditions reported the greatest prototypicality threat (Figure 5).

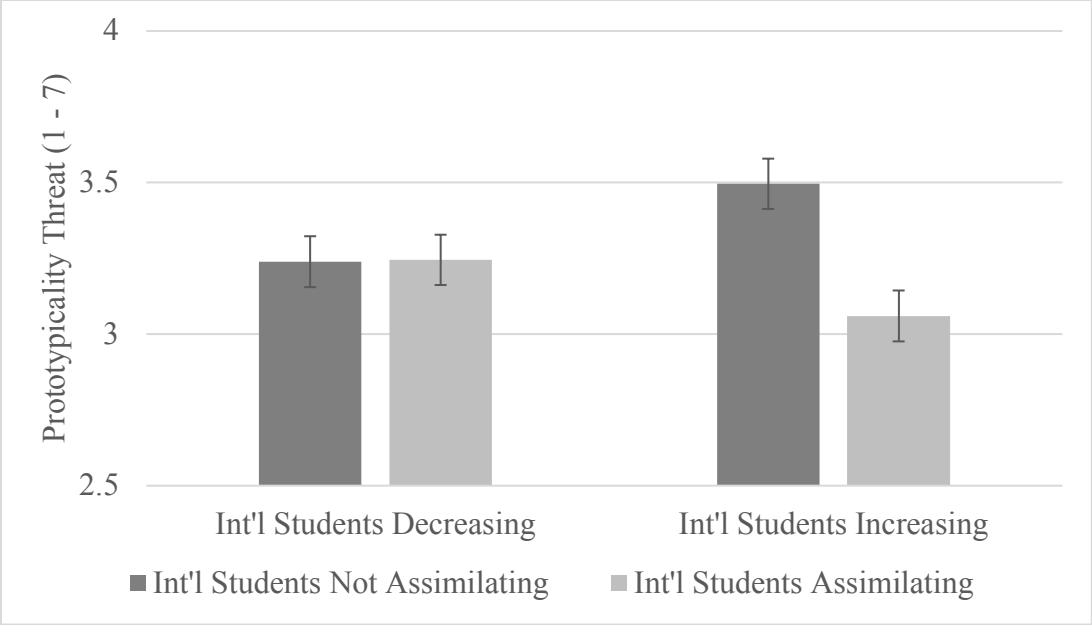

Figure 5. Study 5b interaction of international student increase manipulation by international student assimilation manipulation on prototypicality threat.

Moderated mediation – effects of prototypicality threat on outcome variables. Consistent with prior analyses, we next looked at the consequences of prototypicality threat in our full moderated mediation model (Figure 2). As seen in Table 8, we found a significant indirect effect of perceived international student increase on each of our outcome variables through prototypicality threat, but only for participants who were told that international students weren't assimilating to traditional undergraduate norms.

Table 8

Study 5b Conditional Indirect Effect of International Student Increase on Desired Decrease in International Students, Assimilation Endorsement, Aversion to Diversity, Anti-International Student Attitudes, and Aversion to Marking in the International Students Not Assimilating and International Student Assimilating Conditions.

Conditional Level of Outgroup Assim. Expectations	Indirect Effect	Bootstrapped Standard Error	Bias-Corrected Lower Limit	Bias-Corrected Upper Limit
DV = Desired Decrease in International Students				
No Assim.	**.05**	**.03**	**.00**	**.11**
Yes Assim.	-.04	.02	-.09	.00
DV = Assimilation Endorsement				
No Assim.	**.03**	**.02**	**.00**	**.08**
Yes Assim.	-.02	.02	-.07	.00
DV = Aversion to Diversity				
No Assim.	**.05**	**.03**	**.01**	**.12**
Yes Assim.	-.04	.03	-.09	.01
DV = Anti-International Student Attitudes				
No Assim.	**.05**	**.03**	**.00**	**.11**
Yes Assim.	-.03	.02	-.09	.00
DV = Aversion to Marking				
No Assim.	**.05**	**.03**	**.01**	**.11**
Yes Assim.	-.03	.02	-.09	.00

Note. SD = standard deviation. Bias-corrected 95% confidence intervals were calculated using 50,000 bootstrap samples (with replacement). Significant conditional indirect effects ($p < .05$) are highlighted in boldface. Ideology, year in school, and ethnicity are included as covariates.

