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Student Preferences for College and Career Information

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ABSTRACT
This study examined the preferences of high school seniors (N = 2901) for receiving college and career information, an area not well-studied previously. Key findings are parents and peers are rated to be very helpful sources of college and career information; school counselors are a helpful source of information for first generation and low income students; and the internet is a helpful source of information, but email and one on one are more preferred sources of information. The findings of this study are useful for K-12 education, college access, and higher education professionals to consider when developing policies and programs to provide college and career information to students.

Keywords: college choice, college majors, information, student preferences

Despite decades of attention focused on closing college opportunity gaps, racial and ethnic disparities persist and degree attainment by socioeconomic status continues to widen (ACT, 2015; Bailey & Dynarski, 2011; Farmer-Hinton & Holland, 2008; Gewertz, 2016; Kimura-Walsh et al., 2009). Research has consistently shown that access to information influences students' college decisions, yet many students—especially those from disadvantaged high schools—lack the information needed to make knowledgeable decisions regarding whether or how to pursue a postsecondary education (Bell et al., 2009; Bettinger et al., 2012; Engberg & Wolniak, 2010; Hoxby & Turner, 2015; Oreopoulos & Dunn, 2013; Roderick et al., 2008). Unsurprisingly, a large number of students choose to forgo college due to inadequate information and confusion surrounding the college admissions process (Bell et al., 2009; Castleman et al., 2012; Chen & DesJardins, 2007).

Students need structured social support, mentoring (Kimura-Walsh et al., 2009; Roderick et al., 2008), and access to accurate and up-to-date college information (Gilstrap, 2016; Hoxby & Turner, 2013) if they are to understand the necessary steps required to navigate the college admissions process (Poynton et al., 2019). Unfortunately, many schools lack consistent mechanisms to channel information to students, leaving those searching for college information on their own to navigate their college path (Bell et al., 2009; Brown et al., 2016; Bryan et al., 2011). Providing college information and guidance does not require a lot of money, but it does demand human capital (developing a college knowledge and infrastructure within high schools) and social capital (interconnected and interdependent schools and families) to ensure that all students have the resources needed to make informed college decisions (Plank & Jordin, 2001; Simmons, 2011). Social and human capital play important roles in

both access to information and connection to valuable sources of support (Mulhern, 2019a; Plank & Jordin, 2001; Robinson & Roksa, 2016). Mulhern (2019b) found that school counselors directly impact student educational attainment, specifically high school graduation and college attendance, selectivity and persistence, by providing students with improved information and personalized assistance.

College Information

College information (formal and informal, stated and unstated) and skills to apply information to students' individual and unique situations are needed to successfully navigate the college decision making process (Brown et al., 2016; Conley, 2010; Hartman, 2014; Poynton et al., 2019; Robinson & Roksa, 2016; Roderick et al., 2009; Savitz-Romer, 2012). Students gather college information through different mechanisms including online searching, informal conversations with peers and family, and through formal interactions with K-12 and postsecondary staff (Kim & Gasman, 2011; Waters & Williams, 2009). How college information is shared and promoted to students and families matters (Brown et al., 2016; Hartman, 2014; Oreopoulos & Dunn, 2013; Perna et al., 2008).

Research has shown that furnishing students with college and financial aid information are effective ways to increase college enrollment (Bettinger et al., 2012; Hoxby & Turner, 2013; Owen & Westlund, 2016) and providing informational nudges on key tasks that students need to complete while connecting them to support are compelling college access strategies (Castleman & Page, 2015, 2016; Damgaard, & Nielsen, 2018). However, recent studies evaluating nudging interventions at scale have highlighted the need for further refinement to more clearly understand and unpack the mechanisms behind how students prefer to receive information and guidance (Avery et al., 2019; Bird et al., 2019; Gurantz et al., 2019; Page et al., 2019).

Online Information

College admissions information is readily available today, but with the overabundance of mobile applications and online resources, it is unlikely that any two students have the same information when making their postsecondary decisions. Although information is readily available on the internet, it does not mean students have knowledge, access, or understanding of what is available or how to discriminate between accurate, helpful information versus harmful guidance on the internet.

Internet experience is connected to perceptions of information quality and usefulness and corresponds to whether students see the internet as a useful source of information (Fetherston, 2017). Information literacy and proficiency are also important factors in utilizing college information (Andreae & Anderson, 2011; Burek, 2017). Non-native English speakers and college students are more likely to use the internet as their primary source of career and job information (Aydın, 2015; Carver, 2010; Puckett & Hargittai, 2012) and university web

pages are the most used and most trusted source of information by pre-college students (Areces et al., 2016).

Sources of Information

The relationships that students build with their families, communities, neighborhoods, and peers play a significant role in their postsecondary decisions (Aydin, 2015; Tierney, 2006). Family and community support are essential in efforts to increase college access, especially to raise educational aspirations and increase information about financial aid and college opportunity (Long, 2008). Educational and home settings are among the most prevalent sources of information for students seeking college and career information (González Canché et al., 2014). For students who have college educated family members, access to college information begins at a young age, which allows for a more informed path to college (Crosnoe & Muller, 2014). Students with college educated parents tend to have more information about the importance of high school grades, course selections, and elective choices and the impact these have on future college options (Crosnoe & Muller, 2014).

Families are typically the primary source of social capital for students, but schools serve as extrafamilial institutions and provide a crucial source of social capital for K-12 students (Byun et al., 2012; Cabrera & La Nasa, 2000; Holcomb-McCoy, 2007; Perna & Titus, 2005). School based social capital refers to the social relationships and networks in schools that can be used to improve life outcomes (Lin, 2002). Teachers and other school staff play a more direct role in assisting students as they prepare and plan for college (Martinez & Castellanos, 2018). First-generation students rely heavily on school staff and alumni to make sense of college options and entrance requirements (Duncheon, 2018), and almost exclusively turn to school resources to navigate the college matriculation process (Kimura-Walsh et al., 2009; Perna et al., 2008).

Some high schools are better prepared to support students than others (Brown et al., 2016; Robinson & Roksa, 2016). Ahearn et al. (2016) found that many high schools struggle to support students with information about community college certificates or associate degree programs, and instead focus solely on four year programs and leave many students with fewer postsecondary options. Teachers report needing more information on college and career options, especially for non-traditional students and those who are struggling academically (Ahearn et al., 2016).

High School Counselors

In many schools, school counselors are the primary source of college and career information (Morton et al., 2018) and students benefit when school counselors share information and provide assistance navigating the process (McDonough, 2015; Mulhern, 2019b; Roderick et al., 2009). Using social capital theory as a framework, Ingels et al. (2004) examined data from the 2002 Education Longitudinal Study to investigate if contact with a high school counselor for college information increased college

application rates and they found that counselor contact was associated with increased application rates. Similarly, Engberg and Gilbert (2014) looked at the number of hours students spent with their high school counselor and found increased time with a high school counselor about college information was a significant predictor of college application rates. They also noted when financial aid information and assistance was offered, students were more likely to attend four-year colleges (Engberg & Gilbert, 2014). Hurwitz and Howell (2014) reported that the addition of one extra high school counselor per high school increased four year college enrollment rates by 10 percentage points. School counselor effectiveness is extremely important for students living in poverty and attending underperforming schools, likely in part due to social capital and the lack of other sources these students have for college information and assistance (Mulhern, 2019b).

Parents who contact the school counselor regarding their child's high school plans receive more college information than their peers whose parents do not contact the counselor (Bryan et al., 2009). Most school counselors believe working with parents concerning college opportunities is a major part of their job (Holcomb-McCoy, 2010), and when they provide college and career information, support, and guidance, opportunity gaps begin to close (Belasco, 2013; Hurwitz & Howell, 2014; Castleman, Owen, & Page, 2015; Owen, 2014; Owen & Westlund, 2016).

