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Complete Issue

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Journal of College Access

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Thank You Patrick O'Connor

This issue is dedicated to
Co-Editor Dr. Patrick O'Connor,
who has dedicated
31 years to school counseling.

Patrick will return to private practice
in college access consulting.

Thousands of students have benefited
from Patrick's service as a school
counselor and we look forward to his
continued contributions to
increase access to college.



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COVER PHOTO

Student from Western Michigan University, Venezia “Nezi” Jones. Photo is courtesy of Christine Robinson. Used with permission granted by Jones and Robinson.



About the Journal



An Overview

The *Journal of College Access* (JCA) focuses on the current trends, research, practices, and development of all types of programs, policies, and activities related to the access of and success in postsecondary education. Issues of college aspiration, qualification, application, enrollment, and persistence are the primary emphases.

The Journal was co-founded by Dr. Patrick O'Connor and Dr. Christopher Tremblay. O'Connor is associate dean of college counseling at Cranbrook Schools, and Chief Strategist and CEO of College is Yours, an organization dedicated to expanding college opportunity. He is a board member and past chair of the Michigan College Access Network (MCAN). Tremblay is Director of Admissions and Recruiting for the Taubman College of Architecture and Urban Planning at the University of Michigan.

Launched in March 2014, JCA is a part of Western Michigan University's ScholarWorks, a digital showcase of research, scholarly and creative output.

Affiliations

JCA is affiliated with the Michigan College Access Network and the Center for Postsecondary Readiness and Success (CPRS). MCAN is a statewide non-profit organization with a mission to increase college readiness, participation, and completion in Michigan, particularly among low-income students, first-generation college going students, and students of color.



MICHIGAN COLLEGE ACCESS NETWORK



The Center for
**Postsecondary
Readiness and Success**

The goal of the Center for Postsecondary Readiness and Success is to increase equitable and accessible pathways to postsecondary success for all people. Located at American University in Washington, D.C., the Center creates aligned systems, driven by student outcomes to disseminate new knowledge and discovery of college and career readiness and persistence models, while simultaneously connecting this new knowledge to K-12 and higher education policy formation.



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Coming Soon: Special Issues



We have three special issues in progress focused on these important topics:

College Access and Success for Undocumented Students

This issue will reveal the challenges and opportunities for undocumented students in their pursuit of and completion of higher education.

Guest Editors:

Diana Camilo, University of Mississippi

Belinda Zamacona, University of California-San Diego

Access and Blackness:

Antiracist College Counseling and Advising

This issue will offer innovative perspectives or interventions in the context of college and career readiness, as it pertains to antiracist counseling and advising and postsecondary access of Black students. To combat the racist structures which pervade the career counseling and college counseling/advising fields, and disproportionately marginalize Black students, practitioners working with Black youth must be equipped with Antiracist frameworks.

Guest Editors:

Ian P. Levy, Manhattan College

Caroline Lopez-Perry, California State University

Long Beach

Equity-Based Career Development and Postsecondary Readiness

The special issue will focus on manuscripts using an equity-based career development lens to prepare at-risk, minoritized, special needs, and vulnerable populations for postsecondary opportunities. The former first lady of the United States, Michelle Obama, created two initiatives (Reach Higher Initiative and Better Make Room) aimed at exposing young people to college and career planning as well as emphasizing the need for everyone to obtain additional education and training beyond a high school diploma. This special edition will build on these two initiatives and focus on preparing students from vulnerable populations for optimal career and postsecondary outcomes.

Guest Editors:

Erik Hines, Associate Professor, Florida State University

Renae Mayes, Associate Professor, University of Arizona



From the Editors



Authored by
Dr. Patrick O'Connor
Dr. Christopher W. Tremblay
Dr. Laura Owen




Welcome to our newest issue.

One of the founding principles of JCA is the idea that research needs to expand college access, especially to populations where college advice has been in short supply. That principle is significantly advanced in this edition, where we begin with research that identifies the college access needs of foster youth, and how those needs differ from other populations.

JCA was also founded on the belief that research needs to address some of the long-standing assumptions about the keys to college access. One of those key components – the belief of counselors and principals in the importance of college access – receives a vigorous workout in this edition, as do the beliefs about the value of text messaging in college access. Each study leaves a better-defined construct, with insights that can improve the ability of advising professionals to increase college access.

Christine Robinson closes this edition with a perspective piece on College 101, a college access program for at-risk youth, and the qualities that make it different from other programs.

2021 promises to be an busy year at JCA, as no less than three special editions are in the works and expected to roll out. We look forward to a year of continued growth and success, and wish you the same. 



College Choice and Enrollment among Youth Formerly in Foster Care



Authored by

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Alex Williams (*University of Louisville*)

ABSTRACT

Despite being among the most disadvantaged groups with respect to college access and success in the United States, youth formerly in foster care (YFFC) remain an understudied population in higher education research. Although they aspire to college at high levels, youth in foster care enjoy less postsecondary access and success than their peers who have not experienced foster care. This study seeks to better understand how YFFC compare to their peers regarding college preparation, choice, enrollment, and financing; academic self-concept and degree aspirations; and concerns about paying for college. Using Perna's (2008) college choice model and data from the 2016 The Freshman Survey (TFS), we conduct bivariate comparisons and regression analysis to compare college readiness and enrollment between YFFC and non-YFFC who are first-time, full-time freshmen. We report the results of our findings and discuss how these contribute to existing research and apply to the financial and educational needs and strengths of YFFC.

Keywords: Youth formerly in foster care, college readiness, college choice, college enrollment

Despite being among the most disadvantaged group with respect to college access and success in the United States, youth formerly in foster care (YFFC), remain an understudied population in education research (Kearney, Naifeh, Hammer, & Cain, 2018; Pears, Kim, & Leve, 2012). This lack of attention is somewhat surprising considering that YFFC lag well behind peers in attaining a postsecondary credential (Gillum, Lindsay,

Murray, & Wells, 2016; Okpych & Courtney, 2018). Although studies have found that the vast majority (70%-80%) of youth in foster care aspire to attend college (Jones, 2010; Wolanin, 2005) access and success in postsecondary education remains low. Compared to 60% of their peers, about 39% enroll in college (Courtney, et al., 2011) and only 10% graduate by age 25 (Pecora, et al., 2006; Rios & Rocco, 2014). Postsecondary graduation rates range from 1% to 11% (A Day, Dworsky, Fogarty, & Damashek, 2011; Dworsky & Courtney, 2010; Dworsky & Havlicek, 2010; Merdinger, Hines, Osterling, & Wyatt, 2005; Okpych & Courtney, 2018; Parker & Sarubbi, 2017; RTI International, 2015; Sarubbi, 2019; Villegas, Rosenthal, O'Brien, & Pecora, 2014) In a national report on youth in foster care and educational attainment, Wolanin (2005) writes,

If foster youth completed high school and attended postsecondary education at the same rate as their peers, nearly 100,000 additional foster youth in the 18 to 25-year-old age group would be attending higher education. This is the size of the gap in opportunity for higher education between foster youth



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and their peers, and it is the magnitude of the policy problem to equalize opportunities for foster youth (p.7).

The objective of this study is to better understand the postsecondary attainment gap between YFFC and their peers who did not experience foster care (non-YFFC) by illuminating potential differences in college choice and enrollment behaviors between these two groups. Specifically, we ask the following research questions:

How do YFFC compare to non-YFFC with respect to academic preparation, college choice, college enrollment behaviors, and finances/financial aid?

To what extent does being a YFFC impact academic self-concept, highest planned academic degree (i.e., none to a professional degree or doctorate), and concerns about paying for college?

Given the lack of empirical work in this area, these questions are intentionally broad, exploratory in nature, and intended to provide a foundation for future research.

Review of the Literature

It is helpful to begin with a brief overview of foster care in the United States. Dependent children whose birth parents are unable to care for them may be temporarily placed in state licensed private homes or institutions. Children may be voluntarily surrendered by the birth parent, but may also be removed by

the state due to neglect, physical or emotional abuse, unsafe environments, and more. In 2019, the average length of stay in foster care was 19.6 months (Department of Health & Human Services, 2019). Since its inception in the United States in 1853, there has been debate about the structure and efficacy of foster care, with on-going concern about the long-term outcomes for children (McDonald, Allen, Westerfelt, & Piliavin, 1996). Youth in foster care face disproportionately high rates of incarceration (Barth, 1990; Pecora et al., 2003), mental illness, poverty, substance abuse, and low levels of educational attainment (Barth, 1990; Wolanin, 2005). The scope of this study is relatively narrow in terms of foster care outcomes, focusing on educational attainment.

Collectively, existing empirical studies (Blome, 1997; Davis, 2006; Day, Dworsky, & Feng, 2013; Dworsky & Courtney, 2010; Harris, Jackson, O'Brien, & Pecora, 2009; Kahne & Bailey, 1999; Rassen, Cooper, & Mery, 2010; Wolanin, 2005) find that youth in foster care face a number of barriers to attaining a postsecondary credential. Youth in foster care are less likely than their peers to complete high school and less likely to be academically prepared for college. For example, Blome's (1997) analysis of the 1980 High School and Beyond (HS&B) sophomore cohort found that 15% of youth in foster care were enrolled in a college preparatory track compared to 32% of the comparison group. Poor performance on standardized tests by youth in foster care lend further evidence that

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these youth face issues of access due to low levels of academic preparation (Frerer, et al., 2013).

Once enrolled, youth in foster care may lack the necessary institutional (Dworsky & Perez, 2010; Emerson, 2007) as well as financial support (Merdinger, et al., 2005) necessary for them to graduate from college. Although some college and universities have implemented programs and policies to meet the needs of youth in foster care (Unrau, 2011), most student affairs educators remain unfamiliar with these students' needs. Financial barriers include lack of support from family to pay for school (Wolanin, 2005) and lack of awareness of financial aid options (Davis, 2006).

Collectively, these barriers contribute to low attainment rates. Using data from the National Postsecondary Student Aid Study 2004 (NPSAS:04) and Beginning Postsecondary Students 2001 (BPS:01) Davis (2006) found that 26% of former youth in foster care who entered college in 1995 had obtained a postsecondary credential by 2001 compared to 56% of their peers. Prior research has found similarly low graduation rates. For example, Barth (1990) reported that just three 3 out of 55 youth in foster care in his retrospective study had earned a postsecondary credential (1 AA and 2 BAs).

There are no nationally representative datasets of youth in foster care in educational settings (Davis, 2006). Prior research has

relied on samples drawn from social service programs (e.g., McMillen, et al., 2003), agency records (e.g., Barth, 1990), or research studies aimed at broad understanding of their life course (e.g., the Midwest Evaluation of the Adult Functioning of Former Foster youth, i.e., the Midwest Study). While these studies offer a wealth of information about experience and outcomes of youth in foster care, in some cases the sample sizes (e.g., Barth's 1990 study included just 55 participants) preclude certain statistical methods. Also, most of these studies were not intended to collect substantial information about students' postsecondary educational experiences. Even the authors (Day, et al., 2013) of a more recent study using institutional data from a large Midwestern university acknowledge that they lack important variables such as academic performance and financial aid.

In addition, no single federal dataset contains the data necessary to model longitudinal education outcomes for youth in foster care. The Children's Bureau oversees collection of data on youth in foster care. However, these data systems were designed for policy monitoring and reporting purposes, not to provide detailed information about college access and success. The small sample sizes of youth in foster care in National Center for Education Statistics (NCES) datasets limit conclusion on their outcomes. For example, the proportion of youth in foster care in NPSAS:96 to NPSAS:08 ranges from 0.4% to 0.7%. The data analyzed here are the first of

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their kind nationally.

Conceptual Framework

The model of college choice proposed by Perna (2008) serves as the conceptual framework for this study. The model asserts that multiple layers of context, including social, economic, and policy contexts; higher education contexts; school and community contexts; and habitus influence college choice. Habitus, the focus of this study, was first articulated by Pierre Bourdieu (1990) as part of his theory of cultural capital. *Habitus* is the perceptions, habits, dispositions, and outlook held by individuals as a function of their cultural capital. Put another way, habitus is the *feel for the game* that individuals develop, with games being what Bourdieu referred to as fields, such as education, religion, law, and other social institutions. This habitus layer encompasses a person's individual identity, including their demographics, cultural capital, and social capital. Perna's (2008) model conceptualizes the relationships among *habitus* and the demand for higher education (e.g., academic preparation and achievement), supply of resources (e.g., family income), and the expectation of benefits and costs. These all influence the college choice process.

Method

The preceding conceptual framework guides our empirical analysis to answer our research questions about how YFFC compare to non-YFFC with respect to college readiness and college enrollment. First, we conducted

bivariate comparisons of YFFC to all first-time, full-time (FTFT) freshman that were never in foster care in terms of gender, race/ethnicity, value of college attainment, information about college, and assistance with college processes.

Next, we ran a series of ordinary least squares regression models to better understand the relationship between habitus and college readiness and college enrollment. Habitus is operationalized as described above—demographic characteristics, access to information about college, and support in the college readiness and enrollment process. Our focal independent variable is whether a student said they were in foster care after age 13 (more detail below). As such, the variable identifying whether the students had been in foster care after age 13 was force entered first to determine whether there is a relationship between having been in foster care with the outcomes of interest: financial concern, , and academic self-concept.

The other independent variables in the regression analyses were added in blocks, using forward entry such that only variables that added to the predictive power of the model would enter. After the foster care variable, a block of demographics and background characteristics associated with the particular outcome were included such as race/ethnicity, sex, summer bridge participation, and number of years studying various subjects in high school. The next block represents financial variables such as type of

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aid received and financial concern. The final block includes general reasons for attending college.

Data

Data for this study come from the Cooperative Institutional Research Program's (CIRP) Freshman Survey (TFS), administered by the Higher Education Research Institute at UCLA. The 2016 TFS was administered at 253 colleges and universities nationwide and was completed by 171,300 incoming freshmen. The 2016 TFS introduced a new item that asked students to indicate whether they had lived in foster care or as a dependent of the court at any time since they turned 13, and more than 1,000 students (n=1,147) responded in the affirmative to this question. Given that a student who has lived in foster care after age 13 can identify as independent on the FAFSA, analyses of students' concerns about and strategies for paying for college underscore critical differences between former foster care youth and the national sample of FTFT first-year students. Including only FTFT students produced our sample of 156,608, of which 1,019 reported they had been in foster care or a dependent of the court since age 13.

Sample Characteristics

With respect to selected demographic characteristics, we found several differences between respondents who were YFFC and those who were not (see Table 1 on page 13). Women were overrepresented among YFFC

compared to non-YFFC peers. This is somewhat surprising given that according to the latest data from the Adoption and Foster Care Analysis and Reporting System (AFCARS, 2015), females comprised 48% of the youth in foster care in 2015. Students of color were overrepresented among YFFC: about 63% of YFFC in the sample self-identified as a person of color, compared to 37.5% of non-YFFC respondents. African American students represented 26.8% of the YFFC sample and East Asian students represented 23.4%, compared to 12.9% and 7.2% of non-YFFC. For reference, in 2015, 24% of youth in care identified as Black or African American, 22% as Hispanic (of any race), 42% as White, and 1% as Asian (AFCARS, 2015). A higher proportion of YFFC (28.1%) did not identify English as the primary language spoken at home relative to non-YFFC (7.3%). Youth formerly in foster care were also more likely to self-identify as first-generation students (38% compared to 2%). Finally, a lower proportion of YFFC identified as heterosexual or straight compared to non-YFFC (85% compared to 91.6%). See Table 1 on page 13

Respondents who identified as YFFC reported various forms of disability in greater proportion to non-YFFC. About 6% of YFFC reported a learning disability compared to 3.4% of non-YFFC. Attention deficit hyperactivity disorder, autism, physical disability, and chronic illness were also reported by a greater percent of YFFC compared to non-YFFC. Finally, about 22% of

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Table 1.
Demographic Characteristics of Sample

	YFFC	Non-YFFC
	%	
Women	65.4	58.8
Race/ethnicity		
Person of color	62.7	37.5
African American	26.8	12.9
American Indian/Alaska Native	4.7	1.8
East Asian (e.g., Chinese, Japanese)	23.4	7.2
Latino/Hispanic		
Mexican American/Chicano	22.4	7.3
Puerto Rican	4.6	2.3
Other	5.5	6.7
English not primary language	28.1	7.5
First-generation	37.5	1.9
Sexual orientation- Heterosexual or straight	85	91.6
Disability		
Learning	5.9	3.4
Attention Deficit Hyperactivity Disorder	10.6	6.3
Autism	2.1	0.6
Physical	7.8	4.8
Chronic illness	3.6	2.7
Psychological disorder	21.5	11.1

Source: Authors' Analysis of 2016 The Freshman Survey.

Table 2.
Academic Preparation and Aspirations

	YFFC	Non-YFFC
	%	
GED	0.4	0.1
HS GPA		
B or below	33.1	23.1
A or A +	23.4	30.2
4 or more years of high school math	77	89.3
Aspire to a bachelor's degree or higher	96	98.8

Source: Authors' Analysis of 2016 The Freshman Survey.

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YFFC reported some form of psychological disorder (e.g., depression, anxiety), compared to 11% of non-YFFC. This is important to note given the higher incidence of mental health challenges reported among youth in foster care (Geenen et al., 2015).

Findings

Based on several characteristics, YFFC reported being less academically prepared for college than non-YFFC (see Table 2 on page 15). YFFC reported earned lower grades in high school than non-YFFC: about 23% of YFFC reported having an A or A+ cumulative GPA in high school compared to 30.25% of non-YFFC. Also, a lower proportion of YFFC reported taking four or more years of math compared to non-YFFC. Degree aspirations were high for both groups, with 96% of YFFC aspiring to a bachelor's degree or higher compared to about 99% of non-YFFC.

A number of differences in reasons for choosing and enrolling in college emerged in the responses from YFFC and non-YFFC. First, YFFC appeared to attend colleges that were further away from home than non-YFFC: 31.5% of YFFC reporting that their current institution was more than 500 miles from home, compared to 21% of non-YFFC. A greater proportion of youth formerly in foster care reported that becoming more cultured and preparing for graduate school was a very important reason for going to college relative to non-YFFC.

Some differences emerged between YFFC and non-YFFC with respect to who influenced their college choice decisions. Perhaps not surprisingly, higher proportions of YFFC reported being influenced in their college choice process by people other than parents or relatives. Although parents can play an important role in the information youth receive about their choice of college and career (Owen et al, 2020), youth in foster care likely have limited interaction with parents. About 52% of YFFC said parents or relatives were somewhat or very important in their choice of college compared to about 58% of non-YFFC. Teachers and high school counselors also seemed to be more influential in the college choice process for YFFC versus non-YFFC. Financial assistance was most often cited by both groups as somewhat or very important in the college choice process for both groups, but a greater proportion of YFFC (81.2%) felt this way compared to non-YFFC (74.3%). Interestingly, religious affiliation of the school seemed to hold greater influence on the college choice process for YFFC, although as shown in Table 4 (page 17), a smaller proportion of YFFC reported attending religious services once enrolled compared to non-YFFC.

Behaviors in College

Next, we consider self-reported activities and behaviors of YFFC compared to non-YFFC once they were enrolled in college. YFFC reported attending summer bridge programs in higher proportion compared to non-YFFC (see Table 4 on page 17). Consumption of

College Choice and Enrollment of YFFC

Table 3.
College Choice and Enrollment

	YFFC	Non-YFFC
	%	
Distance from home		
> 500 miles	31.5	21
100 to 500 miles	18	27.8
Accepted to first choice college	70.4	73.3
Attending first choice college	52	56
Reasons for going to college (ranked as very important)		
Becoming more cultured	60.5	54.5
Preparing for graduate school	69.4	62.1
Pleasing family	37.2	35.4
Reasons for choosing college (somewhat or very important)		
Parents/relatives	51.6	58.4
Teacher	47.3	35.6
Academic reputation	61.4	66.4
Financial assistance	81.2	74.3
Cost of college	49.6	38.8
High school counselor	32.2	22
Private college counselor	47.1	57
Good job	47.1	57
Religious affiliation	38.6	29.5
Visit to campus	39.8	49.8

Source: Authors' Analysis of 2016 The Freshman Survey.

College Choice and Enrollment of YFFC

alcohol (beer, wine, or liquor) was reported by a smaller proportion of YFFC compared to non-YFFC. Interestingly, although a greater share of YFFC reported having psychological disorders, a smaller proportion of YFFC reported feeling overwhelmed and having occasional feelings of depression or anxiety than non-YFFC. YFFC seemed more likely to seek out counseling, however, with 63.2% reporting a good or very good chance of seeking out counseling, compared to 48.5% of non-YFFC.

Academic Behaviors in College

With respect to academic behaviors once enrolled, there appeared to be little difference between YFFC and non-YFFC in terms of going to class late, falling asleep in class, or skipping class. A greater proportion of YFFC reported frequently taking on challenges compared to non-YFFC (43.3% compared to 35.7%). YFFC reported studying more and socializing less than their non-YFFC peers. About 10% of YFFC reported spending over 20 hours per week studying compared to about 6% of non-YFFC, whereas 51.4% of YFFC reported socializing six or more hours per week with friends compared to 59% of non-YFFC. Both groups were similar in reporting expectations around time to graduate, with about 90% planning to do so in four years or less. Finally, YFFC reported having a very good chance of working with a professor in greater proportion than non-YFFC (31.1% compared to 23.8%). In sum, YFFC reported behaviors that would presumably lead to academic success at a

higher rate than their non-YFFC peers.
Finances and Financial Aid

A number of differences emerge between YFFC and non-YFFC with respect to finances and financial aid. About 44% of YFFC reported receiving no resources from families to pay for college, compared to 17.6% of non-YFFC. Among non-YFFC, about 32% reported receiving \$15,000 or more from their families to pay for college compared to roughly 23% of YFFC. YFFC appeared to be less likely to report using loans to pay for college and more likely to rely on work-study. About 56% of YFFC reported receiving a Pell Grant compared to 29% of non-YFFC. In addition, YFFC were more likely to report receiving need-based aid and less likely to receive merit-based aid. A greater proportion (23.55%) of YFFC reported having major concerns about paying for college compared to non-YFFC (13.6%). Working more than 20 hours per week was reported with greater frequency among YFFC. About 16% of YFFC reported working more than 20 hours per week compared to 9.4% of non-YFFC.

Academic Self Concept

Finally, we compared YFFC to non-YFFC on index variables related to academic self-concept, social agency, college involvement, and self-efficacy. A low score equates to at least one half of a standard deviation below the mean. An average score is within one half standard deviation above or below the mean. A high score equates to more than a half a standard deviation above the mean. We find

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Table 4.
College Enrollment Behaviors

	YFFC	Non-YFFC
	%	
Summer bridge participation	13.8	5.9
Attended a religious service		
Not at all	42.8	29.6
Occasionally	31.4	37.6
Frequently	25.7	32.9
Did not consume beer	75.7	69.7
Did not consume wine or liquor	69	63.6
Felt overwhelmed		
Not at all	12.9	7.7
Occasionally	46.2	50.8
Frequently	40.9	41.5
Occasional mental health feelings		
Depression	65.8	79.8
Anxious	79.8	84.8
Socialized occasionally with someone of a different racial or ethnic group	88.7	96.6
Late to class frequently	7.6	7.8
Fell asleep in class frequently	6.7	5.6
Skipped class frequently	3.3	2.6
Frequently took on challenges	43.3	35.7
Had above average or greater social confidence	50.6	44.9
Had average intellectual confidence	31.4	33
Spent over 20 hours per week studying	9.5	5.5
Spent 6 or more hours per week socializing with friends	51.4	59
Expect to graduate in 4 years or less	89.5	90
Reported seeking a good or very good chance of seeking counseling	63.2	48.5
Have a very good chance of working with a professor	31.1	23.8
Have a very good chance of getting tutoring in specific classes	44.2	35.4

Source: Authors' Analysis of 2016 The Freshman Survey.

College Choice and Enrollment of YFFC

Table 5.
Finances and Financial Aid

	YFFC	Non-YFFC
	%	
Did not receive resources from family to pay for college	44	17.6
Received \$15,000 or more from families	22.8	31.5
Used their own resources to pay for college	62.3	64.3
Did not receive grants to pay for college	22.7	20.3
Did not receive loans	50.2	44.3
Used military grants to pay for college	3.9	3.4
Used work-study to pay for college	31.2	22.9
Received Pell Grant	56.4	28.8
Received need-based aid	52.8	39
Received merit-based grants	41.4	55.7
Had concerns about having sufficient funds to pay for college	23.5	13.6
Spent over 20 hours per week working for pay	15.8	9.4

Source: Authors' Analysis of 2016 The Freshman Survey.

Table 6.
Index Variables.

	YFFC	Non-YFFC
	%	
Low academic self-concept	33.5	27.6
High social agency	42.2	36.3
Low collegiate reputation	36.5	30.6
College involvement		
Low	28.9	26.3
Average	42.7	39.9
High	28.4	33.8
Low science self-efficacy	35.3	29.6

Source: Authors' Analysis of 2016 The Freshman Survey.

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that a greater proportion of YFFC fell into the low academic self-concept category compared to non-YFFC (33.5% compared to 27.6%). YFFC had higher levels of social agency in greater proportion compared to non-YFFC. In addition, a greater proportion of YFFC were classified as having low science self-efficacy relative to non-YFFC. Finally, a greater proportion of YFFC were classified as having low or average college involvement compared to non-YFFC.

Regression Results

As described in our discussion of methods, we ran three regression models with outcomes focused on financial concern, degree aspirations, and academic self-concept. Variables in each model were entered in a step-wise fashion as blocks to ascertain the unique effect of each block on prior variables. We begin with results from our financial concern model.

Financial Concern

One-third of the variance in our financial concern was explained by the variables in this model ($r^2 = .330$). At the beginning of the model, having been in foster care was associated with increased financial concern. This key independent variable remains significant until hours per week working for pay enters the model in step six. In the final model, while being in foster care nor hours per week working for pay were no longer significant predictors of financial concern, several demographic and background

characteristics remain significant.

After controlling for all variables in the model, students of color and female students were more likely to be concerned about paying for college (see Table 7 on page 20). Emotional well-being was also a concern as those who more frequently felt depressed, overwhelmed by all they had to do, and anxious were also more likely to be concerned about finances. Even after controlling for merit support, those with higher high school grades were less likely to be concerned about paying for college. Further, students who were accepted into their first-choice college were less likely to be concerned about finances.

Not surprisingly, in the final model, those who report higher income were less likely to be concerned about finances. Students who report more financial support from their family and merit support that does not have to be repaid are significantly less likely to be concerned about paying for college. On the other hand, students who reported using more of their own resources to pay for the first year of college, those taking out more loans, and those receiving Pell Grants were more likely to be concerned about paying for college. Finally, those who anticipated getting a job to help pay for college were more likely to report financial concern.

With respect to reasons for attending college in general, after controlling for all other variables in the model, those who attended

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Table 7.
Regression Results for Financial Concerns

	Unstandardized Beta	Standard Error	Significance
YFFC	-0.020	0.021	0.343
Student of color	0.103	0.004	0.000
Felt overwhelmed by all I had to do	0.070	0.003	0.000
Household/childcare duties	0.019	0.001	0.000
Felt depressed	0.060	0.003	0.000
Working (for pay)	0.001	0.001	0.289
Female compared to male	0.063	0.004	0.000
HSGPA	-0.010	0.001	0.000
English primary language	-0.074	0.006	0.000
Felt anxious	0.034	0.003	0.000
Parental income	-0.053	0.001	0.000
Source of aid			
Aid that must be repaid	0.081	0.001	0.000
Job to pay college expenses	0.144	0.002	0.000
Used own resources to pay for college	0.050	0.002	0.000
Grant aid	-0.007	0.001	0.000
Accepted by 1st choice college	-0.027	0.004	0.000
Family resources (parents, relatives, spouse, etc.) to pay for school	-0.004	0.001	0.000
Pell Grant	0.019	0.004	0.000
Reasons for attending college			
To gain a general education and appreciation of ideas	-0.027	0.004	0.000
To be able to get a better job	0.017	0.004	0.000
To be able to make more money	0.012	0.003	0.000
To learn more about things that interest me	-0.013	0.005	0.003
To make me a more cultured person	-0.006	0.003	0.034

Source: Authors' Analysis of 2016 The Freshman Survey. Adjusted R-square 0.330.

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college to get a better job or to make more money were more concerned about finances. By contrast, those who considered gaining a general education, learning more about things that interest them, and making themselves more cultured showed less concern about funding their college education.

Degree Aspirations

Foster care status is not a significant predictor of degree aspirations in our sample. This model accounts for about 28% of the variance in degree aspirations ($r^2 = .284$). Within the first block of demographics and high school experiences, the strongest predictor of degree aspirations is the number of AP courses taken in high school (see Table 8 on page 22). In terms of demographic characteristics, female students and students of color were more likely to have higher degree aspirations once all other variables entered in the final model. Other positive predictors of degree aspirations include high school grades; years of studying biological science, foreign language, and mathematics; and participating in a summer bridge program.

Financially, students from higher income backgrounds have higher degree aspirations. However, all types of financial aid, including loans, merit and need-based aid are also significant, positive predictors of degree aspirations. The only financial variable that negatively impacts degree aspirations is the amount of expenses covered by the students' own resources.

The only general reason for attending college that is a positive predictor of degree aspirations was attending to prepare for graduate or professional school, which makes sense given the outcome of higher degree aspirations. The other general reasons for attending college that entered the model were associated with lower degree aspirations and included to please family, to get career training, to make more money, to become a more cultured person, and to gain a general education and appreciation of ideas.

Academic Self-Concept

Academic self-concept aggregates four self-ratings: academic ability, drive to achieve, mathematical ability, and intellectual self-confidence. This model accounts for about 37% of the variance in the academic self-concept construct ($r^2 = .365$). Entered at step one, foster care status is a significant negative predictor of academic self-concept. That is, before accounting for any other independent variables, having been in foster care was associated with lower academic self-concept. However, at step two, when high school grades entered the equation, foster care status became not significant. That is, after accounting for grades, being a YFFC in and of itself was not a significant predictor of academic self-concept. Once aspects of students' emotional well-being entered the model, being a YFFC was actually associated with higher academic self-confidence. The key independent variable of interest remains significant and positive throughout the remainder of the model. This requires further

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Table 8.
Regression Results for Degree Aspirations

	Unstandardized Beta	Standard Error	Significance
YFFC	-0.039	0.031	0.202
# of AP Courses	0.107	0.003	0.000
Female compared to male	0.061	0.005	0.000
HSGPA	0.048	0.002	0.000
Student of color	0.086	0.005	0.000
Years studying			
Foreign Language	0.015	0.002	0.000
Arts and/or Music	-0.006	0.001	0.000
Mathematics	0.030	0.005	0.000
Biological science	0.052	0.002	0.000
English primary language	-0.010	0.009	0.255
Weeks in summer bridge program	0.017	0.004	0.000
Accepted by 1st choice college	-0.059	0.005	0.000
Parental income	0.016	0.001	0.000
Concerned about ability to pay for college	0.042	0.004	0.000
Source of aid			
Used own resources to pay for college	-0.014	0.002	0.000
Loans	0.008	0.001	0.000
Family resources (parents, relatives, spouse, etc.) to pay for school	0.007	0.001	0.000
Pell Grant	0.054	0.006	0.000
Grant aid	0.026	0.001	0.000
Reasons for attending college			
To prepare myself for graduate or professional school	0.555	0.004	0.000
To please my family	-0.083	0.003	0.000
To get training for a specific career	-0.090	0.005	0.000
To be able to make more money	-0.054	0.004	0.000
To make me a more cultured person	-0.018	0.004	0.000
To gain a general education and appreciation of ideas	-0.014	0.005	0.010

Source: Authors' Analysis of 2016 The Freshman Survey. Adjusted R-square 0.283.

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analysis to tease out the complex relationship between emotional well-being, foster care status, and academic self-concept (see Table 9 on page 24).

After all the blocks of independent variables entered the model, women had lower academic self-concept, while students of color and native English speakers had a higher academic self-concept. High school behaviors (such as hours per week spent studying or doing homework, number of AP courses taken, high school grades, and displaying behaviors associated with habits of mind for lifelong learning) were all positive predictors of academic self-concept. Aspects of emotional well-being, such as feeling depressed, anxious, and overwhelmed were associated with lower academic self-concept.

Several financial variables also remained significant at the end of the model. Students who reported higher income, increased merit support, and receiving a Pell Grant were all more likely to have higher academic self-concept. Students who showed increased financial concern and covered first-year expenses with loans were more likely to have lower academic self-concept. Attending college to make more money, prepare for graduate/professional school, or receive career training were associated with higher academic self-concept; attending to please family or to become a more cultured person were associated with lower academic self-concept.

Discussion

A major contribution of this study is that it is the first nationally representative study exploring the college readiness and college enrollment processes of YFFC, as such datasets of youth in foster care in educational settings do not yet exist (Davis, 2006). Prior research has relied on samples drawn from social service programs (e.g., McMillen, et al., 2003), agency records (e.g., Barth, 1990), or research studies aimed at broad understanding of youth in foster cares' lives (e.g., the Midwest Evaluation of the Adult Functioning of Former Foster Youth). While these studies offer a wealth of information about youth in foster care, in some cases the sample sizes (e.g., Barth's 1990 study included just 55 participants) preclude certain statistical methods. Most of these studies did not collect substantial information about students' postsecondary educational experiences.

A number of interesting findings emerge from this exploratory study. First, we find that the YFFC in this national sample mirror the demographics and academic preparation of youth who have experienced care: students of color were overrepresented among YFFC, as were first-generation students and lower-income students. As we might expect given the challenges youth in foster care may face in education (e.g., disruptions in school from placement changes), YFFC in this national sample appeared to be less prepared academically than their non-YFFC peers. Second, YFFC are also distinct from non-

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Table 9.
Regression Results for Academic Self Concept

	Unstandardized Beta	Standard Error	Significance
YFFC	0.614	0.309	0.047
HSGPA	2.252	0.019	0.000
Habits of Mind Score	0.231	0.003	0.000
Female compared to male	-2.618	0.050	0.000
# of AP Courses	1.574	0.030	0.000
Felt Anxious	-0.731	0.041	0.000
Highest degree planned	0.644	0.032	0.000
Felt depressed	-0.405	0.038	0.000
Studying/homework	0.263	0.015	0.000
Felt overwhelmed by all I had to do	-0.628	0.045	0.000
English primary language	0.695	0.092	0.000
Student of color	0.153	0.051	0.003
Concerned about ability to pay for college	-0.749	0.041	0.000
Parental income	0.084	0.011	0.000
Accepted by 1st choice college	-0.312	0.052	0.000
Sources of aid			
Family resources (parents, relatives, spouse, etc.)	-0.205	0.014	0.000
Grant aid	0.186	0.012	0.000
Pell Grant	0.232	0.061	0.000
Loans	-0.052	0.014	0.000
Reasons for attending college			
To be able to make more money	0.653	0.042	0.000
To make me a more cultured person	-0.544	0.039	0.000
To prepare myself for graduate or professional school	0.323	0.040	0.000
To please my family	-0.228	0.031	0.000
To learn more about things that interest me	0.275	0.063	0.000
To get training for a specific career	0.228	0.047	0.000
To gain a general education and appreciation of ideas	0.149	0.054	0.006

Source: Authors' Analysis of 2016 The Freshman Survey. Adjusted R-square 0.364.

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YFFC in ways that may present challenges to their educational attainment. Consistent with other research (e.g., Geenen et al, 2015), YFFC in this sample reported various disabilities in greater proportion than non-YFFC. For example, about 22% of YFFC reported having psychological disorders (e.g., depression) compared to about 11% of non-YFFC. YFFC also more frequently reported concerns about college affordability and about having fewer resources to pay for college (especially from family). Relative to non-YFFC, YFFC reported relying on need-based aid, work-study, and money earned from their own employment to pay for college. Notably, affordability was a concern for all students in the sample. Finally, YFFC were more likely to be categorized as having a low academic self-concept, lower levels of involvement in college, and a low sense of science self-efficacy, decreasing their likelihood of earning a postsecondary credential despite high aspirations to finish a bachelor's degree.

However, a picture of strength also emerges from the data, one that challenges notions of YFFC operating from substantial educational deficits. As mentioned above, YFFC have high aspirations and expectations for themselves when it comes to earning a degree and the time in which they plan to do it. In the

possible absence of family or relatives to help guide their college choice process, YFFC relied on teachers and high school counselors. Once enrolled, YFFC reported similar behaviors around studying, going to class, and being engaged in their classes (e.g., a greater proportion of YFFC than non-YFFC reported studying more than 20 hours per week.) Also, a greater share of YFFC reported they were likely to work with a professor and likely to seek tutoring for specific courses.

Finally, in our exploratory regression models looking at factors impacting academic self-confidence, we found a modest but positive relationship between being a YFFC and having higher academic self-confidence, controlling for all else. This paints a picture of YFFC who engage in positive behaviors with respect to academic success. In many ways, this is not surprising. Given the overall low rate of college-going among youth

who have experienced care, the YFFC in this sample likely have developed a number of skills and academic characteristics that made them successful in attending college in the first place.

Recommendations

A number of recommendations for research and practice stem from our findings. First, the



“YFFC were more likely to be categorized as having a low academic self-concept, lower levels of involvement in college, and a low sense of science self-efficacy, decreasing their likelihood of earning a postsecondary credential despite high aspirations to finish a bachelor’s degree.”

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picture of strengths mentioned above warrants consideration by practitioners who work in student affairs, financial aid, academic advising, and other similar areas of campus life. YFFC are likely less academically prepared than peers who did not experience foster care and they are more likely to report mental health concerns, yet at the same time they are as likely or more likely than their peers to engage in success-oriented behaviors, such as working with faculty members. For youth formerly in foster care, services targeted toward overcoming their areas of relative weakness (e.g., academic preparation, ability to pay for college) that also capitalize on areas of strength (e.g., academic self-efficacy) may be especially impactful. Practitioners should look to the growing number of campus-support programs (e.g., Western Michigan University's Seita Scholars Program) for YFFC as opportunities to learn about how we can provide support for YFFC (Geiger, Piel, Day, & Schelbe, 2018). Researchers should continue to partner with programs to evaluate their efficacy. This research invites changes to both policy, such as creating an environment that incentivizes engagement opportunities like summer bridge; and practice, by supporting educators who build such efforts (Unrau, 2011).


Second, the relationships among foster care status, demographic characteristics, and paying for college merit additional research. Interestingly, we did not generally find a statistically significant relationship between being a YFFC and degree aspirations or

financial concern, once we controlled for other factors such as college choice, academic preparation, and financial aid. This lack of statistical significance may be a function of the relatively small sample size of YFFC compared to non-YFFC. Yet, recall that after controlling for all variables in the model, students of color and female students were more likely to be concerned about paying for college. Future research with these data will test for interaction effects and, if warranted, run separate models for groups. For example, interactions between gender and race/ethnicity, foster care status, and concerns about paying for college may illuminate the nuanced ways in which economics and sociocultural factors operate together. Future research on the topic of YFFC financing college should also utilize the National Postsecondary Student Aid Study (NPSAS). NPSAS is a readily available national postsecondary dataset that contains some information about students who were in care, although it does not contain as much information about behaviors in college. Finally, future research should look at educational outcomes to the extent possible, such as academic performance and degree completion. With the exception of a few studies (e.g., Okpych & Courtney, 2018), relatively little research has focused on persistence and degree completion for YFFC. This study does not focus on how college choice factors, academic preparation, ability to pay for school, and more impact year-to-year persistence and ultimately degree completion. Yet, such work is needed – for

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YFFC enrolled at four-year institutions as well as community colleges, where almost half of YFFC enroll (Gross, 2019).

Conclusion

This study sought to better understand how YFFC compare to their peers regarding college preparation, choice, enrollment, and financing; academic self-concept and degree aspirations; and concerns about paying for college. What emerges from our findings is a picture of strengths for youth who attend a four-year college and have experienced care. At the same time, we found a number of ways in which YFFC differ from non-YFFC, including academic preparation and mental health concerns – ways that may present barriers to ultimately attaining a degree. This study contributes to the research on YFFC by delving into college choice and college enrollment – areas that have not yet received a great deal of attention among researchers. As with most studies, we raise more questions than provide answers – yet when our findings are taken together with the work of others (e.g., A Day et al., 2011; Angelique Day, Geiger, Piel, & Schelbe, 2019; Geiger et al., 2018; Kirk & Day, 2011), we see specific areas (e.g., academic support) in which practitioners might begin to shape their work to better support YFFC and in which additional research must be done. 

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School Principals' and Counselors' Focus on College-Going: The Impact of School Leader Expectations and Primary Counseling Goals on Postsecondary Education



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ABSTRACT

The purpose of this study was to examine how school counselors', and principals' primary counseling goals and expectations impact postsecondary enrollment in order to learn what best helps students achieve their postsecondary goals. It was found that school counselors' expectations of students were positively related to students' postsecondary education decisions. Further, it was found that principals' primary school counseling goals; regarding preparing students for postsecondary education, was significantly related to an increase in students' decisions to enroll in postsecondary education. These findings support existing evidence that school counselors' high expectations and principals' primary goals are crucial in promoting college-going culture, which may ultimately pave the way for students to attain their goals of earning a college degree.

Keywords: primary counseling goals, expectations, postsecondary enrollment

Preparing students for a successful transition from high school to postsecondary education is an important goal for many high school settings, which may be largely due to the research findings that postsecondary education often becomes a pathway to both economic success and social mobility (Poynton & Lapan, 2017). For instance, according to the United States Department of Education's National Center for Education

Statistics (NCES), students who earned a college degree had a salary one and a half times higher than the average salary and a 10% higher employment rate than those who had a high school diploma only (De Brey et al., 2019). Additionally, 91.9% of high school sophomores in 2002 reported they aspire to have a college degree, however, 52% of those students have attained postsecondary education in 2012 (Chen et al., 2017).

Considering the gaps between students' college aspirations and the attainment of their goals, it is important to examine the factors that contribute to postsecondary outcomes. A number of studies suggest that high school counselors and principals can contribute significantly to successful transitions for high school students from secondary curriculum to postsecondary education programs (Bryan et al., 2011; Kim, et al., 2018; Lapan & Harrington, 2010; Woods & Domina, 2014). Particularly, scholars documented that expectations and/or beliefs school leaders (e.g., counselors and principals) have toward students are vital factors for creating a college-going culture that may affect students'

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decisions to apply for and enroll in postsecondary education (Convertino & Graboski-Bauer, 2018). Indeed, school counselors and principals can serve as institutional agents in which their perceptions about counseling goals may affect students' decisions to apply for and enroll in postsecondary education (Bardhoshi & Duncam, 2009; Beesley & Frey, 2006; Poynton & Lapan, 2017). Therefore, the purpose of this study is to examine how school counselors' and principals' primary counseling goals, and expectations impact postsecondary enrollment, in order to learn what best helps students achieve their postsecondary goals.

School counselors' perceptions of what values or beliefs counselors and principals have for students' postsecondary education are likely important to increase students' awareness of postsecondary options through the promotion of a college-going culture (Athaneses, et al., 2016; McKillip, et al., 2013). Although a substantial body of literature highlighted the importance of beliefs, expectations, and primary counseling goals in college-going culture (McClafferty, et al., 2002; McKillip et al., 2013), few studies examined whether counseling goals and perceptions of counselors' and principals' expectations were associated with students' postsecondary plan or status. This study aimed to validate prior research which describes that school counselors and principals may play critical roles in postsecondary decisions and enrollment of students. Specifically, using nationally representative data from NCES's High School Longitudinal Study of 2009, the

study examines whether counselors' and principals' primary counseling goals affected the likelihood of taking postsecondary educational classes. The study also attempted to investigate counselors' perceptions of both their own and principals' expectations toward students that influenced students' decisions to take postsecondary classes in 2013.

The partnership between school counselors and principals is especially important to promote a student's pursuit of postsecondary education. If principals do not involve school counselors in incorporating college-going culture into a school, principals might be more inclined to focus only on their own views of what will best foster this type of culture (Convertino & Graboski-Bauer, 2017). For example, Convertino and Graboski-Bauer (2017) found in their case study that the changes that were made in favor of college-going culture in an urban, United States high school were based upon the principal's personal perceptions of what would make an effective program. As a result, the culture of the school became less inclusive overall and focused on college-going culture from a "culture of poverty" standpoint or for students from "culturally deficient backgrounds" (Convertino & Graboski-Bauer, 2017, p. 64). When solely focusing on students' college-going ability through a deficit-based lens, the assets and strengths of all students to go to college are not highlighted. Thus, college-going culture in a school is likely to be more impactful when school leaders collaboratively make it a

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priority and principals work with school and community stakeholders to promote it.

Conceptual Framework

We referred to Social Capital Theory (SCT) (Lin, 2001) in this study, which is essentially the idea that principals and school counselors are institutional agents that help students gain access to valuable resources and information, such as materials and knowledge, to prepare students for postsecondary education (Stanton-Salazar, 2011). For example, in their study, Lowery, Mayes, Quick, Boyland, Geesa, and Kim (2019) outline three key standards that align principal and school counselors in promoting social justice advocacy. One of these standards, “**advocacy actions**,” includes creating access to academic rigor for students who are under-represented, which is one way school leaders can help students gain access to materials and knowledge. Also in school settings, evidence suggests that institutional agents are critical to the SCT in which they transmit not only valuable resources, knowledge, and information, but also aspirations, beliefs, expectations, and goals that contribute to academic success (Bryan et al., 2011), college enrollment (Kim et al., 2018), and postsecondary attainment (Poynton & Lapan, 2017).

Next, we incorporated college-going culture as a part of the framework to describe the important roles of principals and school counselors for students’ successful transitions to postsecondary education (McKillip, et al.,

2013). College going culture refers to “the environment, attitudes, and practices in schools and communities that encourage students and families to obtain the information, tools, and perspectives to enhance access to and success in postsecondary education” (Center for Educational Partnerships, 2019, p. 1). McClafferty, McDonough, and Nunez (2002) described college-going culture with nine principles that provide guidelines and steps that schools can take to create a college-going culture, particularly for school staff who wish to build a culture to prepare students to be ready for college. The nine principles include: clear expectations, information and resources, comprehensive counseling model, testing and curriculum, faculty involvement, family involvement, college partnerships, and articulation. The college-going culture emphasizes the important roles of school leaders’ expectations, beliefs, and counseling goals that may lead to enhanced postsecondary outcomes (Athanases, et al., 2016; Lapan & Harrington, 2010; McDonough, 2005; McKillip et al., 2013; Woods & Domina, 2014). In the college-going culture framework, principals have the power to influence students’ postsecondary education status specifically through their commitment to creating and maintaining a culture of college readiness (McDonough, 2005) and through intentional partnerships with school counselors (Beesley & Frey, 2006). Relatedly, explicit counseling goals are integral to creating a college-going culture which contributes to educational success (Athanases, et al., 2016; McDonough, 2005; Woods &

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Domina, 2014).

Perceptions of Primary School Counseling Goals and Students' Postsecondary Education

Several studies documented principal perceptions on counseling goals (Bardhoshi & Duncan, 2009; Beesley & Frey, 2006).

According to Bardhoshi and Duncan (2009), principals ranked responsive services (e.g., crisis intervention) as the most important role of school counselors, followed by creating peer relationships, teaching coping strategies and skills, and individual counseling. Further, McClafferty et al. (2002) assert that in order to foster a college-going culture, school counselors should provide college choice advising that includes information about college types, eligibility requirements, and competitive eligibility, which many do not have time for when assigned a large amount of tasks (both appropriate and inappropriate for their position). Beesley and Frey (2006) examined how principals perceived primary counseling goals, as they saw the above duties, such as responsive services, as being top priority goals along with academic planning/college preparation, career counseling, multicultural counseling/diversity awareness, program evaluation/accountability, and public relations/community outreach. Therefore, while the sample population of this study also included K-12 principals, these principals perceived the role of academic planning/college preparation as slightly more important. Unfortunately, the study did not consider the

impact that principal perceptions of primary school counseling goals have on postsecondary enrollment (Bardhoshi & Duncan, 2009; Beesley & Frey, 2006). One could potentially infer that principals who perceive college preparation as a highly important school counseling goal would promote college-going culture in their school, thus increasing the chances of postsecondary enrollment. However, this cannot be known without further research.

Related to school counselors, many studies address the importance of school counseling in shaping the college-going culture (Bryan et al., 2011; Lapan & Harrington, 2010; Poynton & Lapan, 2017). Specifically, several studies highlighted the significant roles of school counselors influencing college application rates and college enrollment through student-counselor contact (Bryan et al., 2011; Woods & Domina, 2014) and by considering counselor caseload (Woods & Domina, 2014; Engberg & Gilbert, 2014). Other studies found that college counseling focusing on financial aid assistance, college fairs, and college application assistance were associated with positive postsecondary outcomes (Engberg & Gilbert, 2014; Farmer-Hinton & Adams, 2006). In a similar way, Perusse, Poynton, Parzych, and Goodnough (2015) noted eight essential components that school counselors should emphasize in implementing college-going culture, including: college aspirations, academic planning for college and career readiness, enrichment and extracurricular engagement, college and career exploration

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and selection process, college and career assessments, college affordability planning, college and career admission process, and transition from high school graduation to college enrollment. However, little empirical data is known about the impact of primary counseling goals on postsecondary outcomes. Of the few studies, Engberg & Gilbert (2014) examined whether the primary counseling goal of college-going is related to four-year or two-year college enrollment using the High School Longitudinal Study of 2009 (HSL:09). The results showed the importance of the primary goal of college counseling to facilitate students' college outcomes (Engberg & Gilbert, 2014). Thus, our study extended the previous study by examining which primary counseling goals among academic, career/college, and social/emotional development are related to students' decision of taking postsecondary classes.

Expectations of School Leaders Toward Students

From the college-going culture framework, high expectations set by school leaders were important in college-going culture (Athanases et al., 2016). The high expectations may lead to relationships between students and staff, specifically non-academic relationships like advisory programs, which can be incredibly beneficial to students in preparing them for college and higher education (McKillip et al., 2013). McKillip and colleagues suggested that social support, belief of school leaders in students, and setting up achievable academic challenges can contribute to student success

(McKillip et al., 2013). Similarly, Holland (2015) asserts that school staff building trusted relationships with students is vital in effective college-going culture, as is intentionally seeking out students to teach them about college. This is specifically because many students do not seek out this information on their own (Holland, 2015). Also, Bosworth, Convertino, and Hurwitz (2014) contend that college-going culture begins with student-school staff relationships, and that it is the responsibility of principals to set this culture in motion and to partner with school counselors to plan and implement college and career readiness. While there is a significant amount of research on how school leadership generally can promote a college-going culture (Athanases et al., 2016; Bosworth et al., 2014; Holland, 2015; McClafferty et al., 2002; McKillip et al., 2013), not quite as much information exists on the impact of school leaders' expectations on postsecondary education status.

