

# The Role of Diversity Exposure in Whites' Reduction in Race Essentialism Over Time

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## Abstract

Despite multidisciplinary theorizing on the consequences of the changing racial demographics in the United States, few studies have systematically examined how exposure to racial diversity may impact White individuals' lay beliefs about race. In a longitudinal study, we explored whether living in a racially diverse environment with a high multiracial population was related to White individuals' endorsement of race essentialism and its downstream consequences. Endorsement of race essentialism decreased over time, and greater diversity of acquaintances over time was associated with this decrease. Race essentialism reduction also corresponded with a decrease in modern racism and social dominance orientation, and an increase in cognitive flexibility, over time. These findings are consistent with the idea that a racially diverse social context can shape endorsement of race essentialism and lead to social and cognitive benefits for White individuals.

## Keywords

race essentialism, racial diversity, intergroup relations

How do social interactions with racial out-group members confer social and cognitive benefits? Positive racial intergroup contact leads to more favorable racial attitudes (e.g., Pettigrew & Tropp, 2006, 2008). Racial diversity also supports cognitive benefits, including better task performance (Phillips, Northcraft & Neale, 2006), more creative thinking (Antonio et al., 2004), more careful information processing in group tasks (Sommers, 2006), and may uniquely impact White majority group members (Sommers, Warp, & Mahoney, 2008). Given the effect of positive intergroup contact on racial attitudes and cognitive outcomes (e.g., Crisp & Turner, 2011; Pettigrew & Tropp, 2006; Phillips et al., 2006), exposure to racial diversity could challenge how individuals think about racial categories.

Psychological essentialism—the lay theory that social categories have underlying essences that make them what they are—leads people to view social categories as biologically based, immutable, and informative to the perceiver (Gelman, 2004; Haslam, Rothschild, & Ernst, 2000; Prentice & Miller, 2007). Little research to date has empirically tested whether exposure to diversity can influence how White people think about race as a social category or whether there are long-term downstream consequences of changes in essentialist beliefs about race, such as greater cognitive flexibility. Here, we examine both the antecedents and the consequences of race essentialism longitudinally by probing new arrivals' adaptation to a racially diverse context (Hawai'i) over a 9-month period. We measure White individuals' race essentialism, egalitarian

attitudes, and cognitive flexibility, as they adapt to the diversity of this new environment.

## Potential Antecedent of Race Essentialism: Racial Diversity

Research suggests exposure to racial diversity may serve as one antecedent of race essentialism. In a study using computational simulation and converging mouse-tracking methods, individuals exposed to more out-group members perceived racial categories as less differentiated (Freeman, Pauker, & Sanchez, 2016). Developmental studies provide further correlational support for the link between racial diversity and reduced essentialism. Children from more racially diverse environments, or who attended integrated compared to segregated schools, exhibited less essentialism (Deeb, Segall, Birnbaum, Ben-Eliyahu, & Diesendruck, 2011; Pauker, Xu, Williams, & Bidle, 2016; Rhodes & Gelman, 2009). Additionally, studies have

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demonstrated a correlational and experimental association between exposure to racial ambiguity (e.g., individuals who are difficult to racially categorize)—a particular type of racial diversity—and reduced essentialist beliefs about race (Sanchez, Young, & Pauker, 2015; Wilton, Sanchez, & Giamo, 2014; Young, Sanchez, & Wilton, 2013). Notably, this past research used brief encounters with racial ambiguity and brief time periods between assessments. Despite this initial support, little is known about whether race essentialism correlates with diversity exposure over the long term—a gap we seek to address in the current study.

### Potential Consequences of Race Essentialism

**Egalitarian attitudes.** Race essentialism underlies several aspects of constructing and upholding racial inequality. Holding or being primed with essentialist beliefs about race is associated with increased racial out-group stereotyping (e.g., Bastian & Haslam, 2006; Keller, 2005; Levy, Stroessner, & Dweck, 1998; Yzerbyt, Corneille, & Estrada, 2001), decreased interest in interacting with racial out-group members (Lee, Wilton, & Kwan, 2014; Williams & Eberhardt, 2008), and increased expressions of prejudice (Jayaratne et al., 2006; Keller, 2005; Williams & Eberhardt, 2008). The relationship between race essentialism and prejudice has been shown with both blatant/traditional and subtler measures of prejudice, including modern racism (Jayaratne et al., 2006; Keller, 2005; Williams & Eberhardt, 2008). In the current study, we test whether a reduction in race essentialism corresponds with decreased endorsement of modern racism.