Very few published studies have sought to understand, from a student's perspective, how they prefer to receive college information and from whom they prefer to receive advice. Galotti & Mark (1994) reported administering surveys to 322 college-bound high school students to better understand how they made college decisions and they found that students seek college information from parents, friends and college brochures more often than consulting with a school counselor. Johnson and Rochkind (2010) found that students who had a poor relationship with their school counselor were more likely to be unhappy with their college choice. Another study looked at first-time freshman college students from one private and one public institution in the Mid-Atlantic to understand their preferences for college information and found that high school counselors and college websites were the most valuable and the most frequently used information sources (Addington, 2012).

Gallup/Strada Study

The Gallup-Strada Education Network (2017) conducted one of the largest studies to date on preferences for college and career information and advice (Gallup Inc., 2017). To gain a better understanding of information sources, Gallup and Strada's Education Consumer Pulse surveyed more than 22,000 18 to 65 year-old US residents to identify where they received advice about choosing a college major and the perceived helpfulness of the advice given. Respondents identified a number of people and places as sources of information. To better understand the

findings, the researchers broke the responses down into four broad categories:

- Formal sources (*high school and college counselors, media, internet and print*)
- Informal social networks (*family, friends and community leaders*)
- Informal school-based networks (*high school teachers, high school coaches, college faculty, or miscellaneous staff*), and
- Informal work-based sources (*employers, coworkers, people with experience in the field, and military* (Gallup Inc., 2017).

Fifty-five percent of respondents identified friends and family members as their main source for advice when choosing a major. Younger participants (graduated within prior seven years) identified work-based sources and college faculty more often than college and high school counselors. The researchers also noted younger respondents had an increased likelihood of using the internet as an information source for choosing a field of study. Students in four-year programs were more likely to seek advice from their informal social network, whereas first-generation college students and students attending two-year programs are less likely to seek advice from their informal network. Informal work-based sources were rated as the most helpful and formal sources the least helpful, except for first-generation students who regarded formal sources as helpful. However, like the rest of the respondents, first-generation students gave the highest ratings to informal work-based sources of information (Gallup Inc., 2017).

There were also a few differences by race, ethnicity, and gender. Black and White adults seek out their informal social network equally, whereas Asians are more likely, and Hispanics were less likely to use their informal social network for college major advice. Black and Hispanic adults were the most likely to receive advice from formal sources and Whites were the least likely. Women were more likely to consult formal sources and less likely to use their social network for advice (Gallup Inc., 2017).

Based on the findings from the Gallup and Strada survey, a number of changes to existing high school career advising and counseling practices were recommended. However, high school students under the age of 18 were not included in the survey sample, and many of the adults surveyed were forced to rely on memories of how they felt about advice received many years previously. This study aims to build upon the findings from the Gallup-Strada survey by asking high school aged students similar questions to understand who they prefer to receive college information from, and how they prefer to receive it. The research questions asked were:

How helpful have various people and resources been in helping high school students think about a major/field of study? Who do high school students prefer to receive college and career information from?

How do high school students prefer to receive

college and career information?

Methods

To answer our research questions, we employed a web-administered survey with high school seniors to assess where they received college and career information from, how helpful they found the varied information sources to be, and how and from whom they would prefer to receive college and career information. After the data were collected and our overarching research questions answered, we further analyzed the data to assess the extent to which demographic characteristics such as gender, race, intended major, and parent education level impact preferences for and perceived helpfulness of the varied college and career information sources.

Participants

A total of 2,901 high school seniors (70% female; 30% male) who took the ACT® test in February of 2018 participated. The following were the most frequently self-reported race/ethnicities: White (44%), Black/African American (26%), Hispanic/Latino (18%), Asian (4%), and other/multi-race (8%). This is close to the 12th-grader ethnic composition of February 2018 ACT test-takers (43% White, 28% Black/African American, 17% Hispanic/Latino, 3% Asian, 9% other/multi-race) but statistically different in gender composition (55% female, 45% male). Survey respondents had a higher high school GPA (M = 3.36, SD = .50) than the population of February test-takers (M = 3.22, SD = .56) and also had a higher ACT Composite score (M = 20.24, SD = 5.06) than the 12th graders who tested that month (M = 19.04, SD = 4.59). The two groups were the same in composition in terms of family income and parents' educational level relative to the population.

Data collection procedures

An online survey was administered to a random sample of 64,717 students from the 107,868 12th-grade students who had registered to take the ACT in February 2018. Sixty percent of 12th graders were randomly selected to participate in the survey with a 4.5% response rate. Contact information (email addresses) was obtained from ACT's national database of registered test-takers. This contact information was then used to send out an invitation to participate in the study. An invitation to participate in the survey was sent via email in January 2018 and described the purpose of the study, indicated that participation was completely voluntary and would in no way affect students' ACT scores, and stated that survey responses would not be provided to students' chosen universities. The invitation included a survey link unique to the participant and indicated that ACT wanted to know how the student received information related to college and careers. The survey stayed open for two weeks, and no incentives were provided. Students took approximately five minutes to complete the survey. These survey responses were then matched back to the ACT database that includes students' ACT scores (e.g., Composite score and subject specific scores), self-reported demographic information (e.g.,

race, gender), and family background information (e.g., parent's income) provided at the time of test registration.

Measures

Survey of college and career support. The ACT college and career support survey consisted of three sections that measured sources of support in choosing a major, the types of people they preferred to receive support from, and how students prefer to receive college and career information. These constructs are discussed next.

Sources of support. Students were asked "For the questions below, we would like to learn about how helpful various sources of information and advice have been in helping you think about and choose a major or field of study—even if you have not yet decided on a specific one." For each question, respondents were asked to report how helpful, using a five point scale (5= extremely helpful; 1= Not helpful), each source was in helping them to decide on a major or field of study. If the source was not applicable to the student, they were instructed to choose "I did not get information or advice from this source." A total of 15 sources (e.g., teachers, coaches, parents, internet – see Table 1 on page 89) and an open-ended "other" category were provided.

The 15 sources were also classified based on Gallup and Strada's Education Consumer Pulse Survey (Gallup-Strada Education Network, 2017) sources of advice: *formal* (high school counselor, college admissions counselor, internet, print, radio, and television,), *informal social networks* (parents, siblings, extended family, friends, and faith-based community), *informal school-based* (teachers, coaches), and *informal work-based* (employer, military recruiter). For each category, a mean helpfulness score was calculated. Sources that were identified as not applicable by participants were ignored in the mean score calculation.

Interpersonal preferences. Students were asked "Who would you prefer to receive college and career information from?" A total of 11 sources and an "other" category were provided (see Table 3 on page 91); these were the same information sources provided in the previous measure, with the four choices not related to people removed. Students were then asked, based on the sources they chose, which one they would most prefer to receive college and career information from.

Communication preferences. Students were asked "How would you prefer to receive college and career information?" and instructed to choose from a list of eight sources (e.g., classroom presentations, email, text messaging), including an "other" category (see Table 5 on page 93). Students were then asked, based on the sources they chose, which method they would most prefer to receive college and career information from.

STEM major intentions. At ACT test registration, students were asked to indicate which college major they plan to enter.

Student Preferences

Approximately 200 college majors were provided. These choices were recoded into either having a STEM emphasis or not. STEM college majors included Environmental Science, Business/Management, Quantitative Methods, Computer and Information Sciences, Engineering, and the Biological/ Physical sciences. Examples of non-STEM majors included Liberal Arts and General Studies, Arts: Visual and Performing, and English and Foreign Languages (n = 517 intended to major in STEM; n = 2,384 do not).

Major decidedness. In the survey, students were asked to indicate how likely they were to change their major/field of study with four response options: "very likely," "somewhat likely," "not likely at all," (n = 1422) and "I have not yet decided on a major or field of study" (n = 270). Responses were recoded to collapse the "very likely" and "somewhat likely" response options for analysis into a new "likely to change" category (n = 1208). One respondent did not answer this question.

