

Seeking Advice:

An Exploratory Analysis of How Often First-Year Students Meet with Advisors

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Abstract

While it is well understood that academic advising helps students adjust to and deal with the challenges of college, little is known about what influences the extent of their interactions with advisors. Using data from 52,546 full-time, first-year students at a diverse set of 209 institutions, we examined how often students met with academic advisors, and how this varies by student and institutional characteristics. We find that the typical first-year student met with an advisor one to three times during their first college year. However, the number of meetings varied across student subpopulations and institutional types. Findings aim to inform wider discussions about academic advising and student support on college campuses.

Keywords: Academic advising, assessment, supportive campus environment

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The American higher education system is the most complex education system in the world. Colleges and universities have diversified with regard to type, degrees offerings (Lucas, 1994), and social and economic backgrounds of their students (McCormick, 2011). Due to this expansion, it is not surprising that the campus environment can pose significant social, physical, bureaucratic obstacles for incoming students (St. John, Hu, & Fisher, 2011). Navigating the campus, reaching academic goals, and pursuing career or educational ambitions often require guidance from others. White and Schulenburg (2012) argue that academic advisors hold a strategic position in the college environment to facilitate the connection between students' academic choices and the larger purpose of their educational goals. Advisors often guide students through a host of important educational decisions including course selection, degree plan, personal development, and career decisions (Ender, Winston, & Miller, 1982).

Yet, despite the importance of academic advising on college campuses and the growing body of literature showing its positive effects on retention and satisfaction (e.g., Christian & Sprinkle, 2013; Kuh, 2008), little is known about how often today's students take advantage of this valuable resource and how the institutional setting shapes the frequency of interactions with advisors. The present study explores these questions among first-year students by examining the relationship between students' demographic and academic characteristics and how often they met with advisors, and whether these patterns vary by institutional characteristics. Findings aim to inform the wider discussion of academic advising and student support on college campuses.

Literature Review

Academic advising as a formal job category developed in the late twentieth century as a result of the massification of higher education and the shift of faculty responsibilities from holistic student development toward a more exclusive focus on teaching and research (Hemwall,

2008; Self, 2008). Helping students navigate requirements and opportunities, academic advisors serve an important role in undergraduate education (National Academic Advising Association [NACADA], 2014). In the 1980s, academic advising was recognized as a distinct role on campus, with specific responsibilities and guidelines for advisors established by the Council for the Advancement of Standards (Cook, 2009). NACADA (2014) defines expectations for advisors to include supporting the academic experience with a focus on student learning (Hemwall, 2008; Lowenstein, 2005). Responsibilities include assisting students with orientation, course selection, degree planning, personal development, career decisions, and resource access, among others (Ender, Winston, & Miller, 1982; Gordon, 1992). Academic advisors are often the “only individual the students are obligated to visit three or four times each academic year” (Ender, Winston, & Miller, 1982, p. 6).

Students benefit from advisors who can share knowledge, resources, and support across the campus (Self, 2008). Studies of academic advising find that organizational models vary across institutions (Habley, 1988; Lynch & Stucky, 2000). In a now-dated finding, Habley (1988) found differences in advising loads by institutional control, with loads at public institutions about twice that of private ones.

Frequency of interactions with advisors is important due to the relationship between advising and student success (e.g., Barbuto, Story, Fritz, & Schinstock, 2011; Winston, et al., 1984). How academic advising influences student persistence is unclear, as researchers have found both direct and indirect effects of advising on students’ persistence decisions (Kot, 2014; Metzner, 1989; Pascarella & Terenzini, 2005; Swecker, Fifolt & Searby, 2013). Academic advising also impacts student satisfaction, career aspirations, perceptions of a supportive environment, and campus navigation (Cuseo, n.d.; Drake, 2011; Habley, 1981; National Survey

of Student Engagement [NSSE], 2014; Smith & Allen, 2014; Swecker et al., 2013; Trombley & Holmes, 1981; Winston, et al., 1984). These outcomes can be influenced by institutions, as the frequency of contact with advisors can be altered through practices such as intrusive advising (Schwebel, Walburn, Jacobsen, Jerrolds, & Klyce, 2008; Schwebel, Walburn, Klyce, & Jerrolds, 2012). However, students' perceptions of advising roles and satisfaction with the advising experience vary (Christian & Sprinkle, 2013; Kuh, 2008). Students desire accurate information, guidance, and support from their advisors (Allen & Smith, 2008) and the changing student body composition challenges academic advisors to tailor their services to student needs and interests (Cook, 2009; Kennedy & Ishler, 2008).

Study Purpose

While the importance of academic advising is well established, the literature on advising largely ignores the threshold question of how often students meet with advisors and how student and institution characteristics shape the frequency of these meetings. The existing literature examining these questions dates from the 1980s and is not representative of today's diverse college student body (Habley, 1988) or how the organization of advising has changed. To add to and update the empirical literature on advising, