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Effective Advising: How Academic Advising Influences Student Learning Outcomes in Different Institutional Contexts

Lanlan Mu and Kevin Fosnacht

Abstract: Using survey data from 156 bachelor's-granting institutions, this study explored the relationship between academic advising services and seniors' grades and self-perceived gains. We found advising experiences has a positive relationship with students' grades and self-perceived gains. In addition, our results indicate that the institutional advising climate is positively correlated with perceived gains, but not grades. The results also showed that the relationships between advising and students' learning and development varied across institutions. Implications for policy and practice were discussed.

Keywords: academic advising, student learning outcomes

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INTRODUCTION

The American postsecondary education system is the most complex in the world and features colleges and universities with considerable diversity in their control, foci, degree offerings, and students served (Lucas, 1994; McCormick & Zhao, 2005). This complexity is both a strength and weakness of the American system. On one hand, this diversity provides students with substantial choice to allow them to select an institution that best fits their needs. However, this complexity also creates bureaucratic and information barriers that students must overcome to successfully complete college (St. John, Hu, & Fisher, 2011). To help alleviate these barriers, academic advising has become professionalized over time on many American campuses. The goals of academic advising are multi-faceted as advisors help students identify campus programs reach their goals, pick a curriculum to meet their needs and institutional requirements, and pursue future educational opportunities or career goals (Crookston, 1972; Ender, Winston, & Miller, 1982; O'Banion, 1972; White & Schulenburg, 2012). Ideally, advisors hold a strategic position that allows students to connect their academic choices to their larger goals (both academically, professionally, and personally). In practice, advisors help students make numerous decisions ranging from course selection to degree planning to personal development to career planning (Council for the Advancement of Standards in Higher Education [CAS], 2014; Ender, Winston, & Miller, 1982). However, in practice, students receive advice from a variety of sources including peers, family members, and faculty and staff not serving in an official advising capacity (National Survey of Student Engagement [NSSE], 2014; 2016).

While advising is arguably the most important function of the student affairs profession (Light, 2001), the literature on the effects of advising is not very robust. It generally focuses on retention or satisfaction at a single institution (e.g., Braun & Zolfagharian, 2016; Christian & Sprinkle, 2013; Kuh, 2008; Paul & Fitzpatrick, 2015; Vianden & Barlow, 2015). While retention and satisfaction are important outcomes, this literature largely neglects the influence of advising on students' learning and development. This oversight is surprising due to the purpose of advising that focuses on developing the student holistically and the role advising plays in shaping the student experience through practices like course selection and participation in activities like high impact practices. Consequently, we investigated the relationship between advising and students' learning outcomes. As colleges and universities provide academic advising in distinctive ways, we also explored the role the overall institutional advising climates has on these outcomes and how these relationships vary across institutions. Finally, we utilized the findings to make recommendations for practice and future research.

LITERATURE REVIEW

Due to higher education's roots in the medieval European guild system, academic advising was traditionally a part of the faculty's domain and focused on holistic student development (Gillispie, 2003). However, because of the massification of higher education in the mid to late twentieth-century, advising became increasingly professionalized and shifted from the responsibility of faculty to administrators (Hemwall, 2008; Self, 2013). Academic advising was identified as a well-defined occupation on college campuses in the 1980s and CAS codified the expected responsibilities and expectations for advisors (Cook, 2009). The responsibilities of advisors range from orientation, degree planning, course selection, personal development and career decisions, and directing students to important resources and special opportunities (Ender, Winston, & Miller, 1982; Gordon, 1992). Furthermore, advisors are expected to help students "become members of their higher education community, think critically about their roles and responsibilities as students, and prepare to be educated citizens of a democratic society and a global community" (National Academic Advising Association [NACADA], 2006, para. 7).

Despite the shared professional goals for advising, academic advising models vary across institutions (Habley, 1988; Lynch & Stucky, 2000). Drake, Jordan, and Miller (2013) have identified at least 12 models for academic advising; however, three models are predominant: developmental, prescriptive, and proactive or intrusive. These models can differ substantially in their expectations for advisors. The developmental approach helps students explore their academic, career, and life goals and teach students skills to help them throughout their life. Developmental advising is the most traditional of the three main approaches (Crookston, 1972). In contrast, prescriptive advising seeks to provide information on courses, major choices, and academic policies and focuses less on developing the student holistically (Crookston, 1972). Advising meetings in this context are typically initiated by the student and Crookston (1972) likened the advisor to a doctor and the student to a patient. An emerging form of the prescriptive advising is electronic advising where an internet website provides information on a student's academic progress, by providing personalized checklists indicating which academic requirements they have met and more detailed information on course offerings. The third model, proactive or intrusive advising, has the defining trait of advising interactions being initiated by an advisor, not the student (Glennen, 1975). In this model, advisors reach out to students at critical points in their academic career. This model is most frequently used for at-risk (i.e., students on probation) or special (i.e., student-athletes) populations

Habley (1988) found advising caseloads differ by institutional type as advisors at public institutions were expected to have twice the caseload as their peers at private institutions. This relationship appears to be relatively

constant as Fosnacht, McCormick, Nailos, and Ribera (2017) found that first-year students at private institutions met with an advisor 13% more often than their peers at private institutions. Such institutional decisions on how to structure their advising model are important as practices like proactive or intrusive advising promote interactions between students and advisors (Schwebel, Walburn, Jacobsen, Jerrolds, & Klyce, 2008; Schwebel, Walburn, Klyce, & Jerrolds, 2012). Additionally, it is important to note that students' expectations of advising vary, as some prefer prescriptive approaches, while others prefer more a more collaborative decision making process (Christian & Sprinkle, 2013). Despite these differences, students largely desire advising approaches tailored to their needs and interests and accurate information and guidance (Allen & Smith, 2008; Cook, 2009; Kennedy & Ishler, 2008).

The existing evidence indicates that students' interactions with academic advisors are relatively infrequent (Fosnacht et al., 2017; NSSE, 2014, 2016). The typical student appears to have one or two meetings with an advisor per academic year (Fosnacht et al., 2017; NSSE, 2016). However, about 10% of first-year students and 14% of seniors reported never meeting with an advisor during the past academic year. Due to the lack of interactions with formal advisors, it is not surprising that most students reported that their primary sources of advice about their academic plans were from another person other than an academic advisor (NSSE, 2014). Additionally, the sources of advice were commonly informal.

Consequently, the overall institutional advising culture plays a substantial role in how advice filters down to students. The institutional advising culture includes both the structure and format of advising, but also its philosophy as a service organization. Thus, the nature of advising culture is ultimately qualitative. Do advisors proactively reach out to students if they notice a student is about to miss an important deadline or is not on track to graduate in a timely manner? Do advisors have large caseloads, which requires students to reserve an appointment one month in advance and does not permit advisors to act on pressing concerns? Do advisors seek to connect students to special learning opportunities or discuss how their courses relate to future career objective? Do advisors encourage faculty to spread word on important topics to their students?

Di Tommaso (2011) found that students commonly do not have information about the availability of academic services and students indicate that peers, family, and other non-official advisors provide substantial amounts of academic advice (NSSE, 2014; 2016). Therefore, the relationship between advising information and student outcomes may take both direct and indirect pathways, as students may share advice about course selections or special opportunities with their peers. Using more technical terms, advising is highly likely to have spillover effects, where information is passed on from advisor to student/faculty/staff/family member to (another) student. For example,

an advisor may inform a student about study abroad opportunities and the student may inform five friends about study abroad. Methodologically, multi-institutional data is needed to quantify such activity, as these “hidden” advising experiences as such knowledge would be subsumed by the intercept in single-institution studies. Therefore, single-institution studies of advising may be underestimating the effectiveness of advising services by failing to capture such spillover effects.

Most empirical studies of academic advising’s relationship to outcomes have traditionally focused on the influence of academic advising on students’ retention and satisfaction (e.g., Beal & Noel, 1980; Fielstein & Lammers, 1992; Metzner, 1989; Vianden & Barlow, 2015; Waggenspack & Hensley, 1992). For example, Metzner (1989) and Kot (2014) showed that academic advising services have both direct and indirect effects on student retention. A more recent study by Vianden and Barlow (2015) revealed students’ perception of the quality of advising has a positive association with student’s loyalty, an indicator of persistence. Others have found that advising services influence career aspirations, campus navigation, and perceptions of a supportive environment, further supporting the notion that advising has both direct and indirect effects on student outcomes (Cuseo, n.d.; Drake, 2011; Habley, 1981; NSSE, 2014; Smith & Allen, 2014; Swecker, Fiftolt, & Searby, 2013; Trombley & Holmes, 1981; Winston, Miller, Ender, & Grites, 1984). However, while student retention and satisfaction are important student outcomes, they do not purport to measure students’ learning and development (Ewell, 2001). Student learning and development is critically important as it allows students to improve their productivity in the labor market and receive higher wages (Becker, 1993), which is the main reason why students attend college (Eagan et al., 2017).

More recently, a handful of studies began to evaluate how academic advising influences student learning outcomes (Erich & Russ-Eft, 2012, 2013; Smith & Allen, 2014; Young-Jones, Burt, Dixon, & Hawthorne, 2013). Young-Jones and colleagues (2013) examined the association between academic advising and grade point average but did not observe a statistically significant correlation. Erlich and Russ-Eft (2013) found academic advising interventions were correlated with an increase in students’ academic planning. Smith and Allen (2014) tested students’ immediate learning outcomes from advising programs and found that students who contacted advisors often had clearer educational plans and better knowledge of resources. These studies all relied upon a single institution or small samples that make generalizations about the influence of advising difficult. Additionally, as pointed out above, single-institution studies are highly unlikely to capture spillover effects, which may cause researchers to underestimate the effectiveness of advising services.

As far back as 1991, Frost stated that little research had evaluated academic advising programs, yet the effectiveness of academic advising is still unclear.

One reason is the frequency of using a single institution in advising studies impedes comparisons, generalizability, identifying best practices, and may underestimate the effectiveness of advising. The research mentioned above on the relationship between academic advising and student learning outcomes focuses on an institution's specific academic advising services, but not the overall influence of advising across institutions. Consequently, it is difficult to highlight the importance of advising and provide strong evidence of effectiveness to audiences like system trustees and policymakers, which control funding for institutions. Additionally, the decentralized nature of higher education has led to a variety of advising models, which makes a comparison between institutions difficult. To remedy some of these problems in the existing literature, we utilized data from a large, multi-institutional sample to investigate how advising influences two student outcomes: grades and self-perceived gains. Furthermore, we exploited our sample's inclusion of multiple institutions to examine spillover effects of the advising climate, a first in the advising literature. We also modeled variability in the effectiveness of advising to provide initial estimates of how the relationship between advising services and student outcomes varies across institutions.

CONCEPTUAL FRAMEWORK

We were guided by Astin's (1991) Inputs-Environment-Outcomes (I-E-O) model in this analysis of the impact of academic advising on students' learning and development. According to the I-E-O model, student outcomes are a product of student inputs (pre-college characteristics and experiences), the college environment, and the interactions between student inputs and the college environment. Advising is an environment in the I-E-O framework as it is a service provided by institutions. Astin (1991) distinguished two types of between-institutional environment measures. One type includes structural characteristics like institutional size, control, and selectivity. The other type of environment measures depicts an institution "in a more personal and sophisticated manner" (p. 86), such as the sense of community or types of advising services offered. Extant academic work showed evidence that both types of institutional environment characteristics are associated with student learning outcomes (Astin, 1977; Carini, Kuh, & Klein, 2006; Centra & Rock, 1971; Ewell, 1989; Hu & Kuh, 2002; Porter, 2006).

In the I-E-O model, students' input characteristics, such as gender, racial/ethnic identity, social-economic status, personality, academic preparation, determine the students' attitudes towards advising and the types of services sought from advisors. Additionally, advising services mediate or moderate the relationship between students' inputs and learning outcomes, as advising influences participation in educationally beneficial activities and helps students connect their classroom learning to the real world.

RESEARCH PURPOSE AND QUESTIONS

Guided by Astin's (1991) I-E-O model, we used data from a large national student survey to offer deeper insights into how academic advising influences two student outcomes. This study also aims to highlight the variability in advising across institutions. Specifically, we investigated the following research questions:

1. How do students' advising experiences influence their learning outcomes?
2. How does the institutional advising climate influence students' learning outcomes?
3. Do the impacts of academic advising differ across post-secondary institutions? If so, how do the impacts differ?

METHODS

Data Sources

We utilized data from the National Student Survey of Engagement (NSSE) 2014 administration. NSSE is a student survey focusing on first-year and senior undergraduates' participation in educational beneficial activities and their perceptions of learning outcomes. Due to our focus on academic advising, we focused our analyses on senior students who responded to the academic advising module. The academic advising module was a set of questions institutions could choose to append to the core NSSE instrument. We also excluded students attending special-focus institutions such as musical conservatories and divinity schools. Our final sample included 26,516 senior undergraduates from 156 bachelor-granting colleges and universities. The overall response rate for the sample was 34%. Previous research has demonstrated that NSSE data is relatively free from non-response bias at this response rate (Fosnacht, Sarraf, Howe & Peck, 2017).

Tables 1 and 2 describe the students and institutions included in our sample. Males comprised 37% of our sample, compared to 42% for all bachelor's recipients in 2014 (Snyder, de Brey, & Dillow, 2016). White students represented 72% of our sample, compared to 68% for all bachelor's recipients (Snyder et al., 2016). Asian and Pacific Islander, Black, Hispanic and multi-racial students each comprised 5% to 6% of the sample, while the percentage of bachelor's recipients for these groups were 7%, 11%, 12%, and 3% (Snyder et al., 2016). Consequently, our respondents were slightly more likely to be female and White. Two-thirds of the sample had a parent who earned at least a bachelor's degree. The respondents represented a variety of majors. The institutions were roughly evenly split between public and private status. About half of the institutions had basic Carnegie Classification of master's. The undergraduate enrollments of the sampled institutions ranged from less than 500 to over 35,000.

