

Does Contact With Advisors Predict Judgments and Attitudes Consistent With Student Success? A Multi-institutional Study

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We introduce 5 cognitive and 3 affective outcome measures related to student judgments and attitudes that might result from quality advising encounters. The outcomes have been linked to, or can be conceptualized as predictive of, retention. We examined these outcomes in an online survey of 22,305 students from 2 community colleges and 7 universities as a function of (a) whether or how often students contacted faculty/professional advisors in the formal advising system and (b) whether students consulted advisors, self-advised using official advising materials, or relied upon advice from informal sources to choose required classes. Students who contacted advisors scored higher on all outcomes. They reported more knowledge and attitudes consistent with continuing at their institution and completing their educational program.

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Postsecondary institutional leaders hope to inspire specific learning outcomes through academic advising. Many outcomes are institution-specific and thus tied to institutional mission as well as campus mission statements for academic advising (Aiken-Wisniewski, 2010; Schuh, 2008). Moreover, educators often cite advising as a key ingredient in the ultimate student outcome: retention. We identify outcomes students might derive from academic advising that likely contribute to their continued enrollment at their institution through degree completion. We also examine whether these outcomes can be tied to student contacts with advisors in the formal advising system.

The advising assessment literature is replete with the assertion that student learning outcomes of advising vary from institution to institution (e.g., Appleby, 2008; Robbins, 2009). However, we believe that some advising learning outcomes are common to many institutions because they represent cognitive and affective outcomes associated

with student success; that is, they are student judgments and attitudes that are either already known to be, or can be conceptualized as being, tied to persistence. We argue that these capacities reflect some of the cognitive and affective outcomes expected from quality academic advising.

Academic advising has been linked to student retention since the 1970s (e.g., Grites, 1977). Indeed, on surveys administered throughout the last 30 years, college and university administrators have consistently identified improvements in academic advising as a major strategy to increase student retention (Habley, Valiga, McClanahan, & Burkum, 2010). However, according to Cuseo (2003) and Voorhees (1990), despite the conceptual connection between advising and retention, little empirical evidence supports the link. In our examination of the literature, we identified a few single-institution studies that demonstrate a direct link between advising and retention (Seidman, 1991; Vowell, Farren, & McGlone, 1990). However, most studies purported to show an association between advising and retention featured advising as part of a package of interventions such as contracts, goal setting, freshman year experiences, or intensive group support sessions (Abelman & Molina, 2001; Austin, Cherney, Crouner, & Hill, 1997; Hudesman, Avramides, Loveday, Waber, & Wendell, 1993; Kirk-Kuwaye & Nishida, 2001; Lopez, Yanez, Clayton, & Thompson, 1988; Morehead & Johnson, 1964; Novels & Ender, 1988; Steele, Kennedy, & Gordon, 1993). Unfortunately, the complexity of these advising situations precludes a clear identification of the critical ingredient associated with student retention.

To complicate matters, a few studies indicated that academic advising influences retention indirectly by affecting other outcomes, such as study skills, grades, academic integration, institutional commitment, or satisfaction (Braxton, Duster, & Pascarella, 1988; Metzner, 1989). More recently, Kuh (2008) and Young-Jones, Burt, Dixon, and Hawthorne (2013) reported a relationship between advising and factors linked to retention (e.g., student self-efficacy, study skills, and engagement

in educationally purposeful activities). Nonetheless, whether the influence of academic advising is direct or indirect, the processes through which advising asserts influence on retention remain unclear, leading us to concur with Habley, Bloom, and Robbins (2012) that “there is ample room for scholarly inquiry into the effectiveness and outcomes of academic advising efforts” (p. 291).

We propose that the learning experienced by students as a result of participation in academic advising is one mechanism through which advising exerts its influence on retention. However, before we can empirically examine this proposition, we first must confirm that students learn from advising encounters. The empirical connection between students’ participation in advising and the learning thought to result from it has only recently been considered (Erlich & Russ-Eft, 2013).

Our study is a first step toward showing that connection. We introduce five cognitive and three affective outcome measures related to student judgments and attitudes that might result from quality advising encounters. We examined these outcomes with an online survey of 22,305 students from two community colleges and seven universities as a function of (a) whether or how often students contacted faculty/professional advisors in the formal advising system and (b) whether students consulted advisors, self-advised using official advising materials, or relied upon advice from informal sources to choose required classes. Results are based on analyses of covariance (ANCOVAs).