Similarly, race essentialism and support for existing racial hierarchies are mutually supportive constructs. If differences between racial groups are natural, it may follow that existing racial inequalities should also be natural and vice versa. Indeed, race essentialism is correlated with system-justifying motivations that aim to maintain current racial hierarchies, such as social dominance orientation (SDO; Keller, 2005; Williams & Eberhardt, 2008). In the current study, we test whether a reduction in race essentialism corresponds with decreased endorsement of SDO (see Brescoll, Uhlmann, & Newman, 2013).

**Cognitive flexibility.** Race essentialism also has consequences for thinking flexibly about social and nonsocial categories. People who adopt less essentialist beliefs about race perceive race as more fluid and malleable (Chao, Chen, Roisman, & Hong, 2007; Mallon, 2007; No et al., 2008) and have more flexible perceptions of social category membership (Pauker & Ambady, 2009; Slepian, Weisbuch, Pauker, Bastian, & Ambady, 2014). Additionally, holding and making salient multiple racial identities (which goes against essentialist thinking) increases flexibility in cognitive processing (Gaither, Remedios, Sanchez, & Sommers, 2015). Holding essentialist beliefs about race, on the other hand, leads individuals to be close-minded and hampers creative thinking (Tadmor, Chao, Hong, & Polzer, 2013). The current study tests whether a reduction

in race essentialism is associated with greater flexibility in cognitive processing.

### Current Research

One ideal setting to examine whether exposure to racial diversity leads to changes in race essentialism is Hawai'i. Among the United States, Hawai'i houses the most racial diversity, the largest multiracial population, and is one of the few states with a non-White majority. According to the U.S. Census (2010), Asians make up the largest group in the state (38.6%), followed by multiracial individuals (23.6%), Whites (22.7%), and Native Hawaiians and Other Pacific Islanders (10%). Additionally, there is recent evidence that children raised in Hawai'i exhibit less essentialist thinking about race compared to children raised in the continental United States (Pauker et al., 2016). Exposure to a racially diverse setting with a large multiracial population could lead to shifts in race essentialism that should shape social and cognitive processing. Hawai'i serves as an ideal setting to explore this claim, providing insight into how impending demographic changes in the United States may impact inter-group relations.

Thus, the goals of the current study are to (1) investigate whether essentialist beliefs about race change over time in a racially diverse setting, (2) examine whether the diversity of newly formed relationships in this setting is associated with a change in race essentialist beliefs, and (3) explore the downstream consequences of essentialist belief change. In line with these goals, we have three hypotheses. First, White students who have moved from the continental United States to Hawai'i will show a reduction in their race essentialism. Second, exposure to racial diversity will be associated with a decrease in White students' endorsement of race essentialism over time. Third, a decrease in White students' endorsement of race essentialism over time will be associated with an increase in egalitarian attitudes (i.e., a decrease in modern racism and SDO) and cognitive flexibility over time.

## Method

### Participants and Design

The current research follows changes in essentialist beliefs among 143 White (104 women and 39 men) incoming first-year students who moved from the continental United States to Hawai'i to attend college. This population typically represents 29% of the incoming first-year class of University of Hawai'i at Mānoa (UHM) students. We based our sample size on a data collection stop point of 2 years given the tenure of the grant period. We collected data longitudinally across two time points; data were collected at Time 1 (T1) around the first-year student orientation and at Time 2 (T2) approximately 9 months later ( $M = 8.37$ ,  $SD = 3.20$ ) at the end of students' first year of college.

Of the 143 students who participated in our longitudinal survey study, 99 responded at both time points. According to university records, 21% of the original 143 students were no

longer enrolled at T2. When we remove those students, the overall attrition rate of  $\sim 30\%$  drops to  $\sim 9\%$ . Thus, the majority of attrition likely reflects the typical first-year dropout rate (35.7%) for White students from UHM (Mānoa Institutional Research Office, 2014).

### Measures and Procedure

We measured respondents' self-reported endorsement of race essentialism, exposure to members of various racial groups, egalitarian attitudes, and flexibility in thinking at T1 and T2.<sup>1</sup>

**Race essentialism.** We measured race essentialism with the Race Conceptions Scale (RCS; Williams & Eberhardt, 2008). The RCS is a well-validated scale with good internal ( $\alpha = .84$  to  $.93$ ) and test-retest reliability ( $r = .82$ ) that measures the extent to which individuals believe that race is biologically based versus socially constructed. Respondents rated 22 items on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Higher scores indicated greater endorsement of race essentialism: T1 ( $\alpha = .82$ ) and T2 ( $\alpha = .90$ ).

