Recruiting Chapter

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1 Introduction

This chapter presents a social network analysis of off-campus recruiting visits made by US colleges and universities to US private high schools. Colleges and universities visit high schools that enroll desirable prospects, while high schools accept visits from colleges and universities that offer enrollment opportunities valued by some segment of the class. An off-campus recruiting visit is an indicator of a relationship between a college and a school that can be analyzed using standard tools of social network analysis. We analyze visits made in 2017 from a sample of 25 selective private colleges and universities and a sample of 17 public research universities. Analyses investigate which types of private high schools receive visits from which types of colleges and universities, emphasizing comparisons within and between public and private postsecondary institutions.

The motivation for these analyses is grounded within the sociology of higher education, particularly two theoretical and empirical syntheses developed by Mitchell Stevens and colleagues (Stevens, Armstrong, & Arum, 2008; Stevens & Gebre-Medhin, 2016). Stevens et al. (2008) introduces metaphors that describe how sociology has conceived the functions of higher education. The stratification tradition conceives of higher education as a "sieve" – an instrument that strains and separates – that allocates people to occupational and social positions. This metaphor builds on "Max Weber's core insight that education has a dual character" (Stevens et al., 2008, p. 129), on one hand, serving social mobility by redistributing access to privileged positions and, on the other, serving social reproduction by granting privileged families disproportionate access to universities that confer privileged positions. The institutional theory tradition in sociology conceives of higher education as a "hub" that connects, pollinates, and legitimizes "prominent institutional sectors of modern societies" (e.g., professions, the philanthropic sector, corporate sector). As a hub, higher education is "simultaneously a powerful and fragile social institution. On the one hand, higher education [is powerful because it] connects and reciprocally blesses various forms of privilege. Elite groups (e.g., high-status families, professions, politicians, scientists, intellectuals) and those aspiring to be a part of them use higher education to certify their legitimacy" (Stevens et al., 2008, p. 137). On the other hand, higher education is fragile because it depends on "patronage as a primary source of revenue."

Stevens & Gebre-Medhin (2016) introduces three alternative metaphors to describe the relationship between higher education and the American political economy. The "association" conceptualization, observed by Tocqueville (1862), views colleges as voluntary (i.e., non-governmental) organizations founded by voluntary associations – principally religious congregations and local business interests – that rely "on the collective contributions and goodwill of their memberships" (Stevens et al., 2008, p. 126). Second, the "national service" configuration views higher education as a public-good engine of economic development and nation building and thus worthy of investment from federal and state governments. Third, "market" configuration conceives of higher education as a private good, suggesting that colleges should survive by competing for customers rather than rely on public funding. Each of these configurations is more or less associated with particular historical epochs and particular types of colleges and universities. For example, the association configuration defined US higher education through the 19th century, but remains salient for private colleges and universities.

These metaphors are useful for comparing public flagship universities to selective private colleges and universities. Selective private colleges and universities depend on patronage from affluent households (market

configuration) and philanthropic interests (association configuration) and primarily serve social reproduction rather than social mobility. Historically, public flagship universities depended on government funding associated with the national service configuration and served social mobility rather than reproduction. Since the 1980s, reductions in public funding associated with the emergence of the market configuration encourage public flagship universities to prioritize patronage from affluent households and philanthropic interests. As suggested by the adage, "he who pays the piper calls the tune," reliance on affluent private-sector interests increases the likelihood that public flagship universities – like selective private colleges and universities – will primarily serve social reproduction rather than social mobility.

We argue that the recruiting behavior of colleges and universities is an indicator of organizational enrollment priorities and, in turn, the extent to which enrollment priorities serve social mobility or social reproduction. However, access to concrete data on university recruiting behaviors has been a persistent barrier to empirical research. We collected data on off-campus recruiting visits made in 2017 by "scraping" URLs (e.g., "Coming to a neighborhood near you") once per week from college/university admissions websites and – for a sample of public research universities – by issuing public records requests. The first study from this data collection analyzed visits made by 15 public research universities (Salazar, Jaquette, & Han, conditionally accepted). The overwhelming majority of public research universities in our sample made more out-of-state visits than in-state visits, a finding antithetical to historic mission of public universities. These out-of-state visits focused on wealthy, predominantly white schools and communities, with a disproportionate number of visits to out-of-state private high schools but relatively few visits to in-state private high schools.

Building on Salazar et al. (conditionally accepted), this chapter analyzes off-campus recruiting visits to private high schools made in 2017 by a sample of 25 selective private colleges and universities and 17 public research universities. We utilize social network methods and emphasize comparisons within and between public and private postsecondary institutions. Analyses are informed by two broad, related questions. First, which types of private high schools receive visits from which types of colleges and universities? Second, to what extent do colleges and universities visit private high schools that share similar characteristics with the college (e.g., geographic region, religious affiliation, academic reputation, and racial composition)?

Our decision to analyze visits to private schools is motivated by the idea that recruiting from private schools largely serves social reproduction. Thus, visits to private schools are antithetical to the historic "social mobility mission" of public universities (Haycock, Mary, & Engle, 2010), particularly since most private school visits by public research universities are to out-of-state schools (Salazar et al., conditionally accepted). By contrast, recruiting from private high schools is consistent with the missions of selective private colleges and universities. From this perspective, private school visits by public research universities is an example of "privatization" that serves social reproduction. A weakness of the empirical literature on privatization in higher education is that few studies public and private colleges/universities with respect to a behavior associated with privatization (McClure, Barringer, & Brown, 2019). By comparing public and private colleges/universities on the behavioral dimension of recruiting visits to private schools, we hope to develop new insights about the privatization of public higher education.

Finally, although private school students are more likely than public school students to come from affluent, college-educated households, the population of US private schools contains tremendous variation in religious affiliation, academic reputation, racial and socioeconomic composition, amongst other dimensions (Murnane & Reardon, 2018). Therefore, focusing solely on visits to private schools enables us to develop a nuanced analysis of which types of private high schools receive visits from which types of colleges and universities. These nuances would be difficult to observe in an analysis that also included visits to public high schools.

2 What Do We Know About Off-Campus Recruiting?

This section provides context for our analyses. First, we situate off-campus recruiting within the broader set of marketing and recruiting interventions in higher education and review what market research says about off-campus recruiting. Second, we review empirical scholarship from sociology that considers off-campus recruiting, emphasizing scholarship that considers the relational aspects of recruiting visits and scholarship that considers private high schools.

2.1 Situating Off-Campus Recruiting Within Enrollment Management

The "enrollment funnel" – depicted in Figure 1 – is a conceptual heuristic that identifies stages in the student recruitment process (prospects, inquiries, applicants, accepted applicants, and enrolled students). "Prospects" are "all the potential students you would want to attract to your institution" (Campbell, 2017). "Inquiries" are prospects that contact the institution, including those who respond to a solicitation and those who reach out on their own. The enrollment management industry uses the enrollment funnel to inform marketing and recruiting interventions that target specific stages. Most scholarship on enrollment management focuses on the final stages of the enrollment funnel, specifically which applicants are admitted and the use of financial aid "leveraging" to convert admits to enrollees (e.g., Alon, 2009; Doyle, 2010; Karabel, 2005; Karen, 1990; McPherson & Schapiro, 1998; Posselt, 2016; Waddell & Singell, 2011). By contrast, the enrollment management industry expends substantial resources on marketing/recruiting activities that target earlier stages of the enrollment funnel (Noel-Levitz, 2020).

Institutions identify undergraduate "prospects" by purchasing "student lists" – containing contact, demographic, and academic achievement information – from College Board, ACT, and other vendors. Universities control which prospects are contained within a list by filtering on criteria such as zip code, test scores, and high school GPA. Once prospects and inquiries are identified, they are targeted with remote and face-to-face recruiting interventions designed to solicit applications and deepen engagement. Remote recruiting interventions include postcards, brochures, emails, text messages, and targeted social media. Face-to-face recruiting interventions include on-campus visits by prospects and off-campus recruiting visits by admissions representatives to high schools, community colleges, college fairs, etc. Institutions utilize advertising (traditional and digital) and social media to solicit inquiries and to create positive "buzz" amongst prospects (Dupaul & Harris, 2012). Given the the rise in "stealth applicants" who do not inquire before applying (Dupaul & Harris, 2012), advertising and social media enables universities to tell their story to prospects who do not wish to be contacted.

What do we know about off-campus recruiting from previous research? As is true for most aspects of enrollment management, much of what we know about off-campus recruiting comes from consulting firms (e.g., Ruffalo-Noel Levitz, EAB), professional associations (e.g., NACAC), and from practitioner-oriented publications. Market research describes off-campus recruiting visits as a means of identifying prospects and deepening engagement with prospects already being targeted through mail/email (Clinedinst & Koranteng, 2017; Noel-Levitz, 2020; Ruffalo Noel-Levitz, 2018).

Ruffalo Noel-Levitz (2018) documents the self-reported efficacy of marketing/recruiting interventions. For the median private 4-yr institution, off-campus visits were the second highest source of inquiries (after student list purchases), accounting for 17% of inquiries. Off-campus visits were tied with student list purchases as the highest source of enrollees, accounting for 18% of enrollees. For the median public institution, off-campus visits accounted for 19% of inquiries (second only to student list purchases) and accounted for 16% of enrollees (ranked third after stealth applicants and on-campus visits).

With respect to expenditure, Table 1, reproduced from Noel-Levitz (2020), shows the percentage of undergraduate recruitment budget allocated to different marketing and recruiting activities.[1] The average public university spent 16% of its recruiting budget on off-campus recruiting visits, compared to 12% of its budget on purchasing student lists and 17% of its budget on "prospective student communications" (e.g., mail, email, text, social media) targeting prospects and inquiries. An emergent trend over the past decade – partially a response to public universities seeking nonresident students – has been the growth of "regional recruiters" who target specific metropolitan areas in the US and abroad (Whitney & Schmidt, 2015). These regional recruiters may be college/university employees or they may be independent contractors who live in the metropolitan area they recruit.

[1] Table drawn directly from Noel-Levitz (2020) Figure 9, which is based on a convenience sample of 45 four-year non-profit institutions and 21 four-year public institutions.

2.2 Empirical Scholarship from Sociology

Empirical academic scholarship on off-campus recruiting is mostly limited to a modest number of sociological case studies, which typically analyze off-campus recruiting as part of a broader analysis of enrollment management (e.g., Holland, 2019; Cottom, 2017; Khan, 2011; Posecznick, 2017; Stevens, 2007). Holland (2019) analyzes visits from the perspective of students at two racially and socioeconomically diverse public high schools. Holland (2019) found that high school visits – including college fairs, instant decision events, and small-group representative visits – influenced where students applied and where they enrolled. This finding was strongest for first-generation students and under-represented students of color, who often reported that "school counselors had low expectations for them and were too quick to suggest that they attend community college" (p. XXX) This trust vacuum created an opportunity for colleges because these students were drawn to colleges that connected with them and made them feel wanted. For example, Holland (2019) describes a high-achieving, first-generation, African American student who was admitted by a highly selective liberal arts college but chose to attend a less selective college that "seemed to want him more" (p. XXX). By contrast, affluent students with college educated parents were less taken by such overtures and more concerned with college prestige.

Stevens (2007) and Khan (2010, 2011) are centrally important to our study because they analyze relationships between college admissions counselors and high school guidance counselors. Stevens (2007), an ethnography of the admissions office at a selective private liberal arts college, highlights the relational function of visits. Stevens (2007, p. 54) states that "the College's reputation and the quality of its applicant pool are dependent upon its connections with high schools nationwide." Therefore, during the autumn "travel season," admissions officers visit selected high schools across the country "to spread word of the institution and maintain relationships with guidance counselors" (p. 53-54). The College tended to visit the same "feeder" schools year after year because recruiting depends on long-term relationships with high schools. The high schools they visited tend to be affluent schools – in particular, private schools – that enroll high-achieving students who can afford tuition and had the resources and motivation to host a successful visit. Whereas Ruffalo Noel-Levitz (2018) highlights the effect of recruiting visits on inquiries and enrollees, findings from Stevens (2007) suggest that the College may have valued recruiting visits primarily as a means of maintaining relationships with guidance counselors. From this perspective, recruiting visits may affect outcomes such as inquiries, applications, and matriculation through their affect on high school guidance counselors. The logic is that a guidance counselor who views a college favorably will steer students to the college.

Khan (2010) analyzed recruiting from the perspective of an elite private boarding school in order to understand "how such schools continue to get comparatively under-qualified students into top colleges and universities" (p. 98). The answer begins by considering the goals of colleges, which are represented by admissions officers, and the goals of private high schools, which are represented by guidance counselors. Colleges want high-achieving students who can pay tuition and donate. They want low acceptance and high yield rates, which are important for rankings. Colleges also want a class composed of "interesting characters" whose curricular and extracurricular strengths meet the needs of important campus constituents (e.g., academic majors, the athletic department, clubs, etc.). Private high schools want to send *all* students to the best college possible. Here, high school guidance counselors face "the pressure of making sure their school seems worth it – that ... paying some $40,000+, really does aid students in the college process" (Khan, 2010, p. 105).

