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# Some Birds Have Mixed Feathers: Bringing the Multiracial Population into the Study of Race Homophily

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**Abstract:** Research on race homophily in the United States has yet to meaningfully include the growing multiracial population. The present study confronts this challenge by drawing upon recent conceptualizations of race as a multidimensional construct. In aligning this insight with current understandings of homophily, we identify and address several open questions about the origins of race homophily—namely regarding the possibility of peer influence on racial identity and network selection based on multiple facets of race. Data are from 3,036 youth in two large U.S. high schools with sizable proportions of mixed-race students. Using a stochastic actor-oriented model, we find that students choose friends based on similarity across multiple dimensions of racial identity and that peer influence operates to reinforce multiracial youths' racial self-classification rather than to induce change. This points to a system where race homophily arises through multiple selection mechanisms and is reinforced by pressure toward conformity.

**Keywords:** race/ethnicity; multiracial; social network; homophily; stochastic actor-oriented model; adolescence

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RESEARCH has long sought to chronicle and understand homophily, where people who share a respective commonality are disproportionately connected (Blau 1977; Laumann 1973; Lazarsfeld and Merton 1954; Marsden 1987). Homophily is an inescapable structural phenomenon observed across countless attributes, types of relationships, and points in the life course, leading McPherson, Smith-Lovin, and Rawlings (2021:460) to describe it as the "gravity" of relationships. Among the strongest dimensions of homophily is race/ethnicity (McPherson, Smith-Lovin, and Cook 2001), which remains "the most important divide in our society" (Smith, McPherson, and Smith-Lovin 2014:451). Scholars in the United States have highlighted race homophily as a barometer of progress toward racial equality and improved intergroup relations (Kao, Joyner, and Balistreri 2019; Moody 2001; Quillian and Campbell 2003), with the belief that supporting cross-race friendships can lessen intergroup tensions (Killen, Raz, and Graham 2022).

Despite extensive research on race homophily, this literature has yet to account for *multiracial* individuals in a meaningful way. By multiracial (and mixed race), we mean individuals whose ancestry contains multiple racial groups, regardless of how they self-identify. With rare exception (Echols and Graham 2020), homophily studies have sidelined such individuals by assigning them a monoracial label or placing them in an overarching "other" or "multiracial" category. This has been

justified as mixed-race samples being too small or heterogeneous to allow for more inclusive strategies (Nishina and Witkow 2021). However, the U.S. multiracial population is now estimated at 10.2 percent and rising (U.S. Census Bureau 2021), especially among adolescents, which coincides with the most active developmental period of ethnoracial identity exploration (Umaña-Taylor et al. 2014). These trends both underscore the need to include the multiracial population in the study of homophily and make it increasingly possible. However, doing so will require that network scholars confront the deeper question of how to conceptualize race and similarity given multiracial individuals' multiple identity options (Waters 1990), any of which could serve as the basis for network selection and influence processes.

We confront this challenge and, in so doing, reveal several gaps in our understanding of race homophily. In particular, is homophilous selection informed by one's full racial ancestry or does it vary according to how strongly an individual feels part of a given racial group? In addition, given that racial identity is fluid, how open is this process to network influence? And, if influence is present, do peers influence one another to change their racial classification and/or to maintain an existing classification? In testing these questions, we advance our knowledge of how networks and racial identity co-evolve in the production of race homophily.

In what follows, we provide background on where multiracial individuals fit within the U.S. racial schema and why this enables peer influence on racial identity. We then contrast this understanding of race with how the multiracial population has been conceptualized in studies of race homophily. We provide the theoretical reasoning to support network selection on different dimensions of race, peer influence on racial identity, and differentiating the effect of such influence on change versus stability in racial identification. To examine these newly articulated pathways to race homophily, we use a dual conceptualization of race that sees racial identity as fluid but grounded in a set of options defined by a person's ancestry (Gullickson and Morning 2011). We operationalize this by measuring self-classified race (Roth 2016), distinguishing between primary and secondary dimensions. This approach enables a longitudinal network analysis (Snijders, van de Bunt, and Steglich 2010) that examines the co-evolution of friendship and self-classified race. Our empirical focus is adolescent friendships within two large U.S. high schools that contain sizable proportions of students from mixed-race backgrounds. These schools are ideal contexts for our investigation because their ethnoracial diversity offers the varied friendship and identity options needed to test our questions. We discuss the implications of our findings for the persistence of race homophily and the future of racial boundaries (Alba 2020; Bonilla-Silva 2004; Lee and Bean 2004).

## Background

### *The Multiracial Population and Identity Development*

Contemporary scholars conceive of race as a social construction existing within a cultural context that dictates its categories and rules for membership (Omi and Winant 1994). Racial classification logics detail how people use information such as appearance (phenotype), language, and ancestry to infer (or categorize) someone's

race (Schachter et al. 2021). Importantly, individuals are expected to claim a racial identity that is derived from their ancestors, lest they be seen as inauthentic.[1] Presently, the United States has five state-recognized panethnic racial groups (U.S. Census Bureau 2021), although Hispanic/Latino is widely regarded as a race as well (Morning and Saperstein 2018).[2] The challenge for multiracial individuals is that their ancestry includes multiple racial groups. Although official documents such as the Census allow people to mark multiple categories, a monocentric norm prevails in the form of interpersonal and institutional pressures to claim only one racial identity (Harris 2016; Giebel 2023; Jiménez 2004; Jones and Rogers 2022; Walker 2016). Hence, people with a mixed-race background often feel compelled to classify themselves into a singular racial group. Which identity they should claim is often unclear. Formal policies such as the "one-drop rule" (hypodescent)—mandating that having even one African ancestor required a black classification (Davis 1991)—have not only weakened but provide little guidance for mixed-race individuals with no tracible African heritage (Lee and Bean 2012; Rockquemore and Brunsma 2002). Because prevailing racial classification logics do not extend to people with multiple ancestral groups, multiracial individuals often experience uncertainty regarding their place in the racial schema and which identity label is most appropriate for themself.

As individuals explore various identity options, microlevel relationships serve as a critical site for feedback (Deaux and Martin 2003; Thoits and Virshup 1997). Key to this process is identity verification, which occurs when individuals receive confirmatory feedback about their enactment of an identity (Burke and Stets 2023). Such verification can come from oneself (self-appraisal), others (actual appraisals), or one's perceptions of how others view them (reflected appraisals). Verification generates positive emotions that increase self-esteem and reinforce an identity, whereas the lack of verification produces negative emotions and efforts to resolve ensuing dissonance (Burke and Stets 2023).

Qualitative studies describe how friends and peers of multiracial youth call attention to phenotype, ethnic markers, and racial boundaries that demarcate identity (Jiménez 2004; Khanna 2004, 2010; Renn 2003; Root 2001; Sims 2016). Such appraisals convey one's perceived racial identity, helping youth assess their ability to permeate racial boundaries (Miville et al. 2005; Thekkedam 2013). Peers also help multiracial individuals learn how to enact a given racial identity through speech (Khanna and Johnson 2010) or appearance (Song et al. 2022) as well as how to think, spot discrimination, and have the racial interpretive frame needed to assimilate into monoracial spaces (Twine 1996). Multiracial individuals' identity claims may be invalidated by others, for instance, if their appearance is misaligned with their claimed identity (Khanna 2010; Root 2001; Twine 1996) or they fail to display cultural knowledge indicative of a shared identity (Jones and Rogers 2022; Miville et al. 2005; Sims 2016). Described as a "cultural chasm" (Khanna and Johnson 2010), such invalidation can induce internalizing problems (Albuja, Sanchez, and Gaither 2019; Franco and O'Brien 2018) and negative emotions that prompt efforts to resolve them, including revisiting one's identity (Burke and Stets 2023) or working to assert a preferred identity (Khanna and Johnson 2010).

Experiences such as these create variation in commitment and closeness to the ancestral groups that comprise one's background (Jones and Frank 2023; Umaña-Taylor et al. 2014). Oftentimes, multiracial individuals feel more accepted by members of one ethnoracial group over others (Clayton 2020; Rockquemore 1998), leading them to enact a singular or *primary* racial identity (Good, Chavez, and Sanchez 2010; Khanna 2010; Sims 2016; Thekkedam 2013). Nonetheless, there may remain some degree of closeness to other, secondary ancestral groups, which can prompt multiracial individuals to change their self-categorization or to adopt a "Multiracial" identity (Rockquemore 1998).[3] Identity theory explains how individuals can be temporarily or permanently "in between" identities (Stets et al. 2021). In the case of race, such *fluidity* often appears as individuals reporting different racial self-classifications across time (Davenport 2020; Hitlin, Elder, and Brown 2006; Roth 2012; Saperstein and Penner 2012). Recent estimates are that at least 8 percent of U.S. adults change their racial self-classification, with rates particularly high among those reporting mixed race or who otherwise do not conform to conventional racial categories (Agadjanian 2022).

A handful of studies have investigated how social influence shapes racial classification, though not within the microlevel relationships where identity processes unfold. Some studies find that identity claims are consistent with the racial composition of social contexts such as schools and neighborhoods (Harris and Sim 2002; Hitlin et al. 2006; Nishina et al. 2010). Others measure the racial composition of friendship networks but do not isolate their influence (Herman 2004; Rockquemore and Brunsma 2002). Related work offers evidence of peer influence on the strength of ethnic identification (Leszczensky and Pink 2019), internalized identity meanings (Santos, Kornienko, and Rivas-Drake 2017), and perceptions of others' ethnic identity (Boda 2018). Closest to the question at hand is Echols, Ivanich, and Graham (2018), who found that changes in friendship group diversity were associated with reporting a Multiracial identity. Thus, while theory and qualitative accounts are suggestive that friends influence how multiracial individuals classify themselves, this claim has not been tested.

## *Implications for Homophily*

How does this understanding of multiracial identity development align with conventional approaches of studying homophily? Historically, homophily research has ignored racial fluidity by treating race as a static attribute, which precludes influence as a route to homophily. With network selection presumed the only route to homophily, research has centered on questions of how much of the selection into homophilous relations can be attributed to preferences, population characteristics (i.e., the opportunity pool), and a range of other selection mechanisms (Goodreau, Kitts, and Morris 2009; McPherson et al. 2001; Wimmer and Lewis 2010).

This research has treated the multiracial population in several ways, though mostly in passing. Some studies have not offered multiracial individuals clear or consistent ways to classify their mixed ancestry, leading to their exclusion from analysis (Marsden 1987; Neray, Copeland, and Moody 2023). Others capture whether respondents are mixed race and then align multiracial individuals with a singular

racial group (e.g., coding biracial black youth as black) or conceive of multiracial as part of an "other" category (Goodreau et al. 2009; McPherson, Smith-Lovin, and Brashears 2006; Moody 2001; Schaefer, Kornienko, and Fox 2011). Other studies have recognized the distinct nature of being multiracial, but then treat such individuals as an all-encompassing "multiracial" group (Quillian and Campbell 2003; Schaefer, Simpkins, et al. 2011; Wimmer and Lewis 2010).

Classifying small numbers of multiracial individuals as part of "other" or "multiracial" categories may be justifiable for individual-level questions, where the goal is to understand differences in outcomes across racial groups (though see Nishina and Witkow 2020). However, for network questions such as homophily, such broad categorizations risk enveloping a diverse group whose only commonality is their "other/multiracial" label. Although there are suggestions that the experience of falling outside of conventional racial categories can form the basis of similarity (de Guzman and Nishina 2017; Doyle and Kao 2007), this overlooks group-specific qualities (e.g., culture) that underlie racial in-group preferences.[4] Moreover, it overlooks that multiracial individuals can share *some* racial similarities with monoracial peers.

In this vein, DaCosta (2007) described a "hierarchy of relatedness," in which multiracial individuals feel closest to people who identify with the same racial groups, followed by those with whom they share some overlap, and most distant from people where there is no overlap. This insight comes from an implicit reconceptualization of race. Instead of classifying individuals into mutually exclusive racial categories and then evaluating similarity, this view allows individuals to occupy multiple categories and then evaluates whether any categories overlap for any pair of individuals. For example, Echols and Graham (2020) found that partial similarity increased friendship likelihood compared with no similarity, though not as much as sharing the exact same ethnoracial background (which would include the same combination of racial groups for multiracial youth). Likewise, Nishina and Witkow (2021) found that multiracial youth were nearly twice as likely to have a partial overlap in racial identity with their best friend versus no overlap. These findings point to how partial racial similarity can foster connection and suggest that the important thing about similarity is not only sharing a group identity label but also things such as culture that embody the shared lived experience of a racial group.

The variation in similarity encountered by multiracial individuals is better captured by considering the range of racial groups within one's ancestry. However, it is unlikely that each constituent racial group would be equally salient to network selection. Rather, it is only when an individual identifies with a racial category that similarity on that category is expected to drive friendship (Leszczensky and Pink 2019). By engaging in "selective association" with people who share their racial identity (Khanna and Johnson 2010; Remedios and Chasteen 2013), multiracial individuals can enhance the likelihood of receiving positive feedback and acceptance as an authentic in-group member (Jiménez 2004; Renn 2003; Root 2001; Song et al. 2022). Associating with a singular racial group also signals one's identity (Cooley et al. 2018), which can reduce others' uncertainty and alleviate questions of authenticity (Museus et al. 2016). With regard to race, we expect homophilous selection to

be strongest for one's primary identity and weaker (or even non-existent) for less salient, secondary dimensions of one's racial background.

### *Reconceptualizing Race with Respect to Homophily*

To better represent the multiracial population, we must acknowledge their breadth of racial background while recognizing that individuals may feel closer to some racial groups than others and that this can change over time. To accommodate these features of racial identity, we draw upon recent work that has unpacked the concept of race into multiple dimensions, such as ancestry, phenotype, self-identification, and perceived or "street" race (Roth 2016). We focus on the distinction between an individual's primary racial self-classification and their ancestry. Ancestry refers to the racial categories inherited from one's predecessors and serves as an individual's racial identity options (Gullickson and Morning 2011). By primary racial identity, we mean the racial category that individuals present to others, which is a form of social identity (Tajfel 1981). Multiracial individuals may choose to identify with one or more singular groups within their known ancestry, or adopt a Multiracial identity, whereas individuals with a singular ancestry are effectively constrained to a single racial category. For multiracial individuals, this dual conceptualization acknowledges racial fluidity by allowing their primary racial group identification to change over time but only within the bounds of their ancestry.[5]

This conceptualization of race offers a more flexible way of measuring similarity and facilitates testing for peer influence on racial identification. Moreover, it opens the door to several new questions. With respect to friend selection, similarity can be conceptualized on both primary racial group identity and also secondary dimensions of race. We expect homophilous selection on primary racial self-identification based on the tenet from identity theory that people create a self-verification context to support their most central identities (Verkuyten 2016).

> Hypothesis 1. Individuals will develop friendships with peers who share the same primary racial identity.

Nonetheless, there is theoretical reason to expect that secondary dimensions of racial identity can also be a basis of connection. This may be through identity exploration, which involves social action such as "talking with people, going to ethnic museums, and participating actively in cultural events" (Phinney 1990:503). Through such explorations, people gain a sense of how racial categories are defined and enacted locally, and where they feel they may belong (Song et al. 2022). It may also be that family ethnic socialization creates common experiences or interests that form the basis of connection, even when centered on one's secondary identity. These possibilities are consistent with studies of racial group boundaries that find multiracial individuals often have ties with people from each of their ancestral groups (Doyle and Kao 2007; Quillian and Redd 2009).

> Hypothesis 2. Individuals will develop friendships with peers who share their racial ancestry.

Our dual conceptualization of race also helps with testing for peer influence. First, ancestry provides information needed to identify who has a mixed-race background,

which problematizes their racial categorization (Gullickson and Morning 2011). Second, ancestry serves as a normative constraint on which racial categories people are allowed to claim legitimately, with multiracial individuals at risk of adopting any race that is within their ancestry or a Multiracial identity.[6] Thus, ancestry provides information on who is at risk for which possible changes in identity. Failing to account for either of these constraints mischaracterizes the racial categorization process and can lead to biased empirical tests. Third, ancestry can help to explain why someone who is multiracial would have friends whose racial group categorization differs from their own, which is a necessary precondition for peer influence on *change* in racial categorization. For this situation to arise, prevailing tendencies to sort into racially homogenous friendships must be offset by other selection forces, such as the exploration of a secondary identity, which bring racially dissimilar individuals together.[7] In this manner, selection sets the stage for peer influence to spur change in identity (Schaefer 2018).

Although a dual conceptualization of race facilitates testing for peer influence, it also unearths a theoretical distinction that must be addressed. Network research often adopts a definition of peer influence based upon "directional change" with "heightened similarity as the end point" (Laursen and Veenstra 2021:890). Examples include shifting one's attitudes to become more similar to one's network (Friedkin and Johnsen 2011), adopting a practice that one's network has adopted (Valente 1996), or social learning of high-status behaviors (Brechwald and Prinstein 2011). In the case of racial identification, this would appear as multiracial individuals adopting a different racial category—one shared by their network.

Alternatively, influence can manifest to inhibit change or reinforce one's current status. For instance, social control theory describes how attachment to conventional bonds deters delinquent behavior (Hirschi 1969). Such "stakes in conformity" can work against change or exploring a new identity (Smilde 2005) by serving as an "anchor" or exerting pressure to conform to norms and commonly held attitudes (Cohen 1978). This also shows up as a form of "local network externality" whereby people are increasingly reluctant to change a practice the larger the share of their network who engages in that practice (DiMaggio and Garip 2012). Peer influence as reinforcement is closer to its treatment within identity theory, where the emphasis is on verification of an enacted identity. Namely, similarity in identity meanings held by oneself and others in a situation can provide identity verification and positive emotions that motivate the continued enactment of the identity (Stets et al. 2021). Described as commitment (Stryker 1980), one reason for enacting a racial identity is to maintain ties with friends and community that are based in that identity (Burke and Harrod 2021). In the context of the current question, this process would manifest as greater resistance to change among multiracial individuals whose primary identity is consistent with their friends compared with individuals who lack homophilous network connections. Although peer influence as reinforcement has been discussed, this phenomenon has rarely been studied in natural settings due to methodological challenges (Laursen and Veenstra 2021). Our final two hypotheses distinguish these two manifestations of peer influence.

> Hypothesis 3. Multiracial individuals will adopt the primary racial identity that is most prevalent among their friends. (identity change)

Hypothesis 4. Multiracial individuals will retain the primary racial identity that is most prevalent among their friends. (identity reinforcement)

How peer influence manifests has implications for our understanding of the system of forces that sustain homophily (Cohen 1983). To the extent peer influence leads to change in identity for multiracial youth, this suggests that cross-group ties are instrumental in multiracial identity development. Such a finding would call for attention to those selection processes that bring racially dissimilar people together. In contrast, when influence acts as identity reinforcement, this calls attention to the multitude of processes that promote homophilous selection. Similarity that arises through any means can be "cemented" through identity verification and, for a superordinate identity like race, by fostering similarity on other identity dimensions (Stets et al. 2021). Which form peer influence takes thus has implications for our theoretical understanding of how homophily develops and any efforts to improve intergroup relations (Killen et al. 2022).

## Data and Methods

Our data are from the Teen Identity Development and Education Study, which targeted one midwest (MW) and one southwest (SW) U.S. high school. Both schools are ethnoracially diverse but differ in important ways. The MW school is located in a smaller, more liberal city with a higher average socioeconomic status. The SW school is in a suburb of a large metropolitan area where issues of immigration have been at the forefront of public discourse. These schools are ideal sites for our research question because their high levels of ethnoracial diversity and large multiracial populations (more than one-quarter of each school) offer the friendship opportunities and racial identity options that identity exploration and development requires (Shiao and Tuan 2008).

We provided self-administered surveys to all students in each school at three time points: Spring 2017, Fall 2017, and Spring 2018. Response rates ranged 74–88 percent (MW) and 78–87 percent (SW) across waves. Each survey gathered information on friendships, racial background, and sociodemographic characteristics. In addition, we obtained yearbooks for each academic year that provided data on phenotype and extracurricular activity participation to serve as controls.

Our analytical sample of 3,036 students was constructed based on two criteria. First, students must have been in grades 8–11 at wave 1. Twelfth graders from wave 1 were excluded because they were not observed after the first wave and hence did not provide longitudinal data. Eighth graders from wave 1 were not yet in high school but entered the following year and were measured at waves 2 and 3. Second, students must have provided valid race data to be included at a given wave. Only 3.2 percent (MW) and 4.6 percent (SW) of otherwise eligible cases were excluded due to missing race data.

### *Measures*

*Racial Background.* Information on race was obtained at each wave through a two-question design (full wording in the online supplement, section A). Question 1

asked students to "Think about the specific ethnic-racial group or groups that you are a member of" and select the "category or categories that best describe your ethnic background" from a list of five categories plus an open-ended "Other" option. Approximately one-third of respondents selected multiple categories. For students who marked more than one category (hereafter "multiracial"), a second question asked, "which ethnic group do you feel most a part of" and directed them to select one option.[8]

These questions were used to create two measures: racial identity options and primary racial self-classification. Question 1, which encouraged students to mark multiple options, was used to ascertain each student's *identity options* (which we treat as a proxy for the options available through their ancestry). From these identity options, students selected their *primary racial self-classification*, which we use as a proxy for racial identity (Roth 2016). For monoracial youth, their primary self-classification is the sole category listed under their identity options. For multiracial youth, their primary self-classification is the category they listed under Question 2 as the one they felt closest to (we deem their other groups *secondary*). Respondents with a mixed-race background who did not select one category or wrote in responses such as "biracial" or "I'm mixed," were coded as having a Multiracial self-classification. Note that one's primary self-classification could change across survey waves. In contrast, identity options were held fixed at the full set of categories each student ever reported.

Table 1 presents the distribution of students based on varying definitions of race. Column (a) reports how many students ever listed each racial group (percentages do not sum to 100 percent because students could report multiple categories). Column (b) shows the proportion of monoracial students with each singular self-classification plus students reporting multiple racial categories. Although the majority in each school reported one race, the multiracial populations are sizeable—25.3 percent in the MW and 40 percent in the SW. Column (c) counts multiracial students under a singular racial category if that was the only primary group they ever reported, leaving 9–10 percent of students as racially fluid, indicating that their primary self-classification changed at least once.[9] This is less than half of the multiracial population in each school, implying that most multiracial students had a stable, singular racial self-classification.

The majority of students in both schools self-classified as white, whereas the third most frequent category was black. The schools differ in that the second largest racial group in the MW was Asian, whereas the second largest racial group in the SW was Latino/a. Table SM1 (online supplement) reports the distribution of racial background for biracial youth. These distributions largely mirror the distribution of monoracial categories, with the exception of the Native American and Other categories, where youth were more likely to be biracial than monoracial.

For modeling purposes, we organized information on race into a two-mode "race network" for each school and wave (see Fig. 1). These networks are represented by matrices, with $n$ students as rows and seven columns representing ethnoracial categories (five panethnic groups, Other, and Multiracial). Matrix cells hold one of four values to represent the combination of one's primary self-classification and one's identity options. A "1" denotes the student's primary self-classification at that

**Table 1:** Distribution of racial background for analytic sample

| | Midwest ($n$ = 1,130) | | | Southwest ($n$ = 1,906) | | |
|---|---|---|---|---|---|---|
| | (a) Identity Options[a] | (b) Singular Identity | (c) Primary Self-Classification[b] | (a) Identity Options[a] | (b) Singular Identity | (c) Primary Self-Classification[b] |
| *Racial category* | | | | | | |
| Asian | 31.5% | 22.0% | 24.2% | 9.3% | 2.4% | 3.8% |
| Black | 25.4% | 14.6% | 20.0% | 31.5% | 13.9% | 24.7% |
| Latino/a | 11.0% | 5.0% | 6.1% | 41.1% | 17.1% | 26.1% |
| White | 52.2% | 32.0% | 38.1% | 52.3% | 23.8% | 31.5% |
| Native American | 6.5% | 0.1% | 0.1% | 17.3% | 2.7% | 4.0% |
| Other | 6.6% | 1.0% | 1.4% | 2.4% | 0.2% | 0.3% |
| Multiracial | – | – | 0.4% | – | – | 0.3% |
| Total | – | 74.7% | 90.3% | – | 60.0% | 90.8% |
| Multiple identity options | – | 25.3% | – | – | 40.0% | – |
| Fluid self-classification | – | – | 9.7% | – | – | 9.2% |

[a]Percentages do not sum to 100 percent because students with multiple identity options fall under multiple categories.
[b]Students who reported the same primary self-classification at each survey wave are classified under that racial category. Students who gave different reports across time are reported as fluid.

wave. A "0" indicates a racial category that was one of a student's identity options but not their primary self-classification at that wave. A "10" represents a category that was not one of a student's identity options. And, an "11" represents the self-classification of monoracial students. Our analyses treat values of "10" (structural zero) and "11" (structural one) as fixed over time. These represent constraints on self-classification—structural zeros because that category is not an option for that person given their ancestry and structural ones to designate one's only option (i.e., for monoracial youth). In contrast, scores "0" and "1" represent the options available to multiracial students and can change across waves. In this way, our analysis allows multiracial youth to change their primary self-classification, but those choices must come from their identity options (which includes Multiracial).

*Friendships.* Students were asked to name up to 10 of their closest friends at their school.[10] On average, students named 2.6–3.7 school friends per wave. Friend nominations were coded into an $n \times n$ matrix of directed network relations for each wave. Cells contain a "0" or "1" to indicate the absence or presence, respectively, of an $i \rightarrow j$ tie (i.e., whether the student in row $i$ named the student in column $j$ as a friend). To illustrate, Figure 1 presents a hypothetical one-mode friendship network and corresponding network visualization (i.e., sociogram). Change in friendships across time is summarized using the Jaccard index. Values of 0.33–0.35 (MW) and 0.28–0.32 (SW) indicate that of the friendships ever observed, approximately

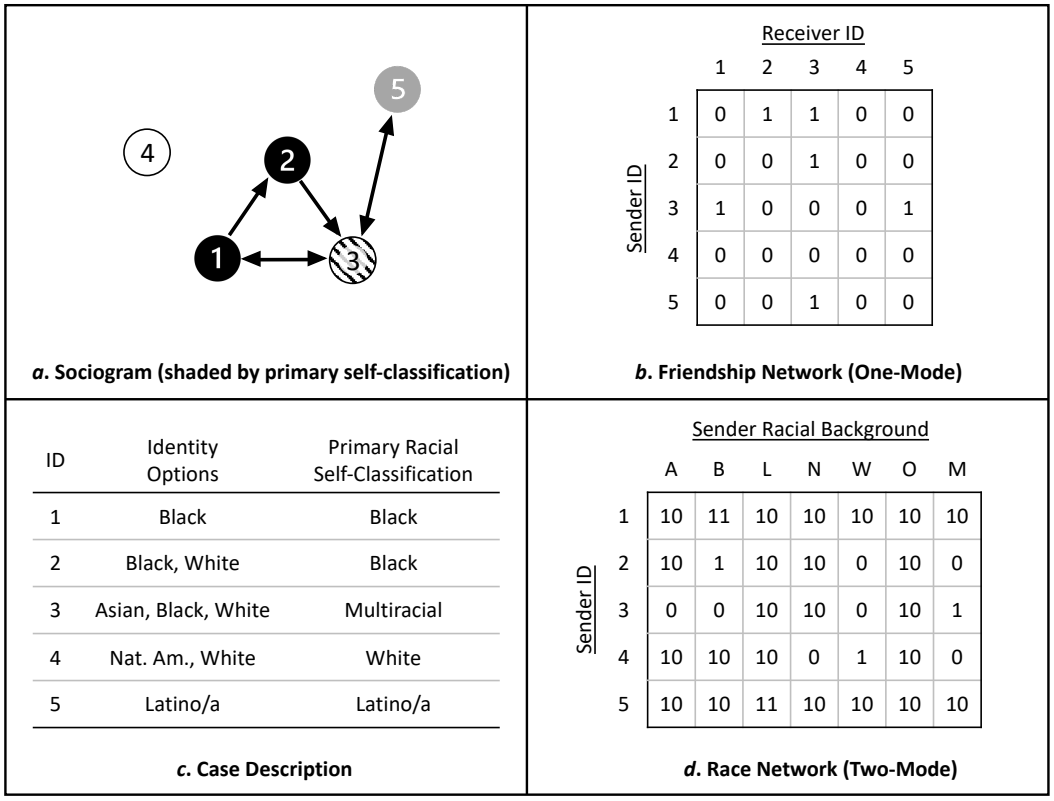


**Figure 1:** Example of coding friendships and race as networks. *Note*: This example illustrates our data specification for one time point. The sociogram in panel *a* and the matrix representation in panel *b* depict the friendship network. Actor 1 named actors 2 and 3 as friends (i.e., sent them a tie), as denoted by arrows in the sociogram and a "1" in the corresponding cells of the matrix. Panels *c* and *d* present equivalent information regarding identity options and primary racial self-classification (Asian, black, Latino/a, Native American, white, other, and multiracial). Actor 1 only reported black, which is indicated by a structural one ("11") in the two-mode race network and structural zeros ("10") for all other categories (the "structural" designation fixes these values in our analysis). Actor 2 also reported a black self-classification at this time point, but had mixed ancestry; hence, the "1" in the race network specified their primary identity, with "0" indicating available options that were not chosen (and "10" indicating options that were unavailable because they were not part of their ancestry). A total of six friendship and six race networks were constructed to represent three survey waves separately within each school.

one-third were stable across adjacent survey waves. This range is suitable for our analysis (Ripley et al. 2022).

*Controls.*[11] The surveys also provided measures for several controls (descriptive statistics are provided in the online supplement, Section D). *Grade cohort* was coded as 8–11 (i.e., rising ninth graders—rising 12th graders) based on the student's grade at wave 1. *Gender* was coded as 0 = male and 1 = female. *Parent education* was the greater of one's mother's or father's highest level (1 = eighth grade or lower; 2 = some high school; 3 = high school graduate or General Equivalency Diploma (GED), 4 = some college, vocational, or technical school; 5 = associate's

degree; 6 = bachelor's degree; 7 = master's degree; and 8 = professional degree). *Immigrant generation* was coded as 1 = respondent born outside the United States, 2 = respondent U.S. born but one parent born outside the United States, and 3 = respondent and parents all U.S. born. *Academic performance* was recorded based on student reports and ranged 1 = mostly F's; 2 = D's and F's; 3 = mostly D's. . . 9 = mostly A's. Ethnic/racial *discrimination* was recorded based on 11 items adapted from the Adolescent Discrimination Distress Index (Fisher, Wallace, and Fenton 2000). Scores range from 1 to 5, with higher values indicating more peer, school, and/or institutional discrimination.

School yearbooks provided information on phenotype and extracurricular activity co-participation. Phenotype was operationalized using student skin tone, which was coded from yearbook photos using the PERLA color palette (Telles 2014; see the online supplement, Section B). Scores ranged from 0 (lightest) to 11 (darkest). *Extracurricular activity co-participation* was measured from group photographs and accompanying rosters for each sport, club, or other activity (Schaefer et al. 2024). For each pair of students, we calculated whether they participated in the same activity during the school year (0 = no; 1 = yes).

## Analytical Approach

Our analysis involves: (1) a series of models to test for selection and peer influence related to racial self-classification, (2) a decomposition step that estimates how much observed homophily can be attributed to these effects, and (3) follow-up analyses that consider possible error in measuring change in self-classification and the implications of model constraints. These all employ a stochastic actor-oriented model (SAOM) (Snijders et al. 2010).

*Statistical Model.* We used an SAOM with multiple dependent variables—friendship and primary racial self-classification. An advantage of the SAOM over other network models is that network and behavior outcomes (i.e., self-classification) are modeled endogenously, which allows for tests of how they affect one another (Duxbury 2023). This is vital for parsing selection from influence on race.

The SAOM assumes that the observed data are the result of a latent sequence of changes unfolding in continuous time and indexed by a long sequence of microsteps (see adams and Schaefer 2018). The model uses a simulation algorithm to recreate the unobserved sequences of microsteps that link observed waves. The model conditions on wave 1 and simulates change between subsequent observations. Individuals, or "actors," are assumed to control their outgoing friendship ties and primary racial self-classification. Each microstep involves one actor making at most one change.[12] Hence, in a given microstep, one actor is chosen at random to consider change in self-classification or friendship, determined by an objective function for the respective outcome (i.e., a *race function* and a *friendship function*). During a microstep, actors consider all possible changes and make the decision that would maximize the respective objective function (though with some stochasticity). This results in an actor dissolving or adding one tie, or no change. Convergence is reached when the model reproduces waves 2 and 3 summary statistics.

Model effects in each function are constructed from an actors' perspective (i.e., "ego") and can reference their own attributes and those of a tie recipient ("alter"). In the friendship networks, egos and alters are students. In the race network, egos are students and alters are the seven racial categories. We refer to model effects using an italicized "shortname," which is how effects are specified in the RSiena software used for the analysis (for further description, see Ripley et al. [2022]). Both the objective functions contained *rate* effects to index opportunities to change. Separate rate effects were specified for each transition or "period" (i.e., with three survey waves there are two periods of change). Each function also estimates *outdegree* effects to control for the average number of ties in the network (i.e., the average number of friends and only one primary self-classification). To improve fit, we allowed outdegree estimates to vary over time (i.e., separate estimates for wave 1 to wave 2 and wave 2 to wave 3).

*Friendship Function.* The effects in this function predict which peers students are more likely to name as a friend. Key terms are those capturing similarity in racial background. We tested the effect of primary racial self-classification using the *from* effect. In predicting whether $i$ named $j$ as a friend, this effect measures whether $i$ and $j$ have the same primary self-classification at that time ($0 = \text{no}$, $1 = \text{yes}$).[13] Overlap in identity options (e.g., any common ancestry) is measured as whether the students in each dyad had any identity options in common ($0 = \text{no}$, $1 = \text{yes}$). We measured this separately for dyads with two multiracial students, a multiracial student naming a monoracial friend and a monoracial student naming a multiracial friend, giving us three measures of partial homophily on race. We did not measure shared identity options for monoracial dyads as this is already captured by the effect of the same primary self-classification. We used a separate *X* effect for each partial homophily measure to allow for possible differences in effect strength (Doyle and Kao 2007; Echols and Graham 2020).

Our models controlled for homophilous selection on background characteristics. For categorical attributes (i.e., gender, grade cohort, and immigrant generation), *sameX* effects capture whether the students in each dyad are the same ("1") or different ("0"). For continuous attributes, we use a *simX* effect to measure similarity. This effect calculates the absolute difference in scores between dyad members and then rescales this difference to range from 0 (maximal difference) to 1 (identical scores). We controlled for the effect of extracurricular activities on friendship with an *X* effect for activity co-participation (Schaefer, Simpkins et al. 2011).

We include effects representing several common network selection mechanisms (Rivera et al. 2010; Wimmer and Lewis 2010). These include reciprocity (*recip*, the tendency to name someone who has named oneself as a friend), transitivity (*transTrip*, the tendency to name one's friends as friends), and the interaction of these two effects (*transRecTrip*). We also controlled for the tendency to avoid open triads (*nbrDist2*) and included several effects to represent the distributions of incoming and outgoing ties (*outActSqrt*, *inPopSqrt*, and *outPopSqrt*).

*Race Function.* Because racial self-classification is a categorical outcome, we modeled it as a two-mode network (Snijders et al. 2013), as shown in Figure 1. With

this approach, students evaluate "ties" representing membership in each category. However, unlike previous applications that allowed actors to choose any category (e.g., adams, Schaefer, and Ettekal 2020), our analysis limited actors to only select a category from within their identity options (through the use of structural zeros and ones, as described earlier).[14] Because the model restricts actors to one tie change per microstep, changing from one category to another requires two microsteps—one to relinquish a category and another to adopt a new category (in either order). This feature is critical for distinguishing peer influence on change versus stability in self-classification; however, it means that at points during model estimation, an actor may have ties to zero or two racial categories, in contrast to the data that allowed only one primary racial identity. This state is temporary, given that the outdegree parameter pulls actors toward having only one tie in the race function, and is consistent with a multiracial person who may be questioning their identity, feeling as though they do not belong in any category or exploring an identity in two categories (Rockquemore and Arend 2002; Rockquemore and Brunsma 2002; Root 1990, 2003).

To test if youth adopt the same racial self-classification as their friends, we used the *to* effect. For student $i$ considering prospective racial category $r$, this effect counts the number of $i$'s friends who have selected category $r$.[15] If peer influence is operative, then students will be more likely to select the category that a larger proportion of their friends have selected. Note that this effect considers the influence of all friends, whether they are monoracial or multiracial.

By default, SAOMs assume that effects have the same magnitude for tie formation and tie dissolution (Snijders et al. 2010). To test for peer influence on change versus stability in self-classification, we relax this constraint by specifying two versions of the *to* peer influence effect—a *creation* version to represent adding a tie (adopting a new self-classification) and an *endowment* version to represent keeping a tie (maintaining one's current self-classification). During the estimation, when actors are evaluating their current self-classification, the endowment version is "switched on" (i.e., included in the function). In evaluating a new self-classification, only the creation version is considered. Estimated creation and endowment effects would be equal if peer influence has the same magnitude of effect on change and stability.

To maintain the overall distribution of racial self-classification, we specified an *altX* effect for each category except white (the reference group). These effects give each racial group its own base probability of being selected. We also control for associations between race and individual attributes. These effects represent the typical approach to predicting self-classification where, for instance, lighter skin tone may predict self-classifying as white. Specifically, we predict racial self-classification based on skin tone (Irizarry, Monk, and Cobb 2023; Khanna and Johnson 2010), experiences of discrimination (Golash-Boza and Darity 2008; Gonlin 2022), and immigration generation (Irizarry et al. 2023; Xu et al. 2021). These effects took the form of interactions between student attributes (*egoX*) and *altX* effects for each racial group.[16]

Using these same attributes, we also controlled for whether students are drawn to a racial identity based on how similar they are to other students who claim

that racial category. We used the *simEgoInDist2* effect that measures the average difference on a given attribute between the ego and every alter who has chosen the respective racial category. For example, given that skin tone is darker on average for Latino compared with white individuals, a white-Latino youth with a darker skin tone will be more similar to his Latino peers than to his white peers. To the extent that matching the prototypical group member is important, multiracial youth will be more likely to select a racial category when the difference between themselves and their peers in a category is small versus large.