Cognitive Outcomes of Academic Advising

The literature on assessment of learning suggests a variety of frameworks for designing learning outcomes, including a focus on institutional mission (Campbell & Nutt, 2008; Hemwall & Trachte, 2003, 2005; Martin, 2007; Melander, 2005), student development (Erwin, 1991), and the framework we chose: What students should be able to know, do, and value or appreciate as a result of the academic advising experience (Maki, 2004, as cited in Aiken-Wisniewski, 2010; see also Angelo & Cross, 1993; Ewell, 1987; National Academic Advising Association [NACADA], 2007; Palomba & Banta, 1999). We opted to study knowledge students gain from advising in the context of our conceptualization of quality academic advising, which was based on an examination of the advising literature of the preceding 30 years.

We conceived quality academic advising as a multidimensional process encompassing five do-

main: provision of accurate information about degree requirements and how the institution works within time lines, policies, and procedures; referral to campus resources for academic and nonacademic problems; integration of the student’s academic, career, and life goals with each other and with aspects of the curriculum and cocurriculum; individuation, or consideration of students’ individual characteristics, interests, and skills; and shared responsibility or encouragement of students to assume responsibility for their education by giving them opportunities to develop and practice planning, problem-solving, and decision-making skills (Smith & Allen, 2006). To design our cognitive outcomes, we focused explicitly on three of these domains: information, referral, and integration.

Information

Our research in single and multi-institutional studies has consistently shown that students place high value on the advisor’s ability to provide accurate information about degree requirements (Allen & Smith, 2008; Allen, Smith, & Muehleck, 2013; Smith & Allen, 2006). Students’ knowledge of requirements they must meet to achieve their educational goals is fundamental to their success, and lack of knowledge about these requirements can lengthen the time for or prevent them from earning their degree. Students who act upon inaccurate or incomplete knowledge of requirements may also become discouraged as they miss deadlines, take unnecessary classes, or omit required courses (Allen, Smith, & Muehleck, in press). Through encounters with knowledgeable advisors, students gain accurate information about requirements for their program of study (Folsom, 2007). Thus, we predicted that students who contacted an advisor would be more likely to agree that they know the requirements for earning their degree or meeting their educational goals than would those who did not contact an advisor.

For success through graduation, students must understand how things work with regard to time lines, policies, and procedures at their postsecondary institution. Colleges and universities make bureaucratic rules that may confuse those unfamiliar with them such that the milieu can frustrate even the most committed student (Godwin & Markham, 1996). Regardless of size and mission, colleges and universities are complex, and students need to develop “cognitive maps” (Attinasi, 1989, p. 268) of the institution and their place within it. Through advising, students

learn how to navigate complex institutional time lines, policies, and procedures of registration, financial aid, grading, petitions/appeals, and graduation. Thus, we expected that students who contacted an advisor would be more likely to agree that they know how things work at their institution than those who did not contact an advisor.

Referral

Colleges and universities offer many resources to assist students with academic or nonacademic problems that might thwart their success. Although provision of these resources is necessary to support student success, it is not sufficient (Kuh, Kinzie, Schuh, & Whitt, 2005). Students must also be aware of and use these resources to benefit from them. Indeed, students who use support services tend to perform better in college (Cuseo, 2003; Kuh, 2008). Advisors who know their students as individuals will direct them to appropriate resources (Folsom, 2007). Thus, we predicted that students who contacted an advisor would be more likely to agree that they know where to access help at the institution than would those who did not contact an advisor.

Integration

Ideally, students engage in educationally purposeful activities that integrate their academic, career, and life goals. In fact, many scholars have suggested that connected learning is a primary goal of liberal education (see, e.g., Cronon, 1998; Schneider, 1997). Students identify particularly influential faculty members as “those who helped students make connections between a serious curriculum, on the one hand, and the students’ personal lives, values, and experiences, on the other” (Light, 2001, p. 110). Students who meet with an advisor regularly are more likely to engage in a range of educationally purposeful activities (Kuh, 2008). In an atmosphere of shared responsibility, advisors help students make educational decisions that allow them to take full advantage of curricular and cocurricular opportunities. Therefore, we expected that students who contacted an advisor would be more likely to report that they understand how their academic choices at their institution connect to their career and life goals than those who did not contact an advisor.