TABLE 1.
DESCRIPTIVE STATISTICS OF THE STUDENT SAMPLE (N= 26,516)

	<i>Percent</i>
Male	37.11
Distance learner	1.90
Transfer student	19.77
Greek-life participant	14.19
On-campus resident	27.56
Student athlete	8.44
Veteran	1.92
Full-time student	92.85
International student	2.77
Race/ethnicity	
White	72.47
American Indian or Alaska Native	0.39
Asian	4.90
Black or African American	5.06
Hispanic or Latino	5.61
Native Hawaiian or Other Pacific Islander	0.17
Other race or ethnicity	1.08
Multiracial	6.18
Prefer not to respond	4.14
Parental education	
High school or less	16.07
Associate's/Some college	19.67
Bachelor	30.76
Master's or higher	33.50
Educational expectations	
Some college	1.83
Bachelor's	25.96
Master's	44.99
Doctoral or professional	27.22
Major field	
Arts & Humanities	12.73
Biological Sciences, Agriculture, & Natural Resources	12.19
Business	5.84
Communications, Media & Public Relations	13.57
Education	5.01
Engineering	8.28
Health Professions	7.12
All Other majors	12.74
Physical Sciences, Mathematics, & Computer Science	4.59
Social Service Professions	3.62
Social Sciences	14.20
Undecided majors	0.11

Table 1. Cont.

<i>Variable</i>	<i>Mean</i>	<i>SD</i>	<i>Min.</i>	<i>Max.</i>
Self-perceived gains (z score)	0.03	0.94	-2.85	1.53
Grades (z score)	-0.04	0.97	-3.43	1.11
SAT/ACT (z score)	0.09	1.00	-3.47	2.65
Student advising experience scale	-0.01	0.96	-2.62	1.89
# of interactions w/ advisors	2.60	1.80	0.00	6.00

TABLE 2.

DESCRIPTIVE STATISTICS OF THE INSTITUTION SAMPLE (N= 156)

	Percent			
Barron's selectivity rating				
Noncompetitive			3.21	
Less competitive			10.9	
Competitive			40.38	
Competitive Plus			7.05	
Very Competitive			21.15	
Very Competitive Plus			5.13	
Highly Competitive			5.77	
Highly Competitive Plus			3.85	
Most Competitive			2.56	
Control				
Public			47.44	
Private			52.56	
2010 Basic Carnegie Classification				
Doctorate-granting (aggregated)			16.67	
Master's (aggregated)			48.72	
Baccalaureate—Diverse Fields			16.03	
Baccalaureate—Arts & Sciences			18.59	
	Mean	SD	Min.	Max.
Student advising experience scale (aggregated)	0.08	0.21	-0.53	0.56
Undergraduate enrollment (1,000s)	5.89	6.82	0.44	36.24

Our dependent variables were seniors' self-reported grades and self-perceived gains. Student-reported grades was an eight-point scale representing a student's most frequent letter grade at this institution. Self-perceived learning gains was a composite of ten items, covering student's cognitive and affective development (see Appendix A). The Cronbach's α for this index was .90. We standardized both dependent variables with a mean of 0 and a standard deviation of 1.

The core independent variables are two indicators of students' advising experiences. The first is a measure asking about the frequency of advising interactions that included the following options: 0, 1, 2, 3, 4, 5, and 6 or more. The second was a composite measure of advising experiences that seeks to measure more qualitative aspects of the advising experience. As the response options included a non-applicable option, the variable was scored using a graded response model, a form of item response theory (IRT) for ordinal variables, which can account for missing and non-applicable data and give different levels of weight to the items. The graded response model has been used by other postsecondary researchers to create similar scales (e.g., Kim & Sax, 2014; Sharkness & DeAngelo, 2011). The items in the advising experiences variable included the following items that asked to what extent students' academic advisors have done the following:

- (1) being available when needed;
- (2) listening closely to your concerns and questions;
- (3) informed you of important deadlines;
- (4) helped you understand academic rules and policies;
- (5) informed you academic support options (tutoring, study groups, help with writing, etc.);
- (6) provided useful information about courses;
- (7) helped you when you had academic difficulties;
- (8) helped you get information on special opportunities (study abroad, internship, research projects, etc.);
- (9) discussed your career interests and post-graduation plans.

We created a score for each student by using the item parameters in Appendix B to estimate the students' most likely location in the latent distribution, given their responses. The α parameter is derived from the slope of the item characteristic curves and estimates how well the item discriminates between individuals. The β parameters indicate the threshold where in the latent distribution a student would choose that response option. The marginal reliability for the advising experiences variable was .85. We checked the IRT assumptions of appropriate dimensionality and local independence for the advising composite variable by estimating an exploratory factor analysis of the items using polychoric correlations. This variable was standardized with a mean of zero and a standard deviation of one. We also derived an

institutional average for the advising experience variable by aggregating the individual-level advising variable up to the institutional level. As the available literature indicates that advising information takes indirect pathways, we incorporated the institutional average of this variable into our analyses to account for and measure the potential spillover effects of advising.

In our multivariate analyses, we used a variety of student and institutional characteristics that have been found correlated with student learning outcomes to serve as controls (Mayhew et al., 2016). Student characteristics included students' sex, race/ethnicity, parental educational level, international student status, educational expectation, student athlete status, Greek-life participation, veteran status, transfer status, distance learner, enrollment status, major field, and standardized test score (SAT or ACT equivalent score). Institutional characteristics included Basic 2010 Carnegie Classification (aggregated), Barron's selectivity index, enrollment size, and control (private vs. public). Tables 1 and 2 present descriptive statistics of these variables.

Analyses

For both dependent variables, we used multilevel modeling to separate the influences of variables at the individual and institutional levels. We began by estimating the intraclass correlation coefficient to examine the ratio of between-institution to the total variation with null models. We then added predictors into multilevel models for our dependent variables. We sequentially estimated models that allowed the coefficient for the two key independent variables (advising interactions and experiences) to vary across institutions. We used a likelihood ratio test to examine if allowing the coefficient to vary significantly improved model fit. Our final model included the fixed effects for all independent variables, a school-specific random intercept, and school-specific random coefficients for variables meeting the above criteria. Restricted Maximum Likelihood was used to estimate the models (Snijders & Bosker, 2012).

LIMITATIONS

This study has several notable limitations. Our findings are limited to institutions that chose to participate in 2014 NSSE survey and the academic advising module and may have self-selected the module for biasing reasons unknown to the researchers. Although we have a comprehensive sample, baccalaureate colleges and master's colleges and universities are overrepresented in our sample. Consequently, we are cautious to generalize results of the current study to all U.S. postsecondary institutions. Additionally, we lack data on how the institutions in our sample structure their advising services. While we attempt to measure and observe the variability in advising services in our analyses, one format may be more or less effective in promoting student

learning outcomes. Consequently, our results should be viewed as a population average and not directly attributable to all institutions.

Our analyses were limited to senior students, due to our available data (NSSE collects data on first-year and senior students) and our focus on advising experiences throughout the entire undergraduate experience. However, this strategy also fails to capture the experience of students who dropped out or transferred. Finally, the results should not be used to make causal inference about the relationship between academic advising and student learning outcomes. While our data source is arguably the most comprehensive source of data on advising available, it has a cross-sectional design, which prevents causal inference.

RESULTS

We report the results in two sections, one for each of our two dependent variables: grades and self-reported gains. The multivariate results can be found in Table 3. All results presented are after other variables were held constant.

Self-reported Gains

We began our analyses for self-reported gains by examining the extent of variation on this measure observed within and between institutions by calculating the intra-class correlation coefficient (ICC). The ICC for self-reported gains was .03, indicating that nearly most variation is attributable to student, not institution, differences. The design effect was larger than 2, indicating a need for multilevel modeling (Peugh, 2010). Furthermore, we estimated a series of nested models to investigate if the coefficients for the frequency of advising meetings and the student-level advising experiences should be allowed to vary across schools. The likelihood ratio tests indicated improved model fit if these parameters were allowed to vary by school.

Table 3 presents the results for our final multivariate model. We found a positive relationship between the frequency of advising meetings and self-reported gains. The model predicted that for each advising meeting, students' perceived gains would increase by 0.04 SDs, holding constant other factors. Similarly, students' perceptions of advising was positively related to their perceived gains. When students' rating of their academic advising experiences increased by one unit, our results indicate that students' self-reported gains would increase about 0.32 SDs. Additionally, the advising experiences measured at the institutional level, our proxy for the advising culture, indicated that a one unit change in this measure would be expected to increase students' self-reported gains by 0.34 SDs.

To answer our third research question, we allowed the estimate for the student-level frequency of advising interactions and advising experiences

TABLE 3.
FINAL MULTILEVEL MODELS OF SELF-GAINS
AND GRADES FOR SENIORS

	Self-Reported Gains		Grades	
	Est.	S.E.	Est.	S.E.
<i>Fixed Effects</i>				
Number of advising meetings	0.04 ***	0.00	0.01 ***	0.00
Student advising experience scale	0.32 ***	0.01	0.07 ***	0.01
Male	-0.05 ***	0.01	-0.17 ***	0.01
Distance learner	0.03	0.04	0.12 **	0.04
Transfer	-0.14 ***	0.01	0.09 ***	0.01
Greek life	0.08 ***	0.02	-0.09 ***	0.02
On-campus resident	0.01	0.01	0.05 **	0.01
Athlete	-0.07 ***	0.02	-0.01	0.02
Veteran	-0.24 ***	0.04	0.01	0.04
Full-time	0.08 ***	0.02	0.08 ***	0.02
International student	0.05	0.03	0.28 ***	0.03
SAT/ACT (z-scored)	-0.08 ***	0.01	0.37 ***	0.01
Race/ethnicity (Reference = White)				
American Indian	0.02	0.08	-0.16	0.09
Asian	-0.02	0.03	-0.19 ***	0.03
Black	0.09 ***	0.03	-0.42 ***	0.03
Hispanic	0.08 **	0.03	-0.18 ***	0.03
Hawaiian/Pac. Islander	-0.08	0.13	-0.45 ***	0.13
Other race	-0.13*	0.05	-0.06	0.05
Multiracial	-0.09***	0.02	-0.18 ***	0.02
Prefer not to respond	-0.16***	0.03	-0.10 ***	0.03
Parent's education (Reference = Bachelor's)				
High school or less	0.05**	0.02	0.00	0.02
Associate's/Some college	0.03	0.02	-0.06 ***	0.02
Master's or higher	-0.04 **	0.01	0.01	0.01

Table 3. Cont.