With respect to counselor expectations, the American School Counseling Association (ASCA, 2019) states that school counselors' beliefs that all students can learn and reach their potential are critical factors to promoting student success. For instance, Bryan et al. (2011) examined whether counselor expectations toward students were associated with student-counselor contact using the Educational Longitudinal Study (2002) (ELS:2002). The study indicated that students who reported they believed their counselors had low expectations toward their education were less likely to meet with school

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counselors (Bryan et al., 2011). It is possible that counselor expectations may affect students' willingness to contact counselors or even their overall relationship with them. Similarly, Muhammad (2008) investigated, with a nationally representative sample (n=941), whether counselor expectations for students' future education were associated with African American students' desire to attend college and their decision to search for colleges to attend. The results demonstrated that counselor expectations are the strongest factor in college aspiration and search among African American students (Muhammad, 2008).

The Current Study

Guided by the social capital theory and college-going culture, we investigated the following question in our study: What is the relationships of counselor and principal expectations and primary goals to students' postsecondary education status after controlling for student and school variables (i.e., gender, race/ethnicity, SES, school type, urbanicity, academic achievement, and counselor caseloads)? We hypothesized that counselors' and principals' expectations and primary counseling goals would be associated with students' postsecondary education plans or status.

Methods

Participants

We used data from the HSLs:09 which is a longitudinal study of a nationally representative sample of high school students, including base year data from Fall 2009 with ninth and eleventh graders, the first follow-up with eleventh graders in Spring 2012, and the update with high school graduates in 2013. Also, the dataset includes important contextual data from other sources such as the school administrators and school counselors in the base year and in the first follow-up. In our study, of the 10,273 analytic sample of high school completers from the Fall 2009 ninth-graders, 0.8% were others (including American Indian/Alaska Native and Hawaiian/Pacific Islander), 4.0% were Asian, 9.4% were Black/African American, 16.1% were Latina or Hispanic, 61.6% were White, and 8.0% identified as multiracial. We combined Hispanic (no race specified) and Hispanic (race specified as one category as Latina or Hispanic) into one category as "others" in the NCES in the ELS:2002 data report (Bozick, Lauff, & Wirt, 2007). Also, we combined American Indian/Alaska Native and Hawaiian/Pacific Islander as "others."

Approximately 50% were male students and 49.8% were female students. Of the sample, 7.9% of students attended Catholic or private schools, while 92.1% students attended public schools. Regarding residential area, 26.7% of students lived in a city area, 35.8% lived in suburban areas, and 37.5% lived in a town or rural area.

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Measures

Dependent variable. Postsecondary education plans/status was measured by asking high school completers who were ninth-grade students in the Fall 2009 about whether they were taking or planned to take postsecondary classes in November 2013. Their responses were measured with a trichotomous variable (yes, no, don't know) originally. In our study, we combined "no" and "don't know" as one category for the regression. While students who answered "no" likely differ from those of "don't know," the aim of this study was to investigate the factors associated with having greater odds of being in the "yes" category as compared with the "no" and/or "don't know" categories. Radford, Ifill, & Lew (2016) suggested that identifying the factors associated with being "no" versus "don't know" may not be highly important to policy implications. The variable was used as an indicator of the postsecondary education pipeline. Of the sample, 75.7% of students reported that they were taking or planning to take postsecondary classes, while 24.3% of students reported that they were not taking or planning to take postsecondary classes in Fall 2013 or were unsure if they will take classes.

Demographic variables. Race/ethnicity was a categorical variable of six categories: White, Latina or Hispanic, Black or African American, others (e.g., American Indian/Alaska Native, Hawaiian/Pacific Islander), and multiracial. Race was dummy coded, with White serving as the reference group.

Socioeconomic status (SES) was measured by a composite variable based on parents' occupation, educational level and income in the HSLS:09 dataset, which is a continuous variable and standardized for use in the regression. School type (i.e., public, private or Catholic) and urbanicity (i.e. city, suburban, town or rural) were both dummy coded with "town" or "rural" and "private" or "Catholic" as reference groups. Academic achievement was defined as academic grade point average (GPA) from students' ninth grade year as a categorized variable, which was treated as a continuous variable and standardized for the regression. The school counselor caseload was a continuous variable in the HSLS:09 dataset that measured the number of students per counselor in a school. In the study, we transformed the variable into a set of four dummy variables (i.e., 250 or less, 251-350, 351-450, and more than 450) with more than 450 as the reference group. This was chosen as the reference group because the American School Counselor Association (ASCA) (2012) recommends that schools maintain student-to-school counselor ratios of 1:250 to foster academic, career, and personal development for all students.

School counselors' perceptions of counselor expectations. There is a scale of the school counselor's perceptions of the counseling staff's expectations that was created by the HSLS:09. The counselors' perceptions of counselor expectations reflect school counseling culture on a macro-level. In other words, it can be proxy variables measuring what expectation the school counseling

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department holds toward students. The scale had six variables (Cronbach's $\alpha = .79$) coded (1=*disagree or strongly disagree*, 2=*agree*, 3=*strongly agree*): "counselors in this school set high standards for students' learning," "counselors in this school believe all students can do well," "counselors^a in this school have given up on some students," "counselors^a in this school care only about smart students," "counselors^a in this school expect very little from students," and "counselors in this school work hard to make sure all students learn." Some variables were re-coded so that high values represented more positive assessments of the counseling staff's expectations. The reliability of the current study was adequate (Cronbach's $\alpha = 0.79$).

School counselors' perceptions of principals' expectations. This variable is a scale of the school counselor's perceptions of the school principal's expectations that was created by the HSLS:09. The scale had six variables (Cronbach's $\alpha = .79$) coded (1=*disagree or strongly disagree*, 2=*agree*, 3=*strong agree*): "principal in this school sets high standards for students' learning"; "principal in this school believes all students can do well"; "a principal in this school has given up on some students"; "a principal in this school cares only about smart students," "a principal in this school expects very little from students"; and "principal in this school works hard to make sure all students learn." Some

variables were re-coded so that high values represented more positive assessments of the principal's expectations. The reliability of the current study was adequate (Cronbach's $\alpha = 0.79$).

Principals' primary school counseling goals. The primary school counseling program goals were the program's most emphasized goals. Principals were asked to identify their most highlighted goals, and four categories emerged: (1) helping students plan and prepare for their work roles after high school, (2) helping students with personal growth and development, (3) helping students plan and prepare for postsecondary schooling, and (4) helping students improve their achievement in high school. Helping students improve their achievement in high school served as the reference group.

Counselors' primary school counseling goals. Other variables considered were counselors' primary school counseling program goals, measuring counselors' most emphasized goals. The four categories are as follows: (1) helping students plan and prepare for their work roles after high school, (2) helping students with personal growth and development, (3) helping students plan and prepare for postsecondary schooling, and (4) helping students improve their achievement in high school. Helping students improve their achievement in high school served as the reference group.

^a Recoded-variables

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Data Analysis

We conducted hierarchical logistic regression analysis to investigate the relationships of the predictors (e.g., demographic variables, school counselor/principal variables) to each category (e.g., Yes, No) of the dependent variable (e.g., whether high school graduates were taking or planned to take postsecondary classes). Given that HSLs:09 is a complex sample using oversampling and multistage collection procedures, we used SPSS Complex Samples 25.0 to correct sampling weights and apply the sample design effects (Bryan et al., 2017).

Results

The correlations among the variables were below .20, except between the variables of counselors' perceptions of principals' expectations and perception of counselors' expectations ($r = .66, p < .01$). We then assessed all variables for multicollinearity with attention to variance inflation factors (VIFs) and tolerance scores. Collinearity, as measured by these factors, was not indicated, with VIF scores not above 1.2 and tolerance scores below .84. Therefore, we proceeded to regression. In Table 1, we presented the results of the final model predicting students' postsecondary education plans or status (see Table 1 on pages 41-42). We entered the variables in two steps with the demographic variables and academic achievement in Model 1, adding school counselor and principal variables in Model 2 (see Table 2 on pages 43-44). The logistic regression model was

significant at the first block comprising only demographic variables and academic achievement, Wald $\chi^2 (14) = 1038.74$, adjusted Wald $\chi^2 (11) = 701.72, p < .001$, Nagelkerke $R^2 = .324$, and at the second block when school counselor and principal variables were entered, Wald $\chi^2 (22) = 835.49$, adjusted Wald $\chi^2 (19) = 615.75, p < .001$, Nagelkerke $R^2 = .327$, change in Nagelkerke $R^2 = .003$. The demographic variables and academic achievement explained 32.4% of the variability and explained an additional 0.3 % of the variability in postsecondary education plans or status after controlling for the demographic variables and academic achievement.

In the final model, after controlling for the demographic variables and academic achievement, principals' primary school counseling goals, school counselors' perceptions of counselor expectations, and school counselors' perceptions of principals' expectations were associated with postsecondary education plans or status, while counselors' primary school counseling goals were not significantly associated with postsecondary education plans or status. Specifically, when principals reported that helping students plan and prepare for postsecondary schooling was the most emphasized goal in their school counseling program above helping students improve their achievement in high school, the odds of taking postsecondary classes increased by 22% (OR=1.22). Also, counselors' perceptions of counselors' expectations were positively associated with taking postsecondary classes

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Table 1a.
Descriptive Part 1

	Weighted N	Weighted Percent or Mean
Student Variables		
Gender^a		
Male	1252625.90	51.0%
Female	1204751.98	49.0%
Race/Ethnicity^a		
Others	20716.661	0.8%
Asian	94589.580	3.8%
Black or African American	251727.445	10.2%
Latino/a	404757.561	16.5%
Multiracial	202834.995	8.3%
White	1482751.64	60.3%
School Type^a		
Public	2272897.34	92.5%
Private or Catholic	184480.541	7.5%
Urbanicity^a		
City	649869.68	26.4%
Suburban	886630.05	36.1%
Town or Rural	920878.14	37.5%
SES		.09

Note. Nagelkerke $R^2 = .327$, Wald $\chi^2 (22) = 835.49$, adjusted Wald $\chi^2 (19) = 615.75$, $p < .001$

^a Reference category for each variable in order: Female, White, Private or Catholic, Town or Rural, more than 450, and improving Academic Achievement.

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Table 1b.
Descriptive Part 2

	Weighted N	Weighted Percent or Mean
Student Variables		
Academic Achievement		2.69
School Counselors' Caseload		
250 or few	512282.371	20.8%
251-350	755861.574	30.8%
351-450	696009.402	28.3%
More than 450	493224.536	20.1%
Counselor's school counseling primary goals		
Preparing for Career/Work Roles	88259.102	3.6%
Personal Growth/Development	316616.277	12.9%
Preparing for Postsecondary Education	1218071.08	49.6%
Improving Academic Achievement	834431.428	34.0%
Principal's school counseling primary goals		
Preparing for Career/Work Roles	106319.521	4.3%
Personal Growth/Development	316198.217	12.9%
Preparing for Postsecondary Education	1331731.38	54.2%
Improving Academic Achievement	703128.763	28.6%
School counselor's perceptions of principal expectations		.08
School counselor's perceptions of counselor expectations		.06
Postsecondary education plan/status		
Yes	1860843.61	75.7%
No or don't know	596534.269	24.3%

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Table 2a.

Final Model of the Hierarchical Multinomial Logistic Regression Analysis Predicting Postsecondary education plans or status (N=10,273)

Postsecondary education plans or status	Yes vs. no ^b		
	<i>B</i>	<i>SE</i>	<i>Odds Ratio</i>
Intercept	-.95	.30	.38**
Student Variables			
Gender ^a			
Male	-.33	.08	.71***
Female			
Race/Ethnicity ^a			
Others	-.18	.44	.83
Asian	.43	.20	1.55*
Black or African American	.37	.16	1.41*
Latino/a	.63	.12	1.87***
Multiracial	.12	.16	1.13
White			
School Type ^a			
Public	-.93	.20	.39***
Private or Catholic			
Urbanicity ^a			
City	.54	.13	1.71***
Suburban	.33	.09	1.39***
Town or Rural			
SES	.92	.07	2.52***

Note. Nagelkerke $R^2 = .327$, Wald $\chi^2 (22) = 835.49$, adjusted Wald $\chi^2 (19) = 615.75$, $p < .001$

^aReference category for each variable in order: Female, White, Private or Catholic, Town or Rural, more than 450, and improving Academic Achievement.

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Table 2b.

Final Model of the Hierarchical Multinomial Logistic Regression Analysis Predicting Postsecondary education plans or status (N = 10,273)

Postsecondary education plans or status	Yes vs. no ^b		
	<i>B</i>	<i>SE</i>	<i>Odds Ratio</i>
Academic Achievement	1.06	.05	2.90***
School Counselors' Caseload			
250 or few	.34	.15	1.40*
251-350	-.09	.12	.91
351-450	.04	.12	1.04
More than 450			
Counselor's school counseling primary goals			
Preparing for Career/Work Roles	-.00	.20	.99
Personal Growth/Development	-.02	.13	.97
Preparing for Postsecondary Education	.03	.09	1.03
Improving Academic Achievement			
Principal's school counseling primary goals			
Preparing for Career/Work Roles	.09	.21	1.09
Personal Growth/Development	.05	.12	1.05
Preparing for Postsecondary Education	.20	.09	1.22*
Improving Academic Achievement			
School counselor's perceptions of principal expectations	-.11	.05	.89*
School counselor's perceptions of counselor expectations	.13	.05	1.14*

^b No category includes: Don't taking or planning to take postsecondary classes in fall 2013, and don't know if they will take classes.
* $p < .05$; ** $p < .01$; *** $p < .001$.

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(OR=1.14). In other words, the odds of taking postsecondary classes increased by 14% compared to no classes (OR = 1.14). When school counselors perceived that other school counselors had a positive impact on student success, had high expectations, cared about all students, and worked hard for the success of all students, they were more likely to take postsecondary classes. Surprisingly, school counselors' perceptions of principal expectations were negatively associated with postsecondary education plans/status (OR=.89). This may be due to other expectations principals have, such as meeting students' social, emotional, and career needs and the school- and district-level vision and goals. School counselors' perceptions that principals believed all students could do well, had high expectations for all students, cared about all students, and worked hard to make sure all students learned, were negatively associated with postsecondary education plans among high school graduates.

Discussion

The present study examined whether school counselors' perceptions of counselor expectations and principal expectations were related to students' decisions regarding postsecondary education. The study also investigated whether perceptions of school counselors and principals about primary school counseling goals were associated with students' postsecondary decisions.

The results indicated that school counselors' expectations of students were positively

related to students' postsecondary education decisions. Also, principals' primary school counseling goals of preparing students for postsecondary options was significantly important for increasing students' decision to take postsecondary classes. These findings corroborate existing evidences that school counselors' high expectations and principals' primary goals about postsecondary education are integral to enhancing college-going culture, which ultimately leads to positive college outcomes (Lapan & Harrington, 2010; McKillip et al., 2013; Woods & Domina, 2014).

Specifically, the study supported previous studies about the influence of counselor expectations on students' decisions or plans to take postsecondary classes (Bryan et al., 2009; Muhammad, 2008). High school students were more likely to plan or take postsecondary classes when their counselors believed all students could succeed and reach their potential in learning. The result is significant in a practical sense, as school counselors are critical social capital that provide information, resources, and support through counseling services (e.g., one-on-one meeting, group counseling, classroom guidance), which may influence whether or not they encourage students to enroll in postsecondary education. Also, this finding supports college-going culture theory in that the culture is created and conveyed through expression of high expectation of school leaders, including counselors (Athanasios et al., 2016, Bosworth et al., 2014; Holland, 2015; McKillip et al., 2013). Furthermore, the results of this study go hand-in-hand with Engberg

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and Gilbert's (2014) finding that schools dedicating more time to college counseling were associated with students' higher rates of four-year college-going. Thus, both counselor expectations and time spent on college counseling are important in postsecondary enrollment.

Interestingly, school counselors' perceptions of principals' high expectations toward students were negatively associated with students' decisions

regarding postsecondary education. Even though high expectations for students were considered some of the most crucial administrative leadership skills that lead to student success (McKillip et al., 2013), Valentine and Parter (2011) found principals' high expectations were not

associated with high school student achievement scores among principal leadership factors. Considering this study used the item that counselors reported whether principals in their school had high expectations for students, it is possible that counselors' perceptions of the principal's expectations may not accurately reflect principal's expectations toward students. A future study may need to examine principals' self-reports on expectations toward students.

Another finding of this study demonstrated that principals' primary counseling goals of

preparing students for postsecondary education are critical factors in postsecondary educational decisions. When principals made college counseling a priority, students were more likely to take or plan postsecondary education. This finding is meaningful in providing quantitative evidence of the importance of principals' primary goal of college counseling. Indeed, this finding echoes the suggestion of McClafferty, McDonough, and Nunez (2002) that

principals play a central role in creating a college-going culture by focusing on college counseling to promote postsecondary outcomes. When principals set the primary goal of college counseling, school counselors may be more likely to be committed to college counseling and to build collaborative relationships

with principals, moving toward the goal of preparing all students for postsecondary education (Convertino & Graboski-Bauer, 2017). Indeed, the principal's focus on college counseling may support and empower school counselors to be able to devote more time and energy to college counseling (McKillip, et al., 2012). Thus, it is incredibly important that principals continue to be trained in *how* to establish a college-going culture, specifically through creating a strong collaborative relationship between themselves, school counselors, teachers, and students. As has been discussed, supportive staff-student



“When principals made college counseling a priority, students were more likely to take or plan postsecondary education. This finding is meaningful in providing quantitative evidence of the importance of principals' primary goal of college counseling.”

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relationships tend to be very helpful in encouraging college-going and promoting student growth, meaning that it is crucial that school leaders adopt an overall more collaborative culture in which this can take place.

Implications

School principal and counselor expectations of high school students and primary school counseling goals are critical components for school principals and counselors to consider when ensuring *all* students are college and career ready when they graduate high school. The findings from our study support pre- and in-service principals and school counselors, higher education faculty, and policy makers as they consider how best to work with one another and identify primary goals focused on students' success in postsecondary education.

The expectations and preparation for students to be college ready by school counselors and principals takes time and collaboration. To promote a college-going culture, students need opportunities to lead, develop skills, and obtain competencies. In a study of students' college readiness and leadership style in two early college high schools, Villarreal, Montoya, Duncan, and Gergen (2017) found that leadership style was a significant predictor of all career readiness foundation skills (i.e., basic skills, thinking skills, and personal qualities) and competencies (i.e., resource management, interpersonal skills, information skills, system management, and

technology use). Principals and school counselors may collaborate to set expectations for secondary students to go to college or pursue postsecondary education, which will likely mean setting up specific opportunities for students to learn about their own leadership styles and skills and how they can implement these in the future.

To encourage college-going for students, some schools provide high school students with college counseling. When considering counseling resources and norms for school counselors, Engberg and Gilbert (2014) found the average student caseload, the number of hours spent on college-focused counseling, and the number of college and counseling resources were significantly related to a schools' college-going culture. While school counselors may advocate for time and materials, school administrators must set the expectation for students to go to college or postsecondary schooling and ensure counselors have appropriate time and resources to support and educate students as they prepare for their futures.

However, as is mentioned by Lowery, Quick, Boyland, Geesa, and Mayes (2018), many school counselors are assigned inappropriate tasks because principals are unsure of their specific roles. Lowery et al. (2018) go on to explain how pre-service educators can benefit from learning more about the school counselor's role, and how collaboration between schooling counseling and leadership pre-service programs can be instrumental in fostering this collaboration both pre- and in-

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service. As has been mentioned, in order effectively promote college-going culture, it is crucial that school leaders are taught how to collaborate properly so that school counselors can spend a sufficient amount of time working with students on college counseling. In their study, Boyland et al. (2019) lay out units of study for higher education preparation programs that foster collaboration between principals and school counselors. Thus, because principals and school counselors have such a great impact on college-going culture and on students' postsecondary enrollment, preparing these administrators to work well together is an often-ignored piece of the puzzle. Implementing these units of study in pre-service programs could be a practical and realistic means by which to teach future school leaders how to collaborate well.

In further discussing the importance of school leaders, it is essential to note that school counselors can serve as liaisons between their students, the high school, colleges, and principals in order to collaboratively guide the students to consider and prepare for college. As the lead decision makers in schools, principals' expectations of students to go to college must be a priority, as well as providing students and school counselors with the information and materials they need at school. In a study of concurrent enrollment, Hanson, Prusha, and Iverson (2015) found that principals believed that concurrent enrollment had a positive impact in their schools and better prepared students for college. By offering prerequisite courses and

concurrent enrollment programs, school administrators and counselors expose students to ways of learning and content that will prepare them for college. College-going culture is further supported in these types of environments, as students can earn college credit while in high school.

Limitations and Future Research


Limited quantitative research exists on the direct impact of perceptions of primary school counseling goals and expectations toward students on postsecondary enrollment. We are contributing to the knowledge base of this topic with this study. The limited amount of research available, specifically quantitative studies about principals' expectations about college-going culture, made it challenging to conduct a thorough literature review with a variety of studies. There are limitations on the data we used for our study, as well. The survey data was collected between 2009 and 2013, and it would be beneficial to conduct a similar survey now in more recent years. A majority of participants in this survey identified themselves as White, which may limit the important consideration of how race relates to postsecondary enrollment.

Building on the findings, future research will be beneficial to extend the current findings to measure the construct of McClafferty (2002)'s college-going culture comprehensively. For instance, future research can use structure equation modeling (SEM) to examine relationships of various college-going culture factors determining enhanced postsecondary

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outcomes. The findings also indicate a need for quantitative research on school leaders' expectation and primary counseling goals. Future research could investigate a moderating and mediating effects of expectations of school leaders (e.g., school counselors and principals) and primary school counseling goals on postsecondary outcomes.

Conclusion

Information and materials to promote a college-going culture are available throughout the United States, however it seems that many schools do not foster this culture in schools. It is evident that school counselors and principals can have a positive impact on students' postsecondary enrollment when they develop and foster a college-going culture in their schools. We recognize more research is needed on collaborative efforts by school leaders and community stakeholders in creating a college-going culture. As school leaders, counselors, principals, and community partners work together to create and foster a college-going culture, it is critical to consider the information, resources and guidance students need in order to make and achieve postsecondary goals for future success. 

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Inside the Black Box of Text-Message College Advising

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ABSTRACT

Making college access and success more equitable at a national scale requires alternatives to intensive in-person modes of pre-college advising. Text-message advising campaigns are a promising intervention model for delivering college application and financial aid assistance affordably to large populations of college-intending, low-income students. College outcome results from a recent series of very large text-message programs have been disappointing however. Going inside the black box of text-message advising to understand why and how students engage in text-messaging programs can help explain program effects and inform the design of future virtual-advising programs. This study uses text mining techniques to investigate the content of 342,000 student text messages from a national text-message advising program. In the program under study, over 30,000 college-intending students from 745 high schools received two-way college advising for 15 months via text messaging with professional advisors. Data mining of the student text messages indicated that students needed substantial individualized assistance and that they used texting primarily for navigating discrete tasks related to testing, applications, and financial aid. In addition to providing substantive findings about college access advising, the study method illustrates how big data tools can extract meaning from large bodies of unstructured text like those generated by the growing number of text-message educational interventions.

Keywords: college access, low-income students, text mining, text-message advising, virtual advising.

Introduction and Background

Family socioeconomic status is a powerful indicator of whether high school students will begin college, what kind of college they will attend, and whether they will earn a college degree (Bailey & Dynarski, 2011; Chetty et al., 2017; Reardon, 2013; Shapiro et al., 2019). A large research literature identifies barriers to college attainment among students who come from low-income families, have non-college-educated parents, or are from minoritized racial groups. In a review of this body of research, Page and Scott-Clayton (2016) group college access barriers into financial, informational, and academic constraints. These constraints are particularly likely to be present among students from schools with high concentrations of students from low-income backgrounds and low college-going rates (Engberg & Wolniak, 2010, 2014; Palardy, 2013; Perna & Jones, 2013; Roderick et al., 2008; Willms, 2010). In-person assistance to overcome these constraints, such as school counseling and out-of-school college access programs, is frequently insufficient for students in high-poverty schools (Avery et al., 2014; Carrell & Sacerdote, 2017; Hyman, 2019; McKillip et al., 2012; Perna et al., 2008; Swail & Perna, 2002). Increasing face-to-face support is labor-intensive and expensive; even exemplary programs can serve only limited numbers of students. Making college



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access and success more equitable at a national scale therefore requires new modes of advising that can be delivered affordably to large populations of students.

Technology-Enabled College Advising Interventions

Technology-based college access interventions have begun to emerge over the past decade as a possible means for reducing socioeconomic gaps in the transition to college (Arnold et al., 2015; Bettinger et al., 2019; Bird et al., 2019; Castleman, 2015; Castleman & Page, 2015, 2016; Fesler, 2020; Fesler et al., 2019; Oreopoulos et al., 2020; Page et al., 2020; Phillips & Reber, 2019). Pre-college admissions and financial aid advising that is delivered by text message is a particularly promising way to engage high school students because of the ubiquity of text messaging among American youth (Lenhart, 2015). Compared with school-based and other face-to-face approaches, texting programs are affordable and can be delivered at scale.