**Racial diversity exposure.** We assessed respondents' exposure to members of various racial groups following prior research on intergroup contact (e.g., Eller & Abrams, 2004; Levin, van Laar, & Sidanius, 2003). Respondents rated their exposure to different groups using 3 items: "How many of your (friends, close friends, and acquaintances) identify as (Asian, Biracial, Black, Hispanic, and White)?" on a scale from 1 (*none*, 0%) to 7 (*almost all*, 100%). From these items, we transformed participants' responses to proportions (0% = 0, 50% = .50) and averaged the friends and close friends items. We kept the acquaintance item separate for each racial group because prior research suggests that the nature of exposure (i.e., friendship vs. acquaintance) may influence the impact of interracial exposure on intergroup attitudes (e.g., Pettigrew & Tropp, 2006).

To obtain the racial diversity exposure score, we calculated a Simpson Index of diversity score (Simpson, 1949). The Simpson Index calculates the probability that any two individuals randomly selected from participants' social network will be from different racial groups (Juvonen, Nishina, & Graham, 2006). We calculated this score based on five racial groups: Asian, Biracial, Black, Hispanic, and White. To calculate the Simpson Index, we took the proportion of students' self-reported friends and acquaintances who belonged to each racial group, squared the value for each group, summed the squared values across the five racial groups, and subtracted this final value from one.<sup>2</sup> For example, someone with 30% White and 70% Asian friends would have a score of .42, but someone with 60% White, 15% Asian, 15% Biracial, and 10% Hispanic friends would have a score of .59. Thus, representation from multiple racial groups rather than only a few influences the score. Simpson Index scores range from 0 to 1 and serve as our measure of racial diversity exposure. The racial group exposure scores used to calculate the Simpson Index were reliable at T1 ( $\alpha s = .75$  to  $.92$ ) and T2 ( $\alpha s = .83$  to  $.92$ ) for friends and close

friends, which were averaged together; acquaintances were measured with a single item for each racial group.

**Egalitarian attitudes.** Following prior work (e.g., Knowles, Lowery, & Schaumburg, 2009), the Modern Racism Scale (MRS; McConahay, 1986) and SDO (Pratto, Sidanius, Stallworth, & Malle, 1994) were used to measure egalitarian attitudes. For the MRS, respondents rated 6 items on a scale from 1 (*strongly disagree*) to 7 (*strongly agree*). Higher scores indicated greater displays of modern racism: T1 ( $\alpha = .79$ ) and T2 ( $\alpha = .89$ ). For the SDO Scale, respondents rated 14 items on a scale from 1 (*very negative*) to 7 (*very positive*). Higher scores indicated greater support for social inequality: T1 ( $\alpha = .89$ ) and T2 ( $\alpha = .92$ ).

**Cognitive flexibility.** Following Isen and Daubman (1984) and others (e.g., Friedman & Förster, 2000), respondents were asked to categorize weak, moderate, and strong exemplars of four different categories (furniture, vehicle, vegetable, and clothing) using Rosch's (1975) norms. Respondents received nine exemplars (3 at each level of fit; e.g., camel, bike, and car for the category vehicle) per category, totaling 36 exemplars. Exemplars were presented in blocks by their respective categories with the stipulation that the first exemplar in each category was always a strong exemplar (Isen & Daubman, 1984). Respondents were asked to rate the extent to which each exemplar belonged to the category on a 10-point scale from 1 (*definitely does not belong*) to 10 (*definitely does belong*). Cognitive flexibility would be displayed by rating weak exemplars as more strongly belonging to that category (e.g., a respondent could flexibly see that a weak exemplar-like camel could belong to the category vehicle). Effects were strongest with the weak exemplars, but we found a similar pattern of results with the moderate exemplars. Therefore, we collapsed the cognitive flexibility scores across weak and moderate exemplars ( $\alpha = .70$ ).

## Results

### Analytic Strategy

We used multilevel modeling to analyze our longitudinal data. At Level 1 of our model, the unit of analysis was the time wave, which included measurements over two time points within participants. At Level 2 of our model, the unit of analysis was individual participants. Multilevel modeling is well suited for analyzing these data because it is robust for handling missing data in longitudinal designs and adjusts for bias in significance testing due to nonindependence of observations (Singer & Willet, 2003; Snijders & Bosker, 1999). While data from all participants are included in the estimation of fixed effects, those individuals who only participated during one time point contribute less information to the estimation of random effects parameters. Our multilevel models were estimated using full information maximum likelihood estimation which allows for missing values while estimating individuals' trajectories across

time (Dodge, Shen, & Ganguli, 2008; Nagin, 2005) and is recognized as an appropriate method of handling missing longitudinal data (Allison, 2001; Little & Rubin, 1989). Moreover, we examined whether those who completed both time points ( $n = 99$ ) differed from those who completed only one time point ( $n = 44$ ) on all T1 variables and no differences were found on their essentialism, diversity exposure, cognitive flexibility, or egalitarian attitudes ( $ps > .13$ ). Finally, analyses only using those who participated in T1 and T2 yielded similar results.

We used growth curve analysis with time-varying covariates—an approach that allowed us to test whether a change in our predictors over time was associated with a change in our outcomes. Time wave and time-varying predictors were included at Level 1 of our model. Coefficients for time-varying predictors were fixed (i.e., not allowed to vary randomly). The time-varying predictor variables were T1 centered (Jugert, Noack, & Rutland, 2011; Singer & Willet, 2003). Thus, the T1 value for our predictors was included in each model as well as the deviation of the subsequent time point from the original T1 value (time-varying predictor); T1 values were added to the model as a Level 2 predictor of intercepts. We centered time wave at T2 (time was coded as  $T1 = -1$  and  $T2 = 0$ ) to create a time lag between predictors and outcomes. This approach allowed us to examine whether there was a between-subjects effect (differences between subjects at T1 predicting differences in T2 levels of the outcome variable) or a within-subjects effect (change in the variable across time predicting a change in the outcome variable; Singer & Willet, 2003) of the time-varying predictor on our outcome variables.

We first use unconditional growth models to look at mean-level changes in race essentialism, egalitarian attitudes, and cognitive flexibility over time. We then present conditional growth models with either diversity exposure or race essentialism as a time-varying predictor to examine whether within-subjects change in racial diversity exposure is associated with a change in race essentialism over time and whether within-subjects change in race essentialism is associated with a change in egalitarian attitudes and cognitive flexibility over time. Additional analyses conducted on a subset of items in the RCS that reference race generally, as opposed to White/Black groups specifically, revealed similar results (see Online Supplementary Material; see Table 1 for the means and standard deviations for longitudinal measurement of all variables and see Table 2 for the full set of point biserial correlations at T1 and T2).

### Racial Diversity Exposure and Essentialism Change

To examine whether race essentialism changed over time, we fit an unconditional growth model that examined mean-level changes in race essentialism across the two time points. Regressing race essentialism onto time wave revealed that race essentialism significantly decreased over the course of the study. At T1, race essentialism was significantly higher ( $M = 4.25$ ,  $SD = .73$ ) than at T2 ( $M = 3.99$ ,  $SD = .93$ ),  $B = -.20$ ,  $SE = .06$ ,  $t = -3.67$ ,  $p < .0001$ , 95% confidence interval

**Table 1.** Means and Standard Deviations for Longitudinal Measurements of All Variables.

	Time 1	Time 2
Race essentialism <sup>a</sup>	4.25 (0.73)	3.99 (0.93)
Diversity friends	0.661 (0.13)	0.657 (0.15)
Diversity acquaintances	0.729 (0.09)	0.718 (0.11)
Modern racism	2.68 (0.12)	2.55 (1.19)
Social dominance orientation	2.27 (0.89)	2.26 (0.92)
Cognitive flexibility <sup>a</sup>	5.94 (1.37)	6.47 (1.24)

Note. Mean values for focal predictors at Time 1 (T1) and Time 2 (T2). Standard deviations appear in parentheses.

<sup>a</sup>After the variable name denotes that a change from T1 to T2 was statistically significant.

(CI) =  $[-.31, -.09]$ . Therefore, our hypothesis that participants' essentialist beliefs about race would decrease over time was supported.