*Model Estimation.* We followed the recommended stepwise procedure in developing our model specification (Snijders et al. 2010), which helps to ensure a well fitting and parsimonious model. This entailed fitting an initial model that included key race-related effects and controls that had a strong theoretical or empirical basis. We used score tests (Schweinberger 2012) to evaluate additional effects that were plausible, which were then included in future models as appropriate (but removed if found non-significant).[17]

To account for changes in the student body due to cohort transitions, we used a multigroup estimation strategy for each school (i.e., by treating each pair of adjacent waves as a separate group). This allowed the analytical subsample to differ when estimating changes from waves 1 to 2 versus waves 2 to 3. Models were estimated using version 1.3.12 of the RSiena package (Ripley et al. 2022). All models achieved convergence as measured by an overall maximum convergence ratio of less than 0.25.

# Results

## *Descriptive Changes in Racial Self-Classification*

We begin by describing the primary self-classifications of multiracial youth (for ease of presentation, we focus on the subset of biracial youth). For those racial combinations with at least 10 observations, we calculated the proportion of students with each primary self-classification. These are shown in Figure 2, organized by racial group (note that each combination appears twice). The figure makes several patterns clear. First, across biracial groups, 75 percent or more of biracial students who reported black ancestry self-classified as black. Second, and nearly as strong, is that multiracial students with Native American ancestry consistently self-classified as something other than Native American. These patterns of hypodescent and hyperdescent are consistent with prior research on self-classification (Davenport 2016; Gullickson and Morning 2011; Harris and Sim 2002; Iverson et al. 2022). Third, students with an Asian-Latino background, who were only prevalent in the MW school, tended to self-classify as Latino. Fourth, apart from the above patterns, biracial white students did not exhibit consistent tendencies to self-classify as either white or non-white.

Our full sample contained a total of 349 changes in primary self-classification; however, this was not consistent across racial groups. Multiracial students who reported as Other or Multiracial identity in one wave were far more likely to

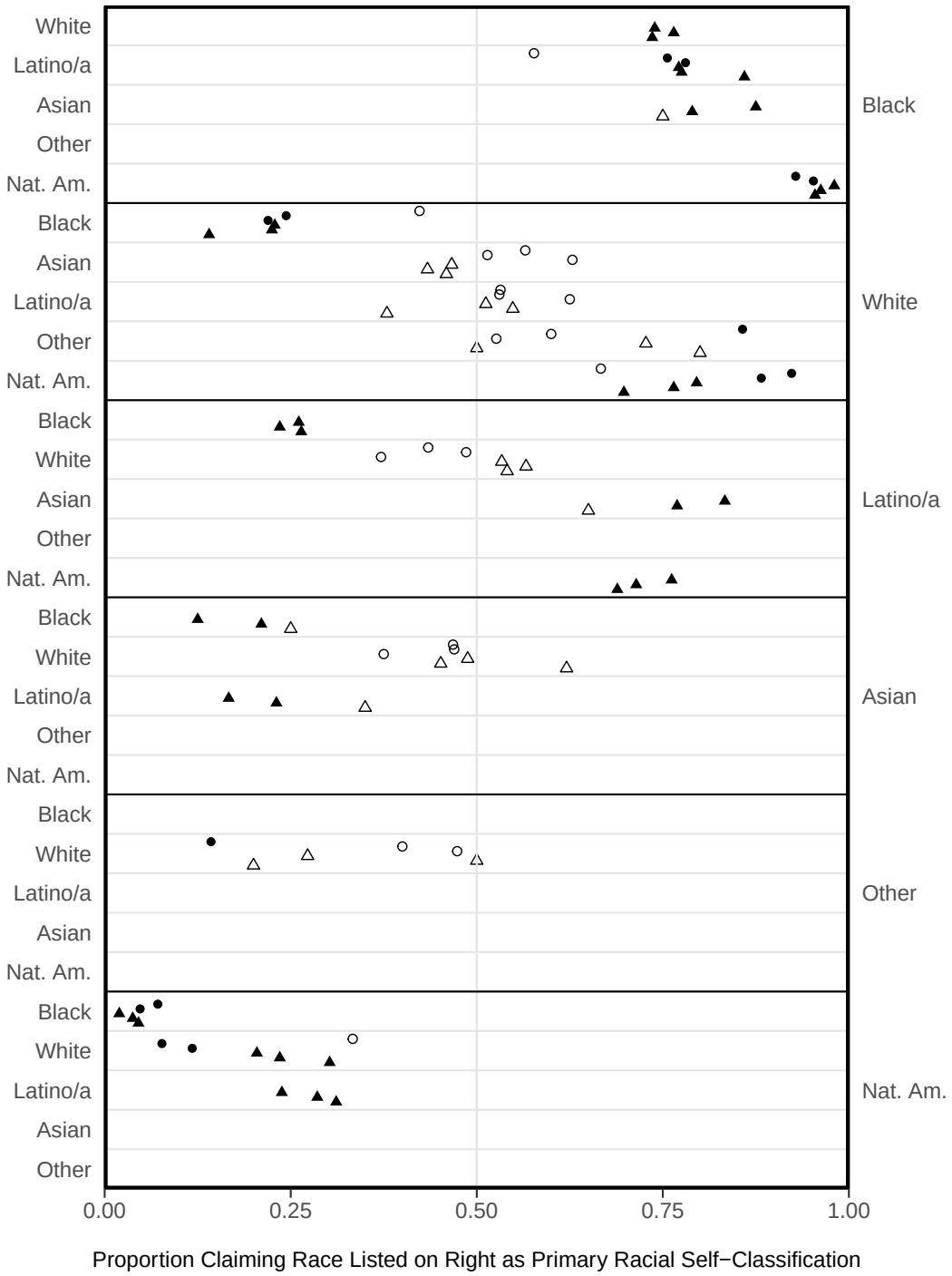


**Figure 2:** Primary racial self-classification for biracial youth. *Note*: Triangles denote MW school and circles denote SW school. Within each row (representing a biracial combination), survey waves are ordered 1–3 from top to bottom. Filled points represent proportions that are significantly different from 0.5 ($t$-test, $p < 0.05$); unfilled points do not significantly differ from 0.5. The figure only includes students with exactly two racial groups as identity options. Proportions only shown if a school wave contained at least 10 students with the respective biracial combination.

**Table 2:** Race-based estimates from main SAOM analysis

| | Midwest | | Southwest | |
|---|---|---|---|---|
| | Model 1 Estimates (SE) | Model 2 Estimates (SE) | Model 1 Estimates (SE) | Model 2 Estimates (SE) |
| *Peer influence* | | | | |
| Friends in racial category | 0.40* (0.12) | – | 0.18* (0.08) | – |
| Race adoption (change) | – | 0.27 (0.17) | – | 0.02 (0.13) |
| Race maintenance (stability) | – | 0.54* (0.19) | – | 0.20† (0.11) |
| *Homophilous selection* | | | | |
| Same primary self-classification | 0.33* (0.04) | 0.33* (0.03) | 0.37* (0.03) | 0.36* (0.03) |
| Shared identity options | | | | |
| Multiracial → multiracial | 0.25* (0.06) | 0.25* (0.06) | 0.12* (0.03) | 0.12* (0.03) |
| Multiracial → monoracial | 0.04 (0.05) | 0.04 (0.05) | 0.02 (0.03) | 0.02 (0.03) |
| Monoracial → multiracial | 0.17* (0.04) | 0.17* (0.04) | 0.01 (0.03) | 0.01 (0.03) |

*Note:* Effects with dashes (–) were not estimated in that model.
* $p < 0.05$; † $p < 0.10$.

report a different identity in the following wave, consistent with research on adults (Agadjanian 2022). Importantly, there was no tendency for students to be drawn toward or away from identifying with any particular racial group (see the online supplement Table SM3).

## Selection and Influence on Primary Racial Self-Classification

Key estimates from our first set of SAOMs are presented in Table 2. The online supplement offers results for controls that provide additional intuition to the model as well as all model estimates (Tables SM4 and SM5, Section F). To help convey effect magnitudes, we convert estimated parameters into odds ratios when sensible by exponentiating the respective coefficient. This indicates how a one-unit change in the effect is predicted to affect the odds of a tie, all else being equal. We estimated two main models: Model 1 explored Hypotheses 1 and 2 and constrained peer influence to be equal for change versus stability in racial self-classification, whereas model 2 freed those effects to vary in accordance with Hypotheses 3 and 4.

*Primary Racial Self-Classification.* As shown in model 1, the estimates for peer influence are positive and statistically significant in both schools (Table 2). Multiracial youth were more likely to claim a particular racial self-classification as the number of friends in that ethnoracial group increased (MW: $b = 0.40$, $p < 0.001$; SW: $b = 0.18$, $p < 0.01$). For each additional friend in an ethnoracial group, the odds of an adolescent choosing that group increased by 1.2 (SW) to 1.5 (MW) times. This offers evidence to support peer influence on racial self-classification.

Our next step was to test what form peer influence took: to promote change in self-classification (Hypothesis 3) or enhance stability (Hypothesis 4). Model 2 replicates the specification of M1, but with two versions of the peer influence effect (representing stability and change). In light of non-significant effects for peer influence on change in both schools, we find no support for Hypothesis 3. Instead, both schools provide evidence consistent with peer influence on stability in self-classification (MW: $b = 0.54$, $p < 0.001$; SW: $b = 0.20$, $p = 0.059$).[18] This suggests that the predominant form of peer influence on racial self-classification was in suppressing change. For each additional friend who shared one's self-classification, the odds of maintaining that identity increased by 1.2 (SW) to 1.7 (MW) times.

*Friend Selection.* We now turn to friend selection in model 1, noting that model 2 estimates are nearly identical. Beginning with effects related to race (Table 2), we find that youth tended to befriend peers with their same primary racial self-classification, which supports Hypothesis 1. In both schools, the estimate for this form of homophilous selection is positive and statistically significant (MW: $b = 0.33$, $p < 0.001$; SW: $b = 0.37$, $p < 0.001$). The parameter values of 0.33 or greater indicate that students were at least 1.4 (exp[0.33]) times more likely to befriend someone with the same versus a different primary racial self-classification.[19]

Next is the effect of common identity options for the three types of multiracial dyads (i.e., multiracial → multiracial, multiracial → monoracial, and monoracial → multiracial), which serves to test Hypothesis 2. In both schools, the shared identity options effect is positive and significant in dyads with two multiracial youth (MW: $b = 0.25$, $p < 0.001$; SW: $b = 0.12$, $p < 0.001$). This indicates that multiracial youth were from 1.1 (SW) to 1.3 (MW) times more likely to befriend a multiracial peer if they shared any identity options. Among the other dyad types, only the MW school has a significant effect: Monoracial students were 1.2 times more likely to name a multiracial friend if they shared any identity options ($b = 0.17$, $p < 0.001$). That these effects are significant net of shared primary racial self-classification suggests that sharing a secondary racial identity can motivate friendship. Although these results offer support for Hypothesis 2, variation in the presence and strength of ancestry homophily across types of multiracial dyads calls for further inquiry to understand these differences.

An open question is whether these effects represent mixed-race friendships that span racial groups (e.g., a white-Latina student who befriends someone with a different primary self-classification but has a Latina background) or whether these effects merely coincided with having the same primary self-classification (e.g., white-Latina friends who both primarily self-classify as Latina and also share white ancestry). Model 3 tested this with an interaction between same primary self-classification and same identity options (see the online supplement).[20] This interaction represents dyad members who were similar in both their primary self-classification and had some secondary racial background in common.[21] We find a non-significant interaction in the MW school and a borderline significant negative interaction in the SW school ($b = -0.14$, $p = 0.095$). Main effects remained significant for shared identity options (MW: $b = 0.20$, $p = 0.05$; SW; $b = 0.17$, $p < 0.001$) and shared self-classification (MW: $b = 0.33$, $p < 0.001$; SW; $b = 0.38$,

**Table 3:** Proportion of observed race homophily attributable to each source

| | Standard (six months) Estimates | | Extended (four-year) Estimates | |
|---|---|---|---|---|
| | Midwest | Southwest | Midwest | Southwest |
| Trend | 0.45 | 0.46 | 0.02 | −0.13 |
| Control | 0.27 | 0.20 | 0.59 | 0.54 |
| Selection | 0.22 | 0.33 | 0.30 | 0.40 |
| Influence | 0.03 | 0.01 | 0.05 | 0.11 |
| Indeterminate | 0.02 | 0.02 | 0.04 | 0.04 |

*Note:* The SAOM was fitted to data with six months between observations. Standard results represent the sources of homophily measured over a six-month window (following Steglich et al. 2010), whereas the extended results are from allowing the model to iterate across a hypothetical four-year time span (i.e., by multiplying the rate parameters in each function by eight prior to simulating the decomposition models). Estimates reported for the period of wave 1 to wave 2.

$p < 0.001$). The negative interaction in the SW suggests that the effects of primary and secondary self-classification were not fully additive. The positive main effect of identity options in both schools indicates that multiracial youth befriended peers who shared a secondary identity but not their primary self-classification. In other words, friendships developed among youth who shared racial background distinct from their primary self-classification, thereby bridging racial group boundaries.

## *Decomposing Sources of Race Homophily*

We now turn to the question of how much responsibility peer influence and selection carried in producing observed levels of race homophily. We follow the procedure outlined in Steglich et al. (2010), which relies upon the simulation capabilities of the SAOM to "imagine" network-race co-evolution under various alternative conditions. These simulations begin with the wave 1 observation in each school and then simulate how friendships and racial self-classification evolve across six months to the next observation point (then repeats, by conditioning on wave 2 and simulating up to wave 3). The basic idea is to compare how much homophily is produced by the full model (M2) relative to reduced models that systematically exclude effects of interest. When an effect is instrumental in producing homophily, its exclusion will result in less homophily compared to the full model.

We modify the Steglich et al. (2010) procedure to account for the categorical nature of racial self-classification. We measure homophily on primary racial self-classification using the E-I index (Krackhardt and Stern 1988), which is calculated as the number of cross-group ties minus same-group ties, divided by the total number of ties. The measure equals 1 if all ties are cross-group, –1 if all ties are within group, and 0 if there are equal numbers of same- and cross-group ties. This measure has the advantages of a linear scale and the absence of a null model that adjusts homophily based on a baseline model (Bojanowski and Corten 2014).[22] This is important because race is fluid in our model, meaning the baseline level of homophily will change as actors' self-classifications change, which can lead to undesirable behavior.[23] The E-I index does not have this feature, which makes it

better suited for testing how the mechanisms in our model affect the total amount of homophily (Schaefer et al. 2018).

The results of our decomposition are presented in Table 3 under the standard (six months) estimates column. The total amount of homophily to explain is calculated as the difference between the average E-I value produced by the full model and the E-I value expected by chance.[24] The proportions in each row were calculated by apportioning this difference to the source in each row. The *trend* proportion represents how much homophily was produced by a model that only included rate and outdegree terms, which represents if actors changed their self-classification and ties randomly. These proportions range from 0.45 to 0.50, which signifies that nearly half of the homophily observed over time is a product of initial conditions. Namely, starting levels of race homophily are quite high, and this carries forward over time, even as actors randomly change friends and self-classification.

The *control* proportion represents all effects in the friendship and race function except those that include race (i.e., homophilous selection and peer influence). These results suggest that from 17 percent to 27 percent of the race homophily explained by the model can be attributable to non-race factors. This set includes effects such as reciprocity and triad closure that magnify existing levels of homophily (Wimmer and Lewis 2010) as well as selection based on background attributes that are associated with race (i.e., consolidation; Blau 1977). With regard to change in racial self-classification, skin tone is likely to be of utmost importance, in that without the constraints of skin tone more actors would change their primary self-classification and become dissimilar to their friends. The *selection* proportion represents homophily attributable to selection based on the four race-based effects. These account for 20–33 percent of the homophily produced by the model. Hence, direct selection based on common identity options and racial self-classification is as important, if not more, than the entire set of controls in creating race homophily. Although it is unsurprising that race-based selection explains this much homophily, it is perhaps surprising that controls explain about as much.

Finally, the proportion accounted for by *influence* ranges from 1 percent to 3 percent. Although these proportions appear small, there is important nuance here. Critically, only multiracial youth are at risk for peer influence. The level of homophily in friendships among monoracial youth, who are the majority in each school, cannot be directly affected by peer influence. Hence, peer influence does not have the same "reach" to drive homophily as does selection based on race. It is notable that in the MW school, the influence proportion is roughly one-seventh of the race-based selection proportion. This school contains a larger share of multiracial youth (40 percent) compared with the SW school (25 percent). Even though the schools showed similar rates of change in racial classification (9–10 percent), the greater proportion of multiracial youth in the MW should provide greater capacity for peer influence to reverberate through the network and affect homophily. It is also important to note that the (2 percent) *indeterminate* proportion is attributable to either race-based selection or influence, but our procedure cannot discern which (Steglich et al. 2010).

To further probe these results, we estimated how these proportions might differ across a longer time span, such as a normative four-year high school tenure. The

extended (four-year) estimates column in Table 3 provides these results. Of note, the share accounted for by *trend* is far lower than the previous estimates—with more change opportunities, random changes moved the network further from the initial, homophilous conditions.[25] Other portions showed a corresponding increase, though the *control* and *influence* portions increased more than did *selection*. For instance, after six months, the portion of homophily explained by influence was 2–15 percent of the portion explained by selection, which rose to 18–26 percent for the hypothetical four-year period.[26] This difference indicates that control and influence effects took longer to have their impact on homophily than did the main effect of homophilous selection on race. Although this is just a thought experiment and does not account for change in identity processes across development (Umaña-Taylor et al. 2014), it reminds us of the powerful cumulative effect that network processes can have (e.g., DiMaggio and Garip 2012).

## Follow-Up Analyses

We conclude with two follow-up analyses that offer additional insight to our approach and results. First is a sensitivity check to address the possibility that observed changes in racial self-classification could be a product of error. Our main analysis took changes in respondent self-classification at face value. However, it is possible that some change could be due to misreporting on the part of respondents. Because it is unclear if such error would be sufficient to drive our results for peer influence, we conducted the following robustness check.

We revisited our data for insights as to whether changes in self-classification were consistent with other information respondents had provided. For each student whose primary racial self-classification differed from the preceding wave, we checked whether they had reported the new classification as an identity option at any previous time point. We also looked for whether students who changed self-classification had reported parent or grandparent birthplaces that were consistent with their new classification. Students reporting Latino/a, Asian, or black were deemed to be consistent if at least one ancestor was born in a country where that ethnoracial group was the numeric majority. For students where we could not find information consistent with their claimed change, we recoded the student to have a stable self-classification across time (either their most frequent or earliest self-classification). Of the 349 instances of self-classification change, 48 could not be substantiated through other means. Though admittedly limited, this strategy gave us a high confidence that instances of recorded change were valid.

Using these "verified" data, we reestimated model 2. We focus on the race function as these estimates are most likely to be impacted by changes in self-classification errors. Figure 3 presents the estimates for peer influence alongside the main model estimates. Effects for peer influence are slightly larger than in the main model. However, our inferences remain unchanged: effects for peer influence on stability remain positive and statistically significant, whereas estimates for influence on race change remain non-significant. This gives us confidence that our findings regarding peer influence are not attributable to erroneous reports of change.[27]

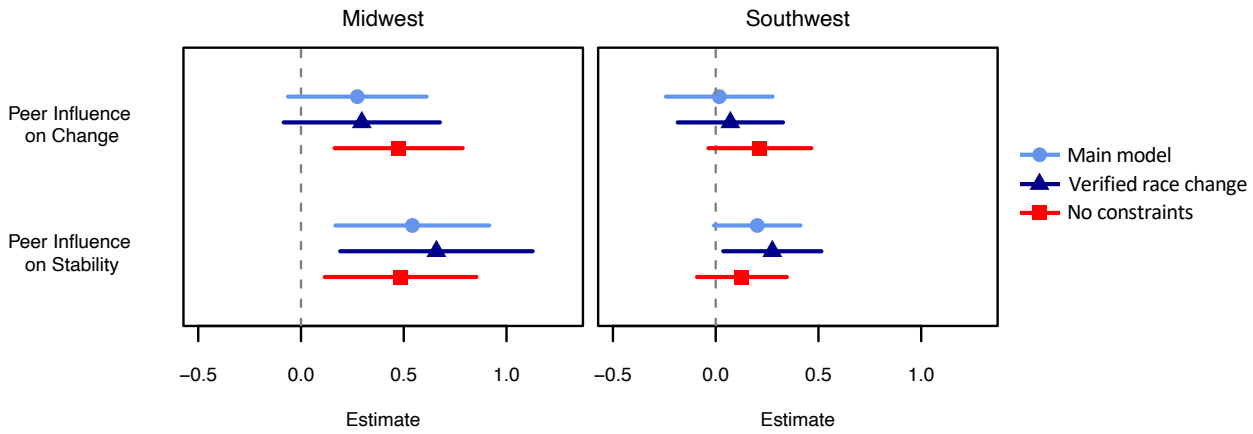


**Figure 3:** SAOM estimates and 95% confidence intervals for peer influence effects in main and follow-up models.

Our second follow-up investigation explores the implication of the constraints our analysis imposed on youth's racial self-classification. We argued that this constraint is vital given that the U.S. racial classification schema dictates that individuals can only claim a racial identity that is part of their ancestry. With future researchers in mind, we ask how important is it to account for individual's identity options? Namely, is our approach viable for modeling identity choice if researchers do not have information on ancestry? To answer this, we remove the identity option constraints for all respondents (monoracial and multiracial), leaving all students at risk for peer influence, with all racial identity options open to them.[28]

Focusing specifically on inferences regarding peer influence, these models show larger effect magnitudes for influence on change and smaller effect magnitudes for influence on stability compared with our main model (see Fig. 3). Critically, these mis-specified models reveal a significant or marginally significant effect of peer influence on change in both schools, which was not present in our main analysis. Moreover, only the MW school shows evidence of peer influence on stability, which our main models found in both schools. This indicates that without constraining identity options, our analysis would have been at risk for false positives regarding the importance of friend influence for identity change and false negatives regarding the effect of influence on identity stability. In short, we had not constrained identity options, we would have reached the nearly opposite conclusion regarding how peer influence operated.

## Discussion

This study investigated race homophily in light of the growing multiracial population in the United States, for whom racial identity can be uncertain, fluid, and subject to peer influence. We set out to test the multiple pathways that link friendships with racial identity and their consequences for race homophily. Our investigation was aided by adopting a dual conceptualization of race that differentiated between

one's identity options (i.e., based in ancestry) and primary racial group identity. We found evidence that peer influence reinforced racial identification and that homophilous selection occurred across multiple dimensions of race. In discussing these findings, we describe how these mechanisms work together to generate and sustain racial homophily and their broader implications.

## *Core Findings*

*Peer Influence.* We found empirical support for the widespread belief that social networks shape racial self-classification (DaCosta 2020). Specifically, we found evidence of influence on stability in self-classification, with no evidence of influence on change in self-classification. For multiracial youth, peer influence inhibited changes in racial self-classification that might otherwise have occurred, thereby preserving racial similarity within friendships. These results imply that when youth did change their self-classification, it was in the absence of same race friends who may have provided validation. This finding is consistent with identity theory, which argues that the lack of verification can lead to a reconsideration of one's identity (Burke and Stets 2023).

More generally, peer influence as reinforcement departs from the conventional assumption of network influence as a source of change (Leszczcensky, Jugert, and Pink 2019). As such, our findings raise the question of how much of the peer influence effect documented in prior research on identity can also be attributed to identity reinforcement as opposed to identity change? Indeed, we could ask this question about peer influence observed for any outcome. Identifying how influence manifests is particularly important for outcomes where the goal is to intervene, such as in the realm of health or risky behavior. Peer influence on stability would point toward reinforcement as a key intervention lever, either strengthening or weakening it according to the desired outcome. In contrast, peer influence on change would point toward investigating the factors that enable learning and diffusion (Zhang and Centola 2019), including why relationships develop between people who differ on the outcome (Schaefer 2018).

*Homophilous Selection.* We revisited the notion of a "preference" for homophily and how it may operate for multiracial youth with multiple identity options. Based on identity theory, we conceptualized selection based on a shared primary racial self-classification as seeking a self-verification context (i.e., peers who validate a salient identity) to avoid challenges to one's authenticity (Museus et al. 2016; Renn 2003; Song et al. 2022). In contrast, similarity in ancestry can either complement similarity on primary identity or serve as an independent and alternative basis for similarity and connection. We found that adolescents befriended one another based on similarity on both primary and secondary racial identity dimensions. The effect of secondary commonality was not simply due to youth with the same biracial heritage befriending one another but represented youth with differing primary identities developing a friendship based on having some racial background in common. This may have occurred through identity exploration, discovering shared culture, or seeking identity verification on a secondary identity. In either case, this reminds us that network selection can operate on "clusters," not just singular

attributes (adams et al. 2020), and calls for work to understand how dimensions of race intersect during selection and the processes behind such effects (e.g., meaning and identity).

*Consequences for Homophily.* While finding evidence of peer influence naturally leads to the question of where influential peers come from (Osgood 2012), the difference in how influence manifests matters in developing an answer. With peer influence on change, the relevant question is why youth choose friends who differ from themselves and can thereby induce change. However, with peer influence on stability, such as we found, the corresponding question is why youth develop friendships with peers who are similar to themselves. These questions point to very different classes of selection mechanisms (Schaefer 2018). Our results suggest that race homophily emerged both directly through homophilous selection on race as well as indirectly through other selection mechanisms. This sets the stage for identity verification, which would strengthen those relationships and one's commitment to the identity (Burke and Stets 2023), the latter appearing as peer influence to maintain homophily.

How much could peer influence that reinforces racial self-classification have affected the overall rate of race homophily, especially because friendships between monoracial youth are not affected by peer influence in the same way? Our decomposition analysis was designed to address this question. We found that peer influence shares responsibility for homophily, though not to the same extent as homophilous selection. Across the six-month interval between observed networks, peer influence accounted for 2–15 percent of the homophily explained by homophilous selection, though that rose to 18–26 percent across a hypothetical four-year period. These estimates suggest that the effect of peer influence on homophily can be non-negligible and may be greater across longer time spans (i.e., with more opportunities for change to unfold).

This points to a lingering gap in our understanding of homophily. Few studies explicitly consider whether the forces that create homophily differ from those that promote the *persistence* of homophily. There is a growing recognition that the factors that drive the formation of network ties may be different from those that support the maintenance of ties (Dahlander and McFarland 2013; Krivitsky and Handcock 2014). Our results highlight the importance of making this distinction for behavior change. Our research is part of a growing body of work that documents asymmetry in peer influence processes (Haas and Schaefer 2014; Rambaran et al. 2017). Altogether, this suggests that on both the selection and behavior side, different processes may be involved in creating versus perpetuating homophily.

## Further Implications

*Multiracial Youth as Bridges.* Should similarity in ancestry matter for friendship beyond similarity in primary racial identity then this *potentially* creates a bridge between racial groups (Lee and Bean 2004) depending upon how identities are aligned within relationships. For example, consider biracial white-Latina friends who claim different primary racial identities (one white and one Latina). Their friendship can be seen to bridge those two racial groups, particularly if the bulk

of their other friendships are centered around their distinct primary identities (i.e., creating a connection between white and Latina friendship groups). In contrast, if the two friends claimed the same primary identity (e.g., both Latina) and their other friends shared that primary identity, then their friendship would not bridge racial groups. We found evidence of the former pattern—friendship between multiracial youth with different primary identities. This is consistent with earlier studies (Doyle and Kao 2007; Echols and Graham 2020) and lends support to hopes that a growing multiracial population will improve intergroup relations and weaken racial group boundaries (Lee and Bean 2004).

This type of bridging behavior may affect intergroup attitudes either directly or indirectly (Levy et al. 2019). Theories argue that under the right conditions, intergroup contact can reduce prejudice (Allport 1954) as can knowledge of intergroup contact among members of one's ingroup (Wright et al. 1997), though support for a causal association is weak (Paluck et al. 2021). There is reason to doubt that intergroup contact attitudes will become more open through one's own intergroup friendships, given that attitudes must be sufficiently open to begin with for such friendships to develop (Khuu et al. 2023). There may be greater capacity for attitude change through extended intergroup contact, such as seeing that one's in-group friends have intergroup friendships. However, a critical question is whether friendships that involve multiracial youth are perceived as in-group or cross-group by others (Love and Levy 2019). If one's perceived racial identity is biased toward the identity of those in their social context (Boda 2018; Cooley et al. 2018), then multiracial individuals' cross-group relationships may not be perceived as cross-group by others. Paradoxically, if multiracial individuals' relationships are perceived as within-group despite crossing group boundaries, they may serve to reify racial categories (Fiel 2021).

*Methodological.* We used a novel operationalization of race as a two-mode network. This approach has the advantage of allowing us to unpack possible differences (or complementarities) in how ancestry and primary group identity informed friend selection and for testing how peer influence manifests. The distinction between influence on identity stability versus adopting a new identity is rarely made in network studies due to the challenge of analytically separating the two. However, with the two-mode operationalization of race, we could separate identity change into distinct steps—relinquishing versus adopting an identity—that could be analyzed independently. This formulation also allowed us to apply necessary constraints on identity options based on ancestry, which prevented monoracial youth from changing their identity and ensured that multiracial youth did not choose an identity outside of their ancestry. This method can readily be applied to test for peer influence with other identities, behaviors, or attitudes, so long as they can be treated as categorical measures.[29]

## *Limitations and Future Directions*

Our measure of identity options was based on adolescent reports of their background. Although the large proportion of multiracial youth that we observed lend support to this approach, we may have incompletely captured students' full

ancestry. This would have primarily affected inferences regarding how ancestry guides friendship. Arguably, for students whose ancestry lacks the salience to merit reporting, such ancestry may also lack the salience to motivate exploration through friendships. Nonetheless, a useful next step would be asking students directly about the racial identity of their ancestors (e.g., Davenport 2016). Moreover, providing an option that allowed students to indicate "Multiracial" as a primary self-classification would better capture how some students conceive of their identity. In addition, we cannot completely rule out peer influence on identity change. Although our sample of multiracial youth at-risk for peer influence was large, we only observed a one-year timespan that may not have been enough time to observe peer influence on change. Moreover, peer influence on change may be more likely to occur during life course transitions, such as going to college, where one enters a new environment surrounded by new peers and must re-establish an identity (Clayton 2020; Renn 2003; Twine 1996).

We found similar results across two different school contexts. Although their high levels of ethnoracial diversity are representative of many schools, one-third of U.S. schools are marked by intense segregation (Frankenberg et al. 2019). It is worth considering whether the processes we studied would unfold differently in less diverse contexts. Certainly, we would expect the strength of homophilous selection to vary based on school factors such as demographic composition or internal stratification (Kruse and Kroneberg 2019; Moody 2001). However, it will be important to examine whether such factors have similar effects across all dimensions of race. We would also expect that ecological factors that enhance ethnoracial salience and clustering (McFarland et al. 2014) would also strengthen the identity conformity process that we observed.

## Conclusion

We set out to include the multiracial population in a more faithful way when examining race homophily. This led to new insights about how different dimensions of race mattered for friend selection and how peer influence on racial self-classification operated. Our finding that peer influence stabilized identity and accounted for only a small portion of race homophily suggests that network models that treat racial identity as fluid and exogenous to network change may not be problematic. In contrast, our findings for selection emphasize the importance of considering the multiple racial categories that inform multiracial youth identities. We illustrate one such strategy, though approaches that capture both full and partial similarity (Echols and Graham 2020) or that weigh identity options by their salience (e.g., Leszczensky and Pink 2019) may also prove suitable, particularly if information on identity options is unavailable.

## Notes

1 Although instances of "affiliative identity" with a non-ancestral race exist, such claims are "an additive aspect of identity that does not supplant but rather exists alongside an ancestral ethnic identity" (Jiménez 2010: 1759).

2 We follow this popular understanding and treat Latino/a as a distinct racial group, alongside white, black or African American, American Indian or Alaska Native, Asian, and Native Hawaiian or Other Pacific Islander.

3 We use multiracial (lowercase) to refer to individuals with multiple ancestral groups and Multiracial (uppercase) to refer to individuals who assert an identity of "Multiracial."

4 One could envision treating every possible racial combination as its own category prior to assessing dyadic similarity, which would ensure that only individuals with exact same racial combination are considered similar. Though an improvement in some ways, this would not account for partial homophily, as we discuss next.

5 Identity options are constrained to one's *known* ancestry, which can differ from genetic ancestry (Roth 2016). Of course, known ancestry can change as one learns about their predecessors (Roth and Ivemark 2018), which is something our conceptual framework would allow. It is also worth noting that one's predecessors were subject to the prevalent racial schema of their era and that dimensions of their race may have changed across time (e.g., as a predecessor reconciled their own racial identity). Key to our conceptualization is how this process is understood by the current generation in terms of awareness of their identity options. For instance, if a biracial grandfather claimed whiteness and is understood by the present generation to have been white (with no knowledge of the grandfather's non-white racial heritage) then the grandfather only contributes white as an identity option. Alternatively, if the present generation were aware that the grandfather adopted a different racial identity across time, stemming from his biracial heritage, then that leaves multiple identity options available to the present generation.

6 The strength of this norm can be seen in the strong reactions to its breaching, such as the case of Rachel Dolezal (https://www.nytimes.com/2015/06/17/us/rachel-dolezal- nbc-today-show.html) or former professor Jessica Krug (https://www.nytimes.com/2020/09/09/us/jessica-krug-george-washington-university.html).

7 This is in addition to other ways that racially dissimilar individuals can become friends, such as homophily on other attributes, shared foci, or random chance (see Schaefer, Simpkins, and Ettekal 2018).

8 Admittedly, this question design makes the monoracial assumption that multiracial youth would feel closer to one of their ancestral groups. Although we can learn much from these data, we would not encourage future use of this exact question given recent scholarship that has identified potential harms of monoracism to multiracial respondents (see Gabriel et al. 2023). Better approaches would be to ask multiracial respondents how close they feel to each group, including options to feel close to all or no groups equally, as well as inquiring directly about a Multiracial identity.

9 This equates to 38 percent (MW) and 23 percent (SW) of multiracial students who changed across waves.

10 Non-school friends could not be included in our analysis because they were outside the sampling frame and did not complete the survey.

11 The default in our analysis is that all attributes are mean-centered prior to model estimation.

12 This is a continuous-time Markov chain Monte Carlo model estimated using an actor-oriented simulation algorithm.

13 This is a form of triad closure, where the presence of $i \rightarrow r$ and $j \rightarrow r$ ties in the race network (i.e., $i$ and $j$ both select race $r$ as their primary self-classification) prompts an $i \rightarrow j$ tie in the friendship network. When $i$ and $j$ have each selected one racial category,

this effect is functionally the same as using the *sameX* effect when race is coded as an actor covariate.

14 To speed estimation, we also added an effect of monoracial status on the rate of change in the race function (using *RateX*) with the parameter fixed at $-100$, which gave monoracial students no opportunities to change.

15 This is another form of triad closure, where the presence of an $i \rightarrow j$ friendship and $j \rightarrow r$ tie in the race network prompts the $i \rightarrow r$ tie in the race network.

16 Main *egoX* effects captured the attribute's effect on choosing a white self-classification, the reference category.

17 For all student attributes, this included *egoX* and *altX* effects in the friendship function and, in the race function, *egoX*, *simEgoInDist2*, and interactions between *egoX* by *altX* effect for each racial group.

18 The SW school estimate is borderline significant, which we take as evidence of peer influence on stability given that (1) the estimate for peer influence on change is essentially zero, suggesting that the significant effect in model 1 is driven by stability and (2) tests for form of peer influence have less power than in model 1, which combined opportunities for change and stability.

19 Follow-up tests added an interaction between primary racial identity homophily and multiracial ego and found that the effect for multiracial youth does not differ from monoracial youth (MW: $b = -0.008$, $p = 0.94$; SW: $b = -0.082$, $p = 0.18$).

20 We only created an interaction for multiracial $\rightarrow$ multiracial dyads because dyads containing a multiracial and monoracial youth that are similar on primary self-classification necessarily share identity options.

21 If the shared identity options effect simply coincided with and supported similarity on primary self-classification, then the main effect of shared identity options would be non-significant and this interaction would be positive, implying that shared identity options only support friendship when they coincide with primary self-classification. If the shared identity options help to bridge racial groups, then the shared identity options main effect would remain significant and positive with the interaction in the model. If the main effect and interaction are both positive and significant, then this would suggest that common identity options are serving both a bridging function and as a secondary commonality.

22 For instance, the $\alpha$ odds ratio used by Moody (2001) calculates the proportion of observed ties that are same group relative to the proportion of dyads that are same group (i.e., the baseline probability of same-group ties).

23 There are scenarios where an actor's race could change due to peer influence, thereby creating more same-group ties, but the baseline also shifts such that the proportion of same-group ties relative to baseline has decreased.

24 The E-I expected by chance was determined by permuting students' racial identity and recalculating the E-I value 1,000 times and then calculating the mean.

25 The negative share in the SW school indicates that there would be less homophily than expected by chance if ties and racial identity changed randomly.

26 Calculated by dividing the influence portion by the selection portion.

27 Full model results in the online supplement (Section I) show that standard errors are generally larger than the main models and estimates for effects representing small groups (e.g., Other race and Multiracial) show greater deviations. However, the overall pattern of results otherwise replicates our main models. There was also minimal change in friendship function estimates between our main model and this follow-up.

28 This was achieved by recoding all 10s and 11s in the race matrix into 0s and 1s, respectively.

29 Constraining behavior options and distinguishing change from stability effects within a SAOM are currently specifiable only for behaviors that can be represented as a two-mode network, which is suitable for categorical measures (including dummy variables).

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