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ABSTRACT

Understanding whether racial attitudes are malleable is critical for addressing the underlying causes of racial discrimination. We examine whether white males' stated attitudes and behavior toward African Americans change based on the number and type of black peers to whom they are exposed. To overcome selection bias, we exploit data from the U.S. Air Force Academy in which students are randomly assigned to peer groups. Results show significant evidence in favor of the contact hypothesis. White males are significantly affected by both the number (quantity) and aptitude (quality) of the black peers with whom they are exposed. Specifically, white men randomly assigned to higher-aptitude black peers report being more accepting of blacks in general and are more likely to match with a black roommate the following year after reassignment to a new peer group with a different set of black peers. We also find that, ceteris paribus, exposure to more black peers significantly increases the probability of a bi-racial roommate match.

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1 Introduction

Considerable attention has been paid to developing the theory of racial discrimination as well as to documenting its empirical prevalence (see Lang and Lehmann (2012) for a thorough recent review.) By comparison, less is known about how people form racial attitudes, and whether and how these attitudes change over time. The purpose of this paper is to address not only how racial attitudes change, but whether any changes in attitude are accompanied by observable changes in *behavior* toward other groups.

We do so in the context of the contact hypothesis, a concept first introduced by Williams Jr (1947) and Allport (1954) in which interpersonal contact can be an effective way of reducing prejudice between groups. The primary difficulty in empirically assessing the contact hypothesis has been overcoming selection and simultaneity problems. As a result, while the cross-sectional evidence is generally consistent with this hypothesis (Pettigrew, 1998), a lingering concern is that this relationship could be driven by reverse causation or confounding factors that impact both attitudes and the choice to associate with other groups. These concerns have led to a handful of studies in which intergroup contact is randomly assigned. Most of these studies have focused on settings such as college dormitory and roommate assignments, where increased proximity has been shown to increase frequency of inter-race contact via email (Marmaros and Sacerdote, 2006) and Facebook (Baker, Mayer and Puller, 2011). This approach has been used by Boisjoly, Duncan, Kremer, Levy and Eccles (2006) and Laar, Levin, Sinclair and Sidanius (2005), who exploit the random assignment of black roommates to examine the impact of intergroup contact on the racial attitudes of white college students, as measured by responses to surveys. Both find that racial attitudes improve as a result of increased exposure to black peers.

While these papers offer compelling causal evidence on the impact of increased intergroup interaction on racial attitudes, data limitations have left some important questions unanswered. The first is whether (randomly) increased intergroup contact and the improvement in racial attitudes leads to meaningful changes in *behavior* toward new and different members of the other racial group. In addition, relatively little is known about whether it is the *type* (i.e., quality) or the *number* (i.e., quantity) of members from the minority group that influences racial attitudes of the majority group.

This is an important limitation, given that in Allport's (1954) formulation of the contact hypothesis, increased contact only improves attitudes when participants have equal status. Similarly, given the economic literatures on statistical discrimination and Bayesian updating, one would expect that individuals would update their statistical or taste-based discriminatory preferences based on the characteristics of the individuals to whom they were exposed.

This paper directly addresses the question of whether the racial attitudes and behavior of white males change based on either the number or type of black peers with whom they interact. To do so, we exploit data in which freshman students at the U.S. Air Force Academy (USAFA) are randomly assigned to peer groups, called squadrons, with whom they live, eat, and train. We ask whether exposure to more or higher aptitude black peers affects white males' subsequent stated or revealed preference for African Americans. Stated preference is measured by the response to a survey question that asks how personal acceptance of African Americans has changed since arriving at the academy. Revealed preference is measured by the likelihood of a white male rooming with a black student in their sophomore year, when students are randomly reassigned to a new squadron with a different set of black peers.

This approach to assessing the contact hypothesis contributes to the existing literature in several ways. To our knowledge, this is the first study to use random assignment to examine how racial attitudes change based on both the number and type of individuals from the minority group with whom one interacts. In addition, rather than relying solely on surveys and their potential pitfalls to measure racial attitudes, we ask whether increased intergroup contact in the freshman year leads to meaningful changes in subsequent *behavior* toward a new and different set of black men in the sophomore year. This enables us to determine whether increased exposure to more or higher aptitude black peers leads white men to spend significantly more time with new African Americans they meet in the future. Thus, the effects we find are more likely to reflect a fundamental change in racial attitudes compared to the previous research that has primarily focused on survey responses.

Results show considerable evidence that racial attitudes and behavior are malleable. Both the number (quantity) and the aptitude (quality) of the black peers to whom white males are exposed play an important role in changing racial attitudes and behavior toward African Americans. Specifically, white males who are exposed to higher-aptitude black peers during their freshman year

report more favorable attitudes toward African Americans generally. Additionally, exposure to more black peers and blacks with higher academic aptitudes significantly increases the likelihood that a white male matches with a black roommate in the following year. Estimates indicate that a one standard deviation increase in black peer aptitude increases a white male's likelihood of rooming with a black male by 15 percent. Importantly, this impact on roommate pairings in the sophomore year is robust to excluding the small proportion of white-black pairs who by chance were also in the same freshman squadron.

Interestingly, the impact of higher aptitude black peers on the roommate choices of white males is primarily driven by white males from southern states, where racial prejudice has historically been most prevalent. Estimates are striking; moving a southern white male from the first quartile to the fourth quartile of the peer black aptitude distribution increases the probability he will room with a black roommate by 35.2 percent.

These findings have important implications for our understanding of how people form, and change, racial attitudes. Results from this study indicate that not only can racial attitudes change based on the type and number of people with whom they interact from other racial groups, but they can do so even for people from regions that have exhibited historically high levels of racism. Furthermore, our results indicate that these changes in racial attitudes can lead to meaningful changes in behavior toward new and different members of the minority group.

The remainder of the paper proceeds as follows. Section II presents the theoretical framework for our study. Section III describes the data. Section IV discusses the methods and presents results. Section V concludes.

2 Theoretical Framework

Incoming freshman students at the US Air Force Academy are placed into military squadrons of around 35 members without any input from the affected students according to a stratified random sorting algorithm (Carrell, Fullerton and West, 2009; Carrell, Sacerdote and West, 2013). This algorithm uniformly distributes females, members of racial and ethnic minority groups, recruited athletes, and alumni of the Air Force Academy Preparatory School across each squadron without

any regard to academic ability. At the end of the freshman year, students are removed from their freshman squadron and placed by the same stratified random sort algorithm into a new squadron, which we will denote as $\mathbb{S}_i$, where $i = 1..36$. Following Chung's (2000) model of roommate matching, let squadron members $s_j \in \mathbb{S}_i$ have preferences over possible roommate choices $s_k \in \mathbb{S}_i$ $k \neq i$. We assume preferences to be complete, reflexive, and transitive, but formed under limited information on the set of possible roommates.

Our primary point of interest in this paper is the evolution of preferences under limited information. The literature on learning in game theoretic experiments provides useful guidance. In this literature, two broad approaches exist; belief-based learning (Cheung and Friedman, 1997; Crawford, 1995; Cooper, Garvin and Kagel, 1997) in which players form beliefs about what players will do in the future based on past play, and reinforcement learning (Roth and Erev, 1995; McAllister, 1991; Sarin and Vahid, 1999) in which strategies are reinforced by payoffs in previous rounds of the game. Camerer and Ho (1999) develop a more general framework of which both belief-based learning and reinforcement learning are special cases. In their 'Experience-Weighted Attraction' model, "strategies have attractions that reflect initial predispositions, are updated based on payoff experience, and determine choice probabilities according to some rule, " (Camerer and Ho, 1999).

Adapting this approach to preferences under limited information, we assume student s_j enters the Air Force Academy with initial attractions to various observable group attributes $g \in \mathbb{G}$, $A_j^g(0)$. The set of group attributes, $\mathbb{G}$, can include members of an academic major, classmates from previous coursework, residents of a given state, members of an athletic team, or of particular interest in this study, a member of a given racial or ethnic minority group. As in Camerer and Ho (1999), we assume these initial attractions are functions of pre-Academy experiences or introspection. During the freshman year, group attraction $A_j^g(1)$ updates based on discounted own experiences with members of group g and observed experiences of others with group g.

We propose that s_j determines the extent to which he believes potential roommate s_k is a member of group g, $m_j(k, g) \in [0, 1]$. Let the weighted attraction of s_k to s_j at the beginning of

the sophomore year (period 2) be

$$W_j^k(2) = \sum_{g \in \mathbb{G}} m_j(k,g) A_j^g(2)$$

and let the preferences of s_j be informed by a rank ordering of $W_j^k(2)$ over possible roommate choices $s_k \in \mathbb{S}_i$.

Given the rank ordering of weighted attractions at the beginning of the sophomore year, roommates are matched. A matching μ is a function $\mathbb{S}_i \longrightarrow \mathbb{S}_i$ such that for all $\{s_j, s_k\} \in \mathbb{S}_i$, $\mu(s_j) = s_k$ if and only if $\mu(s_k) = s_j$. As single rooms are not allowed, we assume that a triple occupancy room must exist if $\mathbb{S}_i$ contains an odd number of members. We assume individual rationality, i.e., that no students are forced to be roommates in the sophomore year.

3 Data

3.1 The Dataset

Our primary dataset is comprised of the USAFA graduating classes of 2002 and 2004-2007. We omit the graduating class of 2003 from our sample because members of this class were not reassigned to new squadrons at the beginning of their sophomore year. These data contain four individual-level measurements of pre-Air Force Academy ability: *SAT* scores[1], an *Academic Composite*, computed by USAFA Admissions as a weighted average of high school GPA, class rank, and the quality of the high school attended, a *Leadership Composite* of high school and community activities, and a *Fitness Score*. In addition, our data contain the state of residence and basic demographic information. In Table I, we present summary statistics at the individual by semester level for white male students. Column 1 shows statistics for all white male students.

To these data we match our primary outcome of interest: roommate matches in the sophomore year. The Air Force Academy does not maintain official records on roommate assignments. However, we were able to obtain the official key log, which contains records on the issuing and returning of keys to dorm rooms. By matching records, we were able to determine individuals assigned to

[1]For students who took the ACT, we report converted SAT scores.

the same dorm room for a variety of lengths of time. In columns 2 through 4 of Table I we report statistics for white males for whom we were able to identify roommate[s] for one or more days. This comprises 99.4 percent of all white male students. Column 2 reports statistics for all white male students for whom we identified roommate[s] for one or more days. Column 3 reports the subset of white male students who were paired with a non-black roommate and column 4 reports for those with a black roommate. For the main specifications in our analysis, we define a roommate pair as anyone assigned to the same dorm room for at least 90 days during the academic semester, though we also report robustness results using a range of definitions. For the 90 day definition, we were able to identify roommates for 96.9 percent of white males. Using a more restrictive definition of at least 240 days within the academic year, we were able to identify roommates for 88 percent of white male students.

Since roommate matches occur within squadrons, we report demographic and pre-collegiate aptitude statistics at the squadron level in Table II. Due to the small number of black students per squadron, the standard deviations of all variables are considerably larger for black students than white male students, although the squadron-level mean values are quite similar.

Our secondary analysis uses data from a climate survey administered to students at USAFA during the spring semester of 2010. This survey asked respondents whether their acceptance towards certain groups (e.g., blacks) has changed since entering the Academy. See Appendix 1 for a copy of the survey. Due to anonymity of the survey, responses were only made available for white males with identifiers by squadron for the graduating class of 2013. To these data we matched squadron-level group characteristics. Survey response rates were just under 50 percent. Although we cannot completely rule out selection into survey taking due to anonymity concerns that prevent us from having respondent-level covariates other than squadron, we can test whether there is selection in response rates at the squadron level. To do so, in Appendix Table A.1 we show that the number of survey responses by squadron is uncorrelated with squadron-level mean black or white male characteristics ($p = 0.432$ on a joint significance F-test).

3.2 Squadron Assignment and Variation in Black Peer Characteristics

Squadrons at the Air Force Academy are comprised of approximately 35 members each of the freshman through senior classes. Members of a squadron share rooms, dine together, play intramural sports together, and undergo military training together. Freshmen members of a squadron have very limited contact with members of other squadrons through the end of March outside of academic classes and intercollegiate sports team participation.

Prior to the start of the freshman and sophomore years, administrators at USAFA implement a stratified random assignment process in which females are first randomly assigned, followed by male ethnic and racial minorities, then white male recruited athletes, then white males who attended a military preparatory school, and then all remaining white male students. This critical feature of our data set enables us to overcome bias due to self-selection into peer groups.

To be a viable test of whether inter-race contact affects racial attitudes and behavior, our research design relies on random sampling variation in the attributes of black peers across squadrons. Figure 1 shows the variation in our academic aptitude measures at the individual and squadron-level for both blacks and white male students. While blacks and white males have similar means and standard deviations in individual SAT and academic composite scores, there is considerable heterogeneity in average peer characteristics across squadrons. The average squadron-level mean SAT score of black students is 1205. The standard deviation of squadron means within cohorts is 94.2. Mean SAT scores range from 920 to 1,465 across squadrons. Likewise normalized mean squadron-level academic composite scores range from -2.39 to 3.71 standard deviations.[2]

Due to the stratified nature of the random assignment process, the variation in the number of black peers across squadrons is less than one would expect under pure random assignment. However, there still remains considerable variation in the within-cohort number of blacks across squadrons. The average squadron has 1.59 black peers, with a range from zero to four. The mean within-cohort standard deviation in the number of black peers is 0.876. The within-cohort variation in the number of black peers across squadrons comes from three sources of exogenous variation.[3]

[2]These statistics exclude the eleven squadrons in our sample that had zero black peers

[3]There is also considerable variation in the number of black students across cohorts, which ranges from 79 blacks in the graduating class of 2004 and 41 blacks in the class of 2007. We include cohort fixed effects in all of our models and thereby exploit only the within-cohort variation in the number of black peers across squadrons.

First, the squadron assignment algorithm places female students into squadrons irrespective of race, allowing for a non-uniform placement of black females to squadrons. Second, USAFA administrators determine assignments to squadrons well prior to matriculation and the start of basic military training. Thus, attrition from the sample through students failing to matriculate either by changing their mind and not showing up, suffering an injury during basic training[4], or quitting during basic training offers an additional source of exogenous variation in the number of black peers across squadrons. Third, late admits and students who suffered injuries or illness during the previous year's basic training (called "turnbacks") are randomly assigned to squadrons irrespective of race and after the completion of the initial assignment process. These three processes which affect the number of black students assigned to each squadron occur without regard to the characteristics of white male students. For this reason, we do not expect to find any systematic correlation between the number of black students per squadron and the characteristics of white peers.

The integrity of our research design critically depends upon the random assignment of students to squadrons conditional on the stratified random sorting algorithm and matriculation. Carrell and West (2010) and Carrell et al. (2013) provide empirical evidence consistent with random assignment into squadrons with respect to academic ability, athletic ability, and leadership ability. In Table A.1, we provide additional tests of whether there is any systematic correlation between attributes of white males and the average attributes of black peers assigned to the same squadron during the freshman and sophomore year.

For this and other regressions in the paper, we determine statistical significance using empirical p-values[5] from 1000 draws of the relevant process, here the squadron assignment algorithm. The empirical p-values represent the fraction of draws where the actual coefficient estimated from our data is greater than the estimated coefficients from the 1000 simulated draws. Hence, this procedure compares correlations between white male attributes and average attributes of black students with the counterfactual of white males from the appropriate class year being distributed among squadrons according to the USAFA stratified random sorting algorithm. Of the 65 selection coefficients, 11 are significant at the 10 percent level, six of which are significant at the 5 percent level, and one

[4]Students who are injured and cannot finish basic training are not allowed to matriculate into the fall academic semester.

[5]This approach to inference is similar to that used by Chetty, Looney and Kroft (2009)

of which is significant at the 1 percent level. One group of five coefficients (out of 13) is found to be jointly significant at the 10-percent level. We interpret these results as broadly consistent with a random draw from the USAFA stratified random sorting algorithm, which by design does not create systematic correlation between attributes of white and black students assigned to the same squadron. Importantly the magnitude of all the correlates is quite small and the coefficients vary in sign. For instance, a one standard deviation increase in average squadron black academic composite is associated with a mere 0.037 *decrease* in white male academic composite.

4 Methods and Results

4.1 Methods

To determine whether white males are significantly affected by variation in the quantity or quality of the black peers they are exposed to during their freshman year, we estimate the following linear probability model:[6]

$$\mathbb{P}\left[\mu_{it}(s_j^W) = s_k^B\right] = \phi_1 + \phi_2 \bar{X}_{jt-1}^B + \gamma_t + \epsilon_{ijt}$$

where $\mathbb{P}[\mu_{it}(s_j^W) = s_k^B$ is the probability that in squadron i at time t, white male student $s_j^W \in \mathbb{S}_i^W$ and black male student $s_k^B \in \mathbb{S}_i^B$ are matched as roommates. $\bar{X}_{jt-1}^B$ are the black peer characteristics that individual j is exposed to during his freshman year, $t-1$. The primary peer characteristics of interest measure the academic aptitude of the black peers (mean SAT scores and Academic Composite) and the number of black peers by squadron. Because white males are exogenously assigned to black peers in the freshman year, estimates of these ϕ_2 coefficients are free from selection bias. γ_t is a cohort fixed effect and ϵ_{ist} is the error term.

4.2 Main Roommate Results

Table III presents our main results. Here, we define a roommate match as any two individuals who were assigned to the same dorm room for a period of at least 90 days during the fall or spring semester. Specification 1 begins by estimating a parsimonious specification that only includes

[6] Our results are robust to a Probit specification. See Table A.2

the main explanatory variables of interest and a cohort fixed effect. Due to the design of the assignment process, which places students into squadrons, adding additional control variables to the model should not, in theory, significantly affect the magnitudes of our coefficients of interest. The remaining specifications in Table III sequentially add control variables to the model.

The pattern of results in Table III provides significant evidence in favor of the contact hypothesis. White males are significantly more likely to room with a black student in their sophomore year after increased exposure in their freshman year to more black peers and black peers with higher academic aptitude. The magnitudes of the effects are quite sizeable. Using the coefficients from our preferred Specification 6, we find that a one-standard deviation increase in the number of freshman black peers (0.876 persons from column 3, Table II) is associated with a statistically significant 0.79 percentage point increase in the probability of having a black roommate, which represents a 14.5 percent increase over the sample average of 5.45 percentage points from Table I.

Likewise, a one standard deviation increase in peer black academic composite is associated with a 19.5 percent[7] statistically significant increase in the probability of a white male matching with a black roommate. On the contrary, we find no statistically significant relationship between peer black SAT scores and the probability of a roommate match, though the estimated effects are positive.[8]

Importantly, the effect sizes we find remain virtually unchanged in Specification 2-4 as we add controls for own demographic characteristics, non-black freshman peer characteristics, and characteristics of the black upperclassman in the freshman squadron. This is consistent with our expectations given the absence of selection in the squadron assignment process.

In Specification 5 we include controls for the academic attributes (SAT scores and academic composite) of the black peers in the sophomore squadron within which roommate matches are made. In Specification 6 we include a sophomore squadron fixed effect to control for any unobservable differences in sophomore black peer characteristics. In both specifications our estimated coefficients of interest again remain virtually unchanged. These results indicate that exposure during the freshman year to more and higher aptitude black peers increases the probability of a

[7] $0.0105/0.0545 = 0.195$

[8] We note that the academic composite effect may dominate the SAT effect because academic composite is a much better predictor of grade performance at USAFA, particularly for blacks.

white-black roommate match in the sophomore year irrespective of the academic aptitude of potential sophomore black roommates. Hence, these results suggest that the effects we find increase the relative attractiveness of all black students at the Air Force Academy, not just those blacks with higher academic aptitude.

In Specification 7-10 we conduct a series of robustness checks. Specification 7 reweights the estimates by the inverse probability of a roommate match to rule out the possibility that the results are driven by selection into the roommate key file. Specification 8 excludes all white males who were randomly assigned to the same sophomore squadron as a black peer from their freshman squadron. We do this to ensure that the results are not driven by the small fraction of white sophomore men who happened to be able to room with black men from their freshman squadron with whom they are likely personally acquainted. In Specification 9, we control for other black peer characteristics that are potentially correlated with academic aptitude (military preparatory school attendance, recruited athlete, leadership composite and fitness score). Finally, in Specification 10, we control for state of residence fixed effects. In all these robustness specifications the effects we find in support of the contact hypothesis remain virtually unchanged.

In Table IV, we test the robustness of our preferred estimate (Specification 6) to various roommate definitions. Across all definitions of roommates from one day to 240 days we again find consistent evidence in favor of the contact hypothesis. Exposure in the freshman year to more black peers and black peers with higher academic aptitude significantly increases the likelihood that a white male matches with a black roommate in the sophomore year, regardless of roommate definition. In the most restrictive definition of a roommate, 240 days assigned to the same room, higher SAT scores of black freshman peers now increases the probability of a bi-racial roommate match in addition to the Academic Composite.

4.3 Heterogeneous Effects

A natural question is whether the effects we find are heterogeneous across incoming attitudes towards race. Although we cannot directly measure incoming attitudes or levels of racial prejudice,

our dataset does contain information on each student's home state of residence.[9] Research has shown that the level of racial bias varies considerably across the United States, with southern states exhibiting the highest levels of racial prejudice(Mas and Moretti, 2009; Stephens-Davidowitz, 2013).

Therefore, in Table V, we estimate separate coefficients for our main variables of interest for students who come from southern or northern states.[10] Results indicate that while there are few differences by region in the impact of the number of black freshman peers, the magnitude of the academic aptitude effect is roughly two times larger for white males who come from southern versus northern states. For Specification 6, the estimated coefficient of 0.0116 indicates that a one-standard deviation increase in peer black freshman academic composite is associated with a 22.3 percent increase in the probability of a southern white male matching to a black roommate in the sophomore year. On the contrary, the estimated effect for northern white males is approximately half as large and statistically insignificant at 11.5 percent. We do not have the ability to carefully identify the cause of this observed difference in the magnitude and significance of effects. But we are intrigued by the possibility that the effect of higher freshman black peer academic composite on the probability of a bi-racial roommate match is the result of southern white males favorably updating their priors regarding African Americans.

4.4 Results on Stated Attitudes

As an alternative measure of racial attitudes and to shed light on why intergroup contact affects roommate pairings, we exploit data from a 2010 USAFA Climate Survey in which students were asked to, "Please rate how your acceptance towards African Americans/Blacks has changed since you came to USAFA." Possible responses included: "Much less accepting", "Somewhat less accepting", "No Change", "Somewhat more accepting", and "Much more accepting". We use responses to this question to analyze how the quantity and quality of black peers affect stated attitudes of white males towards blacks. Unfortunately, this survey question was only administered in one

[9]The military academies are unique in the fact that admissions are made within each congressional district and state. Each member of the U.S. House of Representatives and Senate is allotted five total slots at each service academy in any given year. This process ensures the student body is representative of population centers throughout the United States.

[10]We define southern males as those whose residence is in the original fifteen confederate states: AL, AK, FL, GA, KY, LA, MS, MO, NC, OK, SC, TN, TX, VA, and WV. Northern males by definition come from all other states and territories.

year (2010), thus our analysis of these data is limited to the freshman students who formed the graduating class of 2013.

In Table VI we report results from a series of linear probability models in which we regress the stated probability of white males being either more or less accepting of blacks on our three primary measures of peer black characteristics (academic composite, SAT score, and number). Though limited by small sample size, results from this analysis are broadly consistent with those previously shown on roommate choices. The estimate from Specification 3 indicates that a one-standard deviation increase in peer black academic composite leads white males to report that they are 2.4 percentage points (14.2 percent) more likely to report they are "more accepting" of African Americans generally, though the estimate is not statistically significant. Likewise, being exposed to a one-standard deviation increase in the number of black peers leads white males to be 7.7 percent more likely to report being "more accepting" of African Americans.

Results in Specification 6 show larger and more precisely estimated effects for negative responses to the survey. A one-standard deviation increase in peer black academic composite is associated with a statistically significant 49-percent decrease in the probability a white male reports being "less accepting" of blacks.[11]

Although this survey analysis is limited by the lack of power (i.e., a single graduation cohort of 2013) and potential non-response bias (approximately 50 percent response), the broadly consistent findings offers evidence that the effects on roommates is not likely driven by either the uniqueness of the outcome variable or the particular cohorts of students in the roommate study (graduates from 2002-2007). Rather, evidence from both sets of outcomes provides evidence that exposure to more and higher ability black peers leads white men to have more favorable opinions of blacks generally, and to reveal those improved attitudes when making important choices about whether to spend significant amounts of time with African Americans in the future.

[11]Of the 427 survey respondents, 16.86 percent (72 students) reported being "more accepting", 3.04 percent (13 students) reported being "more accepting", and 80.28 percent (342 students) reported "No Change".

4.5 Generalizability to Other Groups

A final question remains regarding whether the effects we find are limited to blacks or whether there is evidence in support of the contact hypothesis across other groups as our theory section would suggest. To answer this question we repeat our roommate analysis for Hispanics, Asians, members of the football team, and recruited athletes. Results are reported in Table VII. For comparison purposes, Specification 1 repeats results for blacks reported in Specification 6 of Table III while Specifications 2-5 report results for these additional groups. Consistent with our findings for blacks, we find that increased exposure to Hispanics, Asians, football players, and athletes during the freshman year significantly increases the probability of a roommate match during the sophomore year between white male students and members of each under-represented group. For the football players, we also find a significant relationship between the probability of a roommate match and average football player academic composite during the freshman year. This is the only group other than African Americans for which the academic composite is significantly correlated with the probability of a roommate match.[12] Overall, these results provide evidence consistent with the contact hypothesis for additional groups.

5 Discussion and Conclusion

This study provides an empirical test of whether white males' racial attitudes are affected by either the quantity or type of black peers to whom they are exposed. Using data from the U.S. Air Force Academy (USAFA) in which students are randomly assigned to peer groups in their freshman year and subsequently reassigned into different peer groups in their sophomore year, we show that white men's stated and revealed preferences for African Americans improve significantly after exposure to more and higher ability black peers. Specifically, we find that exposure to more and higher ability black peers leads white men subsequently to choose to spend considerably more time with African Americans – as measured by roommate matches –and report feeling more favorably about African Americans generally. We find evidence that these effects are applicable to other non-majority groups.

[12]Since 12.9 percent of football players are African American, we believe it unlikely that this result is driven by black football players alone.

These results provide several important takeaways. First, while we add to the evidence suggesting that exposure to more members of the minority group improves racial attitudes, we also document that the *type* of members from that group affects racial attitudes. These latter effects are important; a one standard deviation increase in black peer aptitude has the same impact on revealed preference for blacks as does a one standard deviation increase in the number of black peers. This highlights the importance of the type of individual with whom one interacts, as well as the frequency of interaction, which is consistent with models in which individuals update prior attitudes regarding other groups. In addition, the importance of the type of individuals with whom one interacts also speaks to the tradeoff between increasing exposure to members of historically disadvantaged groups, and changing the composition of those members. [13]

Finally, our results also illustrate that exposure to more and higher aptitude African American peers can lead to significant changes in subsequent *behavior*. Importantly, these changes in behavior are toward an entirely new and different set of African Americans. This provides rare causal evidence that increased contact does more than change self-reported attitudes; it also leads to meaningful changes in behavior toward African Americans.

[13]For example, by design affirmative action policies increase the number of individuals from disadvantaged groups with whom one interacts, while presumably lowering the average ability levels of members of that group at the institution. While our estimates are not well-suited for predicting the net impact of a major affirmative action policy, we can perform back-of-the-envelope calculations regarding the impact of adding a black student with below-average academic aptitude to a squadron without any black students. Estimates from Table III indicate that the net impact of adding the marginal student would increase net revealed preference for blacks so long as academic ability were not reduced by more than 1.33 standard deviations.

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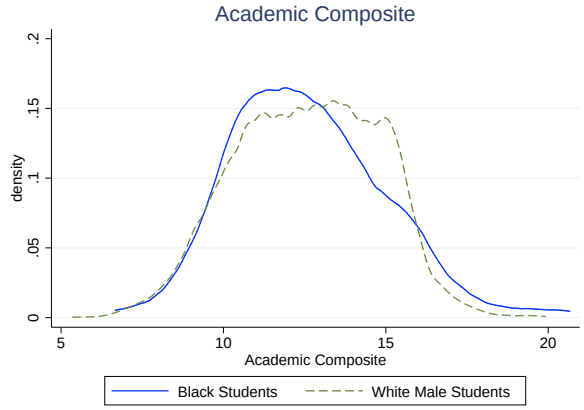
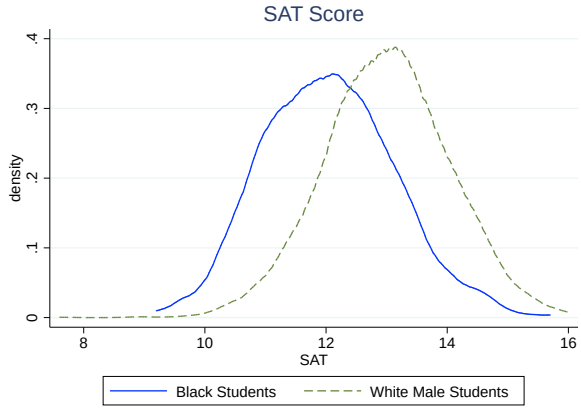
Figure I: Distributions of Academic Ability by Race

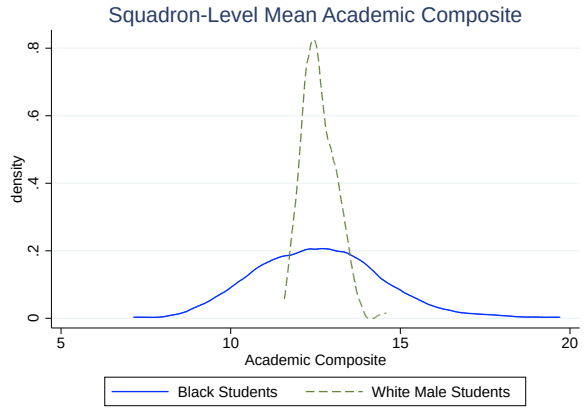
Panel A. Distribution of black and white male academic composite at the individual-level.



Panel B. Distribution of black and white male SAT scores at the individual-level.



Panel C. Distribution of black and white male academic composite at the squadron-level.



Panel D. Distribution of black and white male SAT scores at the squadron-level.

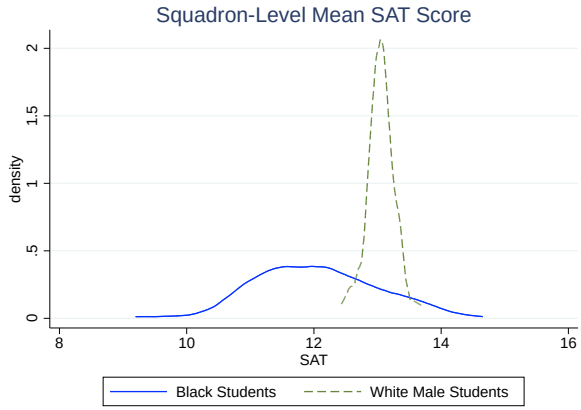


Table I: Summary Statistics for White Males with Matched Roommates

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
		Roommate Duration 1+ Days			Roommate Duration 90+ Days			Roommate Duration 240+ Days		
	Full Sample	All Roommates	Nonblack Roommate	Black Roommate	All Roommates	Nonblack Roommate	Black Roommate	All Roommates	Nonblack Roommate	Black Roommate
VARIABLES	mean (sd)	mean (sd)	mean (sd)	mean (sd)	mean (sd)	mean (sd)	mean (sd)	mean (sd)	mean (sd)	mean (sd)
Academic Composite	12.69	12.70	12.69	12.83	12.70	12.69	12.91	12.69	12.69	12.65
	(2.153)	(2.153)	(2.154)	(2.150)	(2.160)	(2.163)	(2.096)	(2.185)	(2.193)	(2.058)
SAT Score	13.06	13.06	13.07	13.02	13.07	13.07	12.99	13.13	13.14	12.98
	(1.035)	(1.035)	(1.027)	(1.156)	(1.030)	(1.022)	(1.164)	(1.014)	(1.000)	(1.229)
Leadership Score	17.25	17.26	17.26	17.19	17.26	17.26	17.24	17.35	17.33	17.56
	(1.852)	(1.852)	(1.857)	(1.785)	(1.851)	(1.855)	(1.785)	(1.850)	(1.854)	(1.780)
Fitness Score	4.813	4.811	4.808	4.857	4.808	4.805	4.861	4.860	4.847	5.094
	(0.942)	(0.942)	(0.937)	(1.020)	(0.942)	(0.936)	(1.034)	(0.950)	(0.944)	(1.034)
Recruited Athlete	0.272	0.273	0.272	0.282	0.271	0.269	0.306	0.278	0.274	0.338
	(0.445)	(0.446)	(0.445)	(0.451)	(0.445)	(0.444)	(0.462)	(0.448)	(0.446)	(0.476)
Football Player	0.0577	0.0581	0.0577	0.0638	0.0576	0.0576	0.0578	0.0645	0.0637	0.0779
	(0.233)	(0.234)	(0.233)	(0.245)	(0.233)	(0.233)	(0.234)	(0.246)	(0.244)	(0.270)
Black Fresh Academic Composite	12.67	12.67	12.66	12.83	12.66	12.65	12.85	12.75	12.73	12.98
	(1.855)	(1.856)	(1.850)	(1.942)	(1.853)	(1.850)	(1.901)	(1.871)	(1.863)	(2.007)
Black Freshman SAT	12.03	12.03	12.02	12.04	12.02	12.02	12.03	12.04	12.04	11.97
	(0.953)	(0.954)	(0.961)	(0.841)	(0.947)	(0.953)	(0.829)	(0.955)	(0.962)	(0.831)
Black Freshman Leadership	16.81	16.81	16.81	16.81	16.81	16.81	16.86	16.79	16.78	16.86
	(1.486)	(1.483)	(1.495)	(1.262)	(1.483)	(1.492)	(1.302)	(1.488)	(1.497)	(1.331)
Black Freshman Fitness	4.917	4.918	4.926	4.779	4.923	4.931	4.776	4.906	4.912	4.797
	(0.775)	(0.777)	(0.776)	(0.771)	(0.775)	(0.774)	(0.772)	(0.782)	(0.780)	(0.805)
Number of Black Freshmen	1.841	1.840	1.831	1.995	1.844	1.833	2.023	1.810	1.804	1.922
	(0.759)	(0.760)	(0.763)	(0.682)	(0.763)	(0.765)	(0.698)	(0.757)	(0.758)	(0.739)
P(Black Roommate)		0.0578			0.0545			0.0540		
		(0.233)			(0.227)			(0.226)		
P(Hispanic Roommate)		0.0716			0.0692			0.0715		
		(0.258)			(0.254)			(0.258)		
P(Asian Roommate)		0.0535			0.0523			0.0477		
		(0.225)			(0.223)			(0.213)		
Observations	3,274	3,253	3,065	188	3,177	3,004	173	1,427	1,350	77

Table II: Summary Statistics by Squadron

	(1)	(2)	(3)	(4)	(5)	(6)
	Freshmen Students			Sophomore Students		
	Full Sample	White Male	Black M & F	Full Sample	White Male	Black Male
VARIABLES	mean (sd)	mean (sd)	mean (sd)	mean (sd)	mean (sd)	mean (sd)
Academic Composite	12.75	12.68	12.71	12.75	12.68	12.61
	(0.374)	(0.488)	(1.914)	(0.419)	(0.509)	(2.023)
SAT Score	12.96	13.06	12.05	12.96	13.06	12.05
	(0.203)	(0.229)	(0.942)	(0.198)	(0.235)	(0.877)
Leadership Composite	17.28	17.27	16.80	17.28	17.27	16.72
	(0.348)	(0.433)	(1.426)	(0.334)	(0.399)	(1.511)
Fitness Score	4.801	4.817	4.912	4.802	4.818	4.996
	(0.285)	(0.290)	(0.772)	(0.292)	(0.283)	(0.855)
Number of Members	29.67	20.50	1.594	29.67	20.50	1.211
	(3.547)	(3.081)	(0.876)	(3.917)	(3.264)	(0.957)
Recruited Athlete	0.272	0.271	0.350	0.273	0.272	0.350
	(0.0620)	(0.0870)	(0.427)	(0.0758)	(0.101)	(0.417)
Football Player	0.0465	0.0536	0.0879	0.0467	0.0532	0.128
	(0.0492)	(0.0585)	(0.232)	(0.0510)	(0.0643)	(0.291)
Female	0.172		0.253	0.172		
	(0.0369)		(0.368)	(0.0369)		
White	0.823			0.822		
	(0.0412)			(0.0500)		
Black	0.0544			0.0542		
	(0.0296)			(0.0312)		
Hispanic	0.0641			0.0642		
	(0.0303)			(0.0340)		
Asian	0.0501			0.0505		
	(0.0303)			(0.0297)		
Observations	180	180	163	180	180	137

Table III: Impact of Exposure to Black Peers on Roommate Matching

VARIABLES	(1) 90 Days	(2) 90 Days	(3) 90 Days	(4) 90 Days	(5) 90 Days	(6) 90 Days	(7) 90 Days	(8) 90 Days	(9) 90 Days	(10) 90 Days
Black Fresh Academic Composite	0.0075**	0.0077**	0.0075**	0.0072**	0.0080**	0.0079**	0.0080**	0.0074*	0.0069*	0.0070*
	[1.000]	[1.000]	[1.000]	[0.999]	[0.997]	[0.997]	[0.997]	[0.992]	[0.978]	[0.986]
Black Freshman SAT	0.0014	0.0013	0.0015	0.0013	0.0017	0.0030	0.0030	0.0026	0.0013	0.0027
	[0.843]	[0.841]	[0.827]	[0.811]	[0.782]	[0.856]	[0.856]	[0.826]	[0.660]	[0.825]
Number of Black Freshmen	0.0122**	0.0121**	0.0113**	0.0115**	0.0111**	0.0105*	0.0105*	0.0113*	0.0112+	0.0099*
	[0.996]	[0.997]	[0.995]	[0.995]	[0.995]	[0.987]	[0.988]	[0.991]	[0.965]	[0.978]
Year Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Own Characteristics	-	Y	Y	Y	Y	Y	Y	Y	Y	Y
Freshman Non-Black Peer Characteristics	-	-	Y	Y	Y	Y	Y	Y	Y	Y
Black Upper Class Peer Characteristics	-	-	-	Y	Y	Y	Y	Y	Y	Y
Sophomore Black Peer Characteristics	-	-	-	-	Y	Y	Y	Y	Y	Y
Sophomore Squadron FE	-	-	-	-	-	Y	Y	Y	Y	Y
Weighted by P(Roommate Match)	-	-	-	-	-	-	Y	-	-	-
Exclude Freshman Squad-mates	-	-	-	-	-	-	-	Y	-	-
Non-academic Black Peer Characteristics	-	-	-	-	-	-	-	-	Y	-
State of Residence FE	-	-	-	-	-	-	-	-	-	Y
Observations	6,757	6,727	6,727	6,727	6,727	6,727	6,727	6,522	6,727	6,727
R^2	0.009	0.017	0.017	0.018	0.029	0.065	0.065	0.068	0.066	0.100

Dependent variable is probability of roommate match between black and white males. Academic Composite and SAT Score are normalized. Square brackets contain empirical p-values for resampled roommates within existing sophomore squadrons. ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

Table IV: Robustness of Estimates to Alternate Roommate Definitions

VARIABLES	(1) P(BR) 1 Day	(2) P(BR) 7 Days	(3) P(BR) 30 Days	(4) P(BR) 60 Days	(5) P(BR) 90 Days	(6) P(BR) 120 Days	(7) P(BR) 240 Days
Black Fresh Academic Composite	0.0084**	0.0079**	0.0081**	0.0078**	0.0079**	0.0077**	0.0103**
	[0.998]	[0.997]	[0.997]	[0.996]	[0.997]	[0.996]	[1.000]
Black Freshman SAT	0.0031	0.0034	0.0030	0.0026	0.0030	0.0032	0.0059*
	[0.861]	[0.877]	[0.853]	[0.828]	[0.856]	[0.863]	[0.975]
Number of Black Freshmen	0.0095*	0.0094+	0.0094*	0.0094*	0.0105*	0.0098*	0.0085+
	[0.977]	[0.974]	[0.975]	[0.975]	[0.987]	[0.982]	[0.959]
Observations	6,845	6,835	6,812	6,777	6,727	6,652	3,118
R^2	0.062	0.063	0.063	0.062	0.065	0.064	0.075

Dependent variable is probability of roommate match between black and white males. Academic Composite and SAT Score are normalized. All Specifications include controls for year effects, own characteristics, freshman non-group characteristics, and upper group characteristics as in Table III, Specification 5. Square brackets contain empirical p-values for resampled roommates within existing sophomore squadrons. ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

Table V: Heterogeneity of Effects by Region of Origin

VARIABLES	(1) 90 Days	(2) 90 Days	(3) 90 Days	(4) 90 Days	(5) 90 Days	(6) 90 Days	(7) 90 Days	(8) 90 Days	(9) 90 Days	(10) 90 Days
South × Black Fresh Academic Composite	0.0096**	0.0099**	0.0097**	0.0095**	0.0119*	0.0116*	0.0117*	0.0112*	0.0107*	0.0114*
	[0.999]	[0.999]	[0.999]	[0.997]	[0.989]	[0.991]	[0.992]	[0.985]	[0.981]	[0.985]
North × Black Fresh Academic Composite	0.0065+	0.0066+	0.0063+	0.0059	0.0058	0.0060	0.0060	0.0053	0.0048	0.0046
	[0.960]	[0.961]	[0.953]	[0.939]	[0.946]	[0.940]	[0.940]	[0.925]	[0.895]	[0.892]
South × Black Freshman SAT	-0.0040	-0.0046	-0.0046	-0.0049	-0.0039	-0.0018	-0.0018	-0.0036	-0.0031	-0.0031
	[0.373]	[0.313]	[0.294]	[0.284]	[0.235]	[0.357]	[0.358]	[0.247]	[0.312]	[0.277]
North × Black Freshman SAT	0.0043	0.0046	0.0048	0.0047	0.0048	0.0056	0.0056	0.0060	0.0039	0.0058
	[0.925]	[0.936]	[0.932]	[0.931]	[0.929]	[0.931]	[0.932]	[0.945]	[0.796]	[0.933]
South × Number of Black Freshmen	0.0114*	0.0117*	0.0109*	0.0109*	0.0105*	0.0097+	0.0098+	0.0112*	0.0101	0.0067
	[0.984]	[0.986]	[0.979]	[0.979]	[0.984]	[0.965]	[0.964]	[0.979]	[0.934]	[0.843]
North × Number of Black Freshmen	0.0127**	0.0123**	0.0115*	0.0117*	0.0114*	0.0108+	0.0108+	0.0112*	0.0114+	0.0115*
	[0.995]	[0.996]	[0.992]	[0.993]	[0.994]	[0.974]	[0.974]	[0.985]	[0.957]	[0.977]
Year Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Own Characteristics	-	Y	Y	Y	Y	Y	Y	Y	Y	Y
Freshman Non-Black Peer Characteristics	-	-	Y	Y	Y	Y	Y	Y	Y	Y
Black Upper Class Peer Characteristics	-	-	-	Y	Y	Y	Y	Y	Y	Y
Sophomore Black Peer Characteristics	-	-	-	-	Y	Y	Y	Y	Y	Y
Sophomore Squadron FE	-	-	-	-	-	Y	Y	Y	Y	Y
Weighted by P(Roommate Match)	-	-	-	-	-	-	Y	-	-	-
Exclude Freshman Squad-mates	-	-	-	-	-	-	-	Y	-	-
Non-academic Black Peer Characteristics	-	-	-	-	-	-	-	-	Y	-
State of Residence FE	-	-	-	-	-	-	-	-	-	Y
Observations	6,757	6,727	6,727	6,727	6,727	6,727	6,727	6,522	6,727	6,727
R^2	0.009	0.017	0.018	0.018	0.029	0.065	0.065	0.069	0.067	0.100

Dependent variable is probability of roommate match between black and white males. Academic Composite and SAT Score are normalized. Square brackets contain empirical p-values for resampled roommates within existing sophomore squadrons. ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

Table VI: Impact of Exposure to Black Peers on Stated Attitudes

VARIABLES	(1) More Accepting	(2) More Accepting	(3) More Accepting	(4) Less Accepting	(5) Less Accepting	(6) Less Accepting
Average Black Academic Composite	0.016	0.020	0.024	-0.020+	-0.026**	-0.015+
	(0.015)	(0.013)	(0.020)	(0.010)	(0.009)	(0.009)
Average Black SAT Score	-0.006	-0.002	-0.011	-0.004	-0.010	0.007
	(0.014)	(0.014)	(0.017)	(0.008)	(0.008)	(0.007)
Number of Black Members	0.014	0.020	0.020	0.013	0.009	-0.009
	(0.023)	(0.024)	(0.033)	(0.021)	(0.016)	(0.010)
Caucasian Male Academic Controls	N	Y	Y	N	Y	Y
Non-Academic Controls	N	N	Y	N	N	Y
Observations	426	426	426	426	426	426
R^2	0.004	0.016	0.027	0.016	0.051	0.082

Standard errors are clustered by squadron. ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

Table VII: Impact of Exposure to Other Peers on Roommate Matching

VARIABLES	(1) Prob Black Roommate	(2) Prob Hispanic Roommate	(3) Prob Asian Roommate	(4) Prob Football Roommate	(5) Prob Athlete Roommate
Minority Group	0.0079**	-0.0033	-0.0000	0.0087*	-0.0009
Academic Composite	[0.997]	[0.171]	[0.469]	[0.985]	[0.428]
Minority Group SAT	0.0030	0.0034	0.0041	0.0004	0.0190
	[0.856]	[0.770]	[0.829]	[0.571]	[0.823]
Freshmen Count of	0.0105*	0.0111**	0.0130**	0.0097*	0.0114**
Minority Group	[0.987]	[0.997]	[1.000]	[0.983]	[0.997]
Observations	6,727	6,727	6,727	6,365	4,910
R^2	0.065	0.045	0.049	0.091	0.088

Dependent variable is probability of roommate match between black and white males. Academic Composite and SAT Score are normalized. All Specifications include controls for year effects, own characteristics, freshman non-group characteristics, and upper group characteristics as in Table III, Specification 5. Square brackets contain empirical p-values for resampled roommates within existing sophomore squadrons. ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

Table A.1: Falsification Tests - Selection by Group Attributes

VARIABLES	(1) Academic Composiite	(2) SAT	(3) Leadership Composite	(4) Fitness Test	(5) Number Fresh Black
Panel A: White Male Attributes on Average Freshman Black Attributes					
Average Black Academic Composite	-0.037*	-0.032*	-0.012	-0.000	
	[0.010]	[0.013]	[0.232]	[0.512]	
Average Black SAT Score	-0.028+	-0.008	0.004	-0.016	
	[0.048]	[0.323]	[0.596]	[0.148]	
Average Black Leadership Composite	0.011	-0.009	-0.000	-0.020	
	[0.763]	[0.262]	[0.520]	[0.100]	
Average Black Candidate Fitness Test	-0.010	-0.021	-0.001	-0.023	
	[0.289]	[0.084]	[0.477]	[0.066]	
Number of Black Students	-0.021	-0.039+	-0.015	0.042+	
	[0.191]	[0.035]	[0.277]	[0.968]	
Observations	3,976	3,977	3,888	3,977	
R^2	0.003	0.002	0.001	0.003	
F All Variables	2.049	1.875	0.172	1.624	
empirical p	[0.893]	[0.926]	[0.033]	[0.818]	
Panel B: White Male Attributes on Average Sophomore Black Attributes					
Average Black Academic Composite	0.006	-0.019	0.006	-0.005	
	[0.631]	[0.100]	[0.625]	[0.383]	
Average Black SAT Score	-0.037*	-0.017	0.028+	-0.006	
	[0.012]	[0.118]	[0.953]	[0.343]	
Average Black Leadership Composite	0.021	-0.009	0.010	0.006	
	[0.910]	[0.272]	[0.721]	[0.646]	
Average Black Candidate Fitness Test	0.016	0.017	0.018	0.000	
	[0.846]	[0.878]	[0.859]	[0.491]	
Number of Black Students	0.021	0.012	-0.021	0.003	
	[0.835]	[0.770]	[0.198]	[0.505]	
Observations	3,685	3,686	3,686	3,686	
R^2	0.002	0.002	0.002	0.003	
F All Variables	2.222	1.582	1.068	0.0756	
empirical p	[0.837]	[0.638]	[0.568]	[0.004]	
Panel C: Average Freshman Black Attributes of White Males on Average Sophomore Black Attributes					
Average Black Academic Composite	0.007	-0.000	-0.003	-0.001	-0.005
	[0.664]	[0.476]	[0.431]	[0.493]	[0.349]
Average Black SAT Score	0.018	-0.004	0.009	-0.019	-0.020+
	[0.879]	[0.425]	[0.704]	[0.119]	[0.044]
Average Black Leadership Composite	0.013	0.037*	0.024	0.035*	-0.027**
	[0.793]	[0.985]	[0.941]	[0.982]	[0.005]
Average Black Candidate Fitness Test	0.009	0.004	0.010	-0.018	-0.003
	[0.708]	[0.608]	[0.701]	[0.128]	[0.399]
Number of Black Students	-0.018	-0.009	-0.020	0.023	0.010
	[0.220]	[0.336]	[0.196]	[0.852]	[0.732]
Observations	3,690	3,690	3,621	3,690	3,690
R^2	0.001	0.001	0.002	0.002	0.434
F All Variables	0.687	1.968	0.929	1.819	1.954+
empirical p	[0.318]	[0.554]	[0.397]	[0.696]	[0.949]

All specifications include class year fixed effects. Empirical p-values with 1000 randomly selected squadrons are reported under estimated coefficients in square brackets. ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

Table A.2: Main Specifications – Probit Estimation

VARIABLES	(1) 90 Days	(2) 90 Days	(3) 90 Days	(4) 90 Days	(5) 90 Days	(6) 90 Days	(7) 90 Days	(8) 90 Days	(9) 90 Days	(10) 90 Days
Black Fresh Academic Composite	0.0726**	0.0738**	0.0704**	0.0673**	0.0769**	0.0810**	0.0813**	0.0767*	0.0700*	0.0767*
	[1.000]	[1.000]	[1.000]	[0.999]	[0.999]	[0.999]	[0.999]	[0.993]	[0.982]	[0.993]
Black Freshman SAT	0.0133	0.0134	0.0141	0.0132	0.0119	0.0292	0.0292	0.0225	0.0115	0.0268
	[0.859]	[0.855]	[0.855]	[0.839]	[0.730]	[0.861]	[0.860]	[0.811]	[0.665]	[0.823]
Number of Black Freshmen	0.1080**	0.1064**	0.1011**	0.1004**	0.1008**	0.1008*	0.1012*	0.1110**	0.1151*	0.1013*
	[1.000]	[1.000]	[0.999]	[0.997]	[0.996]	[0.992]	[0.992]	[0.995]	[0.989]	[0.985]
Year Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Own Characteristics	-	Y	Y	Y	Y	Y	Y	Y	Y	Y
Freshman Non-Black Peer Characteristics	-	-	Y	Y	Y	Y	Y	Y	Y	Y
Black Upper Class Peer Characteristics	-	-	-	Y	Y	Y	Y	Y	Y	Y
Sophomore Black Peer Characteristics	-	-	-	-	Y	Y	Y	Y	Y	Y
Sophomore Squadron FE	-	-	-	-	-	Y	Y	Y	Y	Y
Weighted by P(Roommate Match)	-	-	-	-	-	-	Y	-	-	-
Exclude Freshman Squad-mates	-	-	-	-	-	-	-	Y	-	-
Non-academic Black Peer Characteristics	-	-	-	-	-	-	-	-	Y	-
State of Residence FE	-	-	-	-	-	-	-	-	-	Y
Observations	6,757	6,723	6,723	6,723	6,723	4,578	4,578	4,208	4,578	4,044

Dependent variable is probability of roommate match between black and white males. Academic Composite and SAT Score are normalized. Square brackets contain empirical p-values for resampled roommates within existing sophomore squadrons. ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.

Table A.3: Number of Survey Responses by Squadron Characteristics

VARIABLES	(1) Number of Survey Responses
Average Black Academic Composite	-1.193*
	(0.582)
Average Black SAT Score	-0.475
	(0.652)
Average Black Leadership Composite	0.439
	(0.648)
Average Black Fitness Test	-0.444
	(0.599)
Caucasian Male Academic Composite	0.565
	(0.690)
Caucasian Male SAT Score	0.130
	(2.278)
Caucasian Male Leadership Composite	0.122
	(0.635)
Caucasian Male Fitness Test	-0.139
	(0.620)
Observations	40
R^2	0.164
Model F	1.376
p-value	0.432

Robust standard errors in parentheses. ** $p < 0.01$, * $p < 0.05$, + $p < 0.1$.