Discussion

Study 5b replicated our full moderated mediation model (Figure 2) among non-international undergraduates. When participants were told that the number of international students at their university would increase and that these students were failing to assimilate to their norms, they experienced prototypicality threat. This in turn led them to push back against the threatening change by desiring fewer international students at their university. In addition,

prototypicality threat spurred efforts to reassert dominant subgroup prototypicality by endorsing assimilation to domestic student norms, disparaging international students and their culture, and pushing back against efforts to give mark the non-international student group with a qualifying "domestic student" label. The close parallels between these findings and those of Studies 2 and 3 speak clearly to the generalizability of prototypicality threat and its significance in explaining dominant subgroup resistance to diversity.

General Discussion

Across five studies (eight including replications), and three distinct populations (White Americans, White British, and non-international undergraduate students) we observed that the concern among members of the dominant subgroup that their claim to represent the superordinate category would be lost (i.e., prototypicality threat) was a significant driver of resistance to diversity. This resistance was expressed not only in the desire to reduce the number of non-dominant subgroup members in the shared social category (i.e., nation or university), but also in the desire to preserve the norms of the dominant subgroup as the norms to which all other subgroups are expected to attend. Not only did we observe that prototypicality threat led members of dominant subgroups to prioritize their own cultural identity, but it was also associated with a rejection of, or aversion to the culture of non-dominant subgroups. In addition, this research provided evidence for two fundamental predictions about prototypicality threat: that it is indeed a phenomenon specific to members of dominant subgroups, and that it produces an aversive emotional state. Finally, these studies demonstrated the influence of a new individual difference moderator, outgroup assimilation expectation, looking at whether or not people

thought that others would readily conform to their subgroup's norms. Only those members of dominant subgroups who did not expect outgroups to conform to their standards were susceptible to prototypicality threat, whereas those who did foresee continued assimilation to their norms felt secure in their prototypicality. In sum, this research helps us understand which members of dominant subgroups are most likely to push back against increases in diversity and why.

Limitations and Future Directions

Although this research provides a substantial quantity of evidence in favor of its predictions about the importance of prototypicality threat, there are a number of limitations which are worth addressing. One of the most obvious criticisms of this work is its reliance of relatively small sample sizes, most notably in Study 3. These studies were conducted prior to the "replication crisis" in social psychology and before arguments for substantially larger samples became widespread. We argue that the strength and consistency of effects observed across multiple replications and contexts speaks to the robustness of our theory and findings. Additionally, in response to the ongoing discussion in the field, we intentionally increased the sample sizes used in Studies 4 and 5. Future research on prototypicality threat will benefit from adhering to emerging best practices about ensuring sufficient statistical power.

Another limitation of this work is that, although we predict prototypicality threat may be triggered by various forms of social change, we largely focused on just one: increases in relative outgroup size. In Study 3, we addressed this limitation by controlling for this change and manipulating prototypicality directly, there are likely other triggers of prototypicality threat worth exploring. For example, members of dominant subgroups might experience prototypicality threat when confronted with ideologies that challenge the notion that there should only be one

subgroup to whom all others are expected to assimilate. Multiculturalist or pluralist conceptions of diversity promote the message that dominant subgroups need not be considered normative and assimilated to (Fredrickson, 1999; Huo & Molina, 2006). These ideologies could be doubly threatening in that they would encourage members of non-dominant subgroups to not feel obligated to conform to dominant subgroup norms. Witnessing this, members of dominant subgroups would likely decrease in their outgroup assimilation expectation, increasing their susceptibility to prototypicality threat.