Goal Commitment

Theory and research on retention predictors directly formed the basis for our goal commitment outcome. Goal commitment, which has been both conceptually (Tinto, 1993) and empirically (Braxton, Sullivan, & Johnson, 1997) associated with retention, can be measured by ascertaining whether students have formulated plans to accomplish their educational goals. Students who lack clear plans may take longer to graduate or may drop out of college (Gore & Metz, 2008). Through shared advisor–advisee responsibility, “effective advising can exert appreciable impact on student retention through its salutary influence on students’ educational and career planning and decision-making” (Cuseo, 2008, p. 5). Therefore, we predicted that students who contacted an advisor would be more likely to report having a plan to achieve their educational goals than those who did not contact an advisor.

Affective Outcomes of Academic Advising

We also focused on what students might come to appreciate or value as a result of participation in academic advising (Maki, 2004, as cited in Aiken-Wisniewski, 2010). Discussions of affective outcomes of advising often suggest elevated objectives for what students learn, such as appreciating the purpose of higher education or valuing the importance of lifelong learning (NACADA, 2007). We opted instead for more straightforward measures that might reflect whether students appreciated academic advising and felt it was worthwhile. We predicted that students who contacted an advisor would be more likely than those who did not to agree that it is important to develop an advisor–advisee relationship with someone on campus. Moreover, seeing the value of advising for themselves and others, they would be more likely to agree that advising should be mandatory.

We also turned to research on student success, which has consistently shown that interaction with faculty and staff outside the classroom exerts a positive influence on a number of student outcomes (Pascarella & Terenzini, 2005). Kuh (2008) asserted that “every advising contact is a precious opportunity of meaningful interaction” (p. 79). Whether they become mentors themselves or emphasize to their advisees the importance of finding mentors on campus, advisors can play a critical role in helping students establish significant relationships with individuals who can help them succeed. Thus, we predicted that students who contacted an advisor would be more likely than

Table 1. Advising learning outcomes and variable names

Variable	Advising Learning Outcome
Knows Requirements	University students: I know what requirements (e.g., major, general education, other university requirements) I must fulfill in order to earn my degree. Community college students: I know what requirements (e.g., prerequisites, general education, transfer requirements) I must fulfill at [name of institution] in order to meet my educational goals.
Understands How Things Work	I understand how things work at [name of institution] (time lines, policies, and procedures with regard to registration, financial aid, grading, graduation, petitions and appeals, etc.).
Knows Resources	When I have a problem, I know where at [name of institution] I can go to get help.
Understands Connections	I understand how my academic choices at [name of institution] connect to my career and life goals.
Has Educational Plan	I have a plan to achieve my educational goals.
Values Advisor–Advisee Relationship	It is important to develop an advisor–advisee relationship with someone on campus.
Supports Mandatory Advising	There should be mandatory academic advising for students.
Has Significant Relationship	I have had at least one relationship with a faculty or staff member at [name of institution] that has had a significant and positive influence on me.

those who did not to agree that they have had at least one relationship with a faculty or staff member at their institution that has had a significant and positive influence on them. Table 1 lists the eight advising learning outcomes and their corresponding variable names.

The Present Study

We examined associations between receipt of academic advising and student learning in two ways. First, we measured whether or how often students received advising from individuals in the formal advising system to **determine if frequency of advising encounters was associated with our eight outcomes**. If the outcomes are valid (i.e., accurately measuring judgments and attitudes students derive from advising), then scores on these measures should be higher for students who have contacted an advisor than for those who have not contacted an advisor. Moreover, among students who have contacted an advisor, those with more contacts should score higher than those with fewer encounters.

Second, we attempted to determine whether the manner in which students get most of their class requirement **information matters for student learning**. Students receive information about required classes from sources other than advisors; for example, institutions **place advising materials** on-

line or **in handouts or guides**. Students also get information from individuals in their informal support system (i.e., friends/other students, family members). If the advising interaction makes a difference in student learning, then learning outcome scores from the survey should be higher for students who consulted an advisor about required courses than for students who self-advised using tools provided by the institution or who relied on advice from friends or family; we made no predictions about how the latter two groups would differ because our primary interest was in comparing students with and without an advisor.