Major availability. At ACT test registration, students were asked to rank how important a list of factors were in selecting a college. Field of study was one option; type of institution (private/public; 4-year, 2-year); location and tuition were additional response options. Responses were categorized as either choosing field of study as their first option ("most important"; n = 1132) or not ("< most important"; n = 1438). There were 331 respondents who did not answer this question.

Parental income. At the time of registering for the ACT, students were asked to answer the question "To plan for financial aid for entering students, colleges need to know financial background of their students. Please estimate the approximate total combined income of your parents before taxes last year." A nine-point scale was provided, with 1 representing less than $24,000 and 9 indicating more than $150,000. These data were recoded into three income brackets: $50,000 or less ($n$ = 1,195); more than $50,000 but less than $100,000 ($n$ = 726); and more than $100,000 ($n$ = 423) with 557 students choosing not to answer the question.

Parents' educational level. Students, at the time of ACT test registration, were provided two places to indicate the education level of their mother, father, and/or guardian. An eight-point scale was provided ranging from 1= less than high school to 8 = Doctorate or professional degree (Ph.D., MD, JD, etc.). Data were recoded from both of these variables into a single variable to represent the parents' educational level with four categories (some college or less [n = 1,183], Associate degree [n = 325], Bachelor's degree [n = 729], or Graduate degree [n = 466]) reflecting the highest education level among both parents, with 206 students choosing not to answer the question.

Race. Students were also asked to indicate their race and ethnicity when registering for the ACT test. Racial/ethnic options provided included: Black/African American (n = 730); American Indian/Alaska Native (n = 28);

White (*n* = 1,232); Hispanic/Latino (*n* = 503); Asian (*n* = 103); Native Hawaiian/Other Pacific Islander (*n* = 5); Two or more races (*n* = 123); and prefer not to respond. For the purposes of this analysis, these options were recoded so that American Indian, Native Hawaiian, and Two or more races were collapsed into a single category (*n* = 156). This resulted in five racial/ethnic categories. Participants who indicated they prefer not to respond were omitted from analyses when race was disaggregated (*n* = 177).

Gender. Gender was self-reported by students at ACT test registration with two response options: male (*n* = 855) or female (*n* = 2,016).

Data analyses

For each research question, descriptive statistics (means, standard deviations, and sample size) and inferential statistics (Analysis of Variance [ANOVA] or chi-square) were calculated using SPSS. For the omnibus ANOVA results in Research Question 1, when Levene's Test of Homogeneity of Variances indicated the assumption was not met for omnibus ANOVA, Welch's F was utilized. Games-Howell post-hoc tests were used following a significant omnibus ANOVA result to account for unequal group sizes and variances. Effect sizes were calculated for all analyses. Eta squared was used to calculate the overall effect of an independent variable on the dependent variable for all ANOVAs. An Eta squared of .01 is considered small, .06 a medium effect, and .14 is large (Cohen, 1988). Hedges' g was used to calculate the effect sizes for pair-wise comparisons from the ANOVA analyses, given unequal sample sizes across group comparisons. Hedge's g is interpreted the same as Cohen's d, where .2 or less is considered a small effect, .5 a moderate effect, and .8 a large effect (Cohen, 1988). For chi-square analyses, Cramer's V was used for the overall effect size. With an analysis where the degrees of freedom is 1, a .1 is small, .03 is medium, and .5 is large (Cohen, 1988). Cohen's h used to calculate the effect sizes for pair-wise comparisons from the chi-square analysis, and is interpreted the same as Cohen's d. For all pair-wise comparison effect sizes, a reference category was used and all other categories were compared to it. Given the large number of analyses, a Bonferroni correction was applied to the reported *p* values for all analyses to control for the Familywise Error Rate and reduce the likelihood of Type I error. Specifically, the reported *p* values for each omnibus test were multiplied by 7 within each dependent variable to account for multiple comparisons. Missing data were treated as missing in all analyses.

Results

Research Question 1: Sources

For the first research question, we sought to investigate how helpful participants perceived interpersonal and media sources were perceived to be by study participants as they decided which major or field of study to pursue. As indicated in Table 1, parents were the most helpful (M = 3.82, SD = 1.19),

followed by friends (M = 3.26, SD = 1.20) and college admission counselors (M = 3.25, SD = 1.27), while the least helpful sources were recruiters (M = 2.26, SD = 1.36), employers (M = 2.57, SD = 1.33), and coaches (M = 2.74, SD = 1.33). The media-based sources of information rated most helpful by students were the internet (M = 3.70, SD = 1.13) and print (M = 3.21, SD = 1.26), while the least helpful sources were radio (M = 2.04, SD = 1.26) and television (M = 2.45, SD = 1.13).

"...Informal Social sources of information were perceived to be the most helpful in navigating the college major decision-making process..."

With the information sources categorized in alignment with the Gallup -Strada Education Network (2017) study, as detailed in Table 1, the Informal Social sources of information were perceived to be the most helpful in navigating the college major decision-making process (M = 3.34, SD = 0.97). Interestingly, these informal sources were perceived to be more helpful than Formal sources (M = 3.18, SD = .93), which consists of people trained to provide such advice. The Informal School-based category of information sources was rated as moderately helpful on average (M = 3.02, SD = 1.13) by study participants. The lowest-rated category of information sources, Informal Work-based, consists of employers and military recruiters (M = 2.52, SD = 1.27).

Next, estimates were generated for respondents by students' demographic characteristics (e.g., gender, race, parent income, parent education, stem major, etc.) to determine if they had a differential relationship to perceived helpfulness for the five sources with the highest helpfulness ratings (parents, friends, college admission counselor, extended family, and high school counselor). The helpfulness ratings of these five information sources were employed as the dependent variables in a series of univariate ANOVAs with the selected demographic characteristic serving as the independent variable.

Means, standard deviations, and η^2 are reported in Table 2 for each of the univariate ANOVA's, along with Hedges' g for post-hoc tests. For brevity, ANOVA details (e.g., F, DF) are not provided here, but are available from the first author on request. For gender, the only statistically significant finding was that males rated high school counselors as more helpful than females ($p < .001$). For ethnicity, statistically significant ANOVA findings were obtained for all dependent variables: parents, friends, extended family, and high school counselor all reached the $p < .001$ level, with $p = .007$ for the admission counselor. Notable findings related to ethnicity are: Black students rated the helpfulness of each of the five sources higher than all other ethnicities, with post hoc tests further revealing those information sources to be significantly more helpful to Black students than White students' college

major decision-making; Hispanic and Asian students rated parents as significantly less helpful than Black and White students; and White students rated high school counselors as significantly less helpful than all other ethnicities.

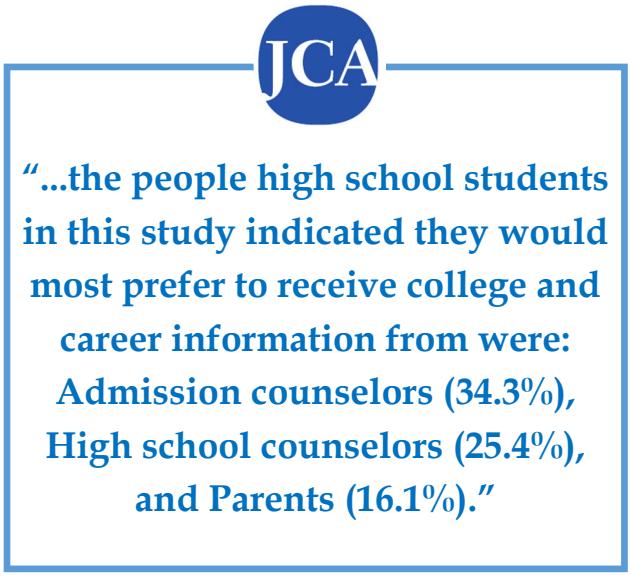
The ANOVAs examining parent income revealed statistically significant findings for admission counselor (p = .031), extended family (p < .001), and high school counselor (p < .001). Students in the lowest income bracket rated each of these information sources to be significantly more helpful in the college major decision-making process than students in higher income brackets. For parent education level, the ANOVAs findings uncovered significant between-group differences for parents (p < .001), admission counselor (p = .009), and high school counselor (p < .001). Parents with bachelor's and graduate degrees were perceived by students to be significantly more helpful than parents with some college or less, with perceived helpfulness ratings increasing in a linear fashion with parent education level. Admission counselors and high school counselors were more helpful to first-generation students (i.e., parent education level = some college or less) than continuing generation students (one parent completed a college degree), with every between-group difference reaching statistical significance except for students with at least one parent holding a bachelor's degree.

The ANOVAs examining major decidedness were significant for parents (p < .001), friends (p = .035), and extended family (p = .035). Students who indicated they had decided on a major and were not likely to change majors rated parents as significantly more helpful than students not yet decided on a major and students likely to change their major. Undecided students rated parents to be significantly less helpful than the other two groups of students. For friends and extended family, undecided students rated each of these sources as significantly less helpful than students who were unlikely to change their major. ANOVAs examining STEM intent and major availability did not reveal any statistically significant between group differences.

Research Question 2:
Interpersonal Preferences

To answer our second research question, "Who would high school students prefer to receive college and career information from?", the participants were asked to respond to three items: two items resulting in quantitatively-oriented data and one item resulting in qualitatively-oriented data. The quantitatively-oriented items asked students "who would you prefer to receive college and career information from?" and listed 11 possible sources of information as response options (e.g., high school counselor, admission counselor—see Table 3) in addition to an 'other' response option. The first item allowed respondents to choose from 0 to 12 of the possible response options with specific instructions to choose all that apply. The responses from 2,810 participants in this study who selected at least one of the 11

named information sources are summarized in Table 3. The majority of high school seniors in this study indicated they would prefer to receive college and career information from high school counselors (65.2%), admission counselors (63.2%), teachers (58.0%), and parents (54.2%). Of the 12 possible information sources, each student selected 3.51 of them on average (SD = 2.02). Over 90% of the respondents indicated they would prefer to receive college and career information from six or fewer of the listed sources. The second quantitatively-oriented item asked students "which of the people you selected would you MOST prefer to receive college and career information from?" and limited respondents to selecting just one of the 11 named response options. As noted in Table 3, the people high school students in this study indicated they would most prefer to receive college and career information from were admission counselors (34.3%), high school counselors (25.4%), and parents (16.1%).



Similar to the first research question, additional chi-square analyses were performed to further describe the study participants' preferences for receiving college and career information from high school counselors, admission counselors, parents, and teachers within selected demographic characteristics, detailed in Table 4. For gender, 10% more females selected admission counselors as the most-preferred source of information than males ($p < .001$). Chi-square analyses examining ethnicity revealed significant between-group differences for admission counselors ($p = .003$) and parents ($p < .001$). Students identifying with an ethnic minority group most preferred to receive information from high school counselors more frequently than White students, and White students selected parents more frequently than ethnic minority students. Black students selected admission counselors as the most-preferred source more frequently than all other ethnicities.

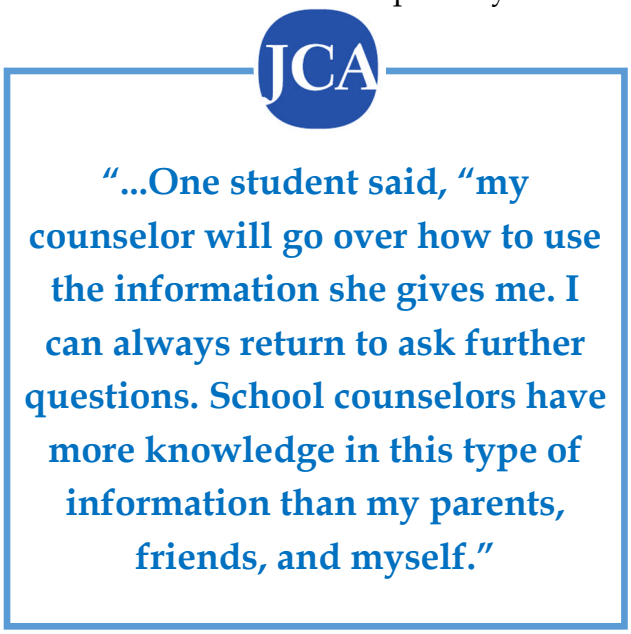
The chi-square analyses examining the most-preferred interpersonal information sources by parent income were significant for high school counselors ($p = .036$) and parents ($p < .001$), with students from lower income brackets selecting high school counselors more frequently than students from the highest income bracket, and students from the highest income bracket selecting parents more frequently than students from lower income brackets. A similar trend was observed with parent education level, where the chi-square analyses revealed statistically significant differences for high school counselors ($p = .001$), admission counselors ($p = .001$), and parents ($p < .001$). As parent education increased,

students selected the high school counselor less often and parents more often as the most-preferred information source, and students with parents holding bachelor's or graduate degrees selected the admission counselor as their most-preferred source less often than students with parents who did not complete a bachelor's or graduate degree. For major decidedness, students who had a clear idea of their intended major selected admission counselors as their most-preferred interpersonal information source more frequently than students who had not yet decided or were likely to change their major (p = .003).

Two of the survey questions were open ended and asked students to briefly explain why they preferred to receive college and career information from the most-preferred source they selected. The findings were evaluated in two discrete categories:

(a) students who indicated they preferred to receive college and career information from their school counselor, and
(b) students who did not identify their school counselor as a preferred source.

Students who responded that they preferred to receive college and career information from their school counselor viewed their school counselor as the most knowledgeable and the best positioned to share accurate and personalized information regarding college and career opportunities (n = 1353, 47%). One student said, "my counselor will go over how to use the information she gives me. I can always return to ask further questions. School counselors have more knowledge in this type of information than my parents, friends, and myself." Another student stated, "As the primary source of the information, I'll be getting information about the specific college and major I'll be pursuing, I would prefer to have someone that is known as the hub of that information to notify me of anything upcoming. It just allows for more convenience." Students feel that the amount of college and career information available to them is overwhelming, but they believe the school counselor will sort through all of it and make their life "easier."



Additional reasons students stated they preferred to receive college and career information from their school counselor included having a strong relationship, trusting their advice as a professional, seeing them as "helpful," believing they are "able" to answer their questions, and feeling safe because that the school counselor "knows" them best and is "looking out for them."

Student Preferences

Students who preferred to receive college and career information from someone other than their school counselor identified college admission counselors, teachers, coaches, clergy, friends, and parents as people who they "trust" and find "knowledgeable" about the process. One student said, "I prefer to receive college and career information from my teachers and parents because they are more supportive and understandable. My parents and teachers have been helping me get more information about colleges. I try getting help from counselors, but they are busy and don't have time to help me out." Another wrote, "I prefer to talk to a college admission counselor and friends because they had experience college. They also would give out advice to a student who is majoring in a big field and how to get through life without being so stress. There is many reasons why I prefer them." Other reasons students stated included a sense that daily interactions with teachers create stronger trusting relationships, a belief that college counselors are best prepared to answer questions about college majors, and feeling parents know them best and are in better positions to help them with their college decisions.

Students who preferred working with someone other than their school counselor to get college and career information do so because they see them as "reliable," experienced in their field, and someone who "wants the best" for them. Both groups feel strongly that their preferred source of college and career information is "knowledgeable about the process" and "cares" about their success. The relational component appears to be tightly aligned to "trusting" their preferred source as an expert. Students typically responded that their preferred source "knows what is best" for them.