Another area in which further research could be beneficial would be looking at the relationship between prototypicality threat and other forms of group-based threat identified in the literature (e.g., Branscombe, Ellemers, Spears, & Doosje, 1999; Riek, Mania, & Gaertner, 2006; Stephan & Stephan, 2000). Across three studies (Studies 3, 4, and 5) we contrasted the predictive strength of prototypicality threat over realistic threat and found that it consistently explained unique variance in our models, a finding consistent with past tests of prototypicality threat (Danbold & Huo, 2015). Nevertheless, it is likely that there are certain situations and outcomes for which realistic threat may be a more powerful predictor. For example, realistic threat may be a more powerful predictor of policy preferences like the allocation of government resources or whether or not immigrants should be eligible for employment, than would prototypicality threat. Although it is probable both that all threats will always matter to some degree in most contexts, and that these threats feed off of and exacerbate one another, further disentangling these threats empirically will be a productive area of future study.

Implications for Theory

This work fills a significant gap in the literature regarding if and how members of

dominant subgroups experience group-based threats. In doing so, it highlights the importance of identity concerns in the way members of dominant subgroups react to social change. That is, as dominant subgroups see themselves losing their standing, they care about more than just their power and resources. The close association between the dominant subgroup identity and the superordinate category identity provides members of these groups with a secure sense of identity and belonging, that is unsettling to consider losing. This research provides new clarity to the nature of prototypicality threat by clarifying the centrality of negative affect to its experience and unpacking its broader antecedents and consequences.

Another theoretical contribution of this research is the introduction of outgroup assimilation expectation, the belief about whether or not outgroups will voluntarily assimilate to dominant subgroup norms, as a meaningful individual difference variable relevant to prototypicality threat. Although past research has look at how beliefs among members of dominant subgroups about their own prototypicality shapes susceptibility to prototypicality threat, this is the first time that beliefs about non-dominant subgroup behavior have been shown to be influential in shaping expectations about dominant subgroup prototypicality. Although we measured outgroup assimilation expectation in Studies 1 through 3, in Study 5, we showed that this may be malleable via experimental manipulation. Future research should investigate the origins of these beliefs in the real world and the degree to which this is malleable across contexts.

Implications for Growing Diversity

A question that is immediately raised when considering prototypicality threat is how to reduce this threat and its negative consequences for intergroup attitudes. One potential answer,

given the results presented here, would be to argue that if non-dominant subgroups do actively conform to the dominant subgroup norms, then the dominant subgroup will not experience any threat despite changes in relative group size. However, despite the comfort this may bring to members of dominant groups, it would be costly for members of non-dominant subgroups to face the expectation of renouncing or suppressing their individual group identities (Apfelbaum, Norton, & Sommers, 2012; Huo & Molina, 2006; Plaut, Thomas, & Goren, 2009). Therefore, although outgroup assimilation is useful in theory testing, it does not provide a particularly practical solution for reducing prototypicality threat. Therefore, alternative strategies must be developed to mitigate prototypicality threat as increased diversity becomes a lived reality, and not just an anticipated future.

One potential palliative to prototypicality threat may be offered by contact theory, the prediction that over time, through contact with members of non-dominant subgroups, members of dominant subgroups intergroup relations will improve (Pettigrew & Tropp, 2006). After all, at least in the United States, people have historically been fearful, then accepting, of many immigrant groups. However, as prototypicality threat can lead members of dominant subgroups to cut off the influx of newcomers via restrictions on immigration or ending policies of integration, there may not be the opportunity for positive contact to even occur. An alternative strategy may, therefore, look more precisely at the nature of prototypicality threat and how it involves competition over how to define the relevant superordinate category. A potential strategy to reduce prototypicality threat may be to reframe the superordinate category in a way that does not deny or replace the norms of the dominant subgroup, but expands them to be more inclusive of multiple groups. In this way, members of dominant subgroups can see themselves represented

in the norms of the superordinate category, but can also see that it is possible for members of non-dominant subgroups to do the same, reducing the perception of prototypicality as zero-sum.