We used frequency of contact with advisor and source of information about required classes to examine advising outcomes in over 22,000 students at nine institutions while controlling for other variables likely to be associated with student learning. The study was conducted by a research collaborative of faculty and professional advisors whose members agreed that our eight outcomes appropriately described expected learning students gain from academic advising. The following questions guided the analyses:

- R1. Do scores on our eight outcomes vary **as a function of frequency of contact with an advisor in the formal advising system**? Specifically, are scores higher

Table 2. Carnegie classification, full-time equivalent (FTE) enrollment, number of participants, and percentage of total sample for each study institution

Institution	Carnegie Classification	FTE	<i>n</i>	%
Community College 1	Associate's/Public/Urban Serving/Multi-campus	1,340–3,406	6,013	27.0
Community College 2	Associate's/Public/Rural Serving/Large	4,152	1,159	5.2
Private University 1	Master's (large programs)	1,821	437	2.0
Private University 2	Master's (large programs)	2,870	1,599	7.2
Public University 1	Master's (small programs)	2,870	1,206	5.4
Public University 2	Master's (medium programs)	4,891	1,495	6.7
Public University 3	Research University (high research activity)	22,134	2,746	12.3
Public University 4	Research University (very high research activity)	22,635	3,647	16.4
Public University 5	Research University (very high research activity)	20,863	4,003	17.9
Total			22,305	100.0

Note. Carnegie Foundation (2010). Community College 1 has four distinct campuses with FTE enrollments of 1,340; 1,946; 2,313; and 3,406.

for students who have contacted an advisor than for those who have not? Among students who have contacted an advisor, are scores higher for those who have more contacts than for those with fewer encounters?

- R2. Do scores on our eight outcomes vary as a function of source of information about required classes? Specifically, are scores higher for students who have relied on an advisor for help in choosing required classes than for students who have self-advised using advising tools provided by the institution or advice from members of their informal social network?

Method

Our research reflects one part of a series of studies in a large-scale, multi-institutional research project conducted in a northwestern state. The project involved many independent and dependent measures concerning students' attitudes toward and experiences with academic advising.

Participants

Participants were enrolled in nine institutions and in Spring 2010 or 2011 completed a web-based survey focused on academic advising. Study institutions included two community colleges, two private not-for-profit universities, and five public universities. The target population included all students enrolled in credit-bearing classes at the community colleges and all fully admitted degree-seeking undergraduates enrolled

at the universities. Of the 107,740 students invited to participate, 28,147 (26.1%) completed the survey. Participation rates ranged from 16% at Public University 3 to 53% at Private University 2.

Because students attend community colleges for a variety of reasons and we wanted all participants to have similar educational goals, we included data only from students who indicated that their reason for attending their community college was "to earn credit toward a bachelor's (4-year) degree." As a result, our sample size was reduced to 22,305 students. Table 2 gives the Carnegie classification (Carnegie Foundation, 2010), size (full-time equivalent enrollment), as well as number and percentage of participants for each study institution. Of the sample, 64.1% were female, 33.1% were new students (i.e., enrolled at their institution for the first time during the academic year in which the survey was administered), and 76.5% were White. The mean age was 25.3 ($SD = 8.5$) years.

Measures

Measures for this study came from responses to selected questions on the *Inventory of Academic Advising Functions—Student Version* (Smith & Allen, 2006).

Frequency of contact with advisor. Students were asked, "Which of the following describes where at [name of institution] you get your PRIMARY academic advising, that is, the advising you consider most central to your academic progress?" Students chose one option from a list that included general institutional representatives

common to all study institutions (“faculty advisor in my program of study”) as well as advising offices (e.g., “advising center,” “student support office”) unique to each institution. In essence, options referred either to specific persons or to offices where students could interact with an advisor. Because most institutions did not have mandatory advising systems, the list also included a no advising option: “I have not received academic advising from faculty or staff at [name of institution].” Students were asked, “On average, how often do you get advice from your primary source of advising, that is, the advising you consider most central to your academic progress?” (this question was omitted for students who selected the no advising option). The respondent could select one of the following options: “at least once per term,” “at least twice per year,” “at least once per year,” and for students who accessed advising at their institution only in the past, “I’m not currently getting academic advising from faculty or staff at [name of institution].”