	Self-Reported Gains		Grades	
	Est.	S.E.	Est.	S.E.
Educational expectations (Reference = Bachelor's)				
Doctoral	0.18 ***	0.02	0.45 ***	0.02
Master's	0.16 ***	0.01	0.23 ***	0.01
Some college	0.01	0.04	0.03	0.04
Major field (Reference = Arts & Humanities)				
Biological Sciences	0.07 ***	0.02	-0.28 ***	0.02
Business	0.28 ***	0.02	-0.10 ***	0.02
Communications	0.25 ***	0.03	0.01	0.03
Education	0.19 ***	0.02	0.21 ***	0.02
Engineering	0.28 ***	0.03	-0.28 ***	0.03
Health Professions	0.23 ***	0.02	-0.07 **	0.02
Other majors	0.02	0.03	-0.27 ***	0.03
Physical Science	0.32 ***	0.03	0.04	0.03
Social Service prof.	0.18 ***	0.02	-0.12 ***	0.02
Social Sciences	0.08 **	0.03	-0.08 **	0.03
Undecided majors	-0.19	0.16	-0.25	0.16
Carnegie Classification (Reference = Doctoral)				
Bac- Arts & Sciences	0.11 *	0.05	-0.03	0.07
Bac- Diverse Fields	0.01	0.05	0.02	0.07
Master's	0.03	0.03	0.07	0.05

<i>Fixed Effects</i>				
Undergraduate enrollment (1,000s)				
Barron's selectivity rating	0.00	0.00	0.00	0.00
Private	0.03 *	0.01	-0.12 ***	0.02
Student advising experience scale (aggregated)	0.04	0.03	0.07	0.04
Intercept	0.34 ***	0.07	0.01	0.10
	-0.60 ***	0.07	0.20 ***	0.09
<i>Random Effects</i>				
Var. (institutional-level intercept)	0.0205	0.0326		
Var. (rand slope of adv exp)	0.0023	0.0011		
Var. (random slope of adv. meetings)	0.0005			
Var. (individual-level residual)	0.7230	0.7271		
*** p<.001; ** p<.01; *p<.05				

to vary across institutions. The random-effect associated with the number of advising meetings had an SD of 0.02. Therefore, the model suggests that each advising meeting was associated with an increase in perceived gains between 0.00 SDs and 0.08 SDs, at a 95% confidence interval. Consequently, advising meetings appear to have no relationship with perceived gains at some institutions, but frequent meetings at highly effective institutions are predicted to produce sizable increases in perceived gains. Additionally, we found substantial variability in the estimates for students' ratings of their advising interactions. The random-effect associated with the ratings had an SD of 0.05. Therefore, the 95% confidence interval for the relationship ranged between 0.23 and 0.41 SDs. In addition to the key advising variables, other control variables had significant relationships with self-perceived gains, when controlling for other factors. Female students reported statistically higher perceived-gains than their male peers. Transfer, veteran, and student athlete status were correlated with lower gains. Students' SAT (or ACT equivalent) score was negatively correlated with student's self-reported gains. Greek-life participation was positively correlated with higher self-reported gains. Students' perception of their gains also varied among racial groups. Black and Hispanic/Latino students reported significant higher gains than their White peers. However, students who preferred not to provide their race, were multi-racial, or marked the catch-all "other" racial category reported lower perceived gains on average. Compared with students who had a parent earn a bachelor's degree, students with a parent who earned a graduate degree reported slightly lower gains, on average. However, their peers with a parental education level of high school or lower perceived higher gains. Students who expected to obtain a graduate degree reported higher self-reported gains than students who only expected to earn a bachelor's degree. Students' major field also showed a significant relationship to self-reported gains. All major fields, except for the undecided and catch-all "other" category, were positively and significantly correlated with perceived gains compared to students majoring in the arts and humanities. Students attending institutions with a Basic 2010 Carnegie Classification of bachelor's – arts & sciences on average perceived more gains than their peers attending doctoral universities. Institutional selectivity, as measured by Barron's rating, was also positively associated with higher perceived gains.

Grades

Like our analyses for self-perceived gains, we began by calculating the ICC. The ICC was .05, indicating most of the variance on this measure occurs within, not between institutions. The design effect was 9.45, indicating a need for multilevel modeling (Peugh, 2010). We also estimated a series of models to test if the random-effects associated with our key student-level advising variables improved the overall model fit. These analyses indicated

the random effects should be included for the advising experiences variable, but not the number of advising interactions.

As shown in Table 3, we found a significant and positive correlation between the number of advising meetings and grades, net of other factors. For each advising interaction, our model predicts that students' grades would increase by 0.01 SDs. Additionally, one SD change in advising experiences was estimated to increase students' grades by 0.07 SDs. This estimate also varied by school as the SD of the random effect associated with advising experiences was 0.03. Consequently, we assess that there is a 95% chance that the relationship between advising experiences and grades ranged between 0.01 and 0.13 for institutions. Thus, the relationship appears to be negligible for some schools, but impactful for other institutions. Furthermore, our measure of advising culture, advising experiences aggregated to the institution level, exhibited no significant relationship with grades.

In addition to these key variables, our model for grades also indicates a number of other significant relationships. Males reported lower grades than females, on average. Distance learner and transfer status were positively associated with higher grades. Greek-life participation was negatively correlated with grades, while living on-campus and enrolling full-time were positively related. International students reported receiving higher grades on average. Standardized test score was positively related with grades. On average, Asian, Black, Hispanic, Hawaiian/Pacific Islander and multi-racial students reported receiving lower grades than their White peers. Students with a parental education level of "some college" reported lower grades on average than students with a parent who earned a bachelor's degree. Students expecting to earn a graduate degree reported receiving higher grades than their peers expecting to only earn a bachelor's degree. Students in most major fields reported lower average grades than students majoring in the Arts & Humanities. Finally, attending a more selective institution was negatively correlated with grades.

DISCUSSION

The American postsecondary system is increasingly complex. While this complexity has appealing features like a diversity of institution types and missions and distinct major fields, the complexity creates information and bureaucratic barriers to student success. Consequently, student advising has become professionalized over the past half century. While there is a consensus among students and administrators that advising generally has positive impacts on student outcomes, the empirical literature on the effectiveness of advising is not robust. It largely looks at outcomes like satisfaction and persistence at a single institution. These studies largely ignore that advising should theoretically have spillover effects, where advice is indirectly passed

on to students, and neglects the historic focus of advising on cultivating students holistically. Due to this gap in the literature, we examined the relationship between advising and students' self-reported gains in a variety of domains and their grades using data on the college experiences of 26,516 senior undergraduates from 156 bachelor's-granting U.S. higher education institutions. Additionally, our analyses focused on multiple advising dimensions ranging from the frequency of advising interactions, students' assessment of the quality of advising at their institution, and an institutional measure of advising culture.

Our findings indicate that these multiple facets of advising each have a unique and positive relationship with student outcomes. Our model estimates that each meeting with an advisor is associated with a 0.04 SD increase in self-reported gains and a 0.01 SD increase in grades, conditioning on other factors. Similarly, students' assessment of their institution's advising quality was positively related to both outcomes. The results indicate that an SD change in this assessment was expected to increase students' self-assessed learning and development by 0.32 SDs, holding other variables constant. The same change was predicted to increase students' grades by 0.07 SDs. These findings comport with previous studies on the direct influences of advising that focused on a single institution or used small samples (Beal & Noel, 1980; Erlich & Russ-Eft, 2012; Metzner, 1989; Smith & Allen, 2014). These findings support current notions of advising services that individual students' interactions with advisors are crucial for learning outcomes. The magnitude of the relationships also indicate that advising interactions have a stronger influence on students' holistic assessments of their learning and development than on their grades. This finding suggests that the historic focus of advising on the cultivation of the full student, rather than course-specific content, is still a key feature of modern day advising.

We also investigated how the relationship between individual advising experiences and our outcome variables varied across institutions. We found that the relationship between students' assessment of their advising experiences and both of our outcomes varied significantly across institutions. Our results indicate the 95% confidence intervals for relationship between students' rating of their advising experience and self-report gains and grades were .23 and .41 and .01 and .13, respectively. These confidence intervals suggest that advising has a substantially differential relationship between students' perceived gains and grades across institutions. We found a similar relationship for the number of advising meetings on the self-reported gains outcome, as we estimated that each advising meeting was associated with a change in perceived gains between 0.00 and 0.08 SDs. However, we did not observe significant variability in the relationship between the frequency of advising and students' grades. Due to the diversity of advising models implemented for undergraduates, the finding that advising has differential

relationships across institutions is not particularly surprising. However, it highlights that many advising models are likely suboptimal and could be improved to foster student success.

Due to the frequency of students' receiving advising from non-advisors (NSSE, 2014), we hypothesized students frequently received advising information indirectly through third parties. Therefore, advising is likely to lead to spillover effects, which may mask the direct effects of advising. Consequently, we incorporated a proxy for the overall institutional advising culture into our models to capture the influence of such indirect sources of advice. We found that the aggregated mean for students' ratings of their advising interactions was positively and significantly correlated with self-reported gains, but not grades. An SD change in the advising culture proxy was modeled to increase students' self-reported gains by 0.34 SDs. This suggests that the quality of peers' interactions with advisors influences students' self-perceived gains, over and above their individual interactions. Consequently, it appears that advising information received indirectly plays a positive role in students' learning and development. Therefore, we can postulate that advising is likely to have spillover effects and that single-institution studies of the impact of advising probably underestimate the impacts of advising due to their inability to capture and model spillover effects.

Implications for research

Academic research on the relationship between academic advising and student learning outcomes is surprisingly limited (Smith & Allen, 2014). While our research answers some crucial questions on the relationship between advising and student learning outcomes, the study raises some important new questions. First, our finding that the effectiveness between advising services and student learning outcomes varies between institutions indicates that some institutions may not be practicing the most effective form of advising possible. Consequently, future research should focus on the qualitative differences between different models of advising services and their relationship to student outcomes. In particular, a study that compared and contrasted different advising models could lead to the identification of best practices for advising. Despite the three primary forms of advising being prominently featured in the advising literature for over 40 years and the near universal opinion that advising is critically important to student success, it is remarkable that these forms of advising have not been directly compared systematically. Given this glaring need, we believe such a study should be a high priority for funders of research. Additionally, such research should examine if particular subgroups of students disproportionately benefit from a particular form of advising. Second, our research indicates that advising is likely to have spillover effects on student outcomes. Therefore, future research on advising should utilize a multi-institutional design, which would allow

researchers to model spillover effects. Also, previous research that used a single institution design should be viewed as likely underestimating the effectiveness of advising services. The nature of advising is also changing due to technology. Therefore, future research should examine the effectiveness of these new forms of advising.

Implications for practice

The current study also has practical implications for advisors and institutions. Our finding that advising services positively and significantly impact students' learning and development indicates that administrators should seek to maintain advising services, even in an era of scarce resources and increasing concerns over college costs. However, we found that advising is more effective at some institutions than others. This finding calls upon advising administrators and other institutional leaders to critically evaluate if their advising services are optimal for the students served and the nature of the institution. For example, institutions like emerging Hispanic Serving Institutions should examine if their advising system and practices, which were most likely designed for a traditional White and male student body, meet the needs of their increasingly diverse student body. We also found a stronger relationship for advising experiences on perceived gains than for grades. This suggests that there may be room for improvement on how advising can improve course performance. In particular, administrators should examine the relationship between advisors and faculty, as these groups can collaboratively work to improve the student experience. Faculty have the potential to directly spread messages from advisors to students, when they are a captive audience, in a cost-effective manner. Additionally, faculty have the untapped potential of being the eyes and ears for advisors, as they can notice if a student is having academic difficulty and work with an advisor to remedy the situation or notify advisors if a student stops coming to class. Finally, our finding that advising the overall advising climate influences students' perceptions of their learning and development has implications for the assessment of advising services. As information appears to flow indirectly to students through their peers, single-campus studies of advising service may not identify the full effect advising has on students.

CONCLUSION

The increasing need for college graduates in the workforce and the diversity of today's college students makes advising an essential part of the college experience. In this study, we sought to investigate how advising impacts student outcomes using a multi-institutional sample, as previous studies on advising tend to be not generalizable and focused on retention or satisfaction. Overall, we found that the frequency of meeting with an advisor was significantly and positively correlated with self-reported gains

and grades. Additionally, student assessments of their institution’s advising quality was positively related to both perceived gains and grades. However, we observed substantial variation in these relationships across institutions suggesting that many advising models do not fully serve students’ needs and could be improved upon to increase student success. Our analyses also indicated that advising has spillover effects (indirect effects through peers) on students’ self-reported gains. This finding suggests that much of the current advising research may be underestimating the effectiveness of advising due to the reliance upon single institution samples. In light of these findings, we recommend that future research use multi-institutional samples to identify advising’s spillover effects and directly compare how different advising models influence the student experience.

APPENDIX A

Self-perceived gains index

How much has your experience at this institution contributed to your knowledge, skills, and personal development in the following areas? (1 = very little; 2 = some; 3 = quite a bit; 4 = very much)

- (1) Writing clearly and effectively
- (2) Speaking clearly and effectively
- (3) Thinking critically and analytically
- (4) Analyzing numerical and statistical information
- (5) Acquiring job- or work-related knowledge and skills
- (6) Working effectively with others
- (7) Developing or clarifying a personal code of values and ethics
- (8) Understanding people of other backgrounds (economic, racial/ethnic, political, religious, nationality, etc.)
- (9) Solving complex real-world problems
- (10) Being an informed and active citizen

APPENDIX B

GRADED RESPONSE MODEL PARAMETER ESTIMATES FOR THE STUDENT ADVISING EXPERIENCE SCALE

Item	α	$\beta1$	$\beta2$	$\beta3$
Being available when needed	3.05	-1.38	-0.58	0.28
Listening closely to your concerns and questions	4.28	-1.27	-0.54	0.19
Informed you of important deadlines	3.67	-0.98	-0.34	0.38
Helped you understand academic rules and policies	4.34	-0.89	-0.24	0.46
Informed you academic support options	3.64	-0.68	-0.03	0.64
Provided useful information about courses	4.67	-0.94	-0.31	0.38
Helped you when you had academic difficulties	4.40	-0.79	-0.20	0.43
Helped you get information on special opportunities	3.38	-0.64	-0.08	0.56
Discussed your career interests and post-graduation plans	2.74	-0.75	-0.11	0.52

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