Conclusion

Diversity is increasing in many countries around the world. Within these countries, many professions and organizations, once segregated by race and gender, are increasing in diversity as well. In order for us to collectively reap the greater equality and productivity promised with growing diversity, we must be attuned to the possibility of greater intergroup conflict that this change may bring as well. Only by understanding the psychological underpinnings of these tensions, as we do here, can we develop strategies to attenuate them.

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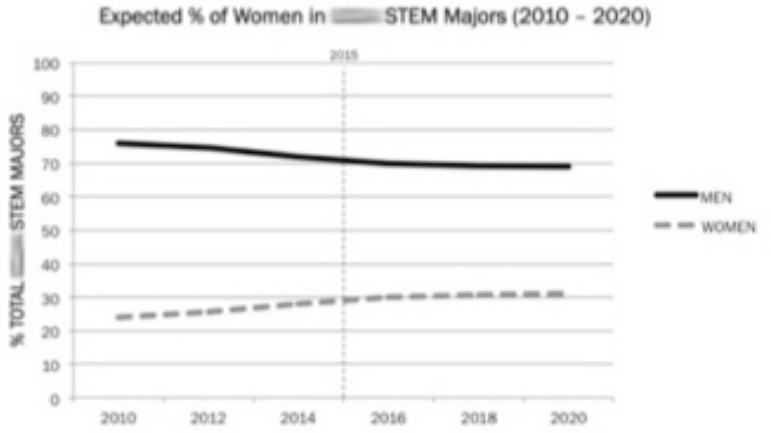
Appendix A – Paper 2 Experimental Stimuli

Paper 2 Study 1 – Majority Retention Condition (University name redacted)

Women expected to remain underrepresented in science and engineering majors at [redacted]

BY STEVE PARK
Posted: April 27, 2015 3:08 am

CAMPUS, NEWS



SHARE TWEET

In recent years, [redacted] has aimed to increase the representation of women in STEM (Science, Technology, Engineering, and Math) majors, with a special focus on majors like Engineering and Computer Science where women are most underrepresented. 2015 marks the 5th anniversary of [redacted]'s Women in STEM Initiative (WSI).

A forthcoming report from the university, however, now states that the WSI has had little effect on the number of women enrolled in STEM majors relative to men at [redacted].

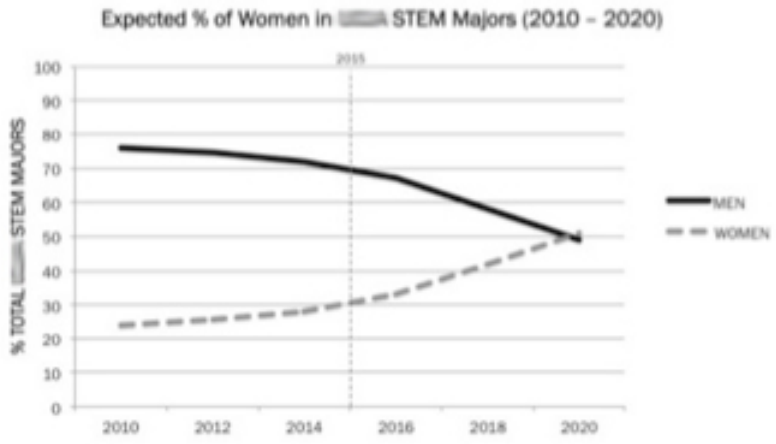
"As a result of the Women in STEM Initiative, we're now seeing no real difference in the proportion of women in STEM majors, especially in majors like Engineering and Computer Science," the report states. "These trends mirror patterns seen at the national level, and so we do not expect to see the number of women in STEM reach the number of men in the coming years."

Paper 2 Study 1 – Majority Loss Condition (University name redacted)

Women expected to surpass men in science and engineering majors at [redacted]

BY STEVE PARK

CAMPUS, NEWS



SHARE TWEET

In recent years, [redacted] has aimed to increase the representation of women in STEM (Science, Technology, Engineering, and Math) majors, with a special focus on majors like Engineering and Computer Science where women are most underrepresented. 2015 marks the 5th anniversary of [redacted]'s Women in STEM Initiative (WSI).