To operationalize frequency of contact with advisors in the formal advising system, we assigned students who responded to these frequency-of-contact questions ($n = 21,851$) to one of three groups. The not advised group ($n = 3,439$) included students who indicated they had not received or were not currently getting academic advising from faculty or staff at their institution. The advised occasionally group ($n = 3,534$) consisted of students who indicated they receive advice at least once per year. The advised frequently group ($n = 14,878$) included students who indicated they receive advice at least once per term or at least twice per year.

Source of information. Students were asked to select the option that best describes where they get most of their “information about classes to take to meet degree requirements.” Options included the institutional representatives and advising offices listed in the previous question; institutional tools students might use to self-advise (“catalog,” “advising website,” “advising guide”); and two options that referred to members of the student’s informal social network: “friend(s)/other student(s),” “family member(s).”

To operationalize source of information about required classes, we grouped students who responded to the question ($n = 21,396$) according to their responses. The advisor group ($n = 12,946$) consisted of students who selected institutional representatives or advising offices. The advising tools group ($n = 7,206$) included students who

selected sources of information that involved institutional tools. The informal-social-network group ($n = 1,244$) included students who selected “friend(s)/other student(s)” or “family member(s).”

Outcome variables. Students indicated their agreement with our eight advising outcomes (see Table 1) using 6-point Likert-type scales where 1 = *strongly disagree* and 6 = *strongly agree*. We used Cronbach’s α , a measure of internal consistency, to assess reliability; the resulting coefficient was .74.

Procedure

Students were sent an e-mail message from a senior administrator at their respective institution inviting them to complete a web-based survey on academic advising accessed through an embedded link. Students at eight institutions were offered a chance to receive one of four \$50 gift certificates from the local bookstore if they completed the survey. One of the research institutions had a policy disallowing incentives for students to participate in research; however, this institution’s participation rate (22%) was comparable to or higher than the other research universities. Survey responses were merged with data from the respective institution’s student information system to obtain demographic characteristics of participants.

Data Analyses

Because we wanted to demonstrate that scores on our eight advising outcomes varied as a function of our two independent variables—frequency of contact or source of information—and not personal or institutional characteristics, we used ANCOVAs to control for other variables that might affect advising learning outcomes. The nine institutions feature unique social and academic environments and students’ interactions with these environments influence their learning (Tinto, 1993). We also controlled for size of institution in response to Hemwall and Trachte’s (2003) suggestion that small colleges produce more advising learning than their larger counterparts. Student characteristics also influence advising knowledge and attitudes. Newly enrolled students (i.e., those who enrolled at their institution for the first time during the year the survey was administered) have encountered fewer learning opportunities than students who have been on campus longer. Finally, because of the impact of GPA on numerous student outcomes

(Pascarella & Terenzini, 2005), we controlled for students' institutional GPA as of the time the survey was administered.

We conducted 2 one-way ANCOVAs to evaluate whether mean scores on each learning outcome, adjusted for differences in the covariates (institution, size of student body, new versus continuing student, and GPA), differed among the three frequency-of-contact (RQ1) and three source-of-information (RQ2) groups, respectively. In our preliminary analyses, we evaluated the homogeneity-of-slopes assumption, which indicated that the relationship between some covariates and some outcomes differed significantly as a function of our independent variables (14% of the relationships for frequency of contact, 30% for source of information). However, none of these models was associated with an η^2 value greater than .001, meaning the covariate/outcome relationship accounted for less than .001% of the variance. For each research question we conducted follow-up tests to evaluate pairwise differences among adjusted mean scores of the three groups. In these follow-up tests, we used the Sidak correction to control for Type I errors.

Results

Frequency of Contact With Advisor

Table 3 presents, for each advising learning outcome, unadjusted means and standard deviations, means adjusted for initial differences of the covariates, and results of ANCOVAs for the three frequency-of-contact groups. All eight ANCOVAs were significant at the $p < .001$ level with effect sizes ranging from $\eta^2 = .01$ to $\eta^2 = .06$.

Follow-up tests revealed a consistent pattern across all eight outcomes: Students in the advised frequently and advised occasionally groups scored significantly higher than students in the not advised group. Students in the advised frequently group scored significantly higher than those in the advised occasionally group.

Source of Information

Table 4 presents, for each advising learning outcome, unadjusted means and standard deviations, means adjusted for initial differences of the covariates, and results of ANCOVAs for the three source-of-information groups. All eight ANCOVAs were significant at the $p < .001$ level with effect sizes ranging from $\eta^2 = .01$ to $\eta^2 = .04$.