Economists and education policy scholars measure the effectiveness of text-message advising programs through quantitative analysis of treatment effects in randomized controlled trials (RCTs). A recent review of results from large-scale RCTs in education in the U.K. and the U.S. concluded that these trials have been generally “uninformative,” however (Lortie-Forgues & Inglis, 2019, p. 158). Recent randomized controlled trials of text-message advising programs, in particular, have shown some positive

outcomes in localized settings but disappointing results when delivered at large scale (Bird et al., 2019; Bergman et al., 2019; Bettinger et al., 2019; Gurantz et al., 2019; Gurantz et al., in press; Hyman, 2019; Page et al., 2019, 2020; Phillips & Reber, 2019). This emerging body of results includes investigations of the impact of large-scale campaigns to encourage students to apply for college (Gurantz et al., in press; Phillips & Reber, 2019), to apply to selective colleges (Gurantz et al., 2019); to apply or reapply for financial aid (Bird et al., 2019; Page et al., 2019), and to understand tax benefits for college (Bergman et al., 2019). Researchers typically measure the effects of interventions on overall college enrollment. Other indicators of treatment effects include the type of postsecondary institution where students enroll, student re-enrollment rates, and financial aid outcomes (Bergman et al., 2019; Bird et al., 2019; Page et al., 2019, 2020). As a group, the remote large-scale advising interventions reported to date have not demonstrated statistically significant differences between treatment and control groups in overall measures of college enrollment. Some researchers have found modest positive effects for specific student subgroups, quality of college enrollments, or likelihood of filing financial aid applications (Page et al., 2019, 2020; Gurantz, 2019; Gurantz et al., in press; Hyman, 2019; Phillips & Reber, 2019).

Despite the discouraging findings from text-message campaigns to date, it is too soon to give up on the search for large-scale virtual

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advising programs that have the potential to move the needle on college access. Instead it is vital to study the reasons why recent text-message interventions that enroll large numbers of students have failed to show treatment effects. Understanding RCT results requires investigating what occurs inside text-message advising and how students are using this increasingly popular advising medium. Researchers can access the data to answer these questions by capturing and analyzing the text messages that students and their advisors exchange. In going inside the black box of what actually happens within text-message campaigns, in sum, “researchers can use the content of the text messages to understand how and why a program worked in the way that it did” (Fesler et al., 2019, p. 708).

Researching the content of text messages in large-sample texting campaigns is challenging methodologically because such studies require analysis of huge amounts of unstructured data in the form of the unstandardized prose that text-message interventions produce. Extracting meaning from tens of thousands—or even millions—of text segments cannot be accomplished with standard qualitative analysis procedures that involve human inspection and manual coding of an entire collection of texts (Saldaña, 2015). From a methodological standpoint, education researchers will need to employ “big data” analytic tools that can extract meaning from large bodies of unstructured text like those captured in text-message interventions (Fesler et al., 2019; Fischer et al., 2020). The use of big

data is relatively new in education and few graduate programs train students in data mining techniques such as text mining (Fischer et al., 2020).

In sum, research on text-message interventions enables new insights about virtual advising programs that call for the investigation of the content of prose messages through new methodological approaches. This paper takes up these substantive and methodological issues by reporting on a data mining study of a text-message advising program intended to improve the college enrollment rates of U.S. high school students.

Purpose of the Study

The research reported here is an investigation into the content of text messages from a large-scale, randomized controlled trial of a national college advising intervention involving 75,000 college-intending students: Digital Messaging to Improve College Enrollment and Success (DIMES). DIMES was intended to influence college application behavior and enrollment outcomes as measured by the difference between treatment and control groups at the end of the trial. However, quantitative impact measures are insufficient to understand what is happening within the intervention program. What kinds of topics do students raise with advisors through text message? Is it possible for students to establish relationships with advisors via text message? Are student needs and concerns sufficiently similar in content and timing that advising could be automated?

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Given these questions, the goals of this study are to describe the type of content of text-message advising interactions and to illustrate the use of text mining as an analytic method for large bodies of text data such as DIMES. Specific research questions are:

1. What is the content of student text messages in text-message college advising?
2. What is the nature of the student/advisor relationship in text-message advising?
3. What kinds of variation in topics and timing appear in student texts?

Study Intervention

“Digital Messaging to Improve College Enrollment and Success” (DIMES) was a 15-month college access advising program that was conducted entirely by text message. In the DIMES program, professional advisors used two-way text-message advising to provide individualized assistance to a treatment group of 31,408 college-intending students from 745 high schools in 15 states. Funded by the U.S. Department of Education Institute for Education Sciences (IES), the RCT was conducted by university-based education researchers. As a partner in the study, the College Board recruited students during PSAT test-taking and provided administrative data about DIMES participants. The advising itself was delivered by uAspire, a national nonprofit organization that specializes in college and financial aid advising for low-income students. A text-messaging platform

provider, Signal Vine, was the final partner, providing the technology for sending, receiving, and storing automated and personalized text messages. (See Avery et al., 2020, for a full description of the sample and intervention design.)

Through the partnership with the College Board, 75,000 students from 15 states signed up to participate in DIMES in Spring 2015 at the point of taking the PSAT as high school juniors. The 745 DIMES high schools had substantial proportions of students who were eligible for free and reduced lunch (Mean=63%) and low two- and four-year college-going rates (Mean=26% and 30%, respectively). The College Board included an invitation to receive text-message advising in PSAT registration materials for all of the PSAT test-takers in these schools. Students who signed up to participate were randomly assigned to either a treatment condition, consisting of 15 months of two-way advising, or a control group that received only automated messages over the program period.

The findings reported here come from analysis of the national study’s treatment group, in which 31,408 students were assigned to a specific professional advisor from uAspire. Advising began in April (2015) of students’ junior year of high school and ended at the end of August (2016) after their senior year. During this period, students received text messages on their cell phone marked with their individually-assigned advisor’s name as the sender. Advisees

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Table 1.
April 2015 to August 2016 DIMES Message Topics, Sample, and Timing

Message # and n	Start Date	Message Topic
1 n=6012	4/9/15	Introduction of program and individual advisor
2 n=8631	4/23	SAT (spring) – registration, preparation & resources
Extra	5/12	I am a human; counter possible misconception that texts are fully automated
3 n=7364	6/1	College search guidance; start on initial list of possible colleges under consideration
4 n=6560	6/30	College affordability; understanding how to pay for college
5 n=5784	8/4	SAT (fall) – registration; taking or retaking
6 n=6458	8/27	Applications overview and planning; fee waivers
7 n=9313	9/21	Deadlines and finalizing college lists of where to apply
8 n=6839	10/14	Application assistance
9 n=3810	11/5	Paying for college; information and normalizing concerns about affordability
10 n=3608	12/ 2	FASFA and financial aid preparation
11 n=4705	1/7/16	FASFA aid and state aid application assistance
12 n=5764	2/2	Financial aid deadlines
13 n=6497	3/1	Finishing aid applications
14 n=7012	3/29	Financial award letter: interpretation; comparisons
15 n=6584	4/26	Pre-enrollment decisions and tasks
16 n=4388	5/24	College accounts and summer tasks
17 n=4380	6/21	College bills; financial aid and initial bill concerns

Note: n indicates the number of students who texted to their advisor at least once during specified message flow period.

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answered or initiated communication with their advisor using the same number and advisor name, as in typical two-way text messaging.

Texting was organized into 18 “message flows” of roughly a month each. Each message flow began with one to two automated “broadcast” messages, sent by the uAspire advisor, that focused on a particular topic such as taking college entrance examinations, deciding where to apply, completing applications, applying for financial aid, choosing where to attend, and carrying out matriculation tasks. Broadcast message topics were pegged to the calendar of college and financial aid decisions and tasks. Following the standardized broadcast message, students and advisors exchanged individualized two-way text messaging. A message flow consisted of the initial outgoing broadcast message and any student or advisor text messages exchanged before the next one. Altogether, the DIMES program yielded close to a million automated and non-automated messages.

Table 1 shows the message flow number, beginning date, and focal topic for each month’s initial outgoing text message.

In order to encourage two-way discussions on the focal topic for the month, the majority of the automated DIMES program messages were phrased as questions that asked students to reply via text message. For example, students received the following broadcast message, marked with their advisor’s name as

sender, that asked them to text back the word *Yes* or *No* (Message 8):

Hi [advisee first name], I wanted to see how your college applications are going. Have you started working on them? Reply Yes or No

In this example, one more round of automation followed a student response:

Response to Yes: That’s awesome. What questions can I answer about the application process?

Response to No: That’s ok, this is a good time to start working on them. Do you know which college application you want to start with?

After each initial outgoing message and any automated follow-up replies, uAspire advisors and advisees exchanged personalized text messages. Students were invited to initiate contact with their advisor and had the option to ask questions or request help by texting on any topic at any time. Advisors encouraged student responses by posing questions, following up on previous conversations, and checking in with advisees on their progress in completing tasks, solving problems, or making decisions.

Method

This study is among the first to pioneer the use of data mining methods to examine the content of a large body of unstructured

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college advising texts: approximately 342,000 text messages that students sent to their advisors over the 15 month period of DIMES. Text mining is a form of data mining that can “turn text into numbers” (Miner et al., 2012, p. 30) by employing algorithms to uncover themes and identify relationships among themes in participant responses. Text mining is especially useful when working with large-scale data sets where it is impractical to follow conventional qualitative methods that require manual inspection and coding of text segments (Zilvinskis & Michalski, 2016). The need to conduct this kind of large-scale, quasi-qualitative analysis will become increasingly common in education as virtual interventions and internet-enabled digital content produce big data in the form of unstructured text (Fesler et al., 2019; Fischer et al., 2020).

Crucially, text mining permits a researcher to preserve and analyze participants’ perspective in their own words, embracing a constructivist epistemology typically absent from large scale data analysis (Lewis, 2020). In addition to feasibility and access to the student voice, text mining was ideal for analyzing the DIMES student message dataset because it allowed for the identification of themes and topics in our large body of unstructured text. This paper features results from a lexical (deductive, researcher-supervised) analysis of student DIMES texts based on a categorization dictionary (Miner et al., 2012) that we validated with the results of a machine-specified (inductive, researcher-unsupervised) algorithmic analysis of the

same data. (See Fesler, 2020) for an example of an additional text-mining strategy, supervised machine learning, that we did not employ in this study.)

Because data mining is just beginning to appear in education studies of college access and completion, we assume that most readers are unfamiliar with text mining. For this reason, as well as to document our analytic process, we therefore introduce text mining concepts and describe the procedures we followed in some detail.

Analytical Framework for Text Mining

Data analysis followed procedures in the Cross-Industry Standard Process for Data Mining, or CRISP-DM (Miner et al., 2012). The CRISP-DM covers all activities related to data mining and was therefore an appropriate choice for this study. As Miner et al. (2012) recommend, we conceptualized the process of text mining as three sequential sets of activities: first, establish the corpus; second, preprocess the data; and third, extract the knowledge from the data. Figure 1 summarizes the steps we followed.¹

Establishing the Corpus

A corpus refers to a collection of documents. The full set of DIMES program text messages included approximately 875,000 automated broadcast messages, manual advisor texts to

¹ We employed a commercially-available data mining software program, WordStat, to conduct the analysis (Provalis, 2016). Many text mining researchers use natural language processing (NLP) packages in R.

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students, and student texts to advisors. For the study reported here, the corpus consisted of the 342,192 individual text messages that students sent from their cell phone to their virtual advisors. All of the texts were captured and saved in the Signal Vine online texting platform.

Preprocessing the Data

Preprocessing refers to a host of activities that happen behind the scenes of the text mining software that prepare the data for knowledge extraction (Miner et al., 2012). During tokenization, for example, the software recognizes distinct words (or tokens) among all characters included in the corpus, usually by identifying punctuation marks and space between words. We employed lemmatization to identify and modify words that are related to one another but appear in different grammatical forms (Ignatow & Mihalcea, 2017; Miner et al., 2012). For example, the text-mining program automatically reduced the words *applies*, *applied*, or *applying* to the simpler form *apply*. This reduction in the number of distinct terms increased the frequency that some words appeared across the corpus, allowing for more intelligible and comprehensive coverage of the student text-message corpus. We also employed a stop-word list, which removed from analysis words commonly found in natural language (e.g., articles, conjunctions, prepositions, and pronouns) or words like DIMES advisors' names that had little substantive relevance to the research questions.

Figure 1
Text-Mining Procedures

<p>STEP 1 Data corpus establishment</p>	<p>Download 873,192 text messages from Signal Vine</p> <p>Separate text into three categories: automated program broadcast messages, student responses, and manual advisor responses</p> <p>Import 342,192 student text message responses, sorted by program message number, into WordStat text mining software</p>
<p>STEP 2 Data pre-processing</p>	<p>Identify distinct words (tokenize)</p> <p>Shorten related words to common root form (lemmatize)</p> <p>Revise stop-word list (exclusion dictionary)</p>
<p>STEP 3 Lexical analysis (deductive)</p>	<p>Identify most-frequent words and phrases (univariate frequency analysis)</p> <p>Create include-word list by category (categorization dictionary)</p> <p>Confirm correct classification (keywords-in-context inspection)</p> <p>Specify rules for words with multiple meanings (disambiguation)</p>
<p>STEP 4 Unsupervised analysis (inductive)</p>	<p>Extract topics via principal components analysis; determine significance of topics using scree plots and inspection of keywords-in-context (feature extraction)</p> <p>Examine relationships among words and phrases with dendrograms and network graphs (cluster analysis)</p>

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Deductive Lexical Analysis

This final phase of text mining included the full range of our deductive and inductive analytic procedures. We carried out the deductive lexical analysis by establishing and refining a categorization dictionary in which we grouped topically-related words and phrases iteratively into folders, and then grouped folders with similar content together into larger categories. Once we assigned a particular word or phrase to a category, the software program automatically assigned all subsequent appearances of that word or phrase to the same category. As in traditional qualitative coding, a given piece of text could be assigned to multiple categories. For instance, a text message about difficulty accessing tax information for the FAFSA federal financial aid application from a non-custodial parent would likely contain words or phrases assigned to the categories of “financial aid,” “parents,” and “problems.”

We defined preliminary categories on the basis of DIMES advising topics and themes that uAspire advisors identified in a series of focus groups. In the focus groups, we asked advisors to describe the questions, issues, and problems that their students were bringing up in advising, along with any typical language that students used to express these topics. The themes and associated words and phrases that advisors identified included, for example, students writing about funding college with text like “*cost, pay for, afford.*” Such words and phrases became part of a “Financial” dictionary category. In a more nuanced

example, advisors shared examples of language that they had come to understand was signaling about whether or not a student understood an explanation or piece of advice. Based on advisors’ input about how students communicated their degree of understanding, we created the dictionary category “Clarity” that indicated the degree of vagueness or certainty in a student text, “*I think so, OK..., kinda; OH! Got it.*”

We compiled advisors’ observations into an initial set of categories by hand-coding the focus group transcripts into interview themes and associated keywords and phrases. The uAspire research director and project manager reviewed the initial categories and associated words for face validity and suggested minor changes and additions. At that point, we created a preliminary categorization dictionary of text-message topics and associated words and phrases.

Next, we inspected unsupervised (machine-generated) frequency lists in which the text-mining software automatically created tables with the words and phrases used most frequently by participants.² Retaining the initial classification from the uAspire focus groups, we then began grouping the student text language from the frequency table of words and phrases into our pre-existing

² In recognition of the fact that raw frequency of a word or phrase does not alone constitute its importance, we followed the conventional weighting method known as term frequency-inverse document frequency (TF-IDF). Specifically, TF-IDF “operates under the assumption that words that appear frequently should receive higher weight unless they also appear frequently across all documents” (Lewis, 2020, p. 236).

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initial categories and subcategories. This process was analogous to typical qualitative coding; here the text being coded consisted of all instances of an intelligible word or phrase. For example, references to specific colleges were assigned to the single category “college names”; terms having to do with feelings or stress were grouped under “emotions”; and designations representing examinations (ACT, SAT, scores, placement testing) were labeled as “testing.” Categories that were more complex required subcategories. For instance, the large “financial” category included the subcategories of financial aid, cost, aid deadlines, scholarships, and fee waivers, each containing its own set of words and phrases.

As the process continued, we refined the content of category folders and occasionally revised dictionary folder names and subcategory locations. To verify that we were interpreting a word or phrase correctly, we referred to keywords-in-context tables that showed the word or phrase embedded in its surrounding text. This enabled us to disambiguate words with multiple meanings and words whose meaning shifted depending on context (Ignatow & Mihalcea, 2017). Once the range of word usage was established in such cases, we crafted rules using Boolean characters and phrases in order to classify the word or phrase correctly. For instance, we specified that a phrase be classified as a question when the word *can* occurred directly before *I*, *You*, *U*, or *We*, or within a specified number of characters away from a question mark.

Revisions to the Categorization Dictionary

When the software succeeded in classifying approximately 60% of the students’ words in our initial categorization scheme, we began relabeling some categories and combining them into overarching themes. This process is similar to axial coding in standard qualitative analysis. At this point, two college access scholars – a school counseling researcher and a higher education researcher – conducted an in-depth review of the draft dictionary based on:

- 1) degree of coherence and independence of each axial category and associated subcategories;
- 2) correspondence of the categories with the research and theoretical literature on college access; and
- 3) representation in the categories of the objectives of each of the DIMES program messages as well as any unanticipated content.

Additional movement of subcategories and associated words and phrases occurred in this expert review. Finally, members of the DIMES quantitative research team and the uAspire project leaders reviewed the final dictionary for face validity.

Table 2 presents the final categorization table themes and sub-themes for the messages. (The full categorization dictionary is available by request to the authors for inspection and to use in replication studies.) The final version of

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Table 2.
Categorization Dictionary by Category with Sample Words and Phrases

<p>Navigating Process</p> <ul style="list-style-type: none"> •Deadlines/timing (<i>Deadline_is, Waiting, Soon, Right_now</i>) •Application process/tasks (<i>Started, Common-App*, Fill*</i>) •College list <ul style="list-style-type: none"> -Decision criteria (<i>First_choice, Size, Close_to_home</i>) -Institution type (<i>HBCU, For_Profit</i>) •Admission cycle (<i>Early_Action, Binding, Rolling</i>) •Eligibility (<i>Qualify, Acceptance_rate, Class_rank</i>) •Essay (<i>Essay*, Personal_Statement</i>) •Interview (<i>Interview*</i>) •Online processes (<i>Website, Login, Password, Portal</i>) •Recommendations (<i>Recommendation*, Recs, Reqs</i>) <p>Financial</p> <ul style="list-style-type: none"> •Aid (<i>FAFSA, CSS, SAR, Finan*</i>) •Cost (<i>Bill, Free, Pay, Price</i>) •Deadlines (<i>FAFSA_Deadline</i>) •Scholarships (<i>Any_Scholarsh*, Apply_for_Scholarsh*</i>) •Waivers (<i>Fee_waiv*</i>) •Taxes and IRS (<i>IRS, Tax*, Tax_return</i>) *Grants (<i>Pell, Pell_Grant, Cal_Grant</i>) <p>Personalization</p> <ul style="list-style-type: none"> •Counseling/personal issues (<i>Options, Transfer, Career</i>) •Explanation for situation (<i>Because, Meant, Wrong</i>) •Fit (<i>Fit, Good_fit</i>) •Judgments re better/best (<i>Best, Better</i>) •Questions (<i>Question*, Ask, Should_I, Whats, Wondering</i>) •Special Status (<i>DACA, TPS, IEP, Dream_Act, No_SSN</i>) •Wants and interests (<i>Really_want, What_I_want, Don't_want</i>) 	<p>Clarity</p> <ul style="list-style-type: none"> •Certainty (<i>Decided, Sure, Definit*</i>) •Uncertainty (<i>Don't_know, IDK, Not_decided</i>) •Understanding or realization (<i>Oh!, Oh_OK</i>) •Vagueness (<i>Guess, Not_really_sure, Kinda</i>) <p>Influencers</p> <ul style="list-style-type: none"> •Community <ul style="list-style-type: none"> -Organizations (<i>College_Board, Questbridge</i>) -Non-DIMES Advisor (<i>Advisor</i>) •Family (<i>Mom, Parent*, My_famil*</i>) •High School (<i>Teacher, Counselor*, Guidance_counselor</i>) <p>Problems and Concerns</p> <ul style="list-style-type: none"> •Barriers (<i>Can't, Bad, Cannot, Forgot</i>) •Can't find (<i>Trouble_finding, Couldn*_find</i>) •Confusion (<i>Mak*_sure, Don't_understand</i>) <p>Relational</p> <ul style="list-style-type: none"> •Advising process (<i>Remind, Contact_you</i>) •Affirmed/encouraged (<i>Awesome, Cool, Sounds_great</i>) •Appreciating help (<i>Thank*, Thanks_so_much</i>) •Humor and informality (<i>Haha, LOL, Woohoo, XDC</i>) <p>College Names</p> <p>College Programs (<i>Math, Major, Want_to_Major</i>)</p> <p>Emotions (<i>Feel, Stress*, Anxi*, Hope</i>)</p> <p>Testing (<i>ACT, SAT, Retake, Subject_test, Test_scores</i>)</p> <p>Military (<i>AFA, ROTC, Airforce</i>)</p>
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Note: Asterisks show truncation, enabling retrieval of different forms of a word.

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the categorization dictionary that emerged from the process described here successfully classified 80% of the non-excluded words and phrases in the body of student text messages for the October 2015 message flow (Message 8). This ratio represents a satisfactory metric identified in content analysis work using similar methods (Bengston & Xu, 1995). When we applied the same dictionary to the student texts from later DIMES message flows, some additional words and phrases (such as *taxes* or *college bill*) had appeared in response to new admission tasks. After adding these words and phrases to existing categories, we finalized the categorization dictionary and applied it to each DIMES message after removing the irrelevant (“stop-list”) words. The final dictionary performed in all 18 messages at or within a few percentage points of the desired threshold of 80% classification of all student words and phrases.

Inductive analysis

In order to validate the categorization dictionary, we conducted a separate, unsupervised analysis and compared the extracted topics with the categorization dictionary topics and sub-topics. We began this analysis with an automatic calculation of the frequency of words and phrases for each message with the categorization dictionary disabled. Using this tool, we established baseline descriptive statistics, including the raw frequency of each word and the percent of student cases in which the most frequent words appeared.

Next, we used feature extraction, in which unsupervised algorithms extract topics through a principal components analysis of clusters of words and phrases. Feature extraction uses a computer-generated matrix of all unique words in rows and all participants in columns to “extract underlying or ‘latent’ dimensions that capture most information contained in the full data matrix” (Miner et al., 2012, p. 942). In this study, principal components analysis resulted in the extraction of 60 linear combinations of words with a factor loading of at least 0.4 in each message flow. Multiple factor loading is acceptable in text analysis because words are used in a variety of contexts, each of which may constitute a valid theme. For example, the words and phrases that suggested a student was feeling certain or uncertain (e.g., *decided*, *don’t know*) might appear in conversations covering many substantive topics, such as whether to retake standardized tests, consider additional colleges, apply for specific scholarships, or submit an early decision application.

Following recommendations by Cattell (1966), we examined a scree plot and retained components above the inflection point for analysis. In cases where the primary factors were of little substantive interest to the research questions (e.g., college names), we employed Kaiser’s (1960) criterion, examining all factors with an eigenvalue of at least 1.0 and retaining those with practical significance for analysis.

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Our final inductive strategy was cluster analysis, also referred to as concept extraction or topic modeling. This technique produces machine-generated hierarchical grouping of words and phrases found near one another most frequently (Miner et al., 2012). In this study, the WordStat software performed a hierarchical clustering algorithm using Jaccard's coefficient to group words iteratively based on their similarity. The program depicted the clustered words in the form of a tree graph, or dendrogram, and produced network graphs indicating the strength of association among words in any unique cluster.

Validation of the Categorization Dictionary

Access to complementary deductive and inductive analysis strategies is one of the strengths of text mining. In this study, we used our set of inductive analysis results to determine the validity of the categorization dictionary by comparing the cluster of keywords that appeared in the machine-generated topics extraction function with the researcher-defined groupings in the categorization dictionary. The group of co-occurring keywords that made up each principal component topic was considered to match the corresponding category in the categorization dictionary when the actual keywords were identical or when the combined keyword set was a clear conceptual fit with the categorization dictionary top-level category or sub-category.

Using both eigenvalue and frequency ordering, we used this method of comparing

principal components topics and categorization dictionary topics for each of the 18 DIMES messages. The machine-generated topics and researcher-generated categories matched for 95% of the words in the student text corpus. This high level of correspondence between the principal components analysis derived by unsupervised algorithms and the researcher-generated categorization dictionary led us to conclude that the categorization dictionary is a valid coding representation of the student text content. As described, we derived the categorization dictionary logic empirically from advisor focus group results and conceptually from the literature on college access. It is more parsimonious and more readily interpretable than topics extraction results. For these reasons, we present our findings according to the themes and topics in the categorization dictionary.