We also collected additional longitudinal data from first-year students born in Hawai'i ( $N = 52$ ; 42 female and 10 male; 67% Asian, 27% multiracial including part Native Hawaiian, 4% White, and 2% Black) who were attending college in Hawai'i (and thus the diversity of their environment was not increasing) to determine whether simply attending college for 1 year was associated with a decrease in race essentialism ( $\alpha = .83$ ). Among students born in Hawai'i, their race essentialism increased (from  $M = 3.89$  to  $4.32$ ), not decreased, over the course of their first year in college,  $B = .44$ ,  $SE = .11$ ,  $z = 4.06$ ,  $p < .0001$ . Therefore, the documented reduction in race essentialism among new arrivals cannot be attributed to the college experience alone, but rather seems specific to newcomers to Hawai'i who are experiencing a new diverse context. We address the unexpected increase in race essentialism for students native to Hawai'i in the General Discussion section.

Next, we predicted that participants' change in racial diversity exposure as measured by the Simpson Index would be associated with race essentialism change over time. We ran a conditional growth model examining within-subjects change where we regressed race essentialism onto time wave centered at T2 and diversity exposure (separately for friends and acquaintances) as time-varying covariates (centered at T1, which means diversity of friends and acquaintances at T1 are in the model). Initial levels of diversity of friends corresponded with participants' level of race essentialism at T2,  $B = -1.29$ ,  $SE = .59$ ,  $t = -2.18$ ,  $p = .031$ , 95% CI =  $[-2.46, -.12]$ , though no such relationship existed for initial levels of diversity of acquaintances,  $B = -.48$ ,  $SE = .92$ ,  $t = -.52$ ,  $p = .602$ , 95% CI =  $[-2.30, 1.34]$ . Within-subjects increase in diversity of friends was not associated with changes in race essentialism,  $B = .74$ ,  $SE = .72$ ,  $t = 1.02$ ,  $p = .308$ , 95% CI =  $[-.69, 2.18]$ , but importantly, within-subjects increase in diversity of acquaintances corresponded with a decrease in race essentialism endorsement over time,  $B = -1.60$ ,  $SE = .71$ ,  $t = -2.26$ ,  $p = .026$ , 95% CI =  $[-3.00, -.20]$ . Therefore, greater diversity of acquaintances over time corresponded with lower endorsement of race essentialism over time. Originally, we

**Table 2.** Point Biserial Correlations at Time 1 and Time 2.

	Race Essentialism	SDO	Modern Racism	Cognitive Flexibility	Diversity Friends
Time 1					
Race essentialism					
SDO	.28***				
Modern racism	.39***	.55***			
Cognitive flexibility	-.13	.10	-.08		
Diversity friends	-.23**	-.01	-.14	.13	
Diversity acquaintances	-.14	-.03	-.12	.05	.54***
Time 2					
Race essentialism					
SDO	.38***				
Modern racism	.57***	.51***			
Cognitive flexibility	-.36***	-.06	-.15		
Diversity friends	-.16	-.04	-.03	.23*	
Diversity acquaintances	-.23*	-.02	-.23*	.19	0.58***

Note. SDO = social dominance orientation.

\*\*\* $p < .001$ . \*\* $p < .01$ . \* $p < .05$ .

anticipated that both diversity of friends and acquaintances would correspond with a decrease in race essentialism over time. Instead, we found that *initial* exposure to diverse *friends* was associated with lower levels of essentialism at T2, whereas it was the *increase* in exposure to diverse *acquaintances* that corresponded to a significant reduction in race essentialism over time. We further discuss these unanticipated results in the General Discussion section.

### Race Essentialism Change and Egalitarian Attitude Change

To examine whether modern racism and SDO changed over time, we fit an unconditional growth model that examined mean-level changes for these variables across the two time points. We regressed modern racism and SDO separately onto time wave centered at T2. Modern racism and SDO were not significantly higher at T1 compared to T2,  $B_s = -.10$  and  $.01$ ,  $SE_s = .10$  and  $.08$ ,  $t_s = -.96$  and  $.16$ ,  $p_s = .338$  and  $.872$ , 95% CIs  $[-.31, .11]$  and  $[-.15, .17]$ . Although participants' modern racism and SDO did not decrease over time on average, examination of the random effects revealed significant heterogeneity in the intercept and slope coefficients, indicating predictors of this heterogeneity should be explored.