Research Question 3:
Communication Preferences

To answer our third and final research question, "how would high school students prefer to receive college and career information?", the participants responded to two items. The first item asked students "how would you prefer to receive college and career information?" and listed six possible response options (e.g., classroom presentations, email, internet – see Table 5) in addition to 'other.' The first item allowed respondents to choose from 0 to 7 of the possible response options with specific instructions to choose all that apply. The responses from study participants who selected at least one of the information sources are summarized in Table 5. The most-frequently selected method for receiving college and career information was Email (69.4%), with slightly less than half of all students selecting One-on-one (48.2%) and Mail (47.6%). Each student selected 2.99 of the communication methods on average (SD = 1.46). Nearly 85% of the respondents indicated they would prefer to receive college and career information from four or fewer of the listed sources, with most students selecting three of them. The second item asked students "how would you MOST prefer to receive college and career information?" and limited respondents to choosing one of the seven response options. As detailed in

Student Preferences

Table 5, Email was the most-preferred method (31.9%), followed by One-on-one (27.7%) and Mail (14.6).

As with the first two research questions, additional chi-square analyses were performed to describe the study participants' most preferred methods (Email, One-on-one, and Mail) for receiving college and career information within selected demographic characteristics, detailed in Table 6. Gender differences emerged for One-on-one (p = .005), with males preferring One-on-one less frequently than female students. Significant differences also emerged when examining Email (p = < .001) and One-on-one (p= .014) by ethnicity. White students selected Email as their most-preferred communication option more frequently than all other ethnicities and selected One-on-one more frequently than all other ethnicities except those identifying as American Indian/Alaska Native. For both Email and One-on-one, the significant chi-square result was due to the difference between White and Black ethnicities.

"Nearly 85% of the respondents indicated they would prefer to receive college and career information from four or fewer of the listed sources, with most students selecting three of them."

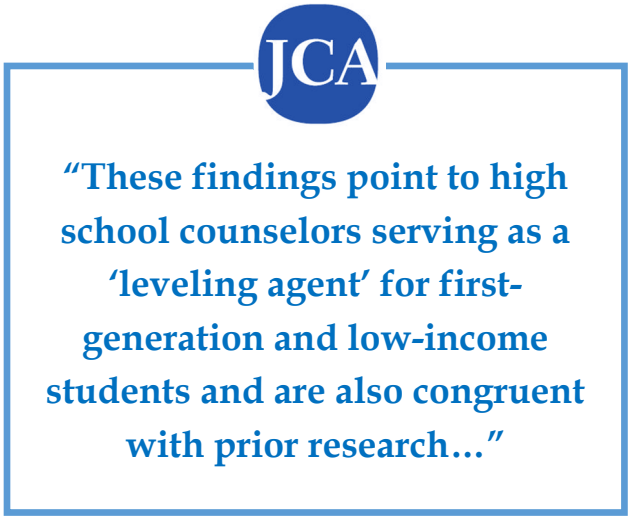
Discussion

The findings of this study both confirm and challenge prior research investigating sources of and preferences for receiving college and career information and provide insight into where and how high school seniors acquire such information and how helpful it was perceived to be. Our first research question assessed how helpful various interpersonal and media-based sources of information were in helping students decide on a field of study to pursue in college and reveals that parents and friends were the most helpful and employers were among the least helpful. This is contrary to the findings of the Gallup-Strada Education Network (2017), which found that employers were more helpful than friends and family. This discrepancy is likely due to the different samples employed in the study. The Gallup-Strada study employed a sample consisting largely of people who had completed a college degree and retrospectively reflected on their experience, while our study consisted entirely of high school seniors in the midst of choosing a major.

The perceived helpfulness of parents increased in lock-step fashion with their education levels, while the helpfulness of high school counselors decreased in a similar, lock-step manner as parent education levels increased and is aligned with prior research (Kim & Schneider, 2005). Similarly, the perceived helpfulness of high school counselors increased as parent income levels decreased. These findings point to high school

counselors serving as a 'leveling agent' for first-generation and low-income students and are also congruent with prior research (Bryan et al., 2011; Castleman et al., 2015; Lara, 2014).

The second research question examined the interpersonal information sources students would prefer to receive college and career information from and indicates that formal networks—high school and admission counselors in particular—are the most preferred sources. This finding was even more pronounced for first-generation students and low-income students, highlighting the important role and function counselors serve for those students (Bryan et al., 2011).



Finally, the third research question investigated how students would prefer to have college and career information communicated to them. Somewhat surprisingly, given prior research on text messaging and the use of social media as promising ways to engage students in the college admission process (Arnold et al., 2015; Lenhart, 2015), Email was the most-preferred communication method, followed by One-on-one and Mail. It is also interesting that the Internet was characterized as the most helpful source of college and career information across all sources (see Table 1), yet was only noted to be a preferred source of information for one-third of our sample—and the most-preferred information source for less than five percent. Unlike the previous research questions, our analyses were not able to detect any statistically significant differences for communication preferences based on parent income or education levels, although the trend observed in the data indicates that as income increases, preferences for receiving information by Email decrease while preferences for One-on-one increase.

Limitations

One notable limitation to the current study is the relatively low response rate with a non-random, slightly unrepresentative sample. Thus, it is important to keep in mind that those who responded to the survey might have different characteristics than the typical high school senior who took the ACT in February 2018. For example, female students were more likely to participate in the survey relative to their male counterparts. Fortunately, there were rarely any gender differences in our findings. We believe that future studies of this nature can be strengthened by the use of a nationally representative sample of 12th graders taking the ACT. Likewise, students who take the ACT test in February have a higher proportion of African American students than any other national test date. While not a direct limitation of our study, we caution the reader in generalizing across

national test dates for a given academic year. Regardless, future research might conduct studies across ACT's national test dates and from students who might not be inclined to sit for the test.

Another limitation of this study concerns the cross-sectional nature of the research design. While it was advantageous to collect students' preferences and sources of college major decisions immediately preceding their enrollment in college, the field could benefit with tracking students across time, including how their sources of college support relate to and inform enrollment into college and persistence, including attaining a college degree.

Finally, the survey questions and options provided in this study aligned with those utilized in the Gallup/Strada study. Some of the survey options need to be teased out further to avoid any confusion for students completing the survey. For example, some students may have interpreted the "college counselor" option to mean a "college admissions representative" while other students might have assumed this referred to a "high school staff member," "college access organization professional" or an "independent educational consultant" designated to assist with college applications, financial aid and other college-going tasks. In the future, these titles could be explicitly identified, and new options added to clarify and better understand the student responses.

Implications for School Counseling Practice

The ASCA national model (American School Counselor Association, 2019) recommends that school counselors calculate the amount of time spent in direct and indirect student services to assess where they are deploying the most energy and to identify gaps in services. In addition to personally understanding how their time is spent, school counselors need to share this information with appropriate stakeholders so that program delivery decisions are made to prioritize college and career advising as major school counselor roles and responsibilities. School counselors must keep abreast of the constantly changing college landscape and current research to make the necessary ongoing adjustments to their college advising practices. School counselors are considered resident experts and the brokers of college and career knowledge and, as such, are expected to be familiar with up to date practices, policies and research.

Administrators, teachers, parents and students rely on school counselors for accurate, timely and up to date information. School counselors must work hand and hand with stakeholders to establish practices that best facilitate student requests for college and career information and provide the individualized one-on-one support students desire (Hatch & Owen, 2015; Savitz-Romer, 2014). If future research continues to validate student preferences for one-on-one advising, college and career advisors and school counselors will need to advocate for and

tackle the logistics necessary to provide this level of support to all students.

When it comes to providing college and career information, we know very little about parents' college knowledge and needs, yet they often have the most influence on their children's college plans. Given that "social capital related to processes such as college application may amass directly to students or may accrue to students through their parents' contact and relationships with school personnel" (Bryan et al., 2011, p. 190), school counselors should consider ways to encourage and enhance collaborative parental relationships. High school counselors could work with parents to help dispel the myths around financial aid and the college admissions process, talk about college match and fit, provide FAFSA and financial aid information, and answer questions about the college transition. They could provide workshops for parents to discuss the social and emotional adjustment of sending a child to college. K-12 and higher education educators should consider how to best support parents and guardians as their students transition from high school to college.

Implications for the Training and Professional Development of School Counselors

Regardless of who students identify as their preferred source of information, they perceive this person to be the most knowledgeable provider of college advice. Standardizing the preparation of all professionals who provide college and career guidance is needed. From pre-service training to ongoing professional development, the requisite knowledge, skills and aptitudes needed to support students as they navigate their college options should be central tenants of all training programs. Professionals engaged in college advising must have the most up to date information to close opportunity gaps and provide the support that students want and deserve. Given the especially important function school counselors serve for students living in poverty and those who are first in their family to attend college, professional development is necessary for educators to stay informed of the most up to date college and career information, yet access to ongoing professional development varies widely between role groups.

Many administrators disagree on how and when school counselor professional development should be delivered, resulting in a lack of consistent and relevant training (Harrison Ross, 2012; Savitz-Romer, 2019). A growing number of authors recognize the need to revamp school counselor professional development models especially when it comes to strengthening school counselor attitudes, knowledge and skills related to postsecondary guidance and researchers continue to call for more school counselor professional development as a solution to school counselor knowledge deficits (Brown et al., 2017, Savitz-Romer, 2019). However, virtually no one is publishing on professional development outcomes, and this needs

further exploration (Brown, et. al., 2016). Teachers and other school staff will need ongoing professional development if they are going to be informed participants in helping all students explore their college options and future majors.

The Council for Accreditation of Counseling and Related Educational Programs (CACREP) standards encourage counselor educator programs to provide stand-alone courses of study, institutes and workshops on counseling students for college education (CACREP, 2015). However, counselor education programs vary greatly in the amount of time devoted to the acquisition of the critical knowledge, skills and competencies needed to provide college exploration, planning and support (National Association of College Admission Counseling, 2016). Counselor educators consistently indicate that their programs provide training in college assessments, affordability planning, college admissions and transition to college support, yet school counselors continue to report feeling underprepared and underequipped to adequately support students with these tasks (Brown et al., 2016). Counselor training programs must assess their student's needs and create a stand-alone college admissions course with tangible, practical, hands on college counseling information and training. College counseling opportunities should be embedded throughout the curriculum so that counselor trainees graduate with the requisite skills needed to support students as they navigate their college options.

Prioritizing activities that utilize the preferred sources and preferences students have for receiving college and career information will allow the field to respond to well-deserved criticism regarding the lack of access students have to high quality college advising and counseling support. Higher education institutions, the business community, philanthropic partners, and K-12 organizations need to work collaboratively to ensure that student voices are heard, and information needs are met as they transition to college and career.

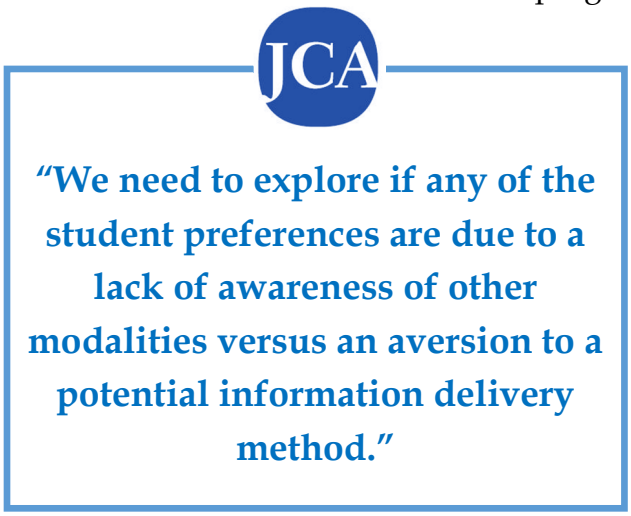
"Prioritizing activities that utilize the preferred sources and preferences students have for receiving college and career information will allow the field to respond to well-deserved criticism regarding the lack of access students have to high quality college advising and counseling support."

Future Research

We must engage in research that will shed a continued light on how students seek college and career information, what sources they turn to understand postsecondary options, and their preferences for receiving this information. Researchers should consider partnering with high schools or school districts that are using college and career

technology platforms or high school exit surveys to gather student feedback and add a few extra questions to assess from whom and how students prefer to receive college information. Some school districts mandate student participation in high school exit surveys as a graduation requirement and partnering with these districts might not only increase the response rate, it would likely lend itself to a more representative sample.

Researchers could also consider collaborating with one or more college access organizations or higher education institutions that have access to a more nationally representative sample and track their students across time to learn how different aspects of support influence college enrollment, persistence, and degree attainment.



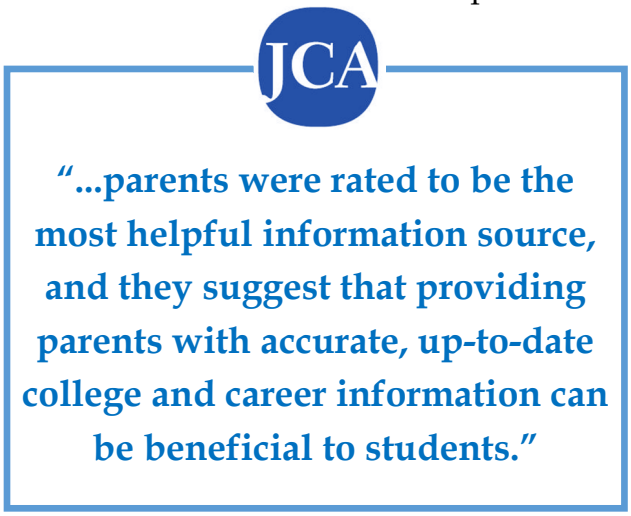
Technology can potentially provide additional support to educators working in under-resourced conditions, yet most research is focused solely on students as the recipients of technological strategies. We need to better understand how technology impacts educators' ability to get information to students and if and how this frees up their time to provide more one-on-one advising. Research can help us better understand what, if any, information can be automated versus what information students prefer to receive via email or what must be done face-to-face. We need to explore if any of the student preferences are due to a lack of awareness of other modalities versus an aversion to a potential information delivery method.

Research has shown that district-wide school counseling policies and smaller counselor-to-student ratios can help facilitate the implementation of robust college and career readiness programs; however, school counselors face a range of competing priorities and demands that often limit the amount of time available for engaging in student college planning activities and initiatives (Brown, et. al., 2016; Hall, 2013; Lapan, Whitcomb, & Aleman, 2012). More research is needed to understand evidence-based practices that are connected to college advising and counseling strategies that best align with student preferences. Research is also needed to better understand the role parents play in the postsecondary planning and decision-making process (Brown et al., 2016). With this research in hand, policy-makers can advocate for the appropriate roles needed to best support students on their postsecondary path.

Implications for Policy

Policies are needed to ensure enough resources are available to support first-

generation and low-income students who typically rely on the school counselor as their major source of support when navigating college opportunities. School districts need to consider equity models that would place more school counselors and college advisors in schools with greater student needs. Higher education institutions could provide additional supports to students and parents attending under-resourced schools. Policies that clarify the role of college access and community-based partners could greatly assist school districts as they weigh the role of school-based staff in providing postsecondary guidance. Policies that require the collection and use of reliable metrics to measure student outcomes will then support evidence-based practices.



Conclusion

How and from whom students prefer to receive college and career information is important for educators, college access professionals, and higher education professionals to know as they assist students and families with the college selection, application, and transition process. The findings of this study indicate that parents were rated to be the most helpful information source, and they suggest that providing parents with accurate, up-to-date college and career information can be beneficial to students. The findings of this study also indicate that low-income and first-generation students prefer school counselors as an information source more than their parents, suggesting that school counselors serve a leveling function. While the Internet was rated to be a helpful source of information, it was among the least-preferred information sources, with interpersonal communication methods (Email and One-on-one) being the most preferred. Analyses of student preferences by selected demographic characteristics revealed differences for interpersonal information sources by gender, race/ethnicity, parent education, and income, few differences emerged when examining how students prefer to receive college and career information. Parent education and income are important characteristics when considering who students prefer to receive information from but are not important when considering how students receive such information. It may be helpful for professionals to consider such differences when developing policies, programs, and interventions designed to provide college and career information to students. JCA

Student Preferences

Table 1.
Perceived Helpfulness Ratings of People and Media Sources Providing College Major Related Information

Source	*n*	*M (SD)*	95% CI [LL, UL]
People	2874	3.17 (0.85)	[3.14, 3.20]
Parents	2745	3.82 (1.19)	[3.78, 3.86]
Friends	2526	3.26 (1.20)	[3.22, 3.31]
Admission Counselor	1991	3.25 (1.27)	[3.19, 3.30]
Extended Family	2174	3.23 (1.31)	[3.17, 3.28]
High School Counselor	2508	3.20 (1.35)	[3.15, 3.25]
Siblings	2050	3.18 (1.36)	[3.12, 3.24]
Teachers	2610	3.16 (1.19)	[3.12, 3.21]
Faith-based	1397	3.03 (1.40)	[2.96, 3.11]
Coaches	1721	2.74 (1.33)	[2.68, 2.81]
Employer	1281	2.57 (1.33)	[2.50, 2.64]
Military Recruiter	870	2.26 (1.36)	[2.17, 2.35]
Media	2723	3.18 (1.05)	[3.14, 3.22]
Internet	2638	3.70 (1.13)	[3.65, 3.74]
Print	2151	3.21 (1.26)	[3.15, 3.26]
Television	1413	2.45 (1.33)	[2.35, 2.52]
Radio	1127	2.04 (1.26)	[1.97, 2.11]
Informal Social	2841	3.34 (0.97)	[3.30, 3.38]
Formal	2859	3.18 (0.93)	[3.15, 3.22]
Informal School-based	2638	3.02 (1.13)	[2.97, 3.06]
Informal Work-based	1462	2.52 (1.27)	[2.45, 2.59]

Note: CI = confidence interval.

Table 2.
Means, Standard Deviations, and Statistically Significant Between Group Differences For ANOVAs Employing Parents, Friends, Admission Counselor, Extended Family, and High School Counselor as Dependent Variables

	Parents			Friends			Admission Counselor			Extended Family			High School Counselor		
Factor	*n*	*M (SD)*	$g(\eta^2)$	*n*	*M (SD)*	$g(\eta^2)$	*n*	*M (SD)*	$g(\eta^2)$	*n*	*M (SD)*	$g(\eta^2)$	*n*	*M (SD)*	$g(\eta^2)$
Gender			(.00)			(.00)			(.00)			(.00)	**		(.01)
Male (1)	847	3.85 (1.16)	.03	774	3.30 (1.18)	.04	613	3.28 (1.25)	.04	658	3.24 (1.32)		787	3.36 (1.28)[2]	
Female (2)	1898	3.81 (1.21)		1752	3.25 (1.20)		1378	3.23 (1.28)		1516	3.22 (1.30)	.02	1721	3.12 (1.37)[1]	.18
Ethnicity	**		(.01)	**		(.01)	**		(.01)	**		(.04)	**		(.04)
AI, NH, > 1 (1)	148	3.65 (1.27)[2]	.16	139	3.12 (1.10)[2]	.03	106	3.25 (1.20)	.10	115	2.99 (1.36)[2]	.05	133	3.31 (1.27)[3]	.27
Black (2)	680	4.00 (1.20)[1,3,4,5]	.15	626	3.45 (1.19)[1,3]	.24	531	3.42 (1.29)[3]	.23	583	3.62 (1.28)[1]	.43	659	3.56 (1.30)[3,4]	.46
White (3)	1180	3.83 (1.14)[2,4]		1083	3.16 (1.19)[2]		823	3.13 (1.26)[2]		910	3.06 (1.27)[2,5]		1049	2.96 (1.32)[1,2,4,5]	
Hispanic/Latino (4)	473	3.66 (1.24)[2,3]	.15	439	3.27 (1.24)	.09	347	3.28 (1.26)	.12	359	3.02 (1.32)[2,5]	.03	428	3.21 (1.36)[2,3]	.19
Asian (5)	97	3.62 (1.19)[2]	.18	93	3.32 (0.99)	.14	71	3.17 (1.10)	.03	77	3.47 (1.13)[3,4]	.33	91	3.37 (1.19)[3]	.31
Parent Income			(.03)			(.02)	**		(.01)	**		(.01)	**		(.02)
<24 to 50k (1)	1104	3.80 (1.23)		1044	3.34 (1.23)		816	3.34 (1.27)[2,3]		901	3.37 (1.33)[2,3]		1042	3.38 (1.32)[2,3]	
50 to 100k (2)	705	3.79 (1.18)	.00	633	3.18 (1.14)	.13	504	3.15 (1.24)[1]	.15	549	3.06 (1.26)[1]	.24	637	3.07 (1.33)[1]	.23
100 to >150k (3)	409	3.96 (1.08)	.13	375	3.20 (1.18)	.12	287	3.10 (1.22)[1]	.19	310	3.11 (1.28)[1]	.20	350	2.86 (1.28)[1]	.40
Parent Education	**		(.02)			(.00)	**		(.01)			(.00)	**		(.01)
Some coll. or less (1)	1094	3.66 (1.28)[3,4]		1035	3.30 (1.25)		820	3.36 (1.26)[2,4]		880	3.21 (1.36)		1049	3.35 (1.34)[2,3,4]	
Associates degree(2)	310	3.80 (1.17)[4]	.11	276	3.24 (1.17)	.05	224	3.08 (1.29)[1]	.22	239	3.30 (1.29)	.07	284	3.11 (1.32)[1]	.18
Bachelor's degree(3)	700	3.95 (1.11)[1]	.24	638	3.30 (1.16)	.00	510	3.20 (1.22)	.13	571	3.24 (1.29)	.02	631	3.11 (1.34)[1]	.18
Graduate degree(4)	449	4.06 (1.04)[1,2]	.33	409	3.13 (1.17)	.14	298	3.08 (1.31)[1]	.22	332	3.14 (1.25)	.05	375	2.91 (1.33)[1]	.33
STEM Intent			(.00)			(.01)			(.00)			(.00)			(.00)
No (1)	2253	3.84 (1.19)		2088	3.29 (1.20)[2]		1645	3.26 (1.27)		1792	3.24 (1.31)		2071	3.19 (1.35)	
Yes (2)	492	3.75 (1.18)	.08	438	3.14 (1.15)[1]	.13	346	3.17 (1.27)	.07	382	3.14 (1.32)	.07	437	3.22 (1.32)	.02
Major Decidedness	**		(.01)	*		(.01)			(.01)	*		(.01)			(.00)
Not yet decided (1)	254	3.53 (1.23)[2,3]	.32	238	3.07 (1.24)[2]	.21	164	3.17 (1.16)	.12	194	3.00 (1.29)[2]	.24	221	2.97 (1.32)	.18
Not likely change (2)	1338	3.91 (1.19)[1,3]		1208	3.33 (1.21)[1]		959	3.32 (1.30)		1052	3.31 (1.31)[1]		1210	3.22 (1.37)	
Likely to change (3)	1152	3.78 (1.17)[1,2]	.11	1080	3.23 (1.16)	.08	868	3.17 (1.25)	.12	928	3.18 (1.31)	.10	1076	3.22 (1.32)	.00
Major Availability			(.00)			(.00)			(.00)			(.00)			(.00)
< Most important (1)	1365	3.79 (1.22)		1262	3.25 (1.21)		983	3.26 (1.28)		1076	3.22 (1.34)		1245	3.23 (1.34)	
Most important (2)	1068	3.86 (1.14)	.06	976	3.25 (1.19)	.00	769	3.21 (1.25)	.04	845	3.23 (1.27)	.01	973	3.11 (1.33)	.09

* = ANOVA significant at p < .05

** = ANOVA significant at p < .01

Note. The numbers in parentheses in factor names refer to the numbers used in illustrating statistically significant between group differences. AI is Amer. Indian/ Islander. White, <24 to 50k parents' income, some coll. or less parents' education, and Not likely change major were all used as reference categories to calculate Hedges g.