Findings

Following our research questions, we begin the presentation of results from the text mining analysis by classifying student text content by topic. Next we consider evidence from the text messages bearing on the advisor/advisee relationship. We then report on individualization and temporal variability in advisees' text-message topics. We conclude the section with an example of a text-message advising conversation that illustrates and summarizes the findings.

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Topics in Student Texts

The results of our deductive text mining analysis using the categorization dictionary appear in Table 3 and Table 4. These tables show the percentage of student cases that included text material in each of the top-level topics in the categorization dictionary. As described earlier, each of the 18 DIMES program message flows consisted of an outgoing broadcast message from the uAspire advisor along with any text messages that the student or advisor sent during the period before the next broadcast message. In interpreting the values in the tables, it is important to reiterate that the case percentages within categories represent the categories of message content among the subgroup of students who responded within that specific message flow.

Values in Table 3 represent the percentage of students who referred at least once to a particular category in any of their text messages within the specified message flow. For example, only 3.5% of advisees included the name of a specific college in at least one text message they sent to their advisor during the first message flow in which advisors introduced themselves and the texting program. In contrast, 53% of advisees mentioned a specific college by name in at least one text during the third message flow, which began with a broadcast message about choosing where to apply.

Viewing the data by semester helps reveal patterns in advisee texts over the course of the academic calendar and admission cycle.

Table 4 summarizes the mean percentage of student cases with text material by topic categories in each of the four different time periods of the DIMES program: the spring semester of students' junior year of high school, the first and second semesters of their senior year, and the post-high school summer. Again illustrating with the category of "College Names," Table 4 shows that an average of 30% of student text messages across the entire DIMES program included the name of at least one college.

Text Content

The categorization dictionary results in Tables 3 and 4 indicate that participating students' text messages to their advisors were dominated by instrumental issues related to understanding and carrying out college and financial aid tasks. Looking across the message flows, it is clear that discussions of specific colleges and issues related to navigating processes comprised the most frequent substantive topics in the student texts. College names were a top content category in 12 of the 18 message flows, reflecting individualized advising content. References to specific colleges were most heavily represented in student texts during the senior year of high school. Texts in this category fell off over the summer, after the typical college admission cycle was complete.

Texts about "navigation" made up the second-most prominent category throughout the students' senior year and constituted the most frequent topic in the post-graduation summer. As shown in the dictionary (Table 2),

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Table 3.
Percent of Student Cases with Text-Message Content by Categorization Dictionary Topic

Message # and Topic	College Names	Navigation	Relational	College majors	Financial	Influencer	Personalization	Clarity	Problems	Testing	Emotions
1. Intro	3.54	11.62	18.83	2.7	5.13	6.33	8.13	4.54	3.63	15.04	1.06
2. SAT-Spring	14.84	13.47	14.74	6.99	2.93	6.69	8.43	5.81	3.69	24.61	1.13
3. College search	53.17	21.71	25.92	22.44	6.75	16.18	17.69	14	7.25	2.12	4.45
4. Affordability	47.13	18.1	24.52	4.67	11.16	11.65	12.95	9.56	7.4	6.08	2.23
5. SAT-Fall	13.84	23.67	24.2	5.88	9.4	11.62	13.86	11.34	9.76	11.84	3.15
6. How apply	44.63	22.85	19.94	4.51	8.7	11.69	10.93	11.73	9.71	4.41	1.76
7. Applicatn list	52.3	21.83	19.2	3.14	5.17	9.12	9.73	8.36	5.7	2.2	0.81
8. Applicatn help	32.78	31.37	23.98	4.52	13.21	13.62	15.65	11.57	9.87	4.15	1.67
9. How pay	16.46	33.78	34.19	4.09	35.46	20.33	20.68	15.69	12.37	1.99	2.24
10. Fin. aid prep	11.53	34.15	23.76	2.04	29.58	17.47	17.64	11.62	10.71	1.37	1.22
11. FAFSA tasks	24.44	29.76	20.54	1.51	22.59	16.97	13.5	10.96	11.58	0.8	1.51
12. Aid forms/ tasks	30.54	25.44	17.19	1.3	19.82	15.07	11.03	9.95	8.97	0.86	1.19
13. Aid deadlines	23.65	25.35	16.73	1.49	19.47	12.22	10.93	11.41	11.08	1.0	1.5
14. Aid offers	44.34	25.54	17.66	3.54	16.94	13.16	12.67	12.81	10.79	1.94	1.07
15. Coll. decision	45.03	27.35	19.64	4.6	17.59	14.37	12.85	13.67	12.18	2.58	1.35
16. Pre-enroll	22.18	26.07	17.9	4.77	17.38	14.13	12.08	14.61	12.08	3.06	1.07
17. College bill	21.55	35.35	25.22	8.63	32.31	22.99	20.59	18.12	17.04	5.08	1.94
18: End and eval	14.09	32.99	13.19	-	31.97	23.62	16.73	3.4	2.98	5.37	3.82

Note: "Military" category not shown (% cases with military category 0 to .44%) Dates of message flows: Spring 2015-high school junior (#1-5); Fall 2015-first semester senior year (#6-10); Spring 2016-second semester senior year (#11-16); Summer 2016 (#17-18)

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Table 4.
Mean Percentage of Responding Students' Message Content by Topic and Time

Topic	Total mean % of cases for all messages	Mean % of cases for Spring/ Summer 2015 messages	Mean % of cases for Fall 2015 messages	Mean % of cases for Spring 2016 messages	Mean % of cases for Summer 2016 messages
College Names	28.7	26.5	31.5	31.7	17.8
Navigation	25.6	16.2	28.8	26.6	34.2
Relational	21.0	21.6	24.2	18.3	19.2
College Majors	17.6	8.5	3.7	2.9	0.0
Financial	17.0	7.1	18.4	19.0	32.1
Influencer	14.3	10.5	14.4	14.3	23.3
Personalization	13.7	12.2	14.9	12.2	18.7
Clarity	11.1	9.1	11.8	12.2	10.8
Problems	9.3	6.3	9.7	11.1	10.0
Testing	5.3	11.9	2.8	1.7	5.2
Emotions	3.7	2.4	1.5	1.3	2.9
Military	0.12	0.17	0.14	0.06	0.10

Note: Dates of message flows: Spring 2015-high school junior (#1-5); Fall 2015-first semester senior year (#6-10); Spring 2016-second semester senior year (#11-16); Summer 2016 (#17-18).

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the navigating processes category included student text-message content referring to deadlines and timing, applications, college lists, admission cycles, eligibility, essays, interviews, recommendations, and online actions. Student texts to their advisors referred to deadlines, eligibility, and online actions across multiple areas such as testing, college applications, financial aid, and enrollment tasks.

Financial issues were another prominent category in student texts. Although appearing throughout the advising program, explicit text language about college costs and financial aid became one of the most frequent student issues for texters beginning in November of students' senior year of high school and continuing through the remainder of DIMES.

Inspection of the extent and longitudinal patterns of less-prominent categories captures additional information about the content of text-message advising. For instance, the personalization category was well represented in texts to advisors across the DIMES period, with up to 20% of student texts including content about the advisee's personal circumstances. Personal situations and questions were highest in texts regarding the college search, paying for college, filling out the FAFSA, and paying the first bill. Parents (a subgroup in the category of "influencers") were highly represented in the texts during November, when paying for college was the topic, and again in June when students were facing financial decisions and processes related to enrollment. The share of

student cases texting about problems and concerns was highest during the last half of the advising program, peaking in Message 17 with content from responding students about dealing with insufficient financial aid and paying the first college bill.

Advising Relationships

About one in five advisees (21%) across all messages included expressions of warmth, humor, and appreciation in their text messages that point to at least some degree of interpersonal connection with their advisors (Table 4). In responding to the introductory message from their DIMES advisor (Message 1), 19% of students included at least one instance of a relational word or phrase in a text message, constituting the most frequent category in this introductory message flow. Interestingly, text messages from the subgroup of students who became frequent DIMES texters included a higher percentage of relational content in the very first message, in comparison to texts from students who sent rare or occasional texts over the program period.

Relational material was most highly represented in the texts that students sent their advisors in the first semester of their senior year (Fall 2015, 24% of cases) as they worked with advisors to decide where to apply, complete college applications, and begin financial aid processes. Relational content in texts declined in the final semester of high school, perhaps because the advising relationship was already established. Alternatively it is possible that students were

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more exclusively task-oriented at this point in the year as they faced school, admissions, and financial aid deadlines. Supporting this premise, relational language became more prominent in the first message of the summer (Message 17, Table 3) in which responding students who should presumably have been locked into their college choice by the national May 1 response date were still deciding which college to attend and struggling to pay the first college bill.

Needs and Problems in Student Texts

Review of keywords-in-context for the most frequent topics illustrates the kinds of questions and concerns that students communicated to advisors. The texts show relatively little advising that rises to the level of counseling, although there were some instances of students asking about what kind of college or program or career might be best for them. In keeping with the emphasis on navigating processes, transactional, task-oriented discussions predominated. There was a preponderance of messages including phrases like “when is the deadline?” and “How do I/Can I/Can I still...?” “and “What do I do about...?” and “How do I find out about...?” Students asked questions about the meaning of terms and concepts. These ranged from very basic questions, “How does financial aid work?” to specific questions about their own situation, “what if my sister is going to college this fall will my financial aid be less?” Some of the conversation was around texting logistics, figuring out when the student could text back a response or get the answer to an advisor’s question. “I’m

about 10 min away to finishing the application i just need my parents to sit down with me and help me finish it.”

Overall, the set of DIMES texts showed that the students who chose to participate found college and financial aid processes to be opaque, complicated, and difficult. Texts show students learning about, discussing, and frequently misunderstanding the steps and processes in testing, college search, applications, financial aid, and enrollment. DIMES advisees rarely mentioned school counselors in their texts, and then almost exclusively in connection with getting fee waivers and transcripts.

Advisees continued to ask substantive questions about college application, financial aid, and enrollment tasks through the final message in the summer after high school graduation. Fully one-third of students responding after the typical college admission cycle ended (Message 17) had text content in the “financial” category, which was the highest incidence of that category across any message. Keywords-in-context inspection showed financial concerns at that point in time were divided among students who were struggling to locate or interpret their financial aid packages and those with insufficient aid to cover their costs.

In sum, students showed considerable confusion about the college topics covered in DIMES advising. Their messages detailed obstacles and problems that students experienced in all major parts of the college

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and financial aid application process.

Variability in Student Texts

Categorization results (Table 3) and subsequent inspection of keywords-in-context tables suggest that the students who texted their advisors in a given message flow were generally responsive to the intended focal issue of each message flow. Message 3 about college search, for instance, elicited student discussion about possible majors and yielded the highest percentage of students mentioning the name of particular colleges. The most frequent responses to the college affordability message flow (Message 4) were about starting at community college and transferring in order to save money. Messages devoted to FAFSA completion (Messages 10-12) prompted student texts about how to fill out the FAFSA and reports of having submitted it. In this sense, student texts can be characterized by common topics and timing as well as shared gaps in knowledge, misunderstandings, and problems.

As Table 3 shows, however, student texts in a given message flow covered a wide variety of issues. Within each category, students posed off-topic or off-time questions, communicated about multiple issues within given categories, and demonstrated different levels of understanding and sophistication. In the initial message introducing the study for example, 5% of the student texts referenced financial issues and 6% mentioned the College Board (the dominant keyword-in-context for the “influencer” category in that message flow). At the enrollment stage, text messages

were spread out around many issues, including decisions about what college to attend, specific family issues, and problems accessing online materials. In the final message flow, some students were seeking advice about matriculation issues like orientation and class registration at the same time that other students were messaging their advisors with questions about how to begin applying for financial aid.

In addition to varied topics and timing, students demonstrated different levels of understanding and sophistication in their messages. In the same message, for instance, one student used the term “super scoring” to ask about how colleges handle multiple SAT scores while another student asked, “what is the benefit of taking the SAT and what is the score range of passing and not passing?”

Illustrating DIMES: An Example

An example of an advising conversation illustrates the key findings about the nature and content of DIMES text-message exchanges. The series of back-and-forth texts shown below took place over a week between a highly-engaged advisee and her uAspire advisor in mid-September of the student’s senior year of high school. The following exchange, quoted with verbatim spelling and capitalization, occurred during the message flow that focused on putting together a college application list (Message 7).

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Advising Conversation

Advisor (Broadcast message, delivered Thursday): Some students qualify for college application fee waivers, which makes it free to apply. have you talked to your counselor to see if you qualify?

Student: not yet

Advisor: ok np [no problem] application fee waivers can save you money (most colleges charge a fee to submit your application); do you know if you qualify for an sat or act waiver?

Student: nope i have no idea

Advisor: ok, then i would recommend meeting with your guidance counselor soon and asking them if you do qualify for an sat waiver, because if you do, you can use that waiver to "buy" college application fee waivers to apply to colleges for free. when do you think you can meet with your guidance counselor?

Student: i'm not sure whenever i get time things are already stressful haha

Advisor: i hear you, [student name]. the beginning of the year is a stressful time for a lot of students. and counselors, for that matter. do you think you'll be able to meet with them by the end of next week?

Student: I can try

Advisor: ok, sounds good. i'll follow up with you next week to see if you've been able to meet with your guidance counselor. by the way, how's your college search going?

Friday:

Student: i know i'm going to try and shoot for [open access local community college name]

Advisor: hey [student name]. ok, gotcha. the good news is that [community college name] accepts most students who apply and it has a very low sticker price, so i think you'll have no trouble getting in, and it could be pretty affordable too. is [community college name] the only school you're considering?

Student: yes for now

Advisor: ok. it's a good idea to apply to at least 4 colleges so you have some options to choose from when the time comes to make a final decision about where to go. what do you like about [community college name]?

Student: i'm not sure of any other community colleges

Advisor: gotcha. how did you decide only to apply to community colleges?

Student: it's cheaper plus i can get rid of my basic classes then transfer

Advisor: it's true that community colleges have a lower sticker price, but they usually don't have the same kind of resources to give a lot of financial aid to give to students that many 4 year schools have, so if you don't receive a lot of financial aid from the state or federal government through fafsa, you could end up paying more out of pocket than if you went to a 4 year school. does that make sense?

Student: yes that makes sense. so it's not always the best option?

Advisor: exactly, not always. and if you only apply to community colleges, you won't be able to compare the aid that you could get from 4 year schools. it's definitely still a good idea to apply to them as financial safety schools (meaning you can definitely get in and afford them), but i think you should at least [add] 3 or 4 4-year schools to your list sound good?

Student: yeah i'll start seriously looking at colleges. do you know any around [hometown] that have good psychology classes?

Advisor: [4-year college name] could be a good choice. psychology is one of the most popular majors there. here's their departments website: [URL]. i also used this site to find some more colleges near [student town], but it doesn't say anything about their psych programs [URL]

Student: [emoji] oh wow haha that sounds good! i'll check it out. i haven't really looked for colleges because i was so set on [community college name] but financially if i could [emoji] have a better price in the long run that would be good

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Advisor: how about you give the site a shot tonight and i can connect with you tomorrow to see how it went!

Student: i don't have internet at my house yet. :(

Advisor: i'm sorry to hear that! can u check it out in school?

Student: [emoji] yeah i'll check it out at school haha yeah we are working on getting internet so it makes my senior year that much easier plus it's better for college to have internet haha

Advisor: very true! have a good weekend and i'll check back in monday!

Monday:

Advisor: hey [student name], how'd that link work out for you?

Student: i haven't had any time :(i haven't forgotten though

Advisor: no worries! do you think you'd be able to check it out today?

Student: tomorrow the latest

Advisor: ok, cool. i'll check in with you tomorrow afternoon to see if you were able to check out the link. here it is again: [URL]

Student: okay thank you!

Tuesday:

Advisor: hey [student name], did you get a chance to check out the link i sent you and add some schools to your list?

Student: yeah i have i don't really remember which ones but i made an account and added some and some colleges i thought i would be interested in

Wednesday:

Advisor: hey [student name], did you get a chance to meet with your guidance counselor yet this week?

Student: no not at all.. what do i need to ask them?

Advisor: the plan was to ask them about whether or not you qualify for an sat fee waiver so you can use it to "buy" college application fee waivers. also, that's

great that you were able to make an account and add some schools on there. could you log in and text me the names of the schools you want to apply to?

Student: yes i'll go to guidance tomorrow morning and ask and yes i'll tell you the colleges tomorrow and i'll try to add some more

Advisor: ok, great. looking forward to hearing what you find!

Thursday:

Student: [emoji] so i do qualify for free lunches so i can get the sat free waver [sic] i just need to go back at lunch and get the form. [emoji] i have [3 college names] for my colleges so far

Advisor: this is great [student name]! thanks for getting back to me with this info. are you pretty confident that you'll be able to get into each of these schools? if you're in school, please don't text back unless you're allowed to be on your phone. thanks!

Student: not each of them but hopefully a good amount plus i'm going to the college fair on the 22nd

Advisor: gotcha. honestly, i think you shouldn't have too much trouble getting into [college name]. it might be worth checking how your gpa compares to the gpas of other students who were admitted to those schools and see how they stack up. you can do that on big future [URL]: you can search the name of your colleges in the search bar. click on their page, then click the applying tab on the left. there should be info on gpa ranges in the subsection in the middle. does that all make sense?

Student: yeah i just don't know my gpa

Advisor: gotcha. do you mean you just don't know your gpa on a 4.0 scale, or you don't know your hs average on a 100 scale?

Student: both haha

Advisor: gotcha. is there a way you can find out? for example, would it be possible to meet with your guidance counselor to find out your average

Student: I can ask tomorrow maybe

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Advisor: ok, sounds good. i'll text you tomorrow to follow up and see if you were able to meet with your guidance counselor

Student: okay sounds good

Friday:

Student: so i have the form for the free waver thing for the sat and i have my gpa now too

Advisor: ok great! What's your gpa? Also, do you plan to use your waiver to register for the sat, or just "buy" college application fee waivers?

Student: i don't know what to do with the waver

Advisor: ok, so the waiver has a code on it. You can enter that during registration for the sat to be free, or, if you don't plan to take the sat, you can call the college board at [800 number] to request application fee waivers using your sat fee waiver. Does that make sense?

Student: it's all kind of confusing

Advisor: i hear you, [student name]. let's start at the very basic: are you planning on registering for the sat?

Student: i don't want to i need to though

Advisor: i get that, [student name]. standardized tests like the sat aren't fun, colleges like [college name] require them, so if you want to apply there, you will need to take it. The next sat is [date], and since you have the waiver, if you register by [day and date] registration is free. You can register online here: [URL]

This conversation illustrates many of the central themes in the text mining analysis. First, the student appears to be using the advising to become aware of, understand, and carry out specific processes, tasks, and decisions: obtaining and using fee waivers, finding out her GPA, deciding whether a college entrance examination is necessary, registering for the SAT, and coming up with a

college list. The function of text-message advising for this student is primarily instrumental and transactional. However, the student also reveals some personal information, like the lack of internet at home. She shares her feelings about feeling stressed and not wanting to take the SAT. In another indication of emotional content, she appears to include emojis and exclamation points in the text messages when she has accomplished a task and achieved a goal like obtaining fee waivers from her counselor or choosing additional colleges for her application list. She uses some relational language (*sounds good, haha*). In another indication of a building relationship, she responds with longer texts as the exchanges progress. She expresses degrees of uncertainty and understanding (*don't know; kind of confusing; yes, that makes sense*). Although the explicit focus of this particular text exchange was choosing a college list, the student still needs personalized help with the "off-topic" issues of testing and fee waivers.

The advisee clearly needed very basic information about the net cost of different kinds of colleges, her eligibility for admission, SAT testing requirements and procedures, and fee waivers. To address these needs, the advisor conveyed specific information, checked for understanding, prompted the student for particular actions, and followed up on whether the student had carried out these actions. The advisor remained focused on the broader topic of choosing where to apply but individualized the text-message advising according to the advisee's particular situation and stage in the application process.

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For instance, the advisor gently debunked the student's assumption that community college would be the only feasible financial option. The advisor also picked up that the student needed to know whether and how to sign up for the SAT before being able to act on information about using fee waivers.

Finally, it is worth noting that this student was highly engaged, remaining in contact with the advisor and carrying out the actions that the advisor suggested. Less-engaged students might not have shared enough with their advisor to receive appropriately customized advice, failed to carry out the advisor's suggested actions, or ignored follow-up texts.

Discussion

Text mining analysis of the nearly 350,000 student text messages provides a methodologically rigorous look at the nature, content, and variability of text-message advising conversations between advisors and students who attended high schools with high percentages of low-income students and low college-going rates. Results carry implications in three areas: technologically-delivered advising modes; student college access needs; and data mining methodology.

Text-Message Mode of Advising

What is the Nature of Advising in this Mode?

Deep conversations and counseling interactions are infrequent in this medium. Instead, data mining results clearly indicate

that students use text-message advising to address concrete, practical issues. Information, logistics, troubleshooting, and responses to nudges for action (Thaler & Sunstein, 2008) comprise the bulk of the content in this form of advising. This finding suggests that text-message advising is particularly well suited to helping students understand and carry out specific college enrollment choices, tasks, and decisions. Combining this mode with in-person advising is a potentially promising model. More research is needed that studies such a blended approach or investigates direct comparisons of in-person and remote advising. Virtual advising could also be expanded beyond text messages with the addition of phone calls, screen sharing conversations, in-person events, workshops, webinars, and videos. These complementary remote modalities would presumably be particularly useful for addressing complicated advising issues as well as helping students fill out forms and interpret documents.

Can Students Establish a Relationship With a College Advisor via Text Message?

Text messages that reach students on their cell phones seem to be a feasible way to deliver personalized college advising for students. A significant group of text-message advisees ask questions, raise individual issues, and use language that indicates a relationship with their advisor. Establishing a relationship over text messages can clearly occur for students who engage with their advisors. Relational

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content is plentiful but not ubiquitous in student texts, however. It is important to note that the majority of students who participated in DIMES exchanged texts with their advisors occasionally or rarely.³ Nearly a quarter of the students who had not opted out of DIMES never texted with their assigned advisor. Increasing the engagement of students who sign up for text-message advising programs is vital to tap the potential of virtual advising for moving the needle on college outcomes more broadly. It is likely that students will be more apt to participate in virtual advising when the advisor is someone they already know. Alternatively, engagement might be improved when someone that students know and trust provides a warm hand-off to a text-message advisor from an outside organization (Bird et al., 2019).

Can Text-Message Advising be Automated?

DIMES text-message advising introduced specific topics that were timed according to the college application and financial aid calendar. Students were responsive to these topics; however, text mining results show variability in advising conversations that indicate the presence of substantial

individualization. Relational language and conversations about students' particular situations indicate that engaged students were using advising to get tailored assistance. According to their questions and comments, students' advising needs ranged widely. Students consistently brought up topics that were unrelated to the focus of a particular advising program message flow. These off-time topics indicate what immediate questions and concerns the student had at a given time and underscore nuances in their individual circumstances that can make advising less generic. In sum, because data mining indicates that participating students use text-message advising for individualized situations and timing, DIMES study results support two-way advising delivered by a human advisor.

The promising results of a fully-automated intervention at Georgia State University in reducing summer melt would seem to contradict this conclusion. The Georgia State POUNCE program uses artificial intelligence "chatbots" that draw from other data sources to provide tailored answers and referrals to would-be incoming students in the summer before beginning college (Page & Gehlbach, 2017). It seems unlikely, however, that algorithms can produce the kind of advising that is required in a longitudinal, comprehensive college intervention that attempts to provide assistance with all of the steps in the college-going process (Klasik, 2012).

³ All 31,408 students were divided into engagement groups through k-means cluster solution on the basis of the number of message flows to which students responded and the number of characters they texted back to their advisors over the course of the entire advising program. Averages are within message flows for all messages where student sent at least one text to their advisor: High engagers (3% of all students, sending their advisor an average of 9.6 texts and 475 text-message characters); Medium engagers (21%, 3.6 texts and 97 characters); Low engagers (52%, 1.9 texts and 31 characters); and Never-engaged (24%).

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Text Mining

This study is one of the very first to use text mining methods to examine the content of college advising for a large, nationally representative sample of students from majority low-income high schools. Text mining procedures, presented in detail earlier, can be used by evaluators and researchers to investigate the needs and characteristics of groups of advisees. In contrast to the typical researcher coding of unstructured qualitative texts (Saldaña, 2015), the approach offers a rigorous method for analysis of text messages for large samples of students. Text mining offers the scale and replicability of positivist statistical methods while including respondent voices as in qualitative methods (Lewis, 2020). For these reasons, this method is ideal for informing funding and policy decisions. Researchers have access to an increasing number of software programs for conducting text mining. As Fischer et al. (2020) suggest, taking advantage of big data in education requires incorporating data mining training for texts and other types of information in graduate curricula and collaborating with computer science and other campus data scientists.

In this study, text mining was used to describe the content of text messages and to investigate variability in the timing of student topics. Specialized categorization dictionaries are available for focused examinations, such as linguistic, opinion, or sentiment analysis (Redhu et al., 2018). Text mining can also be used for probabilistic analysis, such as

predicting college enrollment or success based on student text content. Fesler (2020), for instance, used supervised machine learning techniques to predict which text-message advising interactions led to productive student engagement in the form of student responses and reported action. Data mining has significant potential for the analysis of student social media and other large bodies of unstructured text. In particular, text mining studies of college access can draw from bodies of data such as publicly-available social media communications related to college and financial aid, college essays, or new or reanalyzed sets of interviews and other written accounts.