Thus, we examined the prediction that participants' change in race essentialism would be associated with changes in egalitarian attitudes over time. We ran conditional growth models where we regressed modern racism and SDO separately onto time wave centered at T2 and race essentialism as a time-varying covariate (centered at T1). Lower endorsement of race essentialism at T1 corresponded with lower levels of modern racism and SDO at T2,  $B_s = .62$  and  $.30$ ,  $SE_s = .10$  and  $.08$ ,  $t_s = 6.24$  and  $3.64$ ,  $p_s < .008$ , 95% CIs  $[.42, .81]$  and  $[.14, .47]$ . Importantly, within-subjects decreases in endorsement of race essentialism were associated with decreases in modern racism and SDO over time,  $B_s = .62$  and  $.43$ ,  $SE_s = .14$  and  $.11$ ,

$t_s = 4.42$  and  $3.92$ ,  $p_s < .003$ , 95% CIs  $[.34, .90]$  and  $[.21, .65]$ . Therefore, our hypothesis was supported—participants' reduction in race essentialism was associated with decreases in non-egalitarian attitudes.

### Cognitive Benefits of Reduction in Essentialism

To examine whether cognitive flexibility changed over time, we fit an unconditional growth model where we regressed cognitive flexibility onto time wave. Participants' cognitive flexibility significantly increased from T1 ( $M = 5.94$ ,  $SD = 1.37$ ) to T2 ( $M = 6.47$ ,  $SD = 1.24$ ),  $B = .55$ ,  $SE = .15$ ,  $t = 3.78$ ,  $p < .001$ , 95% CI  $[.26, .84]$ ; participants displayed greater cognitive flexibility over time.

We hypothesized that participants' decrease in endorsement of race essentialism over time would relate to increases in their cognitive flexibility over time. To examine this prediction, we regressed cognitive flexibility onto time wave centered at T2 and race essentialism as a time-varying covariate (centered at T1). Lower race essentialism at T1 was associated with higher levels of cognitive flexibility at T2,  $B = -.34$ ,  $SE = .12$ ,  $t = -2.82$ ,  $p = .005$ , 95% CI  $[-.58, -.10]$ . Importantly, within-subjects decreases in endorsement of race essentialism corresponded with an increase in cognitive flexibility over time,  $B = -.43$ ,  $SE = .21$ ,  $t = -2.05$ ,  $p = .042$ , 95% CI  $[-.85, -.02]$ . We also tested whether race essentialism mediated the effect of time wave on cognitive flexibility (see Online Supplementary Material). A reduction in race essentialism fully mediated the effect of time wave on an increase in cognitive flexibility over time.

### General Discussion

The current study shows that (1) race essentialism is malleable over time, (2) essentialist beliefs about race may be reduced due in part to racial diversity exposure, and (3) a reduction in race essentialism is associated with an increase in egalitarian

attitudes and cognitive flexibility. White students who moved from the continental United States to Hawai'i showed a significant reduction in their essentialist beliefs about race over their first year of college, and this was related to increases in the racial diversity of their acquaintances. For White students whose race essentialism decreased, there was an increase in their egalitarian attitudes and cognitive flexibility.

The current study is the first to use a naturalistic longitudinal design to test whether White newcomers to a racially diverse environment experience a reduction in their essentialist beliefs. The longitudinal nature of our study allowed us to demonstrate how the social environment—specifically a shift to a more racially diverse, highly multiracial environment—is related to a reduction in White individuals' race essentialist thinking over a longer period of time. It is unlikely this effect was because of attending college, as students from Hawai'i (who did not experience a shift in the diversity of their environment) did not exhibit a decrease in their race essentialism over their first year in college.

There were interesting, unexpected differential associations between students' friendship compared to acquaintance diversity and race essentialism. Higher *initial* levels of students' diverse friendships were related to lower essentialism levels 9 months later. Students, however, did not change overall in their friendship diversity over this first year and any variability in *changes* in friendship diversity was *not* related to essentialism change. Students also did not change overall in acquaintance diversity, but variability in students' *changes* in acquaintance diversity was related to essentialism change—those students who did show greater increases in acquaintance diversity also showed greater decreases in race essentialism. While speculative, it is possible that cross-race friendships take more time to form than acquaintances, given the difficulty in forming and keeping cross-race friendships to begin with (Hallinan & Williams, 1987; Trail, Shelton, & West, 2009). So, the results may reflect a change in a precursor to friendships—acquaintances—that is meaningful, and given more time, these relationships may solidify into friendships. Thus, the lack of associations with friendship diversity change in the current study could be due to a lack of time to form new cross-group friendships.