The challenge faced by high school counselors at elite private schools is that "some of these students are slightly better than others. These students will likely get into more than one school – but they can only attend one. And this will lower the chances of your 'second-best' students getting into top schools" (Khan, 2011, pp. 173–174). "Luckily," Khan (2010, p. 105) writes, "the problem for elite boarding schools matches up quite nicely with the problem faced by elite colleges." That is, although college admissions officers receive applications from many outstanding students,

> These outstanding students will also be outstanding to Princeton, Yale, Stanford, and everywhere else. How do you know the ones you pick will attend your school? You can't quite trust applicants, as they are all likely to tell you how much they want to go to your school. And if students you

> accept go somewhere else, there's not much you can do. But you can get better information – information you want – from their high school. And you can reward that school for good information and sanction it for bad information (Khan, 2011, p. 173).

This desire by colleges for trustworthy information about applicant intentions creates an opportunity for high school counselors to advocate on behalf of their students. This opportunity depends on guidance counselors having personal relationships with university admissions offices and on having small enough caseloads to advocate for each student individually.

To explain how high school counselors capitalize on this opportunity, Khan (2011) describes two hypothetical students – Susan and Billy – who both apply to Harvard and Yale. Susan is a shoo-in at both universities, but wants to attend Harvard. Billy has a weaker academic record than most Ivy League students, but has strong extracurricular activities. The guidance counselor tells Harvard that Susan wants to attend Harvard. Next, he informs Yale that Susan will choose Harvard, but Billy loves Yale and has great "character" and extracurricular activities. In the end, Harvard rejects Billy and accepts Susan, thereby, decreasing acceptance rate and increasing yield. Yale rejects Susan and accepts Billy, thereby, also decreasing acceptance rate and increasing yield.

The horsetrading described by Khan (2011) depends on a relationship where the college can trust statements made by the high school counselor and vice-versa. This relationship is the product of repeated interactions over many years. A high school that makes false statements about applicant intentions faces consequences. The college "might stop taking these telephone calls and ignore the information provided. They may even start accepting fewer students from the school, thinking it is less than an honest" (Khan, 2010, p. 106). Because the college and the high school are mutually dependent, however, both "have an incentive to continue with a strong, honest relationship" (Khan, 2010, p. 106). Although, such horsetrading may be less pervasive now than it was in prior decades and may be less common at non-elite private schools. Additionally, college admissions officers from public universities likely have less authority to engage in these tacit negotiations because admissions criteria at public universities face greater public scrutiny than admissions criteria at private colleges and universities.

Even in the absence of horsetrading, maintaining strong relationships is mutually important for the college and for the high school. The college admissions counselor and the high school guidance counselor need to tell one another "their story" and relay that story to constituents (Stevens, 2007). The college admissions counselor explains why the college/university is a "special place" that high school students should want to attend. The guidance counselor explains why the high school is a special place, that even students with lower grades have outstanding extracurricular strengths that will benefit the college.

To summarize, Stevens (2007) finds that off-campus recruiting visits are important for the maintenance of strong relationships between a college and a high school. Strong relationships enable colleges and schools to negotiate and send trustworthy information to one another. In the absence of strong relationships, it is less likely that a college admissions counselor will "take the call" of a high school guidance counselor (Khan, 2010, 2011). Building on these findings, we reason that the presence of a recruiting visit between a college and a high school is an indicator that the college and the high school have a relationship. First, the fact that the college made the effort to visit suggests that the college wants to enroll students from the high school. Second, the fact that the high school hosted the visit suggests that the high school likely views the college as a desirable destination for some of its students. Third, the presence of the recruiting visit suggests the probability of additional interactions (e.g., phone calls).

[CRYSTAL, CAN YOU CLEAN UP THIS PARAGRAPH AND THE NEXT ONE; THESE PARAGRAPHS ARE TRANSITIONING FROM LIT REVIEW INTRODUCTION/BACKGROUND TO OUR PROJECT; AND ALSO MOTIVATING THE ANELYSES THAT WE DO; JUST USE YOUR JUDGMENT. THANK YOU!] Our project collected data on off-campus recruiting visits made in 2017 by a convenience sample of colleges and universities. Our analysis sample is based on three different lists of postsecondary institutions: all public research-extensive universities as defined by the 2000 Carnegie Classification (N=102); all private universities in the top 100 of U.S. News and World Report National Universities rankings (N=58); and all private colleges in the top 50 of U.S. News and World Report Liberal Arts Colleges rankings (N=47). For

each of these institutions, we investigated their admissions website for pages that provided the details of upcoming off-campus recruiting visits. For institutions that posted such pages, we scraped the pages once per week throughout the 2017 calendar year. Many colleges and university only posted certain kinds of events (e.g., hotel receptions and national college fairs) but not others (e.g., day-time visits to high schools). These institutions are excluded from the analyses. Our final analysis sample consists of 17 public research universities, 13 private research universities, and 12 private liberal arts colleges.

Our analyses to date have focused only on visits by public research universities. The big-picture takeaways are as follows. Most public research universities in our sample made more out-of-state than in-state recruiting visits. The exceptions were UC Berkeley, UC Irvine, and North Carolina State University, three institutions with relatively generous state appropriations and the only three public universities in our sample that faced strong nonresident enrollment caps. Across all universities, out-of-state visits systematically targeted affluent, predominantly white schools and communities, usually within populous metropolitan areas. Most public universities also made a disproportionate number of out-of-state visits to private high schools. In addition, analyses of in-state visits found that public high schools in affluent communities were more likely to receive a visit, but this relationship was modest compared to the income disparity between visited and not visited out-of-state public schools. Furthermore, in-state visits did not consistently indicate preferences for majority white high schools or for private high schools.

Figures 2 and 3 show the number of off-campus recruiting visits by public and private colleges and universities in our sample, separated by event type and in-state vs. out-of-state. Table/Figure X demonstrates the disproportionate number of visits to private high schools. The goal of this chapter is to investigate off-campus recruiting visits to private high schools. Which types of private high schools receive visits from which types of colleges and universities? Additionally, to what extent were visits by a college/university to a private high school more likely if the two organizations were similar to one another on key characteristics? Our analyses focus on the characteristics of academic reputation, geographic region, religious affiliation, and racial composition.

3 Network Methods and Data

We utilize network methods rather than conventional descriptive statistics for two, related reasons. First, social network analysis privileges the relationship between actors. The discussion of Stevens and Khan suggests that for private school students, "it is not just the quality of the students that gets them into college but the quality of the relationship between elite high schools and colleges" (Khan, 2011, p. 175). Second, a visit from a college/university admissions counselor to a high school can be conceived as a "network tie" connecting two actors in a social network.

We briefly define essential social network analysis concepts and their operationalization in our analyses. A social network consists of a set of actors – referred to as "vertices" – and the connections – referred to as "edges" between these actors. Whereas "one-mode" networks consist of vertices of the same "type" (e.g., in a publication network each vertex is an author), "two-mode" networks consist of vertices associated with one type of actor/entity having connections to vertices of another type. For example, an actor-movie network consists of actors (mode 1) who appear in movies (mode 2), and an actor shares an edge with a movie if the actor appears in the movie.

Our analyses draw from analyses of "corporate board-director" networks because these are the most commonly analyzed two-mode networks in the social networks literature (e.g., Davis, Yoo, & Baker, 2003). Board-director networks consist of directors (mode 1) who serve on organizational boards (mode 2). In our school-college two-mode network, the vertices are private high schools (mode 1) and colleges/universities (mode 2), and an edge is defined as an off-campus recruiting visits made between the two (e.g., high school i shares an edge with college j if high school i receives at least one visit from college j). Visits can only occur between a school-college pair (not a school-school pair or a college-college pair). This (weighted) network can be represented as a school-by-college matrix (e.g., a 500×40 matrix if our network contains 500 high schools and 40 colleges/universities) in which matrix cell $a_{i,j}$ identifies the number of visits that high school i received from college/university j.

3.1 Two-mode vs. One-mode networks

Two-mode networks are often analyzed as one-mode networks (Borgatti, 2008). Davis et al. (2003) states that "overlapping groups such as boards of directors form a two-mode membership network in which one can conceive of directors as nodes [vertices] connected by a tie of common board membership, or boards as nodes connected by a tie of one or more shared directors" (p. XXX). Thus, a two-mode board-director network can be transformed into two one-mode networks. A weighted one-mode director network can be created as follows: create a director-by-director matrix (e.g., a 100×100 matrix if there are 100 directors in the network); two directors share an edge if they serve together on a board; matrix cell $a_{i,j}$ identifies the number of boards that include both director i and director j (e.g., $a_{i,j} = 0$ if directors i and j do not serve on any of the same boards and $a_{i,j} = 3$ if directors i and j serve on three boards together). Similarly, a one-mode board network is created based on a board-by-board matrix in which two boards share an edge if a director sits on both boards and matrix cell $a_{i,j}$ identifies the number of directors that serve on both board i and board j. Following this approach, we create a one-mode high school network in which two private high schools share an edge if they both receive a visit by the same college/university. Cell $s_{i,j}$ of the school-by-school matrix S indicates the number of colleges/universities that visited both school i and school j. Similarly, we create a one-mode college/university network (herein the college network) in which two colleges share an edge if both colleges visited the same high school. Cell $c_{i,j}$ of the college-by-college matrix C indicates the number of private high schools that received at least one visit from both college i and college j.

3.2 Ego networks

A limitation of our data collection and analysis is that it is based on a convenience sample of 42 colleges and universities, as described above. Thus, for each college and university in our sample, we know all the private high schools they visited (assuming no measurement error). However, for each private high school in our sample, we only know visits they received from the set of 42 colleges/universities in our sample. Given this limitation, it may be useful to think of our data collection as resulting in 42 "ego networks." An "ego" is a single "focal" node (e.g., The University of Notre Dame). An ego network consists "of a focal node ('ego') and the nodes to whom ego is directly connected to (these are called 'alters') plus the ties, if any, among the alters" (p. XXX). For example, the University of Notre Dame ego network consists of all private high schools that received at least one visit from Notre Dame. Additionally, for each high school visited by Notre Dame, the ego network may include all colleges/universities in our sample that also visited the high school.

When analyzing ego networks, researchers often investigate the extent of "homophily" versus "heterophily" (McPherson, Smith-Lovin, & Cook, 2001). Homophily is the idea that two vertices are more likely to be connected if they have similar characteristics (e.g., two people are more likely to be friends on Facebook if they have similar political ideologies). Heterophily, the opposite of homophily, is when pairs of connected vertices have different characteristics from one another. In our analyses, we investigate the extent to which ego network ties are homophilous or heterophilous, focusing on the vertex characteristics of geographic region, religious affiliation, racial composition, and academic ranking.

3.3 Community detection

Many social network analyses utilize data-driven "community detection" algorithms to categorize vertices into a small number of groups (or cluster) based purely on patterns of network ties. Generally, groups are chosen to maximize the number of within-group ties while minimizing ties between members of different groups. We performed hierarchical cluster analysis to allocate colleges and universities into clusters based on their private high schools visits.

4 Network Analyses of Off-Campus Recruiting Visits

This section presents network analyses of visits by colleges and universities to private high schools. Analyses are motivated by two, related research questions. First, which types of private high schools receive visits from which types of colleges and universities? Second, to what extent do off-campus recruiting visits by colleges and universities to private high schools exhibit homophily versus heterophily with respect to the vertex characteristics of geographic region, religious affiliation, academic reputation, and racial composition?

[PARAGRAPH ABOUT TABLE THAT DESCRIBES CHARACTERISTICS OF VISITED VS. NON-VISITED PRIVATE SCHOOLS] Before proceeding to network analyses, Table/Figure X compares the characteristics of private high schools that received at least one recruiting visit from a college/university in our sample to those of private high schools that did not receive a visit. WHICH CHARACTERISTICS TO SHOW: geographic region; religious affiliation; academic reputation; racial composition; enrollment size.

Figure 5 plots the two-mode network of visits to private high schools by all colleges and universities in our sample, with large vertices indicating a college/university, small verticies indicating private high schools and with vertex color determined by geographic region (Northeast, Midwest, South, West). The graph layout places vertices closer together if they are similar to one another in terms of network structure. [SAY WHAT THIS MEANS, DRAWING FROM NOTES FROM RUSS]. Figure 5 suggests a modest relationship between geographic region and network structure. For instance, the high school vertices closest to University of Alabama and University of Arkansas tend to be located in the south. Further, universities located in the same geographic region (e.g., SUNY Stony Brook and Rutgers) tend to be closer to one another than universities located in other regions. However, this relationship is not consistent, for example, Scripps College located in CA is closest to University of Pittsburgh (PA) and Stevens Institute of Technology (NJ). Moreover, the network depicted by 5 is too large to detect nuanced patterns of network structure.

We present results in three steps: First, visits by private colleges and universities; second, visits by public research universities; and, third, comparisons of visits by public research universities to visits by private colleges and universities.

4.1 Visits by Private Colleges and Universities

Figure 6 plots the one-mode network of visits by private colleges and universities. Here, the number of ties between a pair of universities (e.g., Sewanee and Texas Christian University) equals the number of private high schools visited by both universities. The graph layout places colleges/universities closer together if they have similar network structure [MAYBE SAY WHAT THIS MEANS IF YOU HAVEN'T YET]. Additionally, vertex color is determined by hierarchical cluster analysis specified to create $k = 4$ clusters. Although the process of placing vertices was separate from the process of determining community cluster, vertices within the same cluster tend to be closer to one another than those of different clusters.

One cluster consists of Notre Dame, Villanova, Tulane, and Southern Methodist University. Each of these four universities made a relatively high number of visits to private high schools and are relatively centrally located in Figure 6.

Addressing our two motivating research questions – which schools receive visits from which colleges/universities and the extent to which visits are more likely to occur between organizations that share certain characteristics – requires analyses that are more granular than Figure 6. Figure 7 shows characteristics of private high schools visited our sample of private colleges and universities, specifically, geographic region, religious affiliation, academic reputation, and racial composition.

Figure 7 indicates that Notre Dame, Villanova, Tulane, and Southern Methodist University made a large share of visits in the South and the Northeast. With respect to religious affiliation, Notre Dame and Villanova – both Catholic universities – predictably focused visits on Catholic Schools. However, Tulane and SMU also visited a higher share of Catholic schools than most other private colleges and universities. These four universities also visited a lower share of private schools ranked in the top 200 nationally by Niche.

Figure 7 was created from the ego network of each private college and university. Ego networks consist of an ego (e.g., a single college or university), the set of high schools the ego visted (one degree of separation from the ego), and the set of colleges/universities that also visited high schools visited by the ego (two degrees of separation from the ego). Figure 8 plots the ego network of Villanova University, with vertex color determined by religious affiliation. About 50% of Villanova's visits were to Catholic schools, a percentage [?percent?] much higher than most colleges and universities shown in Figure 7, and second only to Notre Dame University. In Figure 8, Notre Dame is closer to Villanova than any other college/university in the Villanova ego network, suggesting that Villanova and Notre Dame visit substantially overlapping sets of schools. Boston College, another Catholic university, is situated a bit further away from Villanova in the clump of colleges that includes Case Western, Tulane, Sewanee, Southern Methodist, and TCU, most of which visit relatively high share of Catholic high schools. By contrast, Villanova is far from nonsectarian liberal arts colleges (e.g., Swarthmore, Smith, Colorado College) which visit fewer Catholic high schools.

A second cluster consits of Boston College, Colorado College, Connecticut College, Emory University, Middlebury, Northwestern Oberlin, Sewanee, Texas Christian University, Tufts, and the University of Denver. This institutions also tend to be located relatively centrally in Figure 6, indicating that many of the high schools they visit are also visited by many private colleges and universities in our sample. Compared to the first cluster, these institutions have a stronger focus on nonsectarian private high schools, with the exception of Boston College, Texas Christian, and Sewanee. The also tended to visit schools with relatively strong academic reputations.

Figure 9 shows the ego network of Emory University, with vertex color determined by geographic region. Located in Atlanta, about 47% of Emory's visits were to schools in the South. Figure 9 indicates that Emory's network structure is similar to several other southern universities – including Tulane, TCU, SMU, and Sewanee, but is dissimilar from Baylor University which made about 56% of visits in the South, but with a focus on schools with a Christian religious affiliation. Figure 9 also suggests that the set of schools visited by Emory overlaps substantially with several institutions located in the Northeast (e.g., Villanova, Boston College, Middlebury) and the Midwest (e.g., Case Western Reserve, Northwestern, Notre Dame).

A third cluster consists of Case Western Reserve, MaCalester, Occidental, Smith, Swarthmore, and Williams. These institutions made relatively fewer visits than institutions in the first two clusters and are located relatively peripherally in the one-mode network, as shown in Figure 6. With the exception of Case Western Reserve, these institutions are liberal arts colleges rather than research universities. They tended to visit a high share of nonsectarian private high schools and also a high share of schools ranked in the top 200 nationally by Niche.

The final cluster consists of Baylor, Harvey Mudd, Scripps, and Stevens Institute of Technology. Figure 6 indicates that all four institutions are rather peripheral to the network. Harvey Mudd, Scripps, and Stevens made relatively few visits to private high schools. By contrast, Baylor visited a fundamentally different set of schools than other private colleges and universities in that Baylor visited a large number of Christian private schools that were not visited by other private colleges and universities in the sample. Overall, these four institutions form a group more because they are peripheral to the overall network as opposed to having similar network structures to one another.

Finally, we comment on the racial composition – defined here as the percent of students who identify as Black, Latinx, or Native – of private high schools visited by private colleges and universities in our sample. Figure 7 shows substantial variation across and within clusters in the geographic region, religious affiliation, and academic reputation of visited private schools. By contrast, the racial composition of visited private high schools was remarkably similar. On average, about one-third of visits were to schools where Black/Latinx/Native students comprised less than 10% of the student body, about 50% of visits were to schools where Black/Latinx/Native students comprised between 10% and 25% of the student body, and about 15% of visits were to schools where Black/Latinx/Native students comprsied more than 25% of the student body. Some colleges (e.g., Williams and Swarthmore) were better than others (e.g., Emory, Sewanee) at visiting schools where Black/Latinx/Native students comprised more than 50% of the population, but these visits to very diverse private schools represented a small share of all visits to private schools. The overall results suggest that when private colleges and universities visit private high schools, they are usually visiting schools that enroll few Black, Latinx, or Native students.

[HOW DOES RACIAL COMPOSITION OF VISITED PRIVATE HIGH SCHOOLS COMPARE TO RACIAL COMPOSITION OF ALL PRIVATE HIGH SCHOOLS? CUT/REVISE TEXT DEPENDING ON ANSWER TO THIS QUESTION] See Figure 4. Private high schools tend to have a higher share of White students than public high schools. Moreover, the private high schools that were visited by private colleges and universities in our sample had a lower share of Black/Latinx/Native students, on average, than the population of private high schools. Our findings suggest that the low number of Black/Latinx/Native students at private colleges and universities may be driven by thse institutions explicitly recruiting from private high schools that enroll few Black/Latinx/Native students.

[NEED TRANSITION TO FOCUS NOW ON HIGH SCHOOLS] Which private high schools received the most visits from private colleges and universities in our sample? Table 2 shows characteristics of the 20 private high schools that were visited by the most private colleges and universities. The last two columns of Table 2 are "degree" and "strength," which are related measures of vertex "centrality." Measures of centrality attempt to identify the most important or influential actors in a social network. "Degree" is defined as the number of edges direclty connected to a vertex. In Table 2, the degree of a high school is the number of private colleges and universities in our sample that visited. The concept "strength" is generally defined as a weighted measure of degree. In our study, colleges often made more than one visit to the same high school in 2017. Thus, Table 2 defines strength as the total number of visits from private colleges and universities in our sample.

The Kent Denver School, the top ranked school in 2,was visited by 23 of the 26 private colleges and universities in our sample. Choate Rosemary Hall was visited by 21 colleges and universities, but these 21 institutions made 34 total visits. Most schools in Table 2 are mostly nonsectarian. Although all received a Niche grade of "A+", they are not uniformly in the upper-echelon of schools ranked in the top 100 nationwide. With the exception of St. Ignatius Prep in Chicago and the Maret School in Washington DC, students who identify as Black, Latinx, or Native comprise less than 20% of all students.

Table 3 shows the characteristics of private high schools by degree band (e.g., visits from 15+, 10-14, etc). Schools that received visits from 4 or fewer private colleges and universities enrolled a greater share of Black/Latinx/Native students. These schools were also disproportionately Catholic schools and were more likely to recieve a grade of "A" or lower from Niche.

Whereas Tables 2 and 3 examine centrality, they do not assess the extent to which high schools cluster into groups, with some high schools visited by nearly all colleges and universities and other groups of high schools only receiving visits from a particular subset of colleges and universities. [THIS IS WHERE THE DIRECT VS. INDIRECT CONNECTION ANALYSIS RECOMMENDED BY RUSS WOULD GO. WE MIGHT ADD THIS TO BURD CHAPTER OR DO AFTER BURD CHAPTER SUBMITTED]

4.2 Visits by Public Research Universities

Figure 10 plots the one-mode network of visits by 17 public research universities, with vertex color determined by hierarchical cluster analysis specified to create $k = 4$ clusters. Accompanying Figure 10 and created from the respective ego networks of each university is Figure 11, which shows the characteristics of private high schools visited by these public reearch universities.

We briefly sketch broad findings before discussing each cluster. First, for must public research universities in our sample, the vast majority of private school visits were to out-of-state schools [WHICH FIGURE/TABLE SHOWS THIS], which is consistent with the idea that public research universities pursue students from affluent households who can afford nonresident tuition price. Second, Figure 11 indicates that public research universities tended to visit private high schools with weaker academic reputation than the set of schools visited by private colleges and universities [LATER, SAY GOING AFTER MONEY WITHOUT ACADEMIC REP]. Third, despite being nonsectarian, most public research universities visited a higher share of private high schools that were Catholic or Chrisitan than those visited by private colleges and universities. Fourth, racial composition of schools visited by public research universities was similar to the set of schools visited by private colleges and universities. A few public research universities appear (e.g., UC Irvine, UC Riverside) appear to visit a more racially diverse set of schools, but these institutions visited very few private schools.

The University of Alabama is a cluster unto itself and is centrally located in the network graph in Figure 10. In 2017, the University of Alabama made 985 visits to U.S. private high schools. This number was more than double the 486 visits made by the University of South Carolina, which ranked second amongst public research universities in terms of number of private school visits, and substantially more than the 687 visits made by Notre Dame, which ranked first amongst private colleges and universities. Drawing from Figure 11, more than 50% of visits by the University of Alabama were in the South. With respect to religious affiliation, nearly 50% of visits were to Catholic schools and about 25% of visits were to Christian schools. In contrast to the majority of private colleges and universities in our sample, the University of Alabama made nearly 50% of its visits at schools that received a grade of less than "A+" by Niche. At the same time 80% of visited schools enrolled fewer than 25% of students who identified as Black, Latinx, or Native.

A second cluster, located nearly as centrally in Figure 10 as the University of Alabama, consists of the University of South Carolina (486 visits) and the University of Colorado-Boulder (379 visits). These institutions ranked second and third amongst public universities in our sample in terms of number of visits. Geographically, both universities recruiting nationally but concentrated on some regions more than others. For both universities, the Northeast and Midwest accounted for about 25% of visits. The University of South Carolina concentrated visits in its home region, the South. CU-Boulder made X% of visits in its home region, the West, and made X% of visits in the South. Both universities made more than 60% of visits at Catholic or Christian affiliated schools. In terms of academic reputation, CU-Boulder visited a slightly stronger set of schools than the University of South Carolina and both universities visited a stronger set of schools than the University of Alabama.

Third, the largest cluster – at nine universities – and the most diverse in terms of geographic location and academic reputation consists of three universities from the Northeast (Rutgers, UMass Amherst, University of Pittsburgh), two Midwest universities (University of Cincinnati, University of Kansas), two universities in the South (University of Arkansas, University of Georgia), and two universities from the West (UC Berkeley, UC San Diego). Located between the center and periphery in Figure 10, these universities made a moderate number of private school visits, ranging from 197 by UC-San Diego to 302 and 303, respectively, by the University of Georgia and Rutgers.

These universities differ in the extent to which visits were concentrated in their home geographic region. At the high end, the University of Georgia – 47th in YYYY US News rankings – and the University of Arkansas – 160th in US News rankings – are located in the South and made at least 75% of visits in the South. The remaining seven universities generally made more visits in their home geographic than other regions but while also making substantial visits outside their home region, particularly in the South. For example, three highly ranked universities – University of Pittsburgh (ranked 58), UC-Berkeley (ranked 22), and UC-San Diego (ranked 35) each made a substantial share of visits in the South. In contrast to private colleges and universities, several public research universities in this cluster largely ignored particular geographic regions altogether. For example, the University of Kansas and the University of Arkansas did not visit the Northeast. The University of Georgia, UC-San Diego, and UMass Amherst largely ignored the MidWest, while the University of Pittsburgh did not visit the West.

With the exception of UC-Berkeley, the universities in this cluster made more than 50% of visits to sectarian Catholic or Christian affiliated schools. Universities that made a substantial share of visits to Christian affiliated schools also tended to make a large share of visits in the share of visits in the South [OVERLAP BETWEEN SOUTH AND CHRISTIAN]. Finally, with the exception of UC-Berkeley, UC-San Diego, and to a lesser extent the University of Georgia – three highly ranked universities – the academic repuation of schools visited by this cluster was substantially lower than those visited by the majority of private colleges and universities in our sample. These results suggest that non-prestigious public research universities visit a large number non-elite private high schools that generally did not receive visits from selective private colleges and universities.

The final cluster consists of five universities – University of Nebraska-Lincoln (159 visits, 104 out-of-state), SUNY Stony Brook (146 visits, 107 out-of-state), UC Riverside (87 visits, 32 out-of-state), UC Irvine (60 visits, 40 out-of-state), North Carolina State University (23 visits, 20 out-of-state). These universities made fewer private school visits than the other public research universities, made a relatively higher share of in-state visits, and generally concentrated visits within their home geographic region. As such, they are located

on the periphery of the network in Figure 10.

Transitioning from the focus on public research universities to a focus on the private high schools they visit, Table 4 shows the characteristics of the 20 private high schools that received visits from the greatest number of public research universities in our sample.

The top five high schools in Table 4 each received visits from 11 (i.e., "degree" equals 11) of the 17 public research universities in our sample. Notably, all five schools were located in either California and Texas. Four of these schools are Catholic and one – The Greenhill School – is nonsectarian. These five schools differed in terms of the number of visits received. For example, both Jesuit College Prep in Dallas, TX and Santa Margarita Catholic High School in Rancho Santa Margarita, CA received 19 visits from 11 public research universities, while Cathedral Catholic High School in San Diego, CA received 13 visits from 11 public research universities [SAY SOMETHING ABOUT WHICH PUBLIC [OR PRIVATE] UNIVERSITIES VISITED THESE HIGH SCHOOLS? THIS CODE BELOW DOES THAT WORK IF YOU WANT TO INCLUDE IT; MAYBE SHOW EGO NETWORK OF A COUPLE HIGH SCHOOLS?]

The set of schools visited by the greatest number of public research universities from our sample differs substanitally from the schools visited by the greatest number of private colleges and universities. Only four of the 20 schools in 4 were also in the anologous table for private colleges and universities (Table 2), specifically the Greenhill School in Addison, TX, Episcopal High School in Alexandria, VA, St. Ignatius College Prep in Chicago, IL, and the McDonogh School in Owings Mills, MD. Compared the top 20 private schools most visited by private colleges and universities, the 20 most-visited schools by public research universities were more likely to be Catholic schools and they had substantially lower academic reputations. Of the 20 schools in Table 4, only one – The Greenhill School in Addison, TX, ranked 64 – was ranked in the top 100 nationally by Niche. By contrast, of the 20 schools most visited by private colleges and universities, nine were ranked in the top 100 by Niche.

The top 20 most-visited schools by public research universities enrolled a somewhat higher percentage of students who identify as Black/Latinx/Native than the schools most-visited by private colleges and universities. For example, of the top-20 schools most visited by public research universities, there were five schools where students who identify as Black, Latinx, or Native represent at least 30% of student enrollment. By contrast, none of the top-20 schools most visited by private colleges and universities enrolled at least 30% of students who identify as Black, Latinx, or Native.

Table 5 shows the characteristics of private high schools by number of public research universities that visited (e.g., 6+, 5, 4, etc.). Compared to schools that received visits from three or fewer public research universities, schools that received visits from several public research universities were disproportionaly located in the South, were more likely to be Catholic schools than Christian or nonsectarian, and were likely to be ranked in the top 200 by Niche or be graded as "A+" by Niche.

4.3 Comparison of Public Versus Private Colleges and Universities

We conclude by comparing the off-campus recruiting visits to private high schools by public research universities to those of private colleges and universities.

For these analyses, we include both in-state and out-of-state visits made by private colleges and universities but we exclude in-state visits by public research universities but we do not exclude. The motivation for this decision is as follows. For most public research universities in our sample, the overwhelming majority of visits to private schools are to out-of-state private schools. Prior research suggests that nonresident enrollment growth by public research universities is substantially motivated by the goal of growing tuition revenue [CITE]. Typically, nonresident tuition price at public research universities is substantially higher than resident tuition price but lower than the price charged by selective private colleges and universities (e.g., in 2018-19 fulltime annual resident tuition price at the University of Colorad-Boulder was $10,728, compared to nonresident tuition price of $35,482, compared to tuition price of $54,120 at Northwestern University). We argue that the pursuit of out-of-state students by public universities is an example of "privatization" because out-of-state enrollment is antithetical to the traditional mission of public universities but is consistent with

the mission of private colleges and universities. Furthermore, we argue that out-of-state recruiting efforts by public research universities focus on affluent households who are also considering private colleges and universities. Therefore, comparing recruiting visits by private colleges and universities to out-of-state visits by public research universities provides a helpful test of the extent to which public institutions are mimicking the behavior of private institutions. Figure 10 plots the one-mode network of visits by the 42 public and private colleges and universities in our sample, with vertex color determined by hierarchical cluster analysis specified to create $k = 4$ clusters. Figure **??** shows the characteristics of private high schools visited by these 42 institutions, sorted by cluster. Of the four clusters from Figures 10 and **??**, one contains solely of public research universities, one contains solely of private colleges and universities, and two contain a mix of private and public institutions.

The public-only cluster consists of five institutions: North Carolina State University, SUNY Stony Brook, UC Irvine, UC Riverside, and the Unviersity of Nebraska-Lincoln. These universities made relatively few (out-of-state) visits to private high schools – ranging from 20 by NC State to 107 by SUNY Stony Brook – and, thus, are located on the periphery of the network in Figure 10. The private-only cluster consists of 13 institutions: Case Western Reserve, Colorado College, Connecticut College, Emory University, Macalester, Middlebury, Oberlin, Occidental, Smith, Swarthmore, Tufts, University of Denver, Williams. This cluster contains nine liberal arts colleges and four universities (U of Denver, Emory, Tufts, Case Western Reserve). Geographically, six of these institutions are located in the Northeast, three in the Midwest, two in the West, and one in the South. Compared to other postsecondary institutions in our sample, the colleges in this cluster made a moderate number of private school visits, ranging from 164 visits by Smith to 337 by Oberlin. Drawing from **??**, visits were spread out geographically rather than concentrated in a particular region. The majority of visits were to nonsectarian schools. Compared to other clusters, these colleges visited schools with strong academic reputations.

We devote more attention to the two clusters that contain a mix of public and private postsecondary institutions. The first of these contains 11 institutions, including eight private universities (Boston College, Northwestern University, Notre Dame, Sewanee, Southern Methodist, Texas Christian University, Tulane, Villanova) and three public research universities (University of Alabama, University of Colorado-Boulder, University of South Carolina). The universities in this cluster made, relatively, a very high number of private school visits – ranging from 333 by Boston College to 931 (out-of-state) visits by the University of Alabama – and are located in the center of the network in Figure 10. Geographically, five of these institutions are located in the South, two in the Northeast, two in the Midwest, and one in the West. **??** shows that most of these institutions – even those not located in the South – made a disproportionate number of recruiting visits in the South. This cluster contains three private Catholic universities (Notre Dame, Villanova, Boston College), which visited a relatively high share of Catholic Schools, and X private Christian universities (Sewanee, Southern Methodist, Texas Christian), which visited a relatively high share of Christian affiliated schools. More notable, however, is the extent to which the three public research universities focused visits on Catholic or Christian private schools. Finally, the universities in this cluster – albeit to a less extent for Boston College, Northwestern, and Tulane – visited private high schools with weaker academic reputations than those visited by the cluster of 13 private colleges and universities. The weak academic reputation of schools visited by Notre Dame – similar to those visited by the University of Alabama and the University of South Carolina – is surprising given that Notre Dame is ranked 19th by US News.

The final cluster contains 13 institutions, including nine public research universities (U. of Arkansas, U. of Cincinnati, U. of Georgia, U. of Kansas, U. of Pittsburgh, UC-Berkeley, UC-San Diego, and UMass Amherst) and four private institutions (Harvey Mudd, Scripps, Stevens Institute of Technology, and Baylor). The universities in this cluster made a moderate number of private school visits – ranging from 111 by Scripps to 257 by Baylor – and are located between the center and the periphery of the network in Figure 10. Whereas, the public and private institutions in the previous cluster (e.g., University of Alabama and Notre Dame) were clearly similar to one another in recruiting patterns, the similarities between public and private institutions in this cluster are less clear. Interestingly, in our analyses of visits by private colleges and universities (above), these four private institutiosn were their own cluster and were on the periphery of the network. Geographically, these institutions are spread across the country, with recruiting visits concentrated in their home region and often in the South. [COMMENT ON SIMILARITIES BETWEEN PUBLIC AND PRIVATE W/ RESPECT TO REGION/RELIGION, ACADEMIC REPUTATION]

5 Discussion

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6 Summary and Discussion

[ADD SUCCINCT, CONCRETE SUMMARY FOCUSING ON BIG FINDINGS AND THEMES; VERY BRIEF DISCUSSION]

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Table 1: Percentage of budget allocated to marketing/recruiting activities by private non-profit 4yr and public 4yr institutions

Activity	Private	Public
Travel	17	16
Student search (purchased lists)	14	12
Prospective student communications	13	17
Events	12	11
Recruitment publications	11	15
Web services and digital advertising	11	13
Traditional advertising	6	6
International recruitment	5	3
Transfer recruitment	4	4
Other	8	3

Table 2: Top 20 most central private HS visited by private institutions

school_name	city	state_code	region	religion	pct_blacklatinxnative	ranking	ranking_numeric	degree	strength
KENT DENVER SCHOOL	ENGLEWOOD	CO	west	christian	6.370370	A+	122	23	24
HARVARD-WESTLAKE SCHOOL	STUDIO CITY	CA	west	christian	16.708385	A+	6	21	22
CHOATE ROSEMARY HALL	WALLINGFORD	CT	northeast	nonsectarian	15.882353	A+	8	20	32
THE LAWRENCEVILLE SCHOOL	LAWRENCEVILLE	NJ	northeast	nonsectarian	15.911873	A+	10	20	22
THE LOOMIS CHAFFEE SCHOOL	WINDSOR	CT	northeast	nonsectarian	11.638591	A+	38	19	27
DALTON SCHOOL	NEW YORK	NY	northeast	nonsectarian	12.718964	A+	32	19	24
THE HOCKADAY SCHOOL	DALLAS	TX	south	nonsectarian	13.935970	A+	59	19	24
ST IGNATIUS COLLEGE PREP	CHICAGO	IL	midwest	catholic	24.253460	A+	298	19	23
ALBUQUERQUE ACADEMY	ALBUQUERQUE	NM	west	nonsectarian	15.862069	A+	83	19	21
UNIVERSITY PREP	SEATTLE	WA	west	nonsectarian	9.683099	A+	249	19	21
THE BISHOP'S SCHOOL	LA JOLLA	CA	west	christian	0.000000	A+	43	19	19
MARET SCHOOL	WASHINGTON	DC	south	nonsectarian	23.112481	A+	100	19	19
THE BRYN MAWR SCHOOL	BALTIMORE	MD	south	nonsectarian	18.491124	A+	98	19	19
LAKESIDE SCHOOL	SEATTLE	WA	west	nonsectarian	9.328358	A+	14	19	19
GREENHILL SCHOOL	ADDISON	TX	south	nonsectarian	16.679718	A+	64	19	19
EPISCOPAL HIGH SCHOOL	ALEXANDRIA	VA	south	christian	16.447368	A+	141	18	31
THE HOTCHKISS SCHOOL	LAKEVILLE	CT	northeast	nonsectarian	14.006515	A+	17	18	29
PHILLIPS ACADEMY	ANDOVER	MA	northeast	nonsectarian	11.759505	A+	3	18	28
WOODWARD ACADEMY	COLLEGE PARK	GA	south	nonsectarian	67.770035	A+	175	18	25
THE KINKAID SCHOOL	HOUSTON	TX	south	nonsectarian	8.654545	A+	89	18	20

Table 3: Characteristics of private HS visited by private institutions, by degree band

degree_band	count	midwest	northeast	south	west	catholic	christian	nonsectarian	other	c1_lt10	c2_10to25	c3_25to50	c4_50+	c1_top200	c2_A+	c3_A	c4_ltA	<NA>
6+	482	12.7%	27.4%	35.7%	24.3%	31.5%	14.3%	53.5%	0.6%	34.4%	52.9%	10.0%	2.7%	31.3%	56.4%	9.3%	1.5%	1.5%
5	82	13.4%	28.0%	31.7%	26.8%	41.5%	25.6%	29.3%	3.7%	32.9%	47.6%	12.2%	7.3%	2.4%	65.9%	26.8%	2.4%	2.4%
4	104	12.5%	27.9%	43.3%	16.3%	57.7%	17.3%	20.2%	4.8%	41.3%	40.4%	12.5%	5.8%	1.0%	50.0%	41.3%	5.8%	1.9%
3	122	26.2%	27.0%	38.5%	8.2%	54.9%	17.2%	25.4%	2.5%	32.0%	49.2%	13.1%	5.7%	NA	39.3%	44.3%	12.3%	4.1%
2	200	20.0%	30.0%	34.5%	15.5%	53.5%	21.5%	22.5%	2.5%	41.5%	33.5%	17.5%	7.5%	1.5%	28.0%	43.5%	24.5%	2.5%
1	335	21.8%	23.9%	39.4%	14.9%	53.4%	27.5%	15.8%	3.3%	33.1%	38.8%	17.3%	10.7%	0.3%	20.9%	32.8%	41.2%	4.8%

Table 4: Top 20 most central private HS visited by public institutions

school_name	city	state_code	region	religion	pct_blacklatinxnative	ranking	ranking_numeric	degree	strength
WOODWARD ACADEMY	COLLEGE PARK	GA	south	nonsectarian	67.770035	A+	175	12	19
JESUIT COLLEGE PREP SCHOOL	DALLAS	TX	south	catholic	18.140794	A+	235	11	19
SANTA MARGARITA CATHOLIC HIGH SCHOOL	RANCHO SANTA MARGARITA	CA	west	catholic	11.600928	A+	475	11	19
NOTRE DAME HIGH SCHOOL	SHERMAN OAKS	CA	west	catholic	31.163548	A+	642	11	15
THE HOCKADAY SCHOOL	DALLAS	TX	south	nonsectarian	13.935970	A+	59	11	15
CATHEDRAL CATHOLIC HIGH SCHOOL	SAN DIEGO	CA	west	catholic	10.384615	A+	536	11	13
GREENHILL SCHOOL	ADDISON	TX	south	nonsectarian	16.679718	A+	64	11	12
FORT WORTH COUNTRY DAY SCHOOL	FORT WORTH	TX	south	nonsectarian	86.909091	A+	327	10	22
JSERRA CATHOLIC HIGH SCHOOL	SAN JUAN CAPISTRANO	CA	west	catholic	13.963211	A+	656	10	18
EPISCOPAL HIGH SCHOOL	ALEXANDRIA	VA	south	christian	16.447368	A+	141	10	17
LOYOLA ACADEMY	WILMETTE	IL	midwest	catholic	10.477583	A+	548	10	15
ST IGNATIUS COLLEGE PREP	CHICAGO	IL	midwest	catholic	24.253460	A+	298	10	14
URSULINE ACADEMY OF DALLAS	DALLAS	TX	south	catholic	23.174971	A+	344	10	14
SERVITE HIGH SCHOOL	ANAHEIM	CA	west	catholic	49.529412	A	NA	10	13
EPISCOPAL SCHOOL OF DALLAS PK-12	DALLAS	TX	south	christian	6.845513	A+	263	10	11
NOLAN CATHOLIC HIGH SCHOOL	FORT WORTH	TX	south	catholic	35.213033	A	NA	9	22
STRAKE JESUIT COLLEGE PREP SCHOOL	HOUSTON	TX	south	catholic	29.076621	A+	191	9	18
BENET ACADEMY	LISLE	IL	midwest	catholic	1.768607	A+	453	9	9
MCDONOGH SCHOOL	OWINGS MILLS	MD	south	nonsectarian	22.320769	A+	311	9	9
TRINITY CHRISTIAN ACADEMY	ADDISON	TX	south	christian	8.648256	A+	460	8	22

Table 5: Characteristics of private HS visited by public institutions, by degree band

degree_band	count	midwest	northeast	south	west	catholic	christian	nonsectarian	other	c1_lt10	c2_10to25	c3_25to50	c4_50+	c1_top200	c2_A+	c3_A	c4_ltA	<NA>
6+	126	7.9%	11.1%	63.5%	17.5%	50.8%	16.7%	31.7%	0.8%	25.4%	54.8%	15.9%	4.0%	23.8%	64.3%	9.5%	1.6%	0.8%
5	82	14.6%	20.7%	47.6%	17.1%	43.9%	19.5%	34.1%	2.4%	31.7%	54.9%	11.0%	2.4%	12.2%	54.9%	25.6%	6.1%	1.2%
4	129	19.4%	24.8%	37.2%	18.6%	46.5%	17.8%	34.1%	1.6%	36.4%	45.7%	14.0%	3.9%	16.3%	48.8%	31.8%	3.1%	NA
3	213	11.7%	27.7%	39.9%	20.7%	43.2%	20.2%	31.0%	5.6%	37.1%	43.7%	13.6%	5.6%	10.8%	50.7%	27.7%	10.3%	0.5%
2	329	17.0%	27.7%	35.9%	19.5%	44.7%	18.5%	32.8%	4.0%	42.6%	41.0%	12.2%	4.3%	10.0%	35.6%	32.2%	18.5%	3.6%
1	585	23.4%	25.5%	33.8%	17.3%	42.7%	32.6%	21.9%	2.7%	42.9%	36.2%	12.1%	8.7%	4.4%	16.9%	27.4%	46.7%	4.6%

Table 6: Top 20 most central private HS visited by all institutions

school_name	city	state_code	region	religion	pct_blacklatinxnative	ranking	ranking_numeric	degree	strength
WOODWARD ACADEMY	COLLEGE PARK	GA	south	nonsectarian	67.770035	A+	175	30	44
THE HOCKADAY SCHOOL	DALLAS	TX	south	nonsectarian	13.935970	A+	59	30	39
GREENHILL SCHOOL	ADDISON	TX	south	nonsectarian	16.679718	A+	64	30	31
ST IGNATIUS COLLEGE PREP	CHICAGO	IL	midwest	catholic	24.253460	A+	298	29	37
KENT DENVER SCHOOL	ENGLEWOOD	CO	west	christian	6.370370	A+	122	29	31
EPISCOPAL HIGH SCHOOL	ALEXANDRIA	VA	south	christian	16.447368	A+	141	28	48
JESUIT COLLEGE PREP SCHOOL	DALLAS	TX	south	catholic	18.140794	A+	235	28	46
HARVARD-WESTLAKE SCHOOL	STUDIO CITY	CA	west	christian	16.708385	A+	6	27	28
MCDONOGH SCHOOL	OWINGS MILLS	MD	south	nonsectarian	22.320769	A+	311	27	27
CHOATE ROSEMARY HALL	WALLINGFORD	CT	northeast	nonsectarian	15.882353	A+	8	26	40
URSULINE ACADEMY OF DALLAS	DALLAS	TX	south	catholic	23.174971	A+	344	26	30
STRAKE JESUIT COLLEGE PREP SCHOOL	HOUSTON	TX	south	catholic	29.076621	A+	191	25	44
LOYOLA ACADEMY	WILMETTE	IL	midwest	catholic	10.477583	A+	548	25	35
PHILLIPS ACADEMY	ANDOVER	MA	northeast	nonsectarian	11.759505	A+	3	25	35
THE KINKAID SCHOOL	HOUSTON	TX	south	nonsectarian	8.654545	A+	89	25	30
EPISCOPAL SCHOOL OF DALLAS PK-12	DALLAS	TX	south	christian	6.845513	A+	263	25	26
THE LOOMIS CHAFFEE SCHOOL	WINDSOR	CT	northeast	nonsectarian	11.638591	A+	38	24	33
ST MARK'S SCHOOL OF TEXAS	DALLAS	TX	south	christian	13.584475	A+	2	24	30
THE BRYN MAWR SCHOOL	BALTIMORE	MD	south	nonsectarian	18.491124	A+	98	24	25
FORT WORTH COUNTRY DAY SCHOOL	FORT WORTH	TX	south	nonsectarian	86.909091	A+	327	23	40

Table 7: Characteristics of private HS visited by all institutions, by degree band

degree_band	count	midwest	northeast	south	west	catholic	christian	nonsectarian	other	c1_lt10	c2_10to25	c3_25to50	c4_50+	c1_top200	c2_A+	c3_A	c4_ltA	<NA>
6+	703	13.2%	27.2%	37.1%	22.5%	39.4%	16.4%	42.2%	2.0%	35.1%	50.4%	11.1%	3.4%	21.8%	54.8%	19.1%	2.7%	1.7%
5	88	20.5%	30.7%	39.8%	9.1%	56.8%	17.0%	22.7%	3.4%	35.2%	37.5%	20.5%	6.8%	1.1%	42.0%	36.4%	19.3%	1.1%
4	118	11.9%	29.7%	44.1%	14.4%	45.8%	23.7%	25.4%	5.1%	40.7%	38.1%	13.6%	7.6%	0.8%	38.1%	41.5%	17.8%	1.7%
3	150	18.0%	26.7%	39.3%	16.0%	50.0%	23.3%	24.0%	2.7%	37.3%	43.3%	11.3%	8.0%	NA	26.7%	42.0%	28.7%	2.7%
2	227	26.4%	22.0%	35.2%	16.3%	50.7%	25.1%	20.7%	3.5%	40.1%	33.0%	18.1%	8.8%	0.9%	20.7%	39.6%	33.5%	5.3%
1	452	26.8%	22.1%	36.3%	14.8%	44.0%	38.3%	14.2%	3.5%	43.1%	33.2%	12.4%	11.3%	0.2%	8.0%	23.0%	62.8%	6.0%

Figure 1: The enrollment funnel

Figure 2: Number of events by type and in-state, out-of-state for private institutions

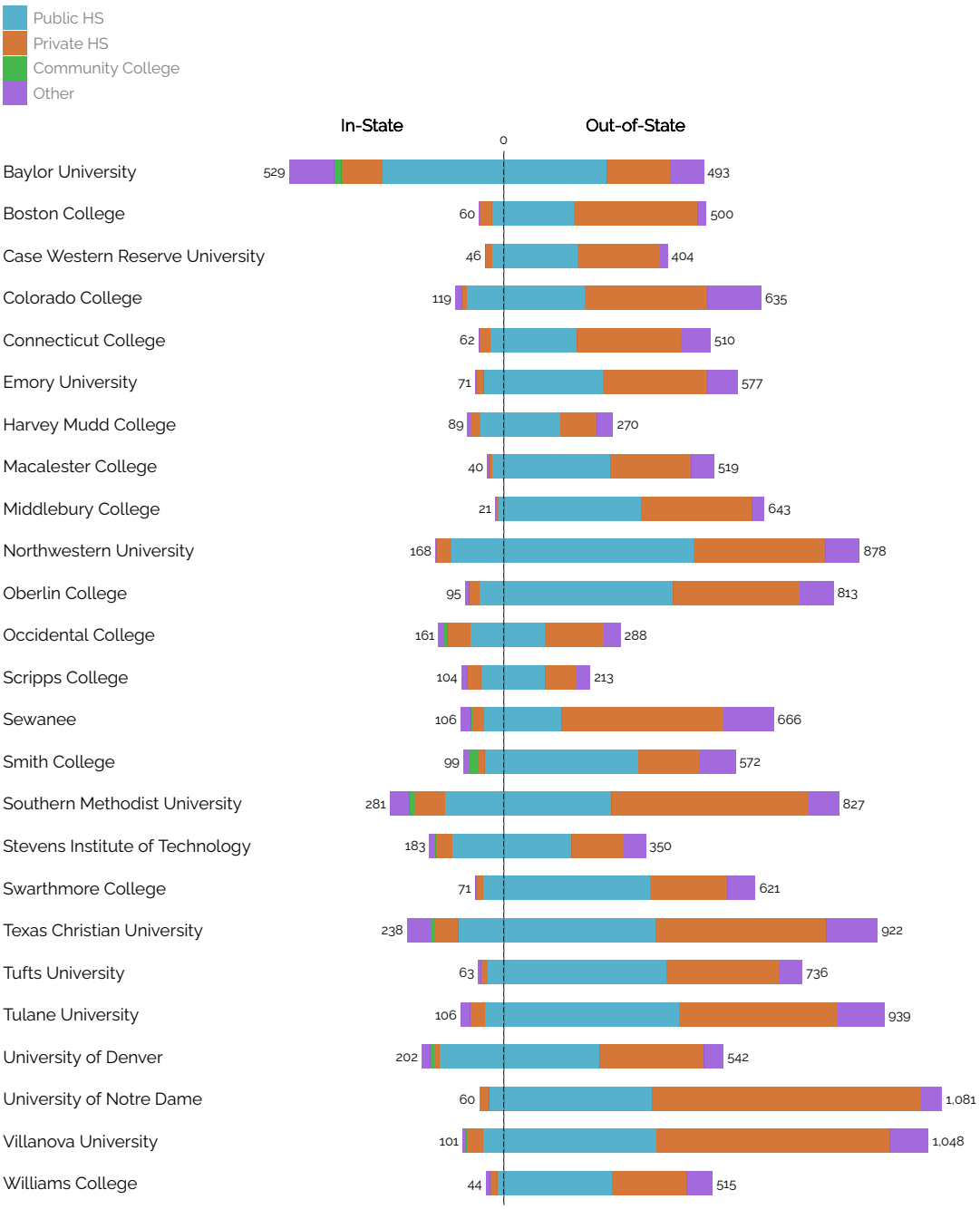


Figure 3: Number of events by type and in-state, out-of-state for public institutions

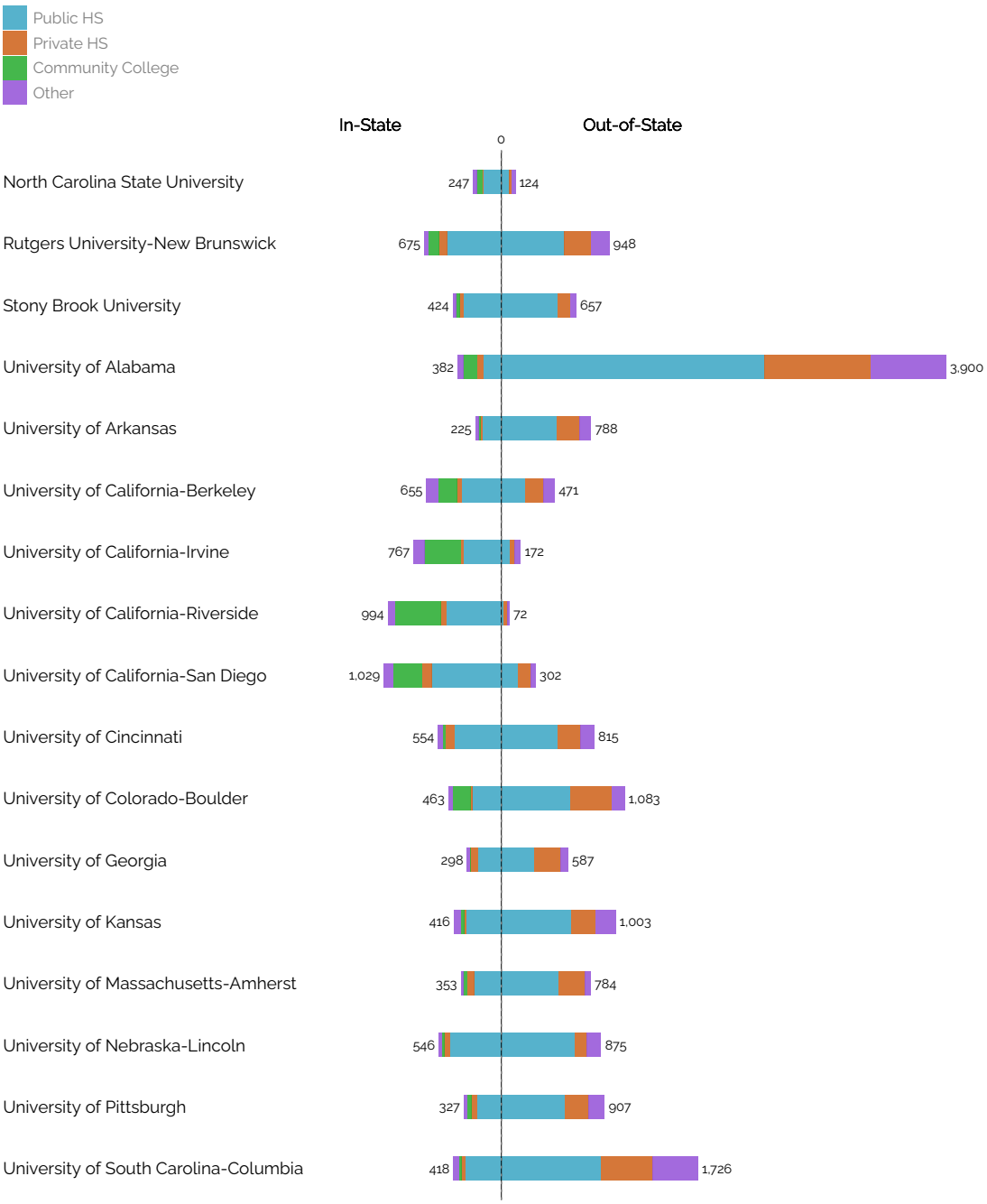
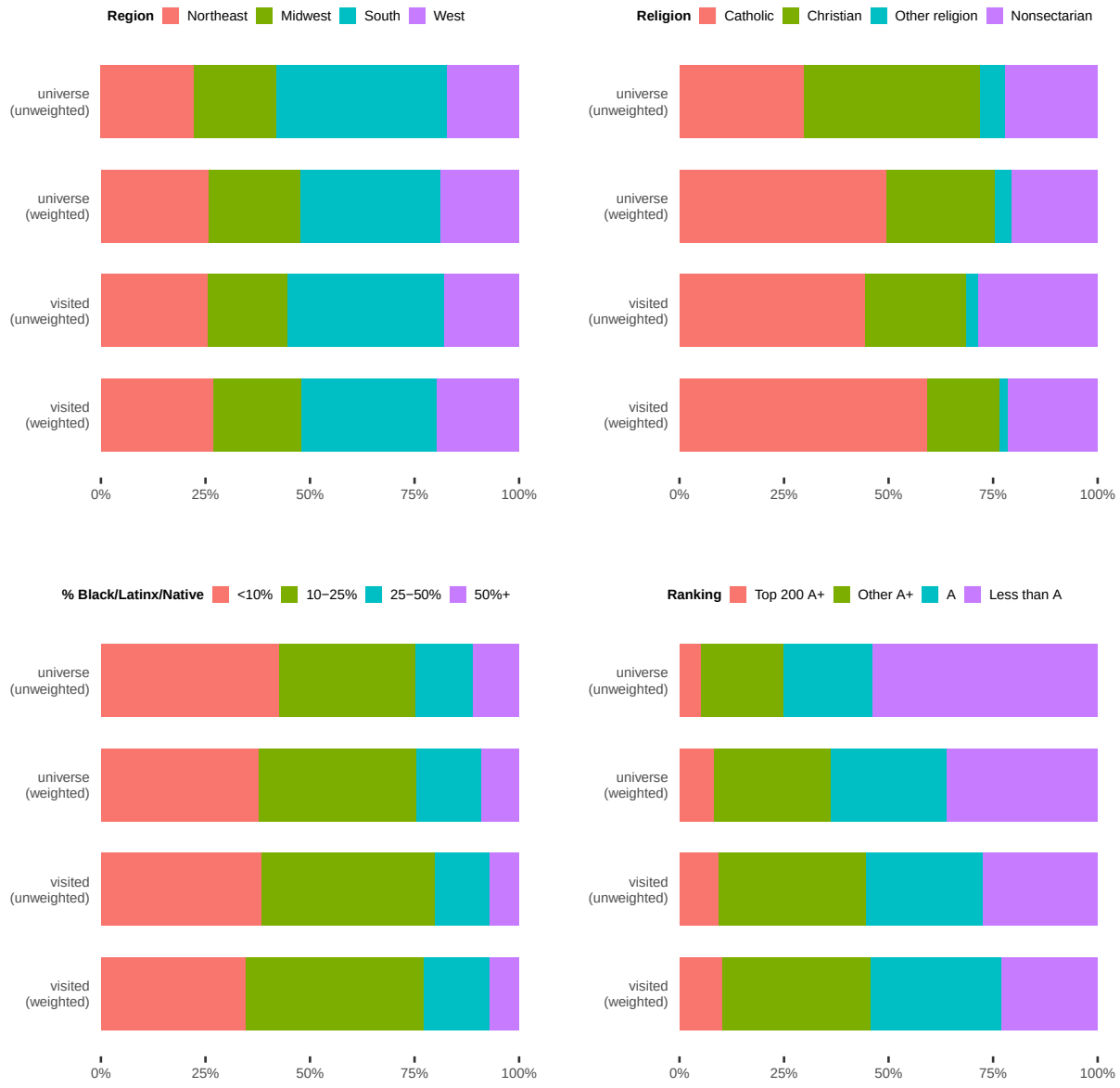


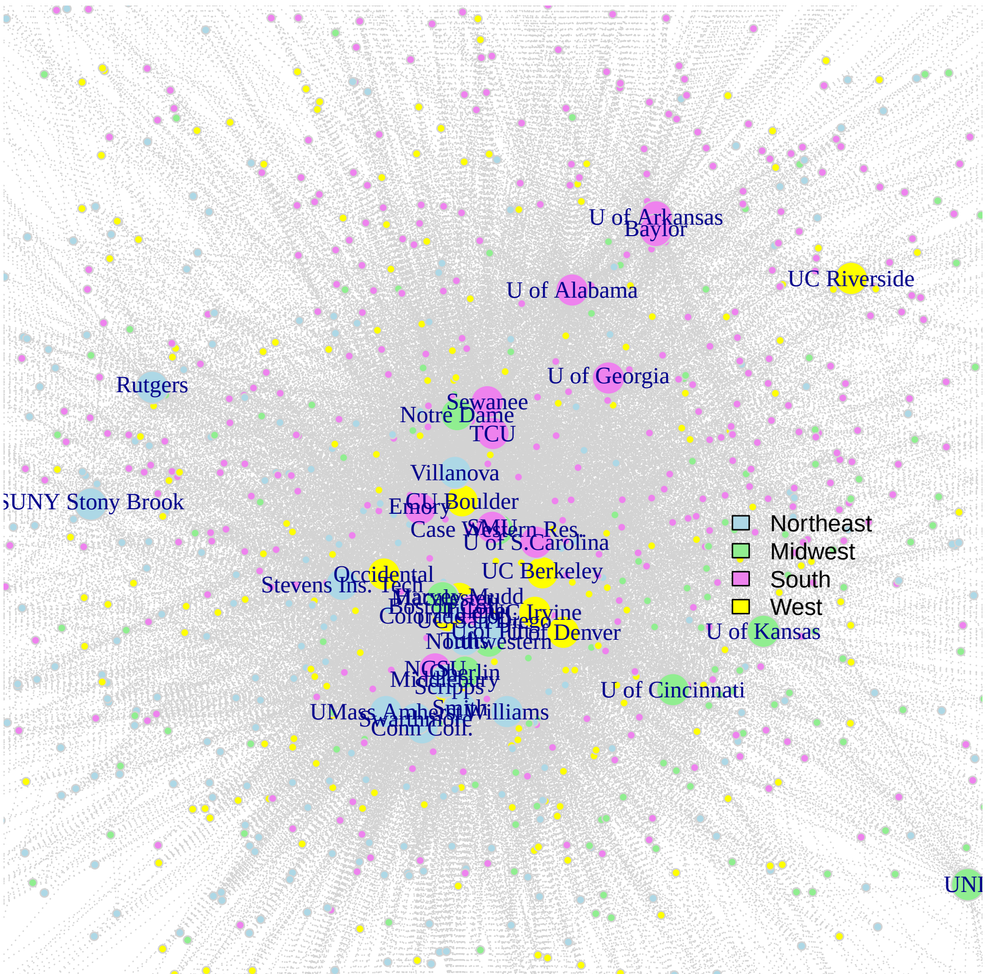
Figure 4: Characteristics of universe of private HS and private HS that received at least 1 visit from sample institutions, unweighted and weighted by 12th grade enrollment



** Universe of private HS (N=3673), private HS visited by sample institutions (N=1738); Universe of private HS is defined as any private schools that enrolls at least ten grade 12 students and is not a special education school, an alternative school, an early childhood center, or an independent school.*

\begin{landscape}

Figure 5: 2-mode network for all institutions, colored by geographic region

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## Warning: Vectorized input to `element_text()` is not officially supported.
## Results may be unexpected or may change in future versions of ggplot2.

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## Results may be unexpected or may change in future versions of ggplot2.

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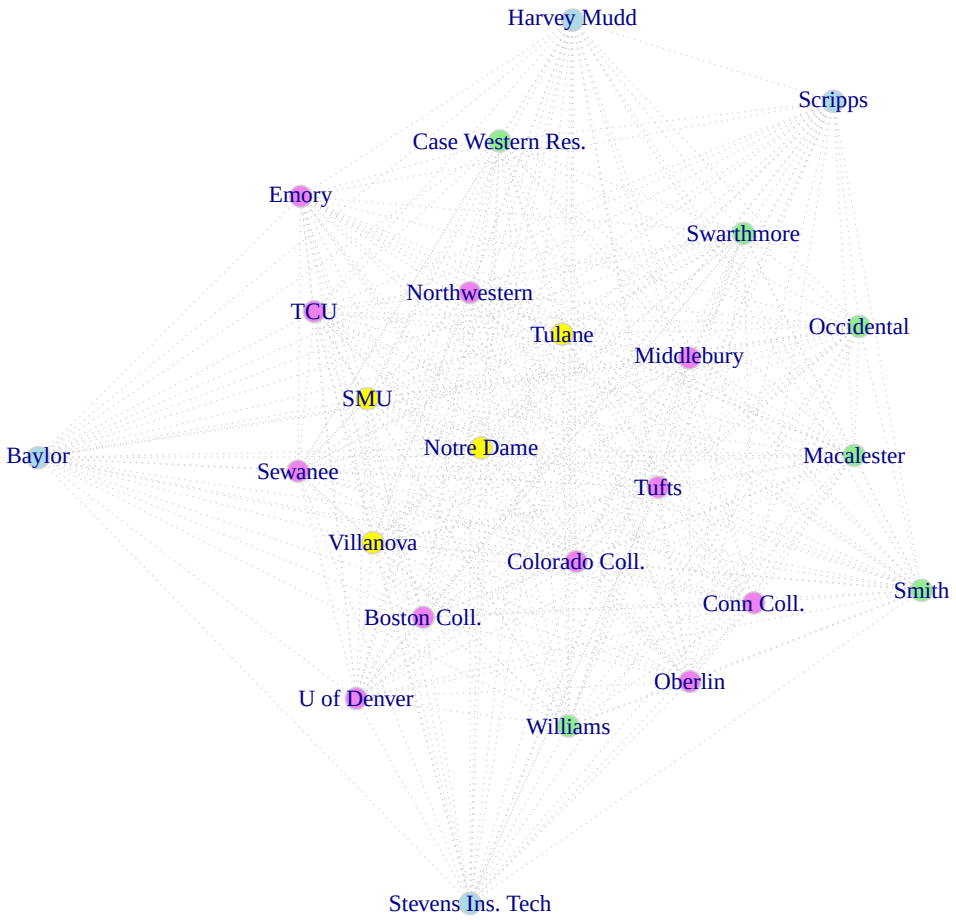
Figure 6: 1-mode network for private institutions, colored by cluster



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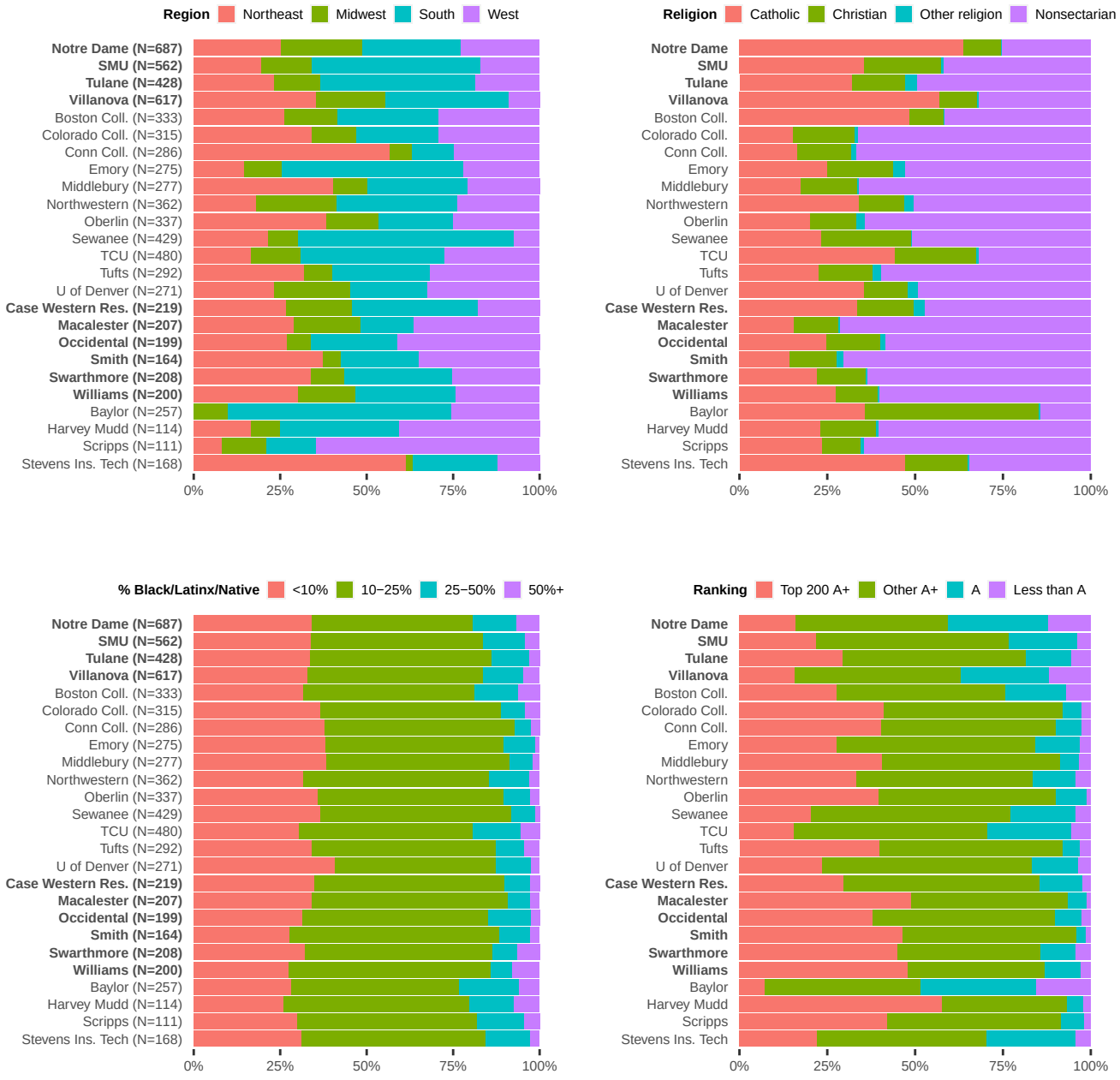
## Results may be unexpected or may change in future versions of ggplot2.
```

\end{landscape}

Figure 7: Characteristics of private HS visited by private institutions



** Universities are grouped by clusters, as indicated by alternating bolded and normal font*

Figure 8: Ego network of Villanova University, colored by religious affiliation

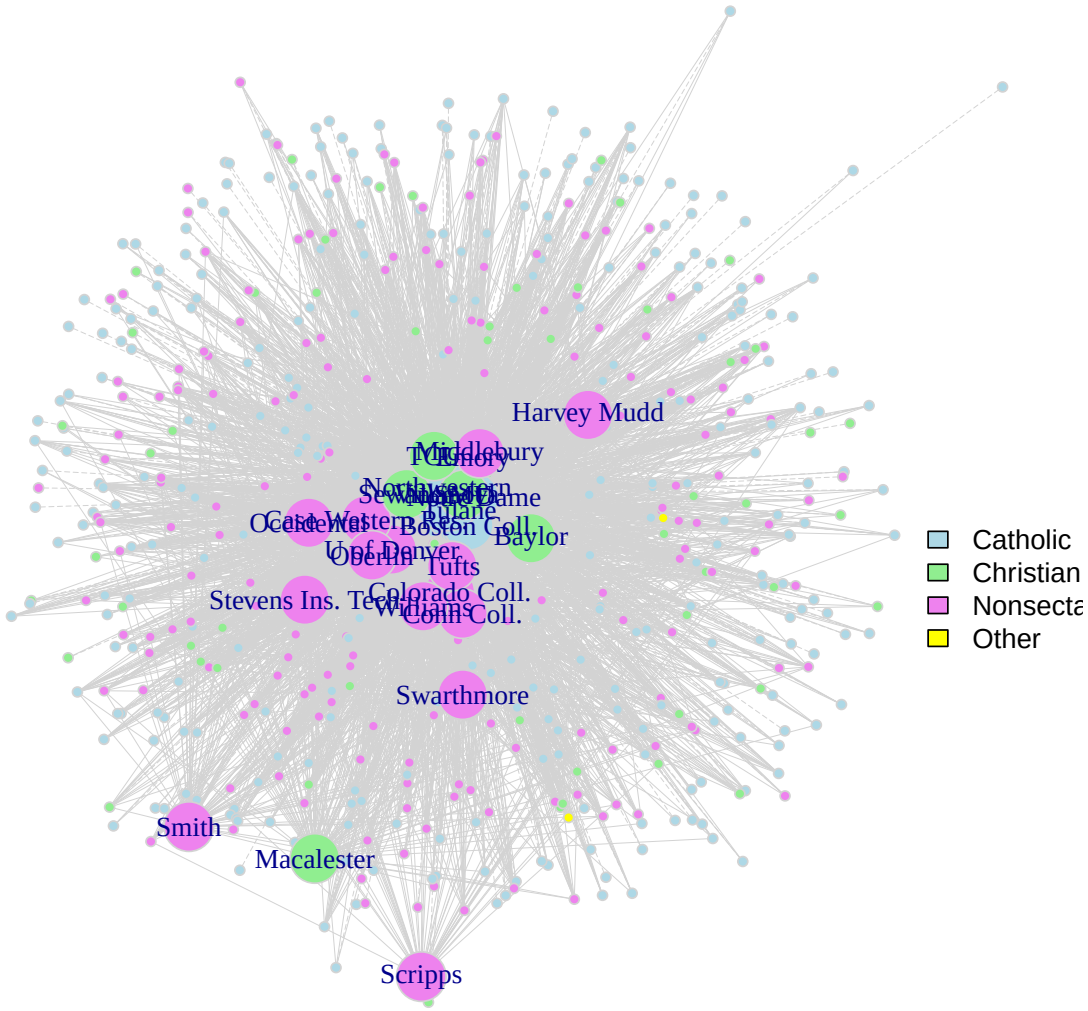


Figure 9: Ego network of Emory University, colored by geographic region

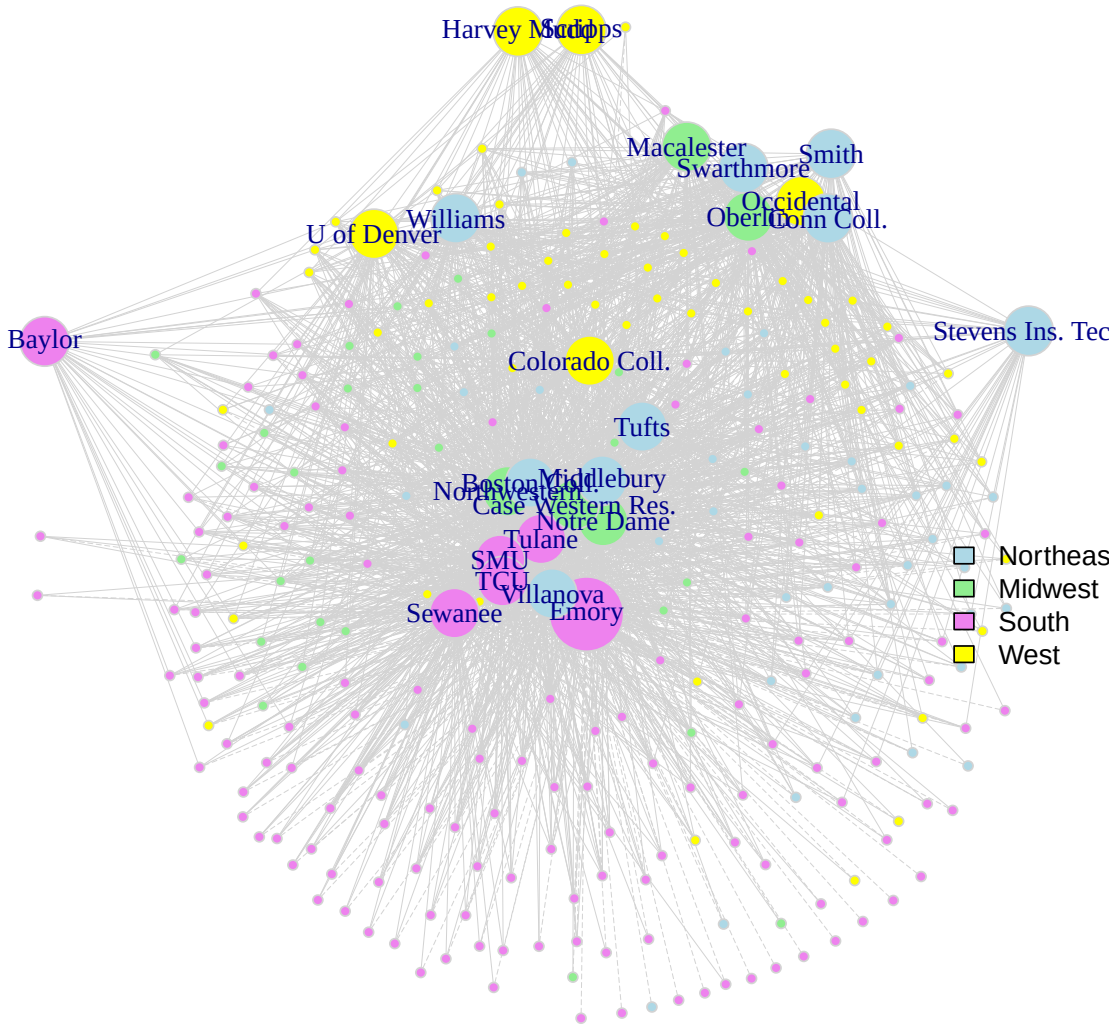


Figure 10: 1-mode network for public institutions, colored by cluster