A forthcoming report from the university now states that the WSI has had a dramatic effect on the number of women enrolled in STEM majors relative to men at [redacted].

"As a result of the Women in STEM Initiative, we're now seeing a much higher proportion of women in STEM majors, with significant gains in majors like Engineering and Computer Science," the report states. "These trends mirror patterns seen at the national level, and we expect to see the number of women in STEM reach, and perhaps surpass, the number of men in the coming years."

Paper 2 Study 2 – Majority Retention Condition

SCIENCE

Women Not Expected to Increase in Science and Engineering Fields

JULY 21, 2014

Observatory

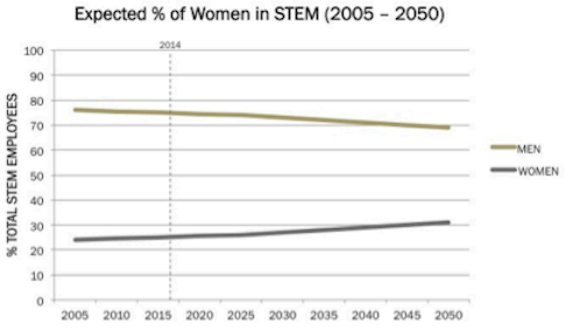
By CASEY JOHNSON

EMAIL
FACEBOOK
TWITTER
SAVE
MORE

For many decades, America has led the world in scientific and technological achievement. As a result, America's STEM (Science, Technology, Engineering, and Mathematics) fields stand at the global forefront of research and innovation.

In the past several years however, some of the largest employers in STEM have been motivated to address the underrepresentation of women in their field. 2014 marks the 8th anniversary of the National Science Foundation's Women in STEM Initiative (WSI).

The WSI has aimed to increase the number of women entering STEM programs at top universities around the country. The most recent data, however, show there has been no significant increase in the percentage of women in these majors over the past 4 years. Extrapolating from these data, the WSI predicts no real changes in the number of women entering STEM professions relative to men.



National Science Foundation

"Despite the efforts of the Women in STEM Initiative, we are still seeing a consistently higher proportion of men entering these fields," the soon to be released WSI 2014 Report states. "If trends continue, we expect to see, at best, a minor increase of women entering STEM careers over the next several decades, remaining a far smaller percentage than men through 2050."

Paper 2 Study 2 – Majority Loss Condition

SCIENCE

Women Expected to Increase in Science and Engineering Fields

JULY 21, 2014

Observatory

By CASEY JOHNSON

EMAIL
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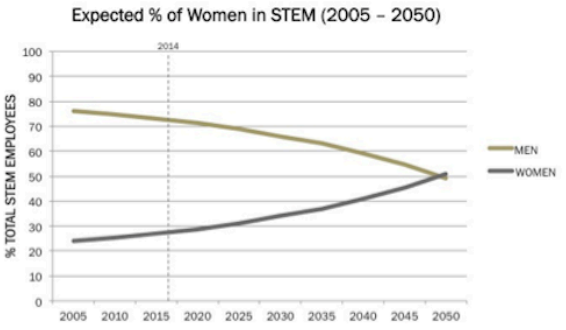
The WSI has aimed to increase the number of women entering STEM programs at top universities around the country. The most recent data show there has been a significant increase in the percentage of women in these majors over the past 4 years. Extrapolating from these data, the WSI predicts a steady surge of women entering STEM professions relative to men.