Conclusion

Remote advising delivered through technology offers new modalities to reach large numbers of students who are likely to need assistance in choosing, applying to, and paying for college. With this goal, over 30,000 college-intending high school students from schools with high percentages of low-income students were offered DIMES advising in the form of two-way text messaging with a trained advisor. The resulting data set of advising messages enabled the use of data mining methods to examine the content of text-message advising for a large sample of college-intending students.

The study demonstrates that it is possible for students to use individualized text-message advising to build a relationship with a counselor, learn about colleges, and receive

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help with college choice, application, and financial aid tasks and decisions. If virtual advising intervention engagement rates remain low, however, stand-alone text-messaging programs like DIMES are unlikely to move the needle in eliminating socioeconomic gaps in college-going.

The DIMES message analysis method and results present a definitive picture of the challenges faced by students who engage with text-message advisors. Text mining is a relatively new

methodology for education that offers a rigorous, replicable method for analyzing the kind of large, unstructured bodies of words that text-message advising can generate and preserve. The detailed picture of student needs for information and assistance that resulted

from mining DIMES advisee texts can inform in-person and blended virtual/face-to-face advising models. In brief, students' text messages to their advisors showed extensive needs for assistance in understanding and carrying out tasks related to college admission and financial aid. Advisees showed considerable confusion about the processes related to college applications, financial aid processes, accepting admissions and aid offers, and preparing to matriculate. They encountered obstacles and problems in multiple aspects of these processes, completed tasks in a non-linear fashion, and faced

challenging individual circumstances. For all of these reasons, students require individualized, two-way advising. Regardless of the advising mode, study findings clearly suggest that virtual advisors need to do more than present information and advice. Instead, advisors need repeatedly and proactively to explain, translate, and unpack terms and concepts. They need to double-check students' comprehension, provide repeated prompts for action, and confirm that students have followed up on tasks in an appropriate and timely manner.

DIMES contributes to knowledge about what students need and what best practices in college advising might entail. Analysis of the "black box" actual content of virtual advising, such as described in this article, can be used to improve the

design of future interventions, thereby increasing the likelihood that redesigned advising campaigns will produce positive treatment effects at scale.

However, the study also shines a light on systemic problems that are at the heart of the continuing socioeconomic gap in college access. Getting to college, this study shows, is complicated, opaque, and difficult for students in high schools with a concentration of low-income students and low college-going rates. It is unlikely that any intervention can fully overcome these structural barriers



"...study findings clearly suggest that virtual advisors need to do more than present information and advice. Instead, advisors need repeatedly and proactively to explain, translate, and unpack terms and concepts."

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(Deil-Amen & Rios-Aguillar, 2014). Both improved advising and policy changes are needed to help this large population of students succeed in negotiating the college-going process. 

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The Student Experience of Two-Way Text-Message College Advising: A First Glimpse

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ABSTRACT

This study examines the experiences of students enrolled in a text-messaging advising program in order to understand the conditions for impact in this rapidly proliferating intervention model. The program under study was a 15-state text-messaging college advising trial that attempted to increase the college enrollment outcomes of over 30,000 students who attended U.S. high schools with large percentages of low-income students. Data came from 3600 advisees who responded to text-message queries about their experiences in the texting program. The content of the queries was informed by focus group responses from 18 program participants. Results indicate that text-message college advising offered students a combination of information, assistance, nudges, and emotional support that many students perceived kept them on track for a successful college process. Text-message advisees who were disengaged or critical of the program mistakenly believed that the advising was fully automated, had sufficient support elsewhere, or were not receiving the texts because of incorrect contact information. Study findings suggest that text messaging is best suited to providing advising on financial aid and other topics requiring specific information and concrete tasks. Students' reports of their experience in the program provide potential explanations for the mixed results that are beginning to be reported for texting programs and suggest implications for more effective designs. The study is useful as one of the first investigations of student responses to virtual advising, but its modest response rates suggest the need for new approaches to collecting evaluation data from participants in text-message advising campaigns.

Keywords: college access, low-income students, text-message advising, virtual advising

Despite considerable policy efforts to increase equity in access to higher education in the U.S., wide socioeconomic gaps in postsecondary enrollment and degree attainment are well documented and appear to be widening (Bailey & Dynarski, 2011; Chetty et al., 2017; Shapiro et al., 2019). Researchers have produced a large body of evidence about the factors that hinder college access for low-income students, including those who are additionally minoritized on the basis of race, ethnicity, immigration background, or first-generation status. College-intending students from these groups face financial barriers as well as informational and procedural challenges across the complex, multiple steps in the college-going process (Deil-Amen & Turley, 2007; Goldrick-Rab et al., 2007; Holzman et al., 2019; Page & Scott-Clayton, 2016).

College-going Interventions

With a high degree of consensus about the factors that impede college access for underrepresented groups, researchers and policy makers have increasingly turned to the study of effective interventions to close enrollment gaps associated with family



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income (French & Oreopoulos, 2017; Herbaut & Geven, 2020; Page & Scott-Clayton, 2016). High school counselors and face-to-face college access programs are the most common structures for providing low-income high school students with information, assistance, and encouragement in the complex college access process (Avery et al., 2014; Swail & Perna, 2002).

School counseling resources are often inadequate in schools with a high percentage of low-income students, however, with an average school counselor caseload in high-poverty schools nearly twice the ratio recommended by the American School Counseling Association (ASCA 2020; Gagnon & Mattingly, 2016; McKillip et al., 2012; Perna et al., 2008). School counselors in public schools are able to spend little time on college counseling (Clinedinst & Hawkins, 2009; McKillip et al., 2012) and many counselors in high-poverty high schools have insufficient training and higher education advising experience to guide students in the full range and complexity of college choice and financial aid activities (Civic Enterprises, 2011).

Community-based nonprofit organizations have attempted to supplement school counseling resources, with studies showing positive effects of selected programs on college behaviors, such as FAFSA filing, college enrollment, and follow-through on college plans in the summer after high school graduation (Avery, 2013; Barr & Castleman, 2018; Bettinger et al., 2012; Bos et al., 2012; Carrell & Sacerdote, 2017; Page & Schooley,

2014). However, both in-school and out-of-school college preparation and advising programs are generally less available in low-income neighborhoods and outside of urban centers (Swail et al., 2012; Tierney & Hagedorn, 2004). And, as Avery et al. (2020) note, even accessible, high-quality programs “are often expensive – sometimes thousands of dollars per student served – and dependent on one-on-one in-person interactions between students and program staff. As a result, they can be difficult to scale” (p. 3). Together, the shortfall in college advising resources and the difficulty and expense of scaling up intensive in-person programs has led to the rapid expansion of experimentation with technology-delivered “light touch” advising (Hyman, 2020).

Text-messaging advising using semi-automated and individual college counseling is a light touch intervention that is rapidly proliferating (Bettinger et al., 2019; Bird et al., 2019; Castleman, 2015; Castleman & Page, 2016; Fesler, 2020; Fesler et al., 2019; Oreopoulos et al., 2020; Page et al., 2020; Phillips & Reber, 2019). Some of these low-cost texting programs have proven effective in decreasing summer melt and increasing behaviors such as FAFSA filing or renewal in relatively localized settings (Bird et al., 2019; Castleman & Page, 2015, 2016, 2017; Page & Gehlbach, 2020). The first published results from very large scale text-message advising campaigns have been disappointing, however, with randomized controlled trials failing to show positive effects of the text-

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message advising treatment (Bergman et al., 2019; Bettinger et al., 2019; Gurantz et al., in press; Hyman, 2020; Page et al., 2019, 2020; Phillips & Reber, 2019). In particular, it appears that information-only text messaging—even one-way text messaging from an advisor that is personalized to the student’s situation—is not effective in increasing college enrollment (Bird et al., 2019; Gurantz et al., in press). The 75,000-student intervention trial that is the focus of the study reported in this paper likewise produced null results in college enrollment outcomes, although the program used two-way, individualized text messaging in which students and advisors exchanged personal communications (Avery et al., 2020). Experiments with text-message trials continue, however, because of the potential that advising using this readily-available virtual communications mode can increase higher education equity affordably on a national scale.

Purpose of the Present Study

Understanding whether and how the potential of text-message advising might be realized is therefore a pressing issue. Investigating the motivations and experiences of students in text-message college advising programs offers a likely avenue for increasing understanding about the conditions for impact in text-message advising. To date, little is known about the student perceptions of text-message college advising. How do students experience advising via text message? What topics and issues do they

bring up over text message? Do advisees find this virtual mode of advising helpful? Do they believe that text-message support has a positive impact on their postsecondary choices and preparation activities? Why do some students sign up for advising and then fail to participate in the texting program? Our study investigated these issues with the following research questions:

How do students perceive the effects of their participation in a two-way, national text-message college advising program?

How do students who sign up for the text-message advising program but fail to participate explain their lack of engagement?

How do participating students evaluate the text-message program?

Theoretical Framework

Principles of behavioral economics and nudge theory (Thaler & Sunstein, 2008) provide a framework for understanding how and why students, particularly those from low-income backgrounds or who are minoritized in other ways, make suboptimal postsecondary decisions.

Although previously utilized in the fields of health, finance, law, and other areas of public policy, behavioral economics principles are entering the education policy sphere (Castleman & Page, 2015; Castleman & Meyer, 2019; Lavecchia et al., 2016).

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Historically, economists have used human capital theory to make sense of individuals' college choices (Becker, 1962). This approach, however, presumes that students are rational beings who view education as a long-term investment and consequently weigh the costs and benefits of college attendance as part of their decision-making process. As evidenced by low college enrollment and attainment rates, high school students do not predictably follow this pattern for a variety of contextual and developmental factors (Boatman et al., 2014; Castleman et al., 2015; Lavecchia et al., 2016). Combining research from psychology, neuroscience, and sociology, behavioral economics provides an alternative lens to understand these deviations that students take from human capital theory when making college decisions (Castleman & Meyer, 2019; French & Oreopoulos, 2017; Lavecchia et al., 2016). Drawing from this work, more education researchers are beginning to use behavioral economic principles to formulate education policy suggestions and interventions including text-message advising and nudging to improve college access and success (Castleman & Page, 2015; Ross et al., 2013), reduce summer melt (Castleman & Page, 2015), and increase FAFSA completion and submission (Page et al., 2020).

Behavioral economics principles provide important insights about how students respond to challenges related to the "informational complexity, procrastination, status quo bias" associated with college decision-making (Castleman & Page, 2015, p. 144). For example, when faced with

imminent distractions including financial, family, friend, and work-related responsibilities, students are less likely to make a present-day sacrifice for a future benefit (Castleman & Page, 2015). Referred to as time-inconsistent preferences, students often procrastinate on completing essential steps of the college process including filling out the FAFSA or registering for the SAT even if they want to go to college (Dynarski & Scott-Clayton, 2006). Students might also deviate from the expected behavior, human capital theory suggests, because they have inaccurate or insufficient information to weigh the benefits of college (Lavecchia et al., 2016). Information about college application and financial aid processes may be less accessible for students from low-income backgrounds whose families are unfamiliar with higher education options and the complex college-going process (Avery & Kane, 2004). Without accessible and timely information, students' tendencies to rely on familiarity, routine, and automatic thinking can result in ill-informed decisions (Lavecchia et al., 2016). Last, when faced with too many choices, students can be cognitively overloaded with complex information and select default or simple options that do not actually serve their best interests (Scott-Clayton, 2011).

Nudge theory has demonstrated significant effects on program participation and take-up (Bettinger et al., 2012). In essence, a behavioral nudge encourages individuals to take specific actions that will lead to more favorable outcomes without limiting choices or making

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choices more costly (Hausman & Welch, 2010; Thaler & Sunstein, 2008). In the field of college access and success, nudge theory has been utilized as a personal assistance mechanism to disseminate college information, provide one-on-one support, and remind students about essential college and financial aid deadlines (Bird et al., 2019; Lavecchia et al., 2016). As previously noted, the effects of behavioral nudges in the form of large-scale college advising text-message interventions have produced disappointing results thus far in terms of college attainment (Bird et al., 2019; Hyman, 2020; Oreopoulos & Petronijevic, 2019). Empirical research investigating how students perceive this form of college assistance is just beginning to appear (e.g., Oreopoulos et al., 2020). This information could provide essential insight into students' decision-making and the ways that they are receiving interventions intended to influence their college-going behaviors.

The DIMES Intervention

The program that was the focus of this study was a large-scale text-messaging college advising trial that used behavioral economics principles to attempt to increase the college enrollment outcomes of students who attended U.S. high schools with high percentages of low-income students and low college-going rates. Digital Messaging to Improve College Enrollment and Success (DIMES) was a U.S. Institute for Educational Studies (IES)-funded randomized controlled trial conducted in collaboration with the College Board (Avery et al., 2020). DIMES

participants were 75,000 students who attended one of 745 U.S. high schools in 15 states. DIMES high schools had substantial proportions of students who were eligible for free and reduced lunch (Mean=63%) and low two- and four-year college-going rates (Mean=26% and 30%, respectively). Among students who had taken at least one College Board assessment, the average college-going rate was approximately 56% across the study high schools.

Students signed up for the DIMES program in the spring of their junior year of high school at the point of taking the PSAT and were randomly divided into equal-size treatment and control groups. The treatment group was 28 percent white, 19 percent black, 36 percent Latinx, and 7 percent Asian. In keeping with national trends, women were 55 percent of the sample. Students' academic profiles were generally consistent with averages for their schools, with a mean high school GPA of 3.3 and PSAT scores in the low 40s in each section (approximately the 33rd percentile of the PSAT/NMSQT score distribution for 11th graders). Because sampling was done at the school level, individual-level socioeconomic data were not available.

The DIMES intervention for the 31,408 treatment group students consisted of 15 months of two-way, individual advising in the form of cell phone text messages.¹ The intervention was designed to help high school

¹ The full treatment sample (N=36,521) was reduced in size to this number by removing students without valid cell phone numbers. (See Avery et al., 2020 for additional details of the DIMES intervention design and sample.)

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students complete all of the steps in the college and financial aid application process. The program began in the spring of a student's junior year of high school and continued until the end of the summer after their high school graduation.

DIMES treatment group students were each assigned an individual, full-time professional college access advisor from uAspire – a leading college access organization with a focus on college affordability. Once or twice a month, students received a standardized outgoing “broadcast” text from their individual advisor, personalized with their name. The topic of each automated broadcast text related to an issue or task pegged to the calendar of testing, college application, and financial aid processes. In between these automated broadcast messages, the uAspire advisor and student exchanged manual text messages that either the student or the advisor could initiate. Each of the 18 message flows in DIMES consisted of the automated broadcast text(s) from the uAspire advisor that introduced a new advising topic or issue and the ensuing set of any manual text-message exchanges between the student and advisor that took place before the next automated broadcast text. Table 1 on page 87 summarizes the content and timing of the message flows.

Methods

The primary source of DIMES data for this study of student experiences with the texting program consisted of the text messages of the

3577 students who responded to end-of-study questions asking about their DIMES experiences and outcomes. Focus groups with 18 DIMES participants informed the development of the text message evaluation queries and provided some additional context for the large text-message data analysis findings.

Exploratory Focus Groups

The DIMES qualitative study co-principal investigators conducted a total of four student focus groups that took place in February 2016 and in May 2016. The purpose of this data collection was to explore the nature and range of student experiences in the advising program as a foundation for designing end-of-study evaluation text message queries for the full treatment group. To achieve the goal of focus group participants who were likely to have rich information, we chose a purposive sample of DIMES high school seniors in the treatment group who had experienced significant engagement with their advisors (Patton, 2002). (We defined significant engagement as having responded to at least five of the first seven message flows.) The College Board provided a random sample of these students to uAspire. In order to yield two focus groups of 5-7 students each, we sent invitations to the first 60 students on the College Board list asking if they were willing to participate in an online focus group and offering an incentive of \$50 for participation. The initial text message invitation was marked with their advisor as sender. In one indication of the difficulty in collecting

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Table 1.
DIMES Message Content and Timeline

Timeline	Message content
Spring/summer of junior year (2015)	<ul style="list-style-type: none"> • Encouragement to start and guidance on college search • Encouragement to register for SAT (customized on whether already registered) • Guidance on SAT exam preparation and score sending • Inform student about potential financial aid eligibility
Fall of senior year (2015)	<ul style="list-style-type: none"> • Personalized college search guidance • Additional messaging about SAT taking/re-taking (customized on SAT history) • Acquiring and using fee waivers • College application guidance
Spring of senior year (2016)	<ul style="list-style-type: none"> • Information about state-specific FAFSA deadlines and resources • Support with FAFSA completion • Assistance reviewing financial aid award letters • Assistance with college choice and deposit decisions
Summer after high school (2016)	<ul style="list-style-type: none"> • Finalizing financial aid and evaluating tuition bill payment options • Information and guidance about required summer tasks • Program evaluation questions (final message)

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program evaluation data, 50 students opened the invitation to participate but only 14 continued to the short online survey to fill out contact and scheduling information. Of these, 10 students agreed to participate and were assigned to one of two online video focus groups. The one-hour focus groups centered on understanding students' motivation to participate in advising, how they experienced advising, and how advising affected their knowledge, actions, and emotions related to tasks and decisions. Using the same procedures, the co-PIs each conducted a second pair of online student focus groups in May 2016. Eight students participated in one of the two groups. The May focus group protocol included an additional question that asked about students' perceptions of the role of advising in their college and financial aid decisions and outcome. The focus group interview protocol appears in Table 2 on page 89.

We conducted holistic thematic analysis of the focus group conversations from each of the recorded online conversations (Saldaña, 2015). This process involved identifying and writing about students' stories of their DIMES experience, with particular attention to their motivations, their ideas about the role and purpose of the advising, their view of the advising relationship, and any conclusions about the effects of advising on their college choices and preparation activities. We used this high-level analysis rather than line-by-line coding in keeping with the goals of using focus group information to inform our text-message evaluation questions and

contextualize the findings from that larger sample.

End-of-Program Evaluation Queries: Sample, Procedures and Analysis

In order to learn about students' experiences with the texting program, advisors initiated the final (18th) DIMES text-message flow at the end of the 15-month program by texting one evaluation question to each of their advisees. A total set of 10 queries was spread over batches of treatment group students, with each batch of approximately 2800 advisees receiving one of 10 questions.² Sending a single question to each student was appropriate for the program's existing text-message mode and more likely to elicit a response than a longer, multi-item survey.

Like all other new DIMES topics, the message that solicited student feedback began with an advisor sending a broadcast text message to each student's cell phone. As with all DIMES messages, the standardized text of the automated broadcast message that began the program's final message flow was personalized with the student's name and marked as coming from the assigned advisor. In this case, the initial automated broadcast text message began with a standard opening alerting students that the texting program would be ending at the beginning of

² The three questions designed for the subgroup of never-engaged students were divided evenly among that total subgroup, making the number of students in each never-engaged batch slightly larger than the batch size of the ever-engaged students.

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Table 2.

Focus Groups Protocol: February and May 2016

Topic	Message content
Assumption of automation	At the beginning of the program, did you think you were texting with a robot at first? What convinced you that there was an actual person responding?
Advising effects	In general, how—if at all—have the texts been helpful to you? How have you used them? (prompts for knowledge and information, actions, decisions). (May only): How, if at all, have the texts helped you with deciding where to apply and where to attend?
Emotions	How (if at all) has the text advising affected your feelings about going to college?
Relationship with advisor	Can you tell me about your relationship with your advisor? Do you feel that your advisor knows the answers to your questions? How were your concerns addressed?
Highlights	What was the most helpful advice you received or the most meaningful aspect of the texting?
Text-message mode	What was it like to receive this advising through text messages? (prompts for advantages/disadvantages; how differs from in-person or school counselor advising; issues or questions that are ill-suited to texting)?
Fit with other supports	Besides these texts, there could be other sources of information and advising that you rely on for making decisions about college. Think about all the people and places where you've gotten help. How does the texting fit in?
Evaluation	<p>What would you tell a junior at your high school who asked whether they should do this next year? Would you recommend this to your friends?</p> <p>Lots of students text back with questions but others have never written us back. Do you have any guesses as to why this might be? Is there anything we could do differently to get those students who haven't texted us back to start texting back?</p>
Suggestions	How could we improve the text advising?

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September and inviting them to text back to their advisor with any final questions. The second part of the text message included one of the 10 open-ended or close-ended queries asking students about their experience with advising or their evaluation of the program and its usefulness. The list of queries appears in Table 3 (page 91) and Table 4 (page 92), along with associated response rates for the group that received that question.

The following is an example of one automated end-of-study text message from the advisor that initiated the final DIMES message flow. It begins with common opening language that all students received and concludes with a sample question received by one batch of 2774 treatment group students who had previously texted back to their advisor during DIMES:

Hi (first_name). This texting program ends Sept 2. Please text me your college and financial aid questions while I'm still around! I do have one quick question for you. Can you please describe something you learned as a result of me texting you about college?

Once a student texted back, advisors responded individually and any subsequent text messages were individualized exchanges.

Students received the final message with the single evaluation query in July or August after high school graduation. One of the first three questions was sent to separate batches of approximately 2900 students each; this “never-engaged” group had signed up to

participate in DIMES but had never texted back to their advisor. Students who had not participated were asked whether they had read DIMES texts, why they had not responded, or what they planned to do after graduating. One of the remaining seven questions was sent to batches of approximately 2800 students each. This “ever-engaged” group included students who had texted back at least once to their advisor over the course of the advising program. Students who had texted their advisors received a question about anything they learned as a result of the program, any actions they took based on advising, how helpful they found the DIMES program, any specific ways they were helped, who else was helping them with college planning and financial aid, whether they would recommend the texting program to other students, or what suggestions they had for improving text advising.

Response Rate

We received text message responses from 3577 students for an overall response rate of 13%. Table 3 summarizes the response rate and frequencies for the group of “never-engaged” students who had never previously texted their DIMES advisors. Table 4 presents the data for “ever-engaged” students who had texted back to their advisor over the course of the previous 17 message flows. The tables list the queries, show the number of students who received that question, and indicate the response rate for each question. The tables also present the frequencies for

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Table 3.

End-of-Study Queries and Responses for Never-engaged Students (N=339)

Query Number	Query content and close-ended frequencies	Number receiving query	Number responding	Percent responding	Of respondents, percent answering query
1	Did you read the text messages I've been sending you this past year about college? YES: 36% NO: 64%	2897	104	3.59%	42.31%
2	Can you share why you didn't respond to any of the messages we sent?	2889	158	5.47%	15.82%
3	What is your Fall plan? College: 56% Job: 26% Military: 6% Other: 6% Not Sure: 6%	2896	77	2.66%	68.83%
TOTAL		8682	339	4%	36%

Note. Percentages for close-ended queries 1 and 3 are for students who responded to the question.

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Table 4.
End-of-Study Queries and Responses for Ever-engaged Students (N=3238)

Query Number	Query content and close-ended frequencies	Number receiving query	Number responding	Percent responding	Of respondents, percent answering query
4	How helpful was this texting program? Text back a number rating the program from 1 (not helpful) to 5 (very helpful) 1–4% (not helpful) 2–3% 3–14% 4–24% 5–55% (very helpful) Mean = 4.24	2780	534	19.21%	65.17%
5	Please describe something you learned as a result of me texting you about college.	2774	343	12.36%	34.40%
6	Please describe something you did related to college planning as a result of me texting you.	2766	442	15.98%	19.91%
7	In what way were my texts helpful for college planning?	2779	419	15.08%	41.29%
8	Besides my texts who else was helping you with college planning and financial aid?	2807	497	17.71%	61.17%
9	Would you recommend this texting program to the new Class of 2017 seniors? YES: 92% NO: 8%	2753	615	22.34%	71.66%
10	How can we improve this texting program for students in the future?	2784	388	13.94%	38.92%
TOTAL		19,943	3238	17%	50%

Note. Percentages for close-ended queries 4 and 9 are for students who responded to the question.

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close-ended question responses. The final column in each table shows the percentage of respondents who texted back to their advisor by responding to the end-of-survey query they received as opposed to bringing up a different topic or asking an unrelated question.

Unsurprisingly, the lowest response rates were from the “never-engaged”: students who had signed up to participate in DIMES and been assigned to the treatment group but who had neither opted out of receiving text messages nor texted back to their advisor. (Never-engaged students made up 24% of the 31,400 treatment group students with valid cell phone numbers.) Although it is notable that we received nearly 350 responses from students who had never texted their advisor over the previous 15 months of DIMES, this constitutes only 4% of this ‘never-engaged’ group. The response rate of students who had texted their advisors at some point during DIMES was higher: 17% of this “ever-engaged” group texted back after receiving the evaluation request. The response rate for subgroups of the ever-engaged students receiving specific questions varied from 12% to 22%. Response rates were higher for close-ended queries that asked for a single-word response, a category, or a numerical rating than for open-ended queries.

The response rates indicated in Table 3 and Table 4 include exchanges in which the student texted back to the advisor by providing an update on their college situation, thanking the advisor, asking a

question, or requesting assistance. Some of these students also answered the program evaluation question that the advisor had posed. About half did not: of the 3577 participants who responded to the text messages in some capacity, 1740 (49%) answered the program evaluation question they received.

A quarter of the students (24.75%; $n=879$) who texted back to their advisor asked one or more questions. Three-quarters of these questions were about finances, including financial aid, FAFSA, scholarships, loans, and student bills. The remaining quarter were questions about college matriculation tasks, transferring and alternatives to college, and individual student situations. Many students texted to express their thanks and appreciation for their advisor’s assistance (20.39% of cases; $n=725$). In 8% of cases, students and advisors had substantive advising conversations, which we defined as back-and-forth exchanges about questions or pending issues in which the student contributed at least five text messages.

Text Message Analysis

We conducted thematic coding (Saldaña, 2015) on the responses to the 10 end-of-program text-message queries. Each case consisted of the entire set of student and advisor text messages that began with the outgoing query of the message. Using a qualitative data analysis program (Hyperresearch), we separately coded the part

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of the text-message exchange in which the student answered the question they received, and the part of the text in which they asked additional questions or wrote about something else that was unrelated to our query. In the case of close-ended questions, we did frequency counts of Yes/No or numerical responses. For open-ended responses, we used a constant comparative method (Miles & Huberman, 1994; Saldaña, 2015), in which we coded student texts line by line, labeling text segments with provisional thematic codes, such as “advising helped with understanding financial aid.” We defined each code with written definitions. We refined the codes and revised and clarified the associated definition until two independent coders achieved an interrater reliability rate of $\geq 80\%$.

Findings

Text-message exchanges constitute the primary source of data for this findings section and provide the first glimpse into how students experience virtual text-message advising. Focus group participants’ responses contextualize the text-message findings with more in-depth information regarding the emotional experience of receiving text-message advising, the nature of the student-advisor relationship, and the role of DIMES in students’ lives. We organize the findings to correspond with our research questions: what students gain from this form of college advising, why some students fail to participate, how students evaluate the text-message advising program, and the benefits

and limitations of this intervention strategy.

How do Students Perceive the Effects of Their Participation in a Two-way, National Text-message College Advising Program?

The purpose of DIMES is to help students with the information, actions, and decision-making that lead to enrolling in a well-matched and affordable postsecondary institution. In evaluating DIMES, we therefore asked students how the text messages were helpful, what they learned from advising, or what they did related to college planning as a result of participating in the text-message advising program (See Table 4, questions 5, 6, 7).

Additionally, we asked one batch of ever-engaged students directly to indicate how helpful they had found their DIMES participation by texting back a number between 1 (not helpful) to 5 (very helpful) (Table 4, question 4). The mean rating of the 534 students who responded to this question was 4.24. Just under 80% of the students gave the program a rating of 4 or 5. Only 7% of students rated the program as a 1 or 2. Overall, the text messages indicate that text-message advising offered responding students a combination of information, assistance, nudges, and emotional support that many students perceived kept them on track for a successful college process.

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Information, Assistance, and Nudges

A quarter of the ever-engaged students who answered one of the open-ended advising queries listed specific ways in which advising influenced them. Students reported that it was helpful to receive information, guidance, and reminders of deadlines and required actions from their advisor. Informational assistance was especially important for students without a family history of college or knowledge of U.S. higher education. Student text messages highlighted the importance of learning from advising about the higher education system and the processes for choosing and applying to colleges.³ For instance, a student from an immigrant family texted: “My family isn’t from America so we didn’t really know how the college process worked but you helped me stay on track.” Another student wrote: “your texts would bring up useful information and stuff that my guidance counselors didn't even mention to me. stuff that i didn't know to do or think about doing and important dates.”

The majority of students’ comments about program effects fell into two categories: financial aid and negotiating processes. Most frequent were comments in which students said that DIMES advising had helped them understand how financial aid worked and assisted them in applying for aid. A quarter of the ever-engaged students who responded to the questions about DIMES effects referred to

financial issues. This emphasis corresponds with the heavy concentration on financial topics in the student-initiated questions in this final set of text-message exchanges. For example, an advisee wrote that, “The FAFSA info and [college] websites you gave me are the reasons I’m already enrolled.” Another student cited both college and financial aid assistance: “you basically told me everything i needed to know about college and how to make it easier and you helped me stay on track of the important things i needed to do in order to get more aid.” Students texted about the importance of advising in completing the FAFSA, seeking scholarships, and applying for loans.

In keeping with nudge theory (Thaler & Sunstein, 2008), the second largest category of DIMES effects comprised student comments about the usefulness of receiving reminders and specific guidance about what they should be doing in the college process. They reported specific actions they took in regard to financial aid as a result of advising: “I looked into fafsa, and as such, was able to afford a more prestigious school,” “I checked up on more scholarships due to you texting me,” and “I visited many financial aid workshops at my school to get a better understanding of how my payment would be set up for each term.” Students repeatedly pointed to the importance of learning about important deadlines. Relatedly, students reported that it was helpful to learn about the logistics or steps to apply to college. Advisees felt they had gained from having someone guide them

³ All student text messages are quoted verbatim with original spelling, punctuation, and abbreviations.

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through the process. As one student texted, this was crucial for students to navigate the process: “you walked me through the steps and you helped me choose the right path.”

In addition to the most-frequent financial and navigational categories of DIMES effects, students texted about ways their advisors helped them with information about a particular issue, such as the difference between early decision and early action, that affected their admission process. Other students acknowledged their advisor’s help in solving a financial aid issue or another problem specific to their personal situation. Only a handful of students said that DIMES advising affected their choice of where to apply to college, possibly because the timing of the text-message queries was so long after the application period that they were less likely to recall any effects of advising on their application list. Timing might not have explained this finding, however, as Fesler’s (2020) study found that students engaged with their text-message advisor much more productively around financial aid issues than college lists. Several students did acknowledge the importance of their advisor’s suggestion to apply to multiple colleges. For example, one advisee texted that because of DIMES: “i saw colleges differently. like it doesn't have to be the most popular colleges.”

Emotional Support

Students also commented that DIMES advising carried emotional benefits. Having an ongoing connection to an advisor reduced

stress and insecurity during the process of applying to college for the student who texted: “your texts made me feel like i had someone to talk to. the whole process of getting into college and applying for scholarships can be really overwhelming.” Another advisee’s text mentioned emotions and self-concept:

there are so many things i did resulting from your texts [advisor name], i can't possibly pick one. everything just fell into place one topic at a time. you were very helpful and easy to contact. you really helped me gain confidence to get into college and not be nervous.

Focus group participants provided in-depth accounts of the emotional support they received through virtual text-message advising. For example, a first-generation Latina student said that she had absolutely nobody to help her and would have been “lost without my advisor.” Her DIMES advisor, she said, had reassured and guided her throughout her process and was the reason she was going to her state flagship university instead of a two-year community college.

I’m from [Big City] High and we have about 4000 students at this one high school. So it’s extremely huge. And often our advisors are---there’s not many of them for as many students as there are. So I have tried to get help from my college advisor at [Big City] High. But I haven’t really stressed it, because I have one on my phone!

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The text message quoted below is from a single student who echoes many of these points, concluding that their college enrollment was a result of DIMES advising. The student describes getting into college as a “long and laborious process” whose successful attainment resulted in increased confidence in the ability to take on the complex challenges of higher education. The text message continues to hint at the emotional aspect of advising, as the student implies that it was sometimes annoying to receive advising texts and includes a final emoji (“xd” signaling happiness or laughter) that communicates warm feelings to the advisor.

Something i have learned from you is that applying for college is like a complex mathematical equation. there [sic] are many parts to it and certain steps you need to take in order to solve it. it can be a long and laborious process, but the moment you find your solution (or when you get into a college) it feels like anything in life is conquerable. now onto the next equation, getting good grades... i'd always forget about college but with you constantly reminding me throughout the year it pushed me towards actually getting it down. i might not have went to college if you didn't bug me about it so much xd

How do Students who Sign up for the Text-message Advising Program but Fail to Participate Explain their Lack of Engagement?

Any program or treatment requires engagement by participants in order to be effective. In the case of DIMES, approximately a quarter of the students who signed up for advising and were assigned to the treatment group never texted back to their advisor over the course of the 15-month program. Because these “never-engaged” students were not among the small group who had opted out of receiving texting,⁴ advisors continued to send program texts to the cell phone number that the student provided at the point of signing up for DIMES. To investigate the reasons for students’ lack of participation, we sent one of three end-of-program evaluation queries to each of three batches of approximately 2900 never-engaged students (Table 3, questions 1, 2, and 3). We present findings here about the rate and type of responses we received from previously non-participating students, the reasons they gave for not having engaged with their advisors, and the relevance of college advising for students’ expressed postsecondary plans. Previously unengaged treatment group students texted back at a very low rate (4%), which is unsurprising given their non-responsiveness throughout DIMES. Given the extremely small numbers of never-engaged students who texted for the first time at the very end of DIMES in response to an evaluation query, it is important to reiterate that the findings about this group are suggestive but that patterns from their data cannot be generalized to the overall group of non-respondents.

⁴ Over the period of DIMES, 9% of the treatment group opted out of receiving messages (Avery et al., 2020).

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Student-initiated Questions From Never-Engaged Students

Students who had never texted back to their advisor were even more likely than the ever-engaged sample to pose questions of their own without answering the evaluation query (64%), suggesting a response bias in the already-small sample. Their questions were even more concentrated on financial aid topics than the student-initiated questions of advisees who had texted with their advisors in the past. Interestingly, slightly over a third (36%) of responding never-engaged students answered “Yes” to the question about whether they had read DIMES advising messages (Table 3, question 1).

Messaging Problems

The text messages from never-engaged students show problems behind the scenes in delivering the advising treatment. We received texts from non-students, saying that the phone number where they had been receiving messages was incorrect and that they were not the recipient named in the messages. Sometimes people associated with the student, usually a parent, texted back that it was they who had been receiving the messages. A few students wrote back to express confusion about how the program worked, assuming that the messaging was fully automated, not understanding that it was possible to text back, or expressing reluctance to incur cell phone message and data charges. One student indicated that the appearance of cell phone text messages might have been problematic: “some of the

messages look like spam so i didn't seem to pay attention to them.”

We coded 332 “messaging problems” across the sample, including among ever-engaged students. Over half of these had to do with suspicion about the source of the text messages. Having apparently forgotten that they signed up for the DIMES program and despite having received outgoing messages from the same advisor over the past 15 months, students responded to the final message by saying they were unfamiliar with the texter: “who are you?” and “who is this!” Many students did not understand that there was a human writing the messages. As one student texted: “sorry i didn't answer i didn't know you were a real person.” Even some respondents from the ever-engaged group held this misconception, like the student who texted: “to improve this texting program stop using bots to send messages students want personalized messages that they can relate to not a robot to show how useless people are really becoming.”

We received responses from previously unengaged students who had received DIMES messages but wrote that they were too busy to reply, did not feel like responding, or found the texts annoying. One parent wrote to say her student was having “a rough year.”

Reliance on Other Sources of Support

A handful of never-engaged students reported that they had not needed DIMES

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advising because they had received help elsewhere or were already set for their postsecondary plan. The many questions they asked about the college process indicated that many of them could have benefitted from advising. Many of their questions were extremely basic, like “how does financial aid work?” Although advisors answered each student, there was little they could do to help students at a point in the year when financial aid deadlines were past, most college admissions processes were effectively finished, and the DIMES program was ending.

We attempted to learn more about the relevance of pre-college advising for non-respondents by asking one batch of never-engaged students about their postsecondary plan (Table 3, question 3). Nearly 60% of the students who answered this question reported that they were planning to attend college in the Fall, indicating that the program content would have been directly relevant to their plans. The remainder were planning full time employment and a few (6%) were joining the military. Even students who were not planning to start college immediately, however, sent questions asking advisors about how to pursue higher education in the future.

How do Participating Students Evaluate the Text-message Program?

We posed two specific questions and analyzed relevant texts across all sub-questions in order to investigate students’ evaluation of the DIMES program itself (Table

4 questions 9 and 10). One batch of ever-engaged students received a query asking: “Would you recommend this texting program to the new Class of 2017 seniors? YES/NO.” Among the 440 students who responded to this query and provided the requested response, 92% responded “yes.”

Appreciation and Gratitude

Along with the high percentage of advisees who answered that they would recommend DIMES to their peers, the predominance of text messages where students thanked the advisor for their guidance and support is an indication of respondents’ positive experience in DIMES. Nearly half of all codes applied to the student text messages across all end-of-study queries were expressions of appreciation and thanks (46% of 7245 codes applied to the full body of student texts in the final DIMES message flow). There were numerous questions from students about whether they could continue to receive advising after the end of DIMES: “can i sign up for this next year too? or next semester? because it is a great help having you.” Some advisees expressed dismay that DIMES was ending. “Wow, that sucks. stay longer so we can have you forever lol,” one student texted, while another wrote, “Nooo why do you have to go!”

Variation and Critiques in Student Evaluations

Like in-person advising experiences, the apparent need for assistance and perceived

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outcomes of DIMES varied greatly across participants' evaluations of the program. We saw a substantial range of understanding of the role of text-message advising and the advising relationship. One focus group participant, an African American student, shared that she found the messages helpful but that receiving them made her feel guilt and stress when she was avoiding college application tasks. A White focus group participant who reported having additional sources of assistance saw the advising as a "business relationship." This advisee used the texting to reassure herself that she wasn't missing any deadlines and to double-check information and advice from her parents or school counselor. Yet another student saw her advisor as a friend and important person in her life, even though they had never met in person.

It is likely that the advisees who were most likely to respond to their advisor's final text query were students who had questions and those who had a positive experience with their advisor and the program. Even given this likely response bias, there were students who texted that they had not gained any useful information or assistance in DIMES: "I didn't use [advising texts] at all really." More specifically, a number of students said that the advising program's offer of help with college choice and applications in September and October occurred too late to be of assistance to them. Some students had made all their decisions about where to apply or already applied to college by this time. One student who found the schedule of topics

mistimed across the program, wrote: "didn't find [the texting] helpful at all. by the time you text me, i already had the topic finished. maybe if you started the program sooner it would have been helpful." And a few students responded with hostility to the message saying that the advising program was ending: "so your [sic] going to finally leave me alone."

Additionally, it is likely that some students were not helped by DIMES advising because they had sufficient assistance with the college process from other sources. Focus group findings underscored the ways in which differing needs, motivations, and expectations affected students' experience of text-message college advising. One of our focus group participants, a young White man whose family had hired a college coach for him, said that he texted his advisor because he wanted "to be polite." We therefore asked a batch of ever-engaged students about who else was helping them with college planning and financial aid (Table 4 question 8) in order to learn more about any unique effects of DIMES advising. In keeping with the focus group results, some students texted back that they were entirely reliant on their DIMES advisor for information and assistance. One student, for instance, responded to their advisor's question of who was helping them with this text: "u, honestly, have [come] much farther to help. i have looked for help but, it always seems like the help doesn't stay long." Others, like the following advisee, seemed to have little need for DIMES: "besides ur texts i was

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being helped by my mom & some of my other family members who have been to college before & have experienced enrolling.” Of the 304 students who answered this question directly, most named parents or other family members, followed by school counselors (20%) and teachers (7%) as providing them with advice and guidance.

Evaluation of Program Components

Focus group participants provided further insight into which components of the text-message advising format they found most useful. Text-message advisees appreciated the flexibility of texting, which afforded them the opportunity to initiate or respond to texts at their convenience. Nearly all focus group participants said they thought it was possible to have a relationship with an advisor over text message and that they were comfortable with this form of communication. Short form texts worked for many topics, they said, although one student said that more complex conversations were better suited to sit-down conversations with a school counselor. Several students pointed to the semi-anonymity of texting as an advantage when they felt unsure about their knowledge or worried that they would be unsuccessful in the college admission process.

Areas for Program Improvement

A second batch of ever-engaged students received a question about how to improve the program (Table 4, question 10). A group of the 388 advisees who responded to this query

provided suggestions for improvement or offered critiques of the text-message advising program itself. These included issues of timing, including the suggestion to start the program earlier and to align the focus of each message flow more closely with what students were working on at that point in the process. DIMES advisor messages about FAFSA completion, for instance, arrived when some students had already completed their financial aid forms although others had yet to begin any financial aid tasks.

Another area of critique had to do with the need for more clarity about who was delivering the advising and why and how students should use DIMES advising. Students who mistakenly assumed that the advising was fully automated criticized the use of “chatbots” instead of human advisors. The misconception that advising was provided by robots was widespread at the beginning of DIMES and persisted to the end of the program for some advisees. Some students were also confused about how advising worked and how they could most usefully engage in the program. A student who texted with a suggestion for improving the program suggested that advisors needed to initiate the advising more effectively: “maybe when you guys first start this you should introduce yourselves more properly and state what you guys are doing, cause i have no idea what this is for.”

Suggestions for improvement indicated that some DIMES advisees wanted even more

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contact and advisor availability. Engaged students complained that sometimes the advisor did not reply immediately to text messages or that they received an automated message that the office was currently closed: “sometimes it was annoying when i had a question but i had to wait until monday or i waited too long afterschool and the office was closed. otherwise, very helpful.” Some asked for even more information and reminders, for example: “the only way i could think to improve it would be more tips/texts in general” and “maybe you all can follow up when texting students like send a double text if it's been two hours or longer since the student has replied because we tend to forget.”

Discussion

Students who responded to questions about their participation in DIMES were generally positive about their experience in the text-message college advising program: 80% said they found it helpful and more than 90% would recommend it to future high school seniors. In focus groups, students said that it was possible to develop a relationship with an advisor solely through text messaging. Indeed, nearly half of the codes from the 3577 students who participated in the final message flow were applied to text-message excerpts thanking advisors for their assistance and support. Advisees reported that DIMES advising helped them learn how the college process worked. They credited the program with assistance in navigating college and financial aid processes and carrying out

required tasks. Text-message advisors helped them stay on track, students said, by reminding them of deadlines, nudging them to complete tasks, and helping them solve problems. Students also pointed to the tangible and emotional benefits of receiving support from a knowledgeable and accessible advisor.

It could have been that the overall intervention was unsuccessful in affecting enrollment rates for treatment group students because students who never responded never saw the messages (were not actually “treated”) or because those students did not need advising because they were not planning to go to college. There was some support for the failure to treat: apparently, some students had failed to respond because of problems with cell phone numbers. However, the responses we got from never-engaged students indicated that many of the students who never texted back to their advisers were, in fact, reading the messages. Most of these previously unresponsive students reported that they were planning to go to college in the Fall, suggesting that the program content was relevant to their postsecondary plan. This group posed numerous questions about applications and financial aid in their texts, indicating that they were planning to go to college and did not have ready access to other sources of information and assistance.

On the other hand, a minority of students reported that they did not need DIMES

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because they had other sources of support. Some found the flow of messages annoying; others reported that the message topics were mistimed. Some seniors were too busy or insufficiently focused on college tasks to reply. A few students were still confused about what the program entailed and who was texting them, having forgotten that they signed up to participate. Even after more than a year in the program, a group of respondents persisted in the misconception that the advising was entirely automated and that they were texting with a robot. Only a few students said they failed to respond because they were not planning to go to college.

The positive overall results from the end-of-program evaluation queries must be considered alongside other measures of DIMES program impact and in recognition of limitations in the quality of the sample. According to quantitative analyses reported elsewhere (Avery et al., 2020), the DIMES intervention did not make an overall impact: treatment and control groups did not have significantly different college enrollment outcomes. Engagement in the program among students who signed up for advising was relatively low, even among those who texted back to their advisor at least once over the 15 months of DIMES (Avery et al., 2020). Approximately a quarter of the treatment group students never returned a text. It is important to reiterate that the 3577 students who answered the end-of-program survey constituted a small sample that was almost certainly unrepresentative of the full group of treatment group members. Even though the

DIMES program was ending and the year's college process was effectively completed, roughly half of the responding students responded to our request by texting back with their own advising questions instead of answering our evaluation query. It is highly likely, therefore, that the respondent group included an overrepresentation of treatment group members who still needed help. Another potentially overrepresented group were advisees who texted back because they had found advising helpful or because they had experienced a warm relationship with their advisor over the course of DIMES.

A related important finding has to do with response rates in DIMES. Characterizing the student experience of virtual advising requires obtaining representative samples of students that can be generalized to the population of intervention participants. Unfortunately this ideal is currently unobtainable, except perhaps in programs that require student evaluations as a condition of receiving funding, offer a significant incentive, or award an educational credential. Many college assistance programs struggle to enroll students who are invited to participate (Bettinger et al., 2012; Gurantz, 2018). Among students who do take up the invitation to receive advising, the amount of engagement with their advisors is variable and generally quite low (Page et al., 2020). Typical student response mechanisms, like web-based surveys, suffer from low response rates (Fosnacht et al., 2017; Lin et al., 2017). Non-response for surveys and attrition from

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longitudinal studies is not random: underrepresented and struggling students are the least likely to respond to evaluation queries or to remain in repeated measures studies (Kelfve et al., 2017; Standish & Umbach, 2019). In the case of DIMES, the data set did not allow us to analyze the demographic or engagement characteristics of the participants who responded to the final message. The 3500 DIMES participants who did answer the evaluation queries at the end of the program likely include an over-representation of students who had established a good relationship with their advisors and students who still needed help or had questions. Interview and focus group samples, like qualitative samples in general, are too small to make statistically sound inferences about population groups. Like the widespread problem of low enrollment (“take-up”) rates in college advising programs, there is currently no good answer to the question of how to induce students to respond to requests for evaluation data.

Despite the null results in the overall DIMES program and limitations in the sample, the student evaluation data are still valuable. Although results should be understood as tentative, the topics and patterns in this group constitute the first direct empirical evidence about how students experience text-messaging college interventions. These results can be tested in other interventions and used to improve program design. Carrying out qualitative studies that look inside the black box of text-message programs is particularly important because DIMES is one of several

recent texting interventions that have shown disappointing outcomes (Bird et al., 2019). It is too soon to abandon the effort to deliver affordable college and financial aid advising at scale, however. In particular, the period of the COVID-19 pandemic has highlighted the need for college access counselors and organizations to use virtual and text message outreach to students.

Several findings are particularly important to highlight, study further, and integrate into future advising programs. First is the predominance of financial aid as a topic of the evaluation responses and student advising questions. This finding corresponds with a rigorous text-mining analysis of the entire corpus of DIMES student text messages (Arnold et al., 2020). The organization that delivered the advising, uAspire, specializes in college affordability. This focus might have affected the heavy representation of financial issues in student texts. However Fesler (2020) also found that text messaging engaged students most productively when concerning financial aid. Low-income students and their families are keenly and centrally concerned with how to pay for college. Financial issues span the entire college process, from the decision about whether and where a family can afford to apply to how to pay the first college bill and buy textbooks after being admitted. These concerns might lead students to accept the offer of convenient help for individual financial aid issues and questions in completing forms and tasks. It is highly unlikely that a texting program that offers

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only financial aid assistance will be effective, however, given the interconnection of financial tasks and decisions with entrance examinations, college lists, applications, and enrollment choices. It is therefore vital to design and test affordable, scalable interventions such as DIMES that offer comprehensive, sustained support to students.

A second large finding has to do with the relative effectiveness of text-message advising across different types of college issues and tasks. Financial aid is a topic that lends itself to the kind of concrete information and reminders of specific actions and deadlines that suit text-message communications. College testing, such as the SAT or ACT, is another concrete topic that seems particularly well-suited to advising through text messages. College entrance examinations did not come up in the student responses about program effects, however, possibly because advising on this topic happened at the beginning of DIMES up to a year before we collected evaluation data. Better timed for our evaluation request were matriculation issues such as housing, course registration, orientation, and finances. Students in the final message flow brought up these focused matriculation topics, again suggesting that text messaging can be effective in communicating information and

assisting students with discrete, concrete topics and tasks.

The relative absence of comments about DIMES effects on college choice corresponds with what Fesler (2020) found in her study of college advising text messages. It appears likely that some aspects of college choice are difficult to address with text messaging. As a focus group student told us, considering whether and where to apply to college might

be topics that require extended, face-to-face conversations. Complicated financial and family issues might also be counseling issues that are poorly suited to text messaging. Similarly, sorting out admission offers alongside the ramifications of financial aid awards might be difficult discussions to conduct over text messages. In support of

this inference, there was a drop-off in DIMES student responses in May and June at the point in the admission cycle where college admission and financial aid offers were complete.

Our findings raise the hypothesis that text messaging is best suited to providing information and assistance focused on financial aid and other topics requiring specific information and concrete tasks. The kinds of counseling interactions that appear to be needed for larger discussions of students'



“Our findings raise the hypothesis that text messaging is best suited to providing information and assistance focused on financial aid and other topics requiring specific information and concrete tasks.”

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goals, decisions, and personal situations are still necessary, however. Interventions like DIMES that are delivered solely by text message, this interpretation implies, might be more effective if they are modified to include some aspects of in-person or technologically-mediated face-to-face discussion. This possibility is supported by the findings of other college intervention studies, in which researchers found that only in-person treatment conditions produced impacts on college enrollment (Bettinger et al., 2012; Carrell & Sacerdote, 2017).

A third large conclusion from our analysis relates to lessons about the various sources of messiness in conducting large-scale, virtual interventions such as DIMES. To be effective, advising needs to deliver the intended treatment to students who need it. Responses from our queries indicated that some program messages had been going to incorrect cell phone numbers. It is important to acknowledge that an unknown number of students in texting programs will not receive the intended treatment. It is probably impossible to solve the problem of incorrect cell phone numbers or to measure the magnitude of the gap between treatment and intent-to-treat. It is likewise difficult to know which students in a large-scale intervention need advising and which are already well-served with family and school support. This was clear from the range of available college guidance sources reported by our focus group participants as well as text-message respondents.

It is also important to provide treatment at the time that students can use it effectively. DIMES advisees suggested that the program begin earlier. There is mixed evidence about the effects of timing of college advising interventions for high school students, however (Bird et al., 2019; Smith, 2018; Sullivan et al., 2019). As our results show, students pursue different timetables within the broad requirements of the college admission cycle.

Setting the size of caseloads so that advisors can really get to know their advisees' situations and individualize assistance would be an avenue to minimizing all of these sources of messiness. This would raise the expense of text-message college advising programs, however. And no texting intervention can fully overcome students choosing not to respond because they are busy or avoiding working on college tasks.

This investigation shows the difficulty of studying students' experience in remotely-delivered interventions. High school seniors like those in our population are unlikely to respond to survey questions, even when embedded in the existing texting mode with their own advisor. Despite a generous incentive, very few students agreed to participate in one of our online focus groups. Achieving a high response rate would seem to require some sort of high-stakes requirement, such as a high school exit interview or scholarship requirement. The timing of data collection within the college application cycle

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will affect what issues students bring up. The potential to muddy the advising relationship by posing evaluation queries in the middle of advising is a problem, however, and is the reason we collected these data at the very end of the DIMES program. More studies are needed that explore innovative ways to study the experiences of texting program participants that will yield representative samples and longitudinal data. Future research should also examine associations between students' experiences in virtual advising campaigns by demographic and engagement factors, analyses that the DIMES dataset did not allow.


Our study also holds implications for designing an effective text-messaging program. It is vital, we discovered, to acculturate students at the beginning of the program. Such orientation should include setting expectations for the purpose of the program and the roles of the student and advisor. Introductions and early communications should be structured to make it clear that the program is not automated, establishing that students are talking to a human being and not a computer. This can be done with informal language and relationship building. Introductions might include a video of the advisor or an initial phone call or video chat. Similarly, advising would almost certainly be more effective if the tasks and timeline were entirely individualized. School counselors, parents, or teachers might be effective allies in endorsing the program to students, reminding them to text their advisor, and intervening when

students stop engaging. Holding some conversations by audio or video, involving parents or school staff, and avoiding automation, would require small advising caseloads, however, which would increase the time and cost of advising. In another potentially worthwhile model, organizations can continue text-message advising after students begin college.

Conclusion

This study contributes to understanding how the increasingly popular text-messaging mode of college counseling functions for participants and what students need from this type of virtual advising. DIMES is one of the most ambitious such interventions to date. Students' reports of their experience in the program provide potential explanations for the mixed results that are beginning to be reported for texting programs (Bird et al., 2019; Gurantz et al., in press; Phillips & Reber, 2019) and suggest implications for more effective designs. Programs that use text messaging exclusively or in tandem with other forms of communication are worth pursuing. Lessons from DIMES can inform the design of future large-scale intervention models in which students will be induced to stay in contact with an advisor who can provide tailored assistance throughout the complex process of choosing, applying, and paying for college. uAspire and other organizations are already making changes in texting programs. With such improvements, more students will be able to establish a

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sustained relationship with a college advisor that gives them the concrete and emotional support they need. As one DIMES student wrote to their advisor: “i’m okay, after this long run with you, i made it to college, wish me luck in the real world...” 

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Perspective:

College 101

On a chilly Midwestern evening, I sat in a school gymnasium with my 80-year-old father, munching on popcorn and watching a high school men's varsity basketball game. My husband is a coach and watching his games with my dad provides an opportunity for my dad and me to connect, spend time together, and catch up. As we watched the game, my dad was eager to hear updates on my new position as a Director of Academic Advising at my university, and on progress I was making toward my Ph.D. in Higher Education Leadership. Between explosive dunks accompanied by roaring cheer and applause, shrill whistle-blows, and loud buzzers, I proceeded to tell him about a pre-college program for at-risk high school students that I was administering at my institution – *College 101*. He listened intently and then, without taking his gaze off the game, calmly and poignantly said, “That is the most important thing you are doing.” I was taken aback by his quick assessment putting *College 101* above my recent promotion and my PhD! Yet, I was pleased because I knew he connected with my passion for the program and understood the importance of its mission.

My dad was a teen parent and a high school dropout. He has struggled throughout his life with self-doubt and feelings of not belonging for a variety of reasons. However, he is an extremely intelligent and well-read man who understands the opportunities missed as a



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result of his decision to drop out of school. “Look at these athletes,” he said, referring to the basketball players on the floor, predominately non-White students at a school with lower graduation rates compared to others in the district. “I imagine most of them will go to college. But what about other students who don’t have a strong support system? If your program can help them see college as an option for their future, that’s what it’s all about.” I humbly agreed with him. As a first-generation college graduate who would soon earn a PhD, I knew firsthand the transformative power of education.

Exposing students to higher education, especially those who may not see college as a choice for their future, is an opportunity to plant seeds of self-exploration and discovery. Through education, students can be challenged to come to their own truth about who they are, rather than internalizing false messages they may have received – messages grounded in negative experiences and unfair judgements within the context of an unjust society. Education holds the potential and power to change the trajectory of students’ lives, the future of their families, their communities, and the world. What could

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possibly be more worthy of an investment of time and energy than that!

What is College 101?

College 101 is a pre-college outreach program (PCoP) for at-risk (at risk of dropping out) high school students. Broadly, PCoPs are programs that ...Provide educational opportunities to increase college participation for underserved populations of pre-college students. PCoPs provide a pipeline for higher education opportunities to encourage and foster students who would not traditionally pursue a postsecondary education. Their mission is to increase educational opportunities and college participation for underrepresented students who are traditionally non-college bound (Sheth & Tremblay, 2019).

Students who participate in the one-day College 101 event are invited back each year to continue to build their understanding of the college experience and to motivate them to stay in school.

College 101 was created by Dr. Paul Hernandez, a former “at-risk” student (at risk of dropping out) with no intention of pursuing a college degree. The son of an immigrant single mother, he grew up on the streets of Los Angeles, engulfed in deep poverty and gang culture. Not seeing school as relevant to him or his life, he dropped out. Later, however, he reengaged in education through a community college, and progressed on to earn an associate’s, a bachelor’s and a

doctorate. Motivated by his past experiences, he created College 101 to inspire, motivate and empower students traveling a path similar to his own (Hernandez, 2011). My dad and I heard Dr. Hernandez’s story at a student success conference where Dr. Hernandez was the keynote speaker; his story became a catalyst for transformational growth for me. While I have never experienced poverty, hunger, or gang culture, I related to the underlying emotions embedded in his story about his K-12 experiences and how he felt he did not belong, that his voice did not matter, and how he struggled to believe in himself and his personal, academic, and professional potential.

At this same conference, I also attended a session to learn more about Dr. Hernandez’s pedagogical approach to working with at-risk students using *Real Talk* strategies. Real Talk is a powerful and effective approach to teaching and learning, where faculty and staff, through narrative sharing, seek to connect with their students and to connect course curricula or desired class lessons with what personally matters to their students based on lived experiences (Hernandez, 2015). The pedagogy relates to narrative theory in that it capitalizes on the power of turning one’s experiences into one’s story as an action for positive change and connection (Hagen, 2007, 2018). Connection is further fostered around *universal themes* or common emotions that all humans experience based on each person’s unique life journey, such as joy, fear, disappointment, and love.

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Over the next few years, through a partnership with Dr. Hernandez, I successfully incorporated the Real Talk approach in my work. To inform others about the pedagogy and its effects on my work, I presented workshops for faculty and staff at my university, as well as at K-12 and higher education conferences. My aim was to empower others also striving to improve student success (“Overcoming Gang”, 2015; Robinson, et. al, 2016; Robinson, 2019; Robinson, 2020).

My continued work with Dr. Hernandez eventually led me to learn about College 101. The foundation of College 101 centers around Real Talk strategies as an approach to inspire personally meaningful experiences for program participants, especially for students who have not yet developed a belief that college can connect to their futures in a purposeful way. For many institutions of higher education, ideal college prospects are perceived to be high-achieving high school graduates as measured by strong high school grade point averages (HSGPA) and standardized test scores including the SAT (NACAC, 2016; Tremblay, 2013). A challenge with this perspective is that research shows the SAT may be biased against students from low socio-economic status (SES) and non-White families (Gilroy, 2007). These students may be perceived as less able to succeed, a perspective often grounded in untested assumptions and cultural ignorance (Osher & Kendziora, 2010; Schanfield, et al., 2019). This is what drew me to College 101. I desired to be an influencer of change, to impact the life

stories of at-risk students along their own journey of self-discovery and transformation. After introducing College 101 to a colleague who works in Admissions at my university, and who shared my beliefs about at-risk student potential, we took the idea to the dean of my college who agreed to fund the project.

Development of the Program

With support and funding in place, and after observing College 101 at another university, my colleague and I began to act on our vision and develop the program. The first step was to recruit college students to form a small student executive board (e-board). With guidance from my colleague and me, students on the e-board were tasked with recruiting and training other student volunteers, customizing and delegating program activities and tasks, and managing logistics of the day itself. This is one unique and impactful aspect of College 101 – the fact that it is led by college students. The coming together of students who bring ideas and perspectives based on their own experiences, who steer the planning and execution of the event, rather than the program being run by faculty or staff who at-risk high school students may perceive as authority figures who could not possibly understand them or their lives and experiences, helps position the program for success.

To form the e-board, I recruited students who had successfully completed the *Phoenix Student Success Program*, a retention program

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for college students academically dismissed and readmitted to the university (Robinson, 2016). These students had experienced academic failure, but were, for the most part, on the other side of the struggle, moving forward in good academic standing. Each of them had their own personal story of failure and triumph in relation to education. Other students were recruited from *Intercultural Business Student Association (IBSA)*, a registered student organization created by a former Phoenix Student Success Program participant and College 101 e-board member. IBSA was created and designed to provide a forum for students to discuss issues relevant to their educational experiences, and to connect socially with diverse student populations (“Intercultural Business”, 2016). In total, about 60 college student volunteers were recruited.

Next, all students were trained as College Positive Volunteers (CPVs). CPVs are students trained to work with K-12 youth to ...act as ambassadors of higher education when serving with youth, exposing them to college options, resources and materials to be successful in the college exploration and application process. As a college access program, CPV reflects efforts to increase the college enrollment and success for all students, and especially underrepresented students, by providing them with support and information about college preparation, paying for college, career selection, financial resources, and more (College Positive Volunteerism, 2018).

While the team was being CPV-trained and roles were being established, my colleague and I simultaneously reached out to alternative high schools in the area as well as to high schools in higher-poverty areas in neighboring communities. We met with high school administrators, counselors, and teachers, to educate them about the program and to invite them to schedule a date for the event. Once a high school accepted the invitation to the program and a date was established, the next step was to schedule a promotional visit for the CPVs to visit the high school. The objective of this visit was to pique the interest of the high school students and to invite them to the event. This was done, again, not by staff or faculty talking to them, but by college students sharing their own Real Talks with the hope that the high school students would connect with the CPVs’ stories and would be inspired to attend the event. Students who signed up for the event submitted a field trip consent form, which included a photo release.

The Day Itself

Before the event, my colleague and I guided the CPVs through a dry run of the coming day as we physically walked the campus, event-by-event, paying attention to every minute detail in order to minimize opportunity for things to go wrong, especially during times of transition from one event to another. The difference between a good outcome and great outcome is attention to detail (Swindoll, 2005), and we made sure we were prepared for a great event!

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The day itself began with my colleague and me meeting with the CPVs over breakfast to connect, ease nerves, and answer last-minute questions. Then, before the high school bus arrived, the college *walk-around CPVs* strategically spread out across the seats in the room where the first interactions with the high school students would take place so that the high school students would fill the seats in-between the college students. This set the stage for immediate interactions between the students to help the walk-around CPVs connect with the high school students throughout the day, to forge relationships with them, answer their questions, and keep them engaged.

The bus unloaded the group of apprehensive and guarded high school students and the day began. During the opening session, the CPVs introduced themselves, sharing their names, where they were from, their majors, and academic status (freshmen, sophomore, etc.). Next, I shared my Real Talk of overcoming my own barriers to success, connecting my story to the students through universal themes of disappointment, failure, hope, and triumph. The purpose of opening the event with a Real Talk is to build trust and connection, a concept captured in this familiar quote, "Students don't care how much you know until they know how much you care." For it to be effective, the opening Real Talk needs to be delivered by someone who can share the story of their own journey in a simple, clear, and straightforward manner. In so doing, the students can connect their own experiences with those of the speaker's. The

speaker's experiences do not have to be the same as the students', since it is the underlying universal themes (disappointment, failure, hope, triumph, etc.) that serve as the basis of the connection between speaker and student. It took time for me to learn how to move my Real Talk from a problem story to one framed in contrast to the problem as a reflection of growth and triumph within a larger sociocultural context. This learned skill provided me a tool of connection that empowered me to move beyond the differences that I perceived to exist between myself and the students, and to reframe those differences as an opportunity to learn and grow from students, reflecting the symbiotic relationship of teaching and learning between student and instructor (Hernandez & Loebick, 2016).

After the opening session, the president of the IBSA shared his Real Talk of growing up as the son of Mexican immigrants who spent his early elementary years moving between Mexico, Florida, and Michigan, where he and his family picked blueberries to survive. He shared that one year picking blueberries as a teenager in Florida, even though he lived just a few miles from Disneyworld, he did not even know it existed. It was at that moment, he shared, that he realized there were two worlds; one where kids were working hard to survive, and one where kids were having the time of their lives. For him, school did not connect to his lived reality. He did not see the purpose of school and attended just enough to be eligible to play soccer. Barely graduating, he went on to college with the

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same poor habits he had developed in high school and, after his first year, he was academically dismissed. He shared what he eventually learned about the importance of education to his future, and how now he was getting ready to graduate with a double major in accounting and finance, and with having won a prestigious internship. This accomplishment, he shared, would change his life and that of his family forever. The high school students were completely engaged. Just as when I first heard Dr. Hernandez, the student's story created a pin-drop moment.

The example of the student's story, as well as others shared throughout the event, offers the perspective that psychological change for at-risk students begins by the sharing of human vulnerability and hope. It is at the intersection of the diversity of the human experience and the universal need for hope that opportunity for empowering at-risk students with encouragement, belief, and the invitation to participate lies, not by sharing information about the accolades of the institution or the steps needed in the admission process. Telling students that they should study, get good grades, and go to college can have unintended consequences of further shaming struggling students by pointing out how different they are from their college-going peers and further

pushing them away from higher education. Connection and trust must be established first. Helping the high school students connect with peers who are just a little further ahead of them as college students, through the sharing of stories of overcoming struggle and challenge, helps at-risk students see that they are not so different. Recognizing the similarities between college students and themselves can help at-risk high school

students to see their future in post-secondary education. After the opening Real Talks, the students' trust was earned and their minds and hearts were opened, ready to receive the information that would contribute to understanding the logistics of navigating the world of higher education.

In terms of empowering students within higher education, College 101 does

not solely focus on recruiting students to attend the hosting institution. Rather, it promotes post-secondary education in general, whether a four-year university, community college, trade school, or certificate program. This approach is another component that makes College 101 unique. It reaches beyond the boundaries of one institution and focuses on the opportunities of post-secondary education in whatever form makes sense for each unique student. To that point, institutions willing to take this



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approach reflects an approach that is enlightened, compassionate, and insightful – projecting the belief that higher education is a public good and by committing resources to a program that does not solely focus on promoting its own institution. This is difficult in an era of declining enrollment and tightening budgets, and in many ways, reflects the heart of an institution.

The remainder of the day involved a series of experiences aimed at exposing students to the culture, practices, and language of higher education. Experiences included presentations on topics such as how to apply to college, the financial aid process, and the existence of campus resources designed for student success, such as academic tutoring and coaching in the Bronco Study Zone (Robinson, 2016). The various sessions were designed to engage the students' minds, hearts, and bodies.

The program design kept them moving by holding the various presentations in different buildings across campus – an approach that also accomplished an embedded campus tour. The opening session took place in the college that houses business majors, which was followed by an icebreaker held in the college that houses education and human performance majors. The students toured a dorm to conceptualize the idea that being in college is like living in a “city of students.” They ate lunch in the new cafeteria that one student described as a “mall food court on steroids.”

One session, held in the college that holds fine arts majors, included strolls by Greek sororities and fraternities, whose members then shared the missions and activities of their organizations, and entertained questions from the high school students about what it takes to get into Greek organizations. A student majoring in music also played guitar and sang her own original music, explaining that she chose music because it is a universal language that connects people from all backgrounds and experiences. In a large lecture hall, a “major fair” was conducted to showcase the diverse offering of majors found within a university. In small groups, CPVs shared why they chose their major, what was required to complete their major, and what career they planned to pursue post-graduation. The CPVs lead discussions asking the high school students to share what they learned from the major fair and to answer questions.

In a smaller classroom, CPVs facilitated an activity where students were invited to think about and share responses to five questions designed to encourage them to reflect and contemplate about their futures. The questions were:

- 1) “What is your goal?”;
- 2) “Why is your goal important?”;
- 3) Who inspires you to reach your goal?”;
- 4) “What is standing in your way?”; and
- 5) “What steps are needed to reach your goal?”

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The questions were designed to encourage students to specifically identify their goals as a first step in the application of strategy, to find their “why” to help them persevere and persist in their progress, to identify a support person or champion for their success, and think strategically about barriers to their success and how they could reframe those barriers as challenges to overcome rather than things that would keep them from moving forward. The activity also encouraged them to operationalize their goals and commit to immediate and longer-term steps needed to reach those goals.

Data Analysis and Lessons Learned

Data across four College 101 events that engaged a total of 128 high school students was collected. After coding and analyzing the data three distinct themes concerning emerging academic and professional identities, overcoming shame, and growing self-awareness emerged from the students’ answers to the questions.

Student academic identity is defined as the appropriation of academic values and practices within a sense of self, reflecting the willingness and commitment to the practices of the academic community (White & Lowenthal, 2011). Students’ comments reflected a growing awareness of and desire to improve behaviors needed for academic success. Comments included, “do my homework,” “continue to do well in my classes,” “raise my grades,” “get caught up in algebra,” “turn in my missing work,” “score

high on my SAT,” “do well on my exams,” and “go to the library.” Students develop their academic identity as a subset of general or global identity development (Was & Isaacson, 2008). Students’ answers reflected an awareness that a commitment to academics was needed in order to progress towards goals related to emerging professional identities. Students’ comments included that they wanted to “go to graduate and go to a good college,” “find a school that is the right fit for me,” “sign up for scholarships,” “research about career fields and colleges,” “look up how many years it takes to get a business degree,” and “one step I can do this week regarding web design is make sure I know the classes necessary in college.”

Representing a diverse range of career interests, students expressed professional goals representing desires to become a dancer, lawyer, web designer, professional athlete, pediatrician, photographer, welder, clothing entrepreneur, military defense contractor and weapon design engineering, music producer, graphic designer, pilot, orthodontist, counselor, and hair dresser. One student stated she wanted to be a mother, and another’s goal was “to be a superstar!” Students were also able to connect the importance of doing well in high school to earn a degree, launch a career, and realize positive life outcomes. This connected to students’ “why” in terms of larger motivating factors. One student commented, “Money is power. No money – no car, no house.” Other comments included, “financial freedom,” and

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“money to be able to relieve things.” Commonly expressed motivators tied to the importance of family. “I want to make my parents happy,” “I want to be able to support my family,” “no one in my family has a degree from college,” and “so I won’t have to struggle when I get my own family.” Other comments that stood out included, “to control my future,” “it’s important to me morally,” “showing people that I’ve made it in the world,” “to be happy,” “to accept change,” “I want to find a place where I can thrive,” “make a difference in the world,” and the comment that pierced my heart the most - “I want to live a life that is worth the pain of existence. I want to matter.” Students’ comments also reflected struggles with feelings of shame. Brown (2008) defines shame as “the intensely painful feeling or experience of believing we are flawed, and therefore unworthy of acceptance or belonging...Shame creates feelings of fear, blame, and disconnect” (p. 29). Comments that reflected students’ sense of shame included “always putting myself down making myself feel like a can’t do it,” “me not believing in myself,” “fear,” “being scared of judgement,” “self-doubt,” and “my lack of confidence and not being willing to take risks.”

Yet, students also talked about a commitment to developing shame resilience by developing a positive mindset and mental toughness from a positive attribution perspective, as seen in comments including that they planned to “stay focused and never stop,” “diminish all the irrelevant stress holding me back,”

“give 100% effort every day,” and “never stop reaching for my goal and don’t let anyone distract me.” Attribution perspective is explained through Weiner’s (2000) Theory of Attribution as the process by which individuals perceive the causes for their successes and failures. When a positive attribution perspective, in which students feel they have control over future success and failures, is applied to feelings of shame, a student’s approach to challenges and responses to failure may improve, positively affecting their academic success and future performance goal orientation.

The fourth question was “Who inspires you to reach your goal?” Answers to this question reflected that students find inspiration from family members, teachers, coaches, and other influential people outside of their families and school including bosses and celebrities. Students also commented that inspiration comes from themselves. Some comments reflecting this diversity of influence included “my inspiration is my daughter,” “my dance teachers who push me to be more confident,” “Drake” (musician and rapper), “one person who inspires me is Kobe” (Kobe Bryant, former professional basketball player), “my mom inspires me because she pushes me to do better and achieve my goals.” Another student commented, “I inspire myself because I know where I want to be and I won’t settle for less.”

The last session of the day involved showing a video recorded by Dr. Hernandez titled, “You Belong.” In his video, Dr. Hernandez

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talked to the audience, stating that they too belong in college, no more or no less than anyone else. With passion and an urgency of purpose in his voice formed from past experiences, he explained, “It’s o.k. for people to not believe in you. It’s o.k. for people to give up on you. That’s perfectly fine. What’s not o.k. is for you to give up on you and for you to not believe in you. That’s not okay” (“Overcoming Gang, 2015”).

Table 1.
College 101 Post-event Survey (N=122)

Survey Questions	Strongly Agree n (%)	Agree n (%)	Neutral n (%)	Disagree n (%)	Strongly Disagree n (%)
1. Meeting and spending time with college students helped me understand what it is like to be a college student.	50 (41)	46 (29)	10 (12)	0	0
2. College 101 taught me information about college that I did not previously know.	43 (35)	55 (45)	8 (7)	1 (1)	0
3. I was inspired to go to college.	55 (45)	43 (35)	8 (7)	1 (1)	0
4. I enjoyed being a part of College 101.	49 (40)	33 (27)	10 (12)	1 (1)	0
5. I would encourage my friends to attend College 101.	66 (52)	34 (28)	8 (7)	0	1 (1)

With that emotional and inspiring end to the event, students were given backpacks, pens, lanyards, etc., assembled for a group photo, and were loaded back on the bus. As the bus pulled away, the CPVs stood along the sidewalk, shouting and waving goodbye to high school students, guarded and apprehensive at the beginning of the day, who now were sticking their arms and heads

out of the bus windows, waving and smiling back, shouting “thank you” to their new college friends.

The Impact

A post-event survey was administered to the students, the results of which are in Table 1. One survey question asked what they liked most about College 101. Comments reflected the importance of the Real Talk approach to helping the students connect their own lives and experiences to the potential of college for their future.

Students stated:

- “I like how they gave us advice”
- “Students tell personal experiences”
- “The different stories and passage of knowledge”
- “That they actually talked to us about their life before college”
- “The stories I heard”


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- “It was impacting to me as a homeless youth”
- “Getting to talk to the college students to see what they really think and feel”
- “The students are just like me; they are relatable”
- “How WMU shared their experiences”
- “Realizing no matter that GPA or where you come from you can still go to college”
- “The inspiration and determination for us to be great”
- “The student volunteer stories”
- “Talking with the WMU students who have experienced this stuff”
- “People telling their experiences”
- “I liked how they changed my view on college”

Feedback from the high school counselors who accompanied the students on the trip was very positive. One counselor said to me, “Thank you for sharing your life story and your heart with the students. This was the very best college experience/tour I have been on. I have taken at least 60-70 college tours!” Another stated that on the bus ride home she heard students “talking about going to college in ways she had never heard them talk before.”

The program was also transformative for the CPVs. One CPV, a senior, said volunteering with College 101 was one of his favorite experiences as a college student. The shared College 101 experience helped the CPVs forge meaningful relationships with each other and the program cultivated a sense of belonging among the CPVs. They hung out together

outside of the program. One CPV confided that they all thought of their College 101 peers as family.

For me, the experience was one of pure joy. After each event, I found myself physically and emotionally exhausted, yet full of new energy, hope, and belief in the importance of higher education. The experience reaffirmed for me why I choose a career in higher education. The bonds I formed with my CPVs are strong. I keep in touch with those who have graduated, and we reminisce about the powerful experience of empowering at-risk high school students through College 101. Not only were the high school students changed, so were we. As I reflect further on the impact of College 101, I wonder how my dad’s life could have been different if he had experienced a program like College 101 when he was in high school, and if my life and the history of my family might have been different. I will never know, but at least I can help others like him today. That is one reason why I am thankful that Dr. Hernandez used his experiences to create College 101. In turn, if my efforts, in some small way, contributed to helping students like the younger versions of my dad and Dr. Hernandez travel a different path, then I am proud of that contribution to making the world a better place. 

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