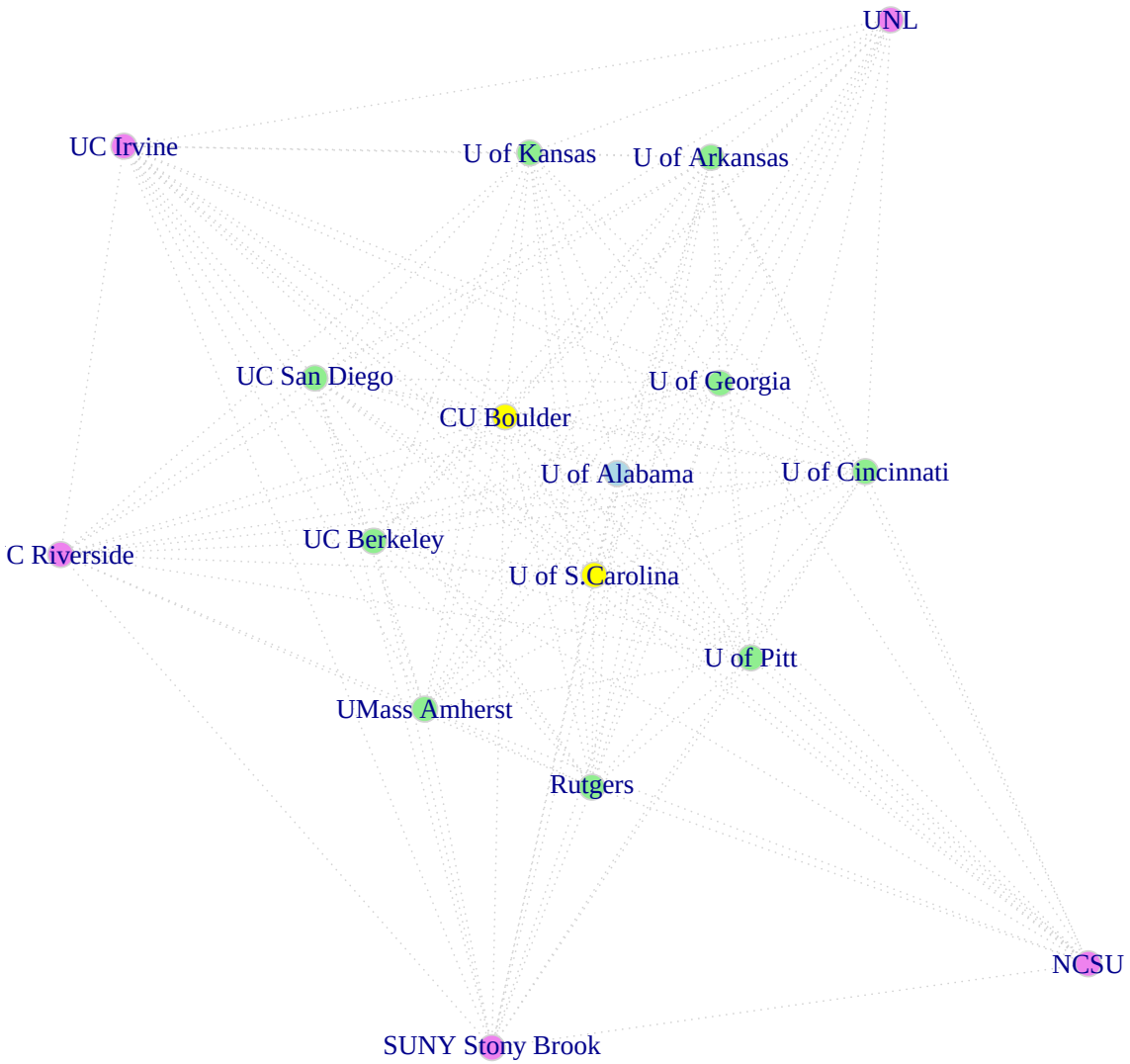
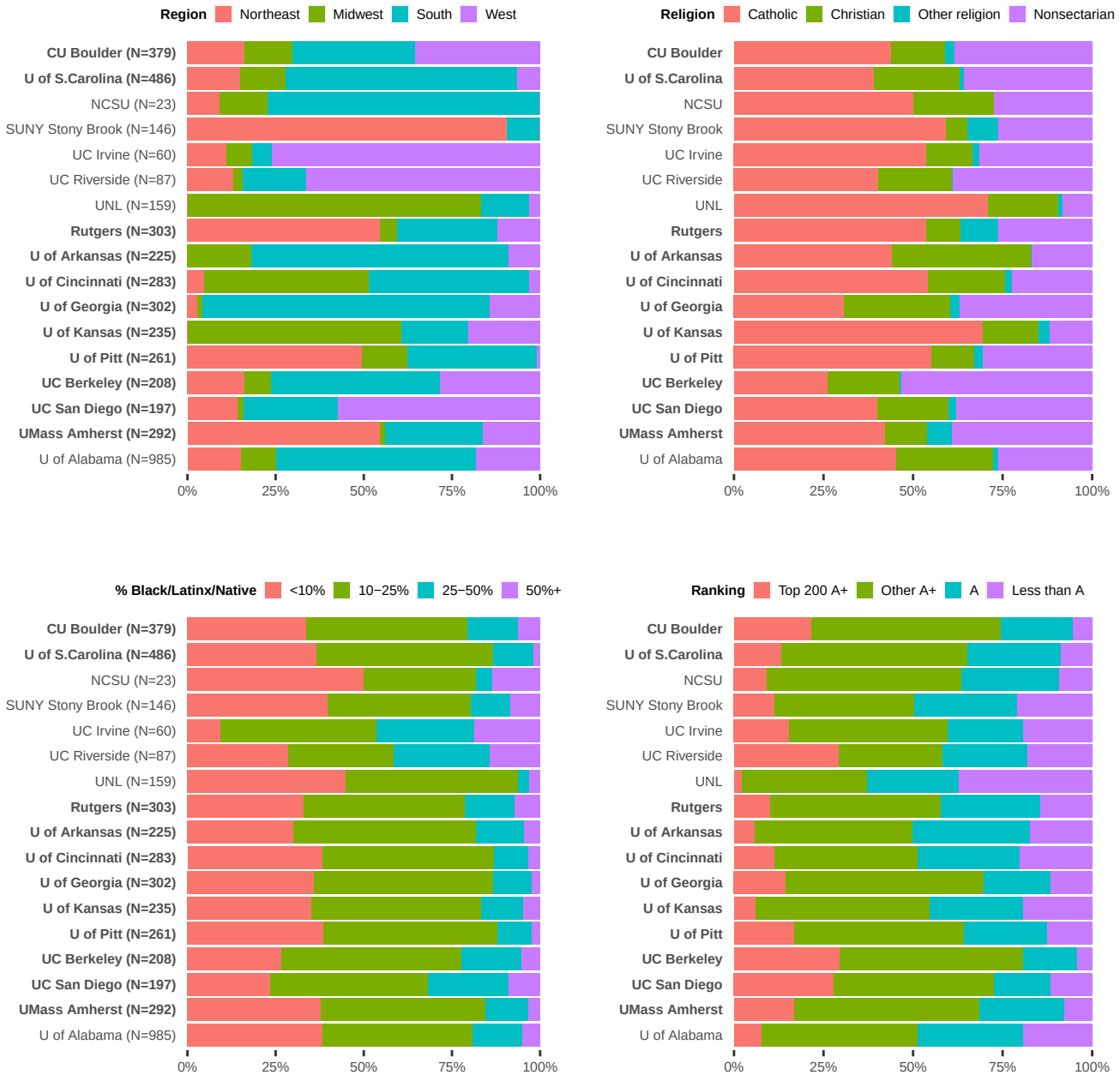


Figure 11: Characteristics of private HS visited by public institutions



* *Universities are grouped by clusters, as indicated by alternating bolded and normal font*

Figure 12: 1-mode network for all institutions, out-of-state visits only for public universities, colored by cluster

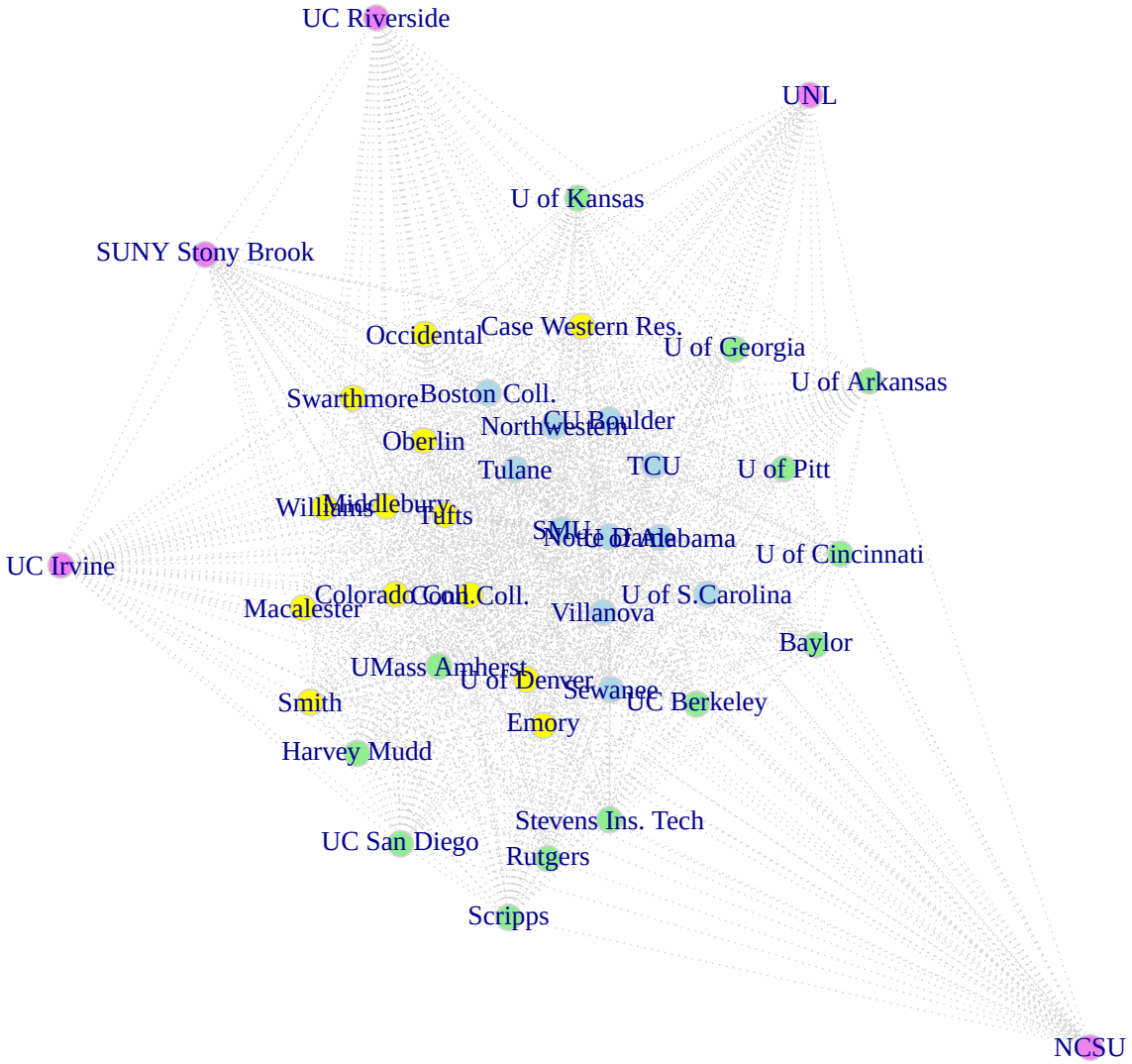
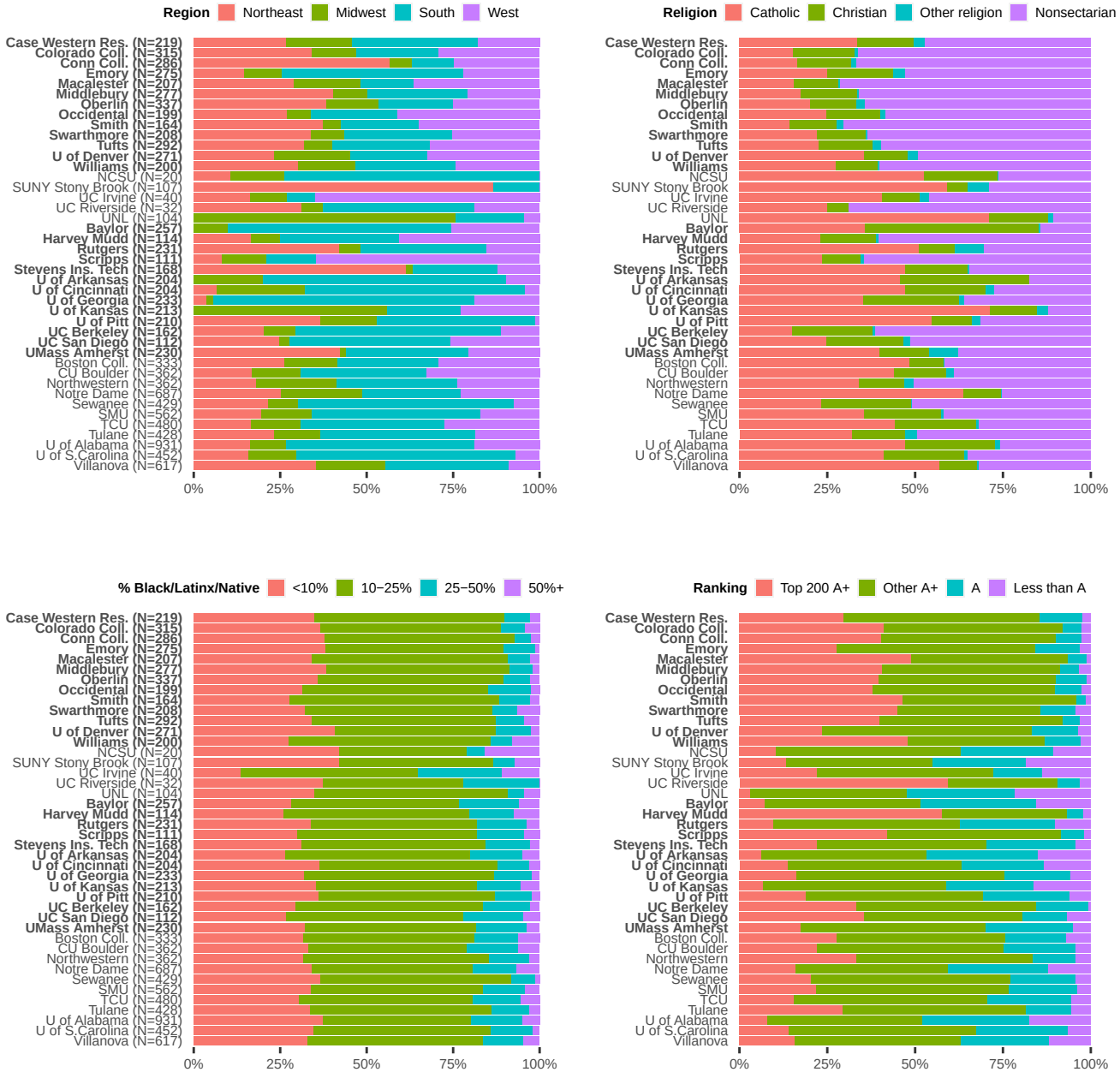


Figure 13: Characteristics of private HS visited by all institutions, out-of-state visits only for public universities



** Universities are grouped by clusters, as indicated by alternating bolded and normal font*