Student Preferences

Table 3.
Interpersonal information source preferences among high school seniors.

	A preferred source		Most preferred source		
Information Source	*n*	%	*n*	%	95% CI [LL, UL]
HS Counselor	1831	65.2	708	25.4	[23.8, 27.1]
Admission Counselor	1776	63.2	955	34.3	[32.5, 36.1]
Teachers	1631	58.0	339	12.2	[10.9, 13.4]
Parents	1523	54.2	448	16.1	[14.7, 17.5]
Friends	760	27.0	35	1.3	[.88, 1.7]
Siblings	577	20.5	55	2.0	[1.5, 2.5]
Extended Fam	547	19.5	39	1.4	[1.0, 1.8]
Coaches	418	14.9	54	1.9	[1.4, 2.4]
Faith-based	324	11.5	18	.6	[0.3, .9]
Employer	237	8.4	25	.9	[0.6, 1.3]
Military Recruiter	123	4.4	12	.4	[0.2, .6]
Other	126	4.3	98	3.5	[2.8, 4.2]

Table 4.
Percent of students selecting high school counselor, admission counselor, or parents as most preferred source of college and career information within selected groups

	HS Counselor			Admission Counselor			Parents			Teachers		
Factor	*n*	*%*	*h(V)*	*n*	*%*	*h(V)*	*n*	*%*	*h(V)*	*n*	*%*	*h(V)*
Gender			(.00)	**		(.10)			(.02)			(.04)
Male	214	24.9	0.01	232	27.0	.21	145	16.9	.04	122	14.2	.09
Female	494	25.3		723	37.0*		303	15.5		217	11.1	
Ethnicity			(.07)	**		(.09)	**		(.12)			(.07)
AI, NH, > 1	43	28.1	.11	47	30.7	.04	24	15.7	.12	21	13.7	.05
Black	181	25.9	.06	283	40.4*	.16	89	12.7*	.21	59	8.4	.12
White	280	23.2		394	32.7		247	20.5		143	11.9	
Hispanic/Latino	149	30.8	.17	154	31.8	.02	49	10.1*	.29	67	13.8	.06
Asian	27	27.8	.11	23	23.7*	.20	11	11.3	.25	17	17.5	.16
Parent Income	**		(.07)			(.04)	**		(.13)			(.02)
<24 to 50k	331	28.7*		400	34.6		137	11.9*		144	12.5	
50 to 100k	173	24.4	.10	253	35.6	.02	116	16.3	.13	79	11.1	.04
100 to >150k	85	21.0*	.18	123	30.4	.09	102	25.2*	.35	45	11.1	.04
Parent Education	**		(.09)	**		(.09)	**		(.22)			(.03)
Some coll. or less	328	28.6*		138	38.2*		89	7.8*		145	12.6	
Associates degree	77	24.5	-0.09	121	38.5	0.01	52	16.6	0.27	29	9.2	-0.11
Bachelors degree	163	23.5	-0.12	218	31.4*	-0.14	141	20.3*	0.37	83	11.9	-0.02
Graduate degree	80	17.7*	-0.26	127	28.1*	-0.22	131	29.0*	0.57	57	12.6	0.00
STEM Intent			(.00)			(.01)			(.00)			(00)
No	581	25.2	.00	789	34.2	.03	369	16.0	.01	280	12.1	.01
Yes	127	25.1		166	32.9		79	15.6		59	11.7	
Major Decidedness			(.05)	**		(.07)			(.04)			(.02)
Not yet decided	63	24.2		85	32.7		54	20.8		29	11.2	
Not likely change	326	23.4	-0.02	521	37.5*	0.10	216	15.5	-0.14	164	11.8	0.02
Likely to change	318	27.5	0.08	349	30.1*	-0.06	178	15.4	-0.14	146	12.6	0.04
Major Availability			(.02)			(.05)			(.02)			(.02)
< Most important	368	12.2		454	32.8		216	15.6		169	12.2	
Most important	257	11.2	.03	410	37.1	.09	187	16.9	.04	122	11.0	.04

* = Chi-square significant at p < .05
** = Chi-square significant at p < .01

Note. AI, NH, > 1 refers to the collapsed race category of American Indian, Native Hawaiian, and two or more races. White, <24 to 50k parents income, Some coll. or less parents' education, and Not likely to change major were all used as reference categories to calculate Cramer's *V*.

Student Preferences

Table 5.
Number and percentage of high school seniors' preferred methods for receiving college and career information.

	Choose all that apply		Select most preferred		
Information Source	n	% selecting	n	% selecting	95% CI [LL, UL]
Email	1880	69.4	711	26.3	[26.4, 28.0]
One on one	1306	48.2	619	22.9	[21.3, 24.5]
Mail	1289	47.6	325	12.0	[10.8, 13.2]
Text messages	976	36.1	171	6.3	[5.4, 7.2]
Internet	912	33.7	124	4.6	[3.8, 5.4]
Classroom presentations	867	32.0	252	9.3	[8.2, 10.3]
Phone/tablet apps	435	16.1	27	1.0	[0.6, 1.4]
Other	12	0.4	3	0.1	[0.0, 0.2]
None of the above	475	17.5	475	17.5	[16.1, 18.9]

Table 6.
Percent of high school seniors selecting email, one on one, or mail as most preferred way to receive college and career information within selected groups.

	Email			Mail			One on One		
Factor	*n*	*%*	*h(V)*	*n*	*%*	*h(V)*	*n*	*%*	*h(V)*
Gender			(.02)			(.01)	**		(.07)
Male	241	29.4	.10	96	11.7	.01	154	18.8	.14
Female	470	24.9		229	12.1		465	24.7*	
Ethnicity	**		(.12)			(.05)	**		(.08)
AI / > 1	40	26.5	.11	12	7.9	0.15	43	28.5	.07
Black	232	34.7*	.29	93	13.9	.04	119	17.8*	.19
White	254	21.8*		146	12.5		298	25.6*	
Hispanic/Latino	119	25.3	.08	51	10.9	.05	111	23.6	.05
Asian	21	23.1	.03	9	9.9	.08	21	23.1	.06
Parent Income			(.05)			(.04)			(.05)
<24 to 50k	314	28.2		136	12.2		246	22.1	
50 to 100k	176	25.6	.06	95	13.8	.05	167	24.3	.05
100 to >150k	86	22.1	.14	38	9.8	.08	108	27.8	.13
Parent Education			(.02)			(.05)			(.04)
Some coll. or less	301	27.2		143	12.9		242	21.9	
Associate degree	81	26.6	.01	46	15.1	.06	76	25.0	.07
Bachelors degree	169	25.3	.04	74	11.1	.06	152	22.7	.02
Graduate degree	110	25.3	.04	42	9.7	.10	114	26.3	.10
STEM Intent			(.04)			(.00)			(.03)
No	565	25.4	.11	267	12.0	.00	523	23.5	.08
Yes	146	30.4		58	12.1		96	20.0	
Major Decidedness			(.02)			(.01)			(.03)
Not yet decided	65	25.6		28	11.0		59	23.2	
Not likely change	363	27.0	.03	162	12.1	.03	324	24.1	.02
Likely to change	283	25.5	.00	134	12.1	.03	236	21.3	.05
Major Availability			(.05)			(.03)			(.05)
< Most important	379	28.5		154	11.6		181	22.0	
Most important	255	23.8	.11	144	13.4	.05	277	25.8	.09

Note. AI, NH, > 1 refers to the collapsed race category of American Indian, Native Hawaiian, and two or more races. White, <24 to 50k parents' income, some coll. or less parents' education, and Not likely to change major were all used as reference categories to calculate Cramer's *V*.

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