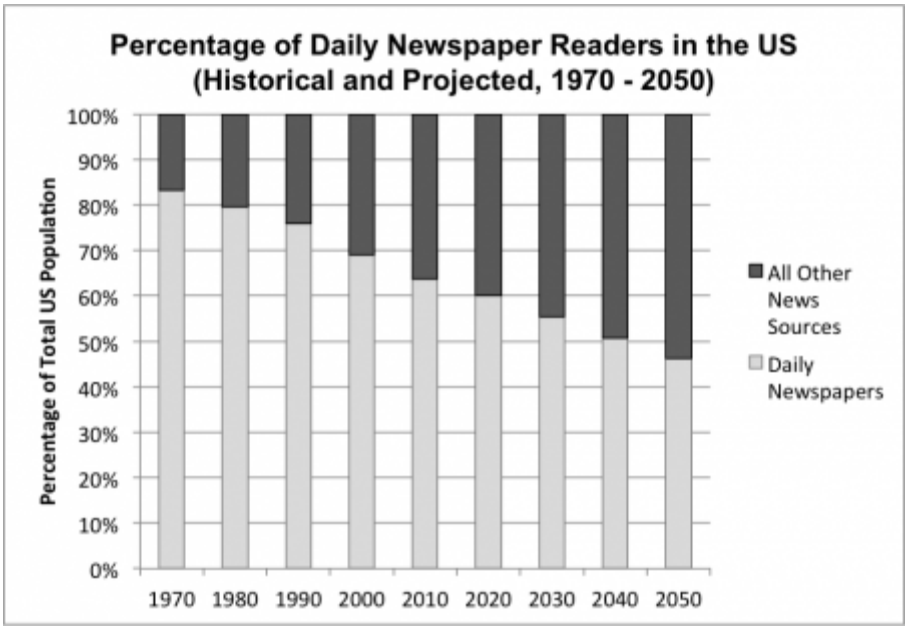


National Science Foundation

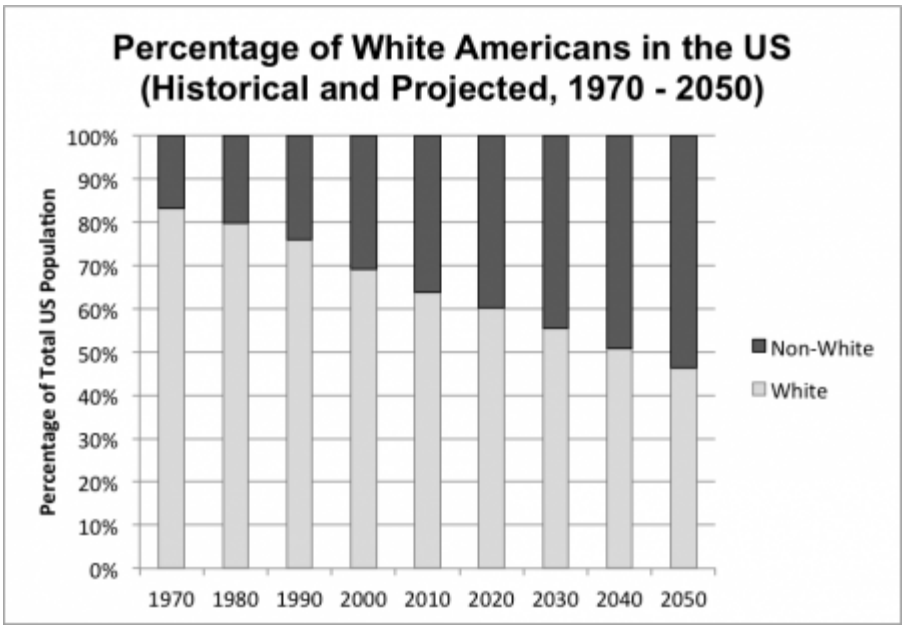
"As a result of the Women in STEM Initiative, we are now seeing a much higher proportion of women on the verge of entering these fields," the soon to be released WSI 2014 Report states. "If trends continue, we expect to see a steady surge of women entering STEM careers over the next several decades, reaching, and perhaps surpassing equal representation with men around 2050."