Follow-up tests revealed that on all eight outcomes, students in the advisor group scored

significantly higher than participants in either of the other two groups. Students in the advising tools group scored significantly higher than those in the informal-social-network group on all but two of the learning outcomes. On items about valuing the advisor–advisee relationship and support for mandatory advising, the informal-social-network group scored significantly higher than the advising tools group.

Discussion

We examined self-evaluations of advising knowledge, as well as advising attitudes, in over 22,000 students from nine institutions as a function of (a) frequency of student contacts with faculty and professional advisors in the formal advising system and (b) source of information about required classes—that is, whether students contacted advisors or self-advised using official advising tools or advice from members of their informal social support system. We asked students about five cognitive outcomes:

- *Knows requirements*. Do they know the requirements they must fulfill to earn their degree or meet their educational goals?
- *Understands how things work*. Do they know time lines, policies, and procedures?
- *Knows resources*. Do they know where to go for help at the institution?
- *Understands connections*. Do they understand how their academic choices connect to their career and life goals?
- *Has educational plan*. Do they have a plan to achieve their educational goals?

Additionally, we examined three affective outcomes:

- *Values advisor–advisee relationship*. Do they agree it is important to develop an advisor–advisee relationship?
- *Supports mandatory advising*. Do they agree that advising should be mandatory?
- *Has significant relationship*. Do they have at least one relationship with a faculty or staff member at the institution that has had a significant and positive influence on them?

Results for frequency of advising were unequivocal. Scores on all eight learning outcomes were significantly higher for students who had met with an advisor in the formal advising system than for those who had not. Among students who had

Table 3. Unadjusted means, standard deviations, adjusted means, results of one-way ANCOVAs, and post hoc analyses for frequency-of-contact groups on learning outcomes

Learning Outcome	Frequency of Contact						Results of ANCOVAs
	Advised Frequently		Advised Occasionally		Not Advised		
	Unadjusted <i>M(SD)</i>	Adjusted <i>M</i>	Unadjusted <i>M(SD)</i>	Adjusted <i>M</i>	Unadjusted <i>M(SD)</i>	Adjusted <i>M</i>	
Knows Requirements	5.09 (1.11)	5.09 _a	4.97 (1.19)	4.93 _b	4.56 (1.44)	4.62 _c	$F(2, 20551) = 197.41, MSE = 1.35,$ $p < .001, \eta^2 = .02$
Understands How Things Work	4.59 (1.24)	4.60 _a	4.43 (1.31)	4.39 _b	4.23 (1.40)	4.23 _c	$F(2, 20544) = 119.39, MSE = 1.59,$ $p < .001, \eta^2 = .01$
Knows Resources	4.52 (1.36)	4.52 _a	4.02 (1.46)	4.02 _b	3.69 (1.59)	3.67 _c	$F(2, 20527) = 522.64, MSE = 1.95,$ $p < .001, \eta^2 = .05$
Understands Connections	5.04 (1.07)	5.05 _a	4.83 (1.19)	4.82 _b	4.64 (1.29)	4.63 _c	$F(2, 20510) = 189.98, MSE = 1.24,$ $p < .001, \eta^2 = .02$
Has Educational Plan	5.48 (0.84)	5.48 _a	5.36 (0.94)	5.34 _b	5.21 (1.11)	5.22 _c	$F(2, 21418) = 121.16, MSE = .81,$ $p < .001, \eta^2 = .01$
Values Advisor–Advisee Relationship	5.20 (1.01)	5.19 _a	4.79 (1.19)	4.80 _b	4.42 (1.39)	4.46 _c	$F(2, 20585) = 594.47, MSE = 1.21,$ $p < .001, \eta^2 = .06$
Supports Mandatory Advising	4.51 (1.47)	4.49 _a	4.04 (1.60)	4.07 _b	3.89 (1.72)	3.93 _c	$F(2, 20564) = 215.82, MSE = 2.32,$ $p < .001, \eta^2 = .02$
Has Significant Relationship	4.51 (1.51)	4.51 _a	4.12 (1.67)	4.07 _b	3.79 (1.76)	3.83 _c	$F(2, 21442) = 305.37, MSE = 2.37,$ $p < .001, \eta^2 = .03$