### *Intergroup Consequences of Race Essentialism*

Changes in race essentialism were associated with social and cognitive benefits over a 9-month period. Consistent with prior literature showing that essentialist beliefs about race hampers creative thinking (Tadmor et al., 2013), we found that reductions in race essentialism over time was associated with greater cognitive flexibility. Similarly, in line with previous research (e.g., Prentice & Miller, 2007), our findings indicate that a reduction in essentialist thinking was associated with increases in egalitarian attitudes over time. These findings suggest that reductions in race essentialism could be a long-term mechanism for how diversity changes racial attitudes and cognitive functioning, providing some insight into *how* diversity

produces social *and* cognitive benefits. Furthermore, as we move toward a multiracial society, the longitudinal results give us insights grounded in a naturalistic context into how diversity may impact people's thinking about race as a social category and how these changing racial conceptions relate to changing egalitarian ideas and cognitive flexibility. These data also raise the question of whether there is a tipping point where exposure to diversity in a context becomes enough for people to change rather than hold on to their existing worldviews.

### *Future Directions and Limitations*

This study is the first to demonstrate how racial diversity in White respondents' social environment relates to decreased endorsement of essentialist beliefs about race. Yet, there may be other aspects of respondents' social environment that the present study could not account for that could impact race essentialism, such as the extent to which the intergroup context espouses norms that value diversity (Christ et al., 2014), provides multicultural experiences (Leung & Chiu, 2010; Tadmor, Hong, Chao, Wiruchnipawan, & Wang, 2012), or supports the use of generic language when describing racial categories (Rhodes, Leslie, & Tworek, 2012). Future research should explore these additional mechanisms. Additionally, the measures of diversity exposure included in this study are self-report measures. Consistent with prior work, participants reported primarily same-race friendships ( $M_s = 63\text{--}69\%$ ) and acquaintances ( $M_s = 55\text{--}62\%$ ). Although it is possible that self-reports of cross-race relationships were inflated, given the complexity of the diversity network calculation, it is unlikely that demand characteristics influenced the current results. However, self-report data may obscure nuances in diversity exposure, and future research should include more objective measures of students' social network diversity (e.g., sports team or club memberships).

The present study design also focused exclusively on White students' race essentialist beliefs. Future research should examine whether these same changes are as prevalent among monoracial racial minority individuals. It may be the case that exposure to a racially diverse, multicultural setting influences racial minority individuals' endorsement of race essentialism, albeit to a lesser extent than it does for racial majority group members. For example, developmental studies have shown that both majority and minority group children in integrated schools exhibit less essentialism than those in monocultural, segregated schools, but these effects tend to be stronger for majority compared to minority kids (Deeb et al., 2011). Interestingly, in the current study, a primarily non-White sample of students local to Hawai'i experienced an unexpected increase in race essentialism. While location did not shift for these students, their social context may have due to the increased exposure to White individuals in their college setting, which then may have been unduly exposed them to more essentialist beliefs about race and resulted in social tuning (Sanchez et al., 2015). Future research should examine the fit between the diversity of a students' pre-college and college environment as well as their racial

majority/minority status to help disentangle the effect of changes in diversity from simply attending college or students' majority/minority status.

## Conclusion

The current study used a novel longitudinal approach to investigate exposure to racial diversity and White students' endorsement of race essentialism over time. As White students spent more time in Hawai'i, they were less likely to endorse race essentialism, and this reduction in essentialism was related to decreases in modern racism and SDO and increases in cognitive flexibility. The observed reduction in race essentialism and the positive downstream consequences illuminate the importance of psychological essentialism for intergroup relations and highlight the benefits of exposure to a racially diverse environment with a large multiracial population for White individuals.

## Authors' Note

Kristin Pauker and Colleen Carpinella contributed equally to this manuscript.

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## Notes

1. Additional measures included as part of the goals of the National Science Foundation grant (gender essentialism, social category flexibility, and perceptions of racial equity in Hawai'i and the United States) are not reported because of the short format of this report. Gender essentialism had nonsignificant effects. Social category flexibility, though related to race essentialism, was conceptually redundant with cognitive flexibility and was researcher created, so we focused on the validated measure of cognitive flexibility. Race essentialism was not consistently associated with perceptions of racial equity and the pattern of results was not hypothesized.
2. The formula is:  $D_C = 1 - \sum_{i=1}^g p_i^2$  where  $g$  = the number of groups, in this case 5, and  $p$  is the proportion of individuals in each group.

## Supplemental Material

The supplemental material is available in the online version of the article.

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