Appendix B – Paper 3 Experimental Stimuli

Paper 3 Study 2 – Control Condition



Paper 3 Study 2 – Majority Loss Condition



Paper 3 Study 3 – Prototypicality Retention Condition

ScienceSpace

American = White? A Lasting Association

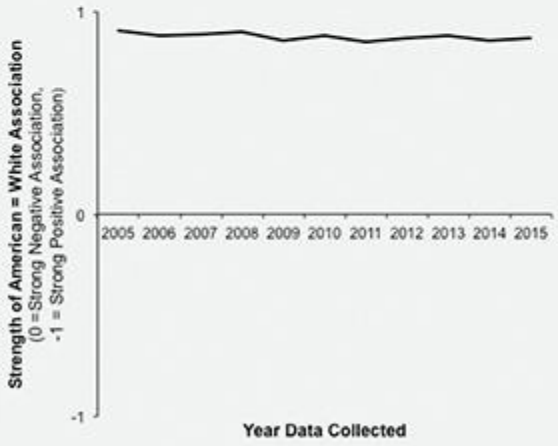
Updated by John Rogers on September 26, 2015, 8:30 a.m. EST

When people are asked to think about "an American", who typically comes to mind? In 2005, researchers at **Harvard University** put this question to the test. The idea was that since Whites have been the majority of the American population for centuries, people would strongly associate being American with being White.

Researchers used well-established techniques designed to get at the automatic associations people may not know that they hold. They found that people of all backgrounds indeed showed a strong association between being American and being White.

What's interesting is that this association has not changed. Each year since 2005, this same association between being American and being White was measured using a large, ethnically diverse, and nationally representative sample. Up to the present day, results looked very similar to how they looked in 2005, with a strong association between being American and being White. Even in 2015, it was shown that people of all ethnicities, still associate being American with being White.

Researchers say that although changing demographics are causing Whites' share of the population in the U.S. to shrink, this change does not seem to weaken the strong association between being American and being White.



Commenting on these findings, expert Dr. Todd Curson from the **American Studies Foundation** said, "For all of American history, the American identity was the White identity. When people thought of an American, they thought of a White person. Now it's clear that this association is here to stay. In the future, ***Whites will still represent what it truly means to be American.***"

Paper 3 Study 3 – Prototypicality Loss Condition

ScienceSpace

American = White? A Fading Association

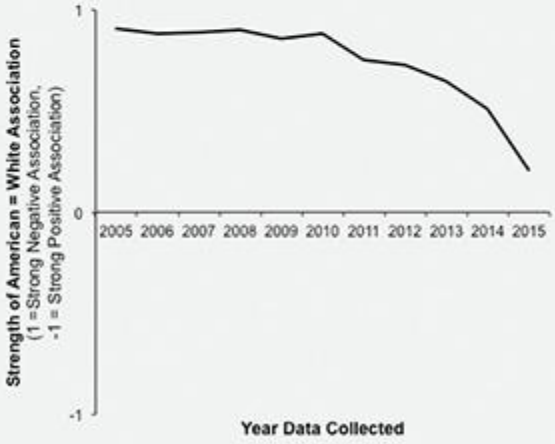
Updated by John Rogers on September 26, 2015, 8:30 a.m. EST

When people are asked to think about "an American", who typically comes to mind? In 2005, researchers at **Harvard University** put this question to the test. The idea was that since Whites have been the majority of the American population for centuries, people would strongly associate being American with being White.

Researchers used well-established techniques designed to get at the automatic associations people may not know that they hold. They found that people of all backgrounds indeed showed a strong association between being American and being White.

What's interesting is that this association is now changing. Each year since 2005, this same association between being American and being White was measured using a large, ethnically diverse, and nationally representative sample. Up until around 2011, results looked very similar to how they looked in 2005, with a strong association between being American and being White. In recent years however, this association has fallen dramatically. In 2015, it was shown that people of all ethnicities, now no longer associate being American with being White.

Researchers say that because changing demographics are causing Whites' share of the population in the U.S. to shrink, this change may be weakening the association between being American and being White.