Note. Ratings were made on 6-point Likert-type scales (1 = *strongly disagree*, 6 = *strongly agree*). Within each row, adjusted means with different subscripts differ at $p < .001$ minimally after the Sidak correction for multiple comparisons was used. Subscript *a* signifies the highest mean and subscript *c* signifies the lowest mean. Covariates: institution, size, new versus continuing student, GPA

Table 4. Unadjusted means, standard deviations, adjusted means, results of one-way ANCOVAs, and post hoc analyses for source-of-information groups on learning outcomes

Learning Outcome	Source of Information						Results of ANCOVAs
	Advisor		Advising Tools		Informal Social Network		
	Unadjusted <i>M(SD)</i>	Adjusted <i>M</i>	Unadjusted <i>M(SD)</i>	Adjusted <i>M</i>	Unadjusted <i>M(SD)</i>	Adjusted <i>M</i>	
Knows Requirements	5.09 (1.11)	5.08 _a	4.92 (1.25)	4.93 _b	4.39 (1.46)	4.42 _c	$F(2, 20307) = 184.58, MSE = 1.34, p < .001, \eta^2 = .02$
Understands How Things Work	4.61 (1.24)	4.61 _a	4.42 (1.31)	4.41 _b	3.97 (1.40)	4.04 _c	$F(2, 20299) = 139.66, MSE = 1.57, p < .001, \eta^2 = .01$
Knows Resources	4.54 (1.36)	4.53 _a	4.03 (1.49)	4.04 _b	3.62 (1.52)	3.66 _c	$F(2, 20283) = 402.59, MSE = 1.95, p < .001, \eta^2 = .04$
Understands Connections	5.06 (1.07)	5.06 _a	4.81 (1.19)	4.80 _b	4.51 (1.34)	4.56 _c	$F(2, 20267) = 188.71, MSE = 1.23, p < .001, \eta^2 = .02$
Has Educational Plan	5.48 (0.85)	5.47 _a	5.35 (0.95)	5.35 _b	5.18 (1.10)	5.21 _c	$F(2, 21157) = 75.85, MSE = .81, p < .001, \eta^2 = .01$
Values Advisor-Advisee Relationship	5.20 (1.02)	5.18 _a	4.73 (1.26)	4.76 _c	4.85 (1.21)	4.85 _b	$F(2, 20338) = 329.18, MSE = 1.23, p < .001, \eta^2 = .03$
Supports Mandatory Advising	4.52 (1.47)	4.50 _a	4.04 (1.63)	4.07 _c	4.22 (1.57)	4.22 _b	$F(2, 20318) = 174.30, MSE = 2.31, p < .001, \eta^2 = .02$
Has Significant Relationship	4.51 (1.52)	4.50 _a	4.10 (1.67)	4.11 _b	3.92 (1.72)	3.99 _c	$F(2, 21179) = 169.75, MSE = 2.39, p < .001, \eta^2 = .02$

Note. Ratings were made on 6-point Likert scales (1 = *strongly disagree*, 6 = *strongly agree*). Within each row, adjusted means with different subscripts differ at $p < .03$ minimally after the Sidak correction for multiple comparisons was used. Subscript *a* signifies the highest mean and subscript *c* signifies the lowest mean. Covariates: institution, size, new versus continuing student, GPA

contacted an advisor, scores were significantly higher for students who had more contacts than for those with fewer encounters. We obtained these (and all) results even when controlling for other variables that likely influence advising learning of students: institution, size of student body, GPA, and status as either newly enrolled or continuing. Contacting an advisor, and doing so more often, was associated with greater self-reported knowledge that likely contributes to student success as well as more positive attitudes toward advising and a greater likelihood of reporting a significant and positive relationship with a faculty or staff member on campus.

Students who received most of their information about required classes from an advisor scored significantly higher on all eight learning outcomes than those who used official advising tools (e.g., guides or web sites) or who relied on advice from friends, other students, or family members. Apparently, students who met with an advisor gained more than just the information that the advising tools contain. On six of the eight outcomes, students who relied on advising tools to choose required courses scored higher than those who got advice from informal sources. Thus, for most of the outcomes we measured, students benefited more from official advising materials or web sites than from their informal network.

Students who used advising tools were less likely than other students to agree that developing an advisor–advisee relationship with someone on campus is important and that advising should be mandatory. Some of these students may be disgruntled former advisees. Others may have not discovered the benefits of advising. In either case, leaders at institutions without mandatory advising systems may wish to identify and reach out to these students to bring them back or introduce them to the support good advising provides.

Student reports of advising knowledge, as well as advising attitudes, were generally on the positive end of the scale (i.e., greater than 4 on the 6-point scale), even for respondents not getting advising (16% of our sample) or selecting required courses based on advice from their informal social network (6% of our sample). However, compared to others, these latter groups were more diverse, as evidenced by the larger standard deviations on most outcomes. Some of these students may not think they need advising. Others may overestimate their learning (i.e., they do not know what they do not know). Nevertheless, because of the connection between advising and the outcomes measured, we

recommend that colleges and universities ensure that students receive advising from official sources, preferably advisors. Mandatory advising would allow institutions to verify that students have gained knowledge and developed attitudes predictive of success.

Limitations and Future Research

The most important limitation of this study is that students were not (and ethically could not be) randomly assigned into frequency-of-contact or source-of-information groups; in essence, students self-selected into these groups. Most of the study institutions did not mandate advising; when we controlled for the institution in which the student was enrolled, we took into account this institutional characteristic as well as others. However, we are left with the question: Are students who manage to find an advisor where advising is not mandated unique in some unmeasured way? Although we controlled for GPA and whether students were newly enrolled, other unmeasured variables may have influenced our results. Longitudinal data would help untangle the relative contribution to advising learning of preexisting student characteristics and institutional or advisor intervention.

Reliance on student self-reports for all measures creates additional limitations. The frequency-of-contact with advisor measure was based on student reports of whether or how often they contacted advisors. Likewise, the source-of-information measure came from students indicating where they get most of their information about required classes. Although likely to be accurately reported, these global measures were probably the reason why, despite the consistency of our findings, our effect sizes (η^2) were small to medium, ranging from .01 to .06. More nuanced measures of processes critical to quality advising encounters would likely strengthen findings linking advising with student learning.

Our cognitive measures of advising learning were indirect (Aiken-Wisniewski, 2010; Robbins, 2009), based on student ratings of their own advising knowledge. Although student self-assessments of knowledge “have a critical role in the learning process” (Sitzmann, Ely, Brown, & Bauer, 2010, p. 181) and have the advantage of being equivalent across multiple institutions, their accuracy in advising contexts has not been investigated. In classroom contexts, self-assessments of knowledge have been found to be moderately related to cognitive learning but strongly related to motivation (the degree to which learners strive to apply

the knowledge they gained) and reactions (the learners' satisfaction with their institutional experience) (Sitzmann et al., 2010). These findings raise the intriguing possibility, worthy of future investigation, that even our cognitive measures were, in fact, measures of student affect. Direct measures of cognitive learning, such as objective tests or essay assignments given pre- and post-advising (Cuseo, 2008), classroom assessment techniques adapted to advising contexts (Hurt, 2007), or ratings of student preparation by others such as personnel in career centers (Kelley, 2008), were beyond the scope of our multi-institutional study.

In this study, we demonstrated an empirical connection between students' encounters with advisors and eight advising learning outcomes. Students reported more knowledge and attitudes predictive of success when they saw advisors, interacted with them more often, and consulted with them rather than official advising tools or other students to choose required courses. This pattern of findings represents a vital first step in establishing the construct validity of our eight advising learning outcomes and an initial step in demonstrating a link between advising and student learning.

Yet, students uniformly scored lower on some outcomes than on others, suggesting that some parts of the advising curriculum measured here may be more difficult for students to negotiate than others. For example, students in all groups were more likely to report that they know the requirements they must fulfill at their institution than where to go for help with problems. Students were also more likely to report that they have an educational plan than that they have had a significant relationship with a faculty or staff member on campus. Further research is needed to determine if these outcomes differentially predict retention so that institutional leaders know how to focus their advising resources to maximize student persistence.

Finally, a factor analysis should be performed to confirm that our grouping of outcomes as cognitive and affective is appropriate. Information on the role of advising satisfaction in advising learning may also prove useful. In sum, researchers should continue to examine the role of advising learning in student success, because the learning that transpires in advising may turn out to be an important determinant of whether or not students stay in school and complete their degrees.

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