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Paper 3 Study 5b – International Student Increase and International Students Not Assimilating Condition (University name redacted)

Monday, May 9

In the news: [redacted] Evaluations 2015-2016 [redacted] Election 2016

University releases new report on international students

BY PAT ROGERS
Posted: May 6, 2016 12:52 pm

SHARE TWEET

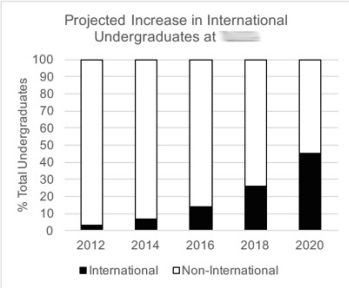
NEWS

As part of an ongoing project to monitor changes within the undergraduate student body, administrators have released a new report detailing trends among international students at [redacted]. The report centers on two key findings, described below.

Key Finding #1 – The number of international students at [redacted] is expected to increase

Over the past few years, the percentage of international students at [redacted] has grown noticeably. Currently about 13% of all undergraduates are international students.

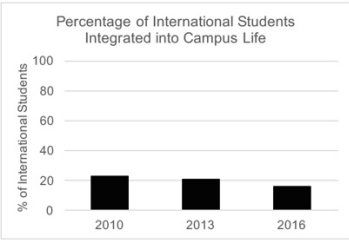
The latest report from the university predicts this number to surpass 25% by the year 2018 and continue to rise to around 40% by 2020. The rising number of international students is part of the university's efforts to transform [redacted] into a "global university".



Key Finding #2 – International students at [redacted] are integrating poorly

Whereas most non-international undergaraduates are well integrated into life at [redacted], a student poll in 2010 found that only 22% of international students at [redacted] showed signs of being fully integrated in campus culture, as measured by participation in campus activities, as well as living with and being friends with domestic students. A more recent poll has shown that this number has showed no signs of improvement, decreasing to less than 20%. As it appears most international students are disinterested in integrating into campus culture, it is unlikely that this number will increase soon.

As a result, classic [redacted] rituals like knowing the [redacted] and fight songs, attending student organized and athletic events, living in the dorms, and knowing campus trivia are hard to find in the international student community. "[redacted] has a long and rich history of traditions," said Susan Barker of the Student Alumni Association, "but most international students just aren't interested in the traditional campus culture."



Paper 3 Study 5b – International Student Decrease and International Students Assimilating Condition (University name redacted)

Monday, May 9

In the news: [redacted] Evaluations 2015-2016 [redacted] Election 2016

University releases new report on international students

BY PAT ROGERS
Posted: May 6, 2016 12:52 pm

SHARE TWEET

NEWS

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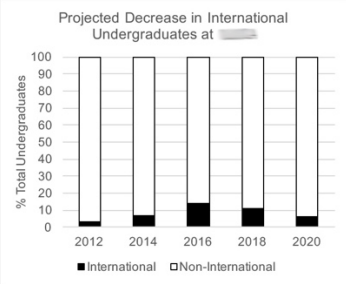
Over the past few years, the percentage of international students at [redacted] has grown noticeably. Currently about 13% of all undergraduates are international students.

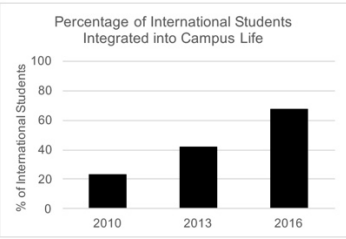
The latest report from the university, however, predicts this number to decrease, dropping to around 10% by 2018 and around 5% by 2020. The declining number of international students is part of the university's efforts to maintain [redacted]s status as a [redacted] public university.



Key Finding #2 – International students at [redacted] are integrating well

Whereas most non-international undergaraduates are well integrated into life at [redacted], a student poll in 2010 found that only 22% of international students at [redacted] showed signs of being fully integrated in campus culture, as measured by participation in campus activities, as well as living with and being friends with domestic students. A more recent poll, however, has shown that this number has risen to over 60%. As it appears most international students are now highly interested in integrating into campus culture, it is likely that this number will continue to rise.

As a result, classic [redacted] rituals like knowing the [redacted] and fight songs, attending student organized and athletic events, living in the dorms, and knowing campus trivia are easy to find in the international student community. "[redacted] has a long and rich history of traditions," said Susan Barker of the Student Alumni Association, "and most international students are becoming very interested in the traditional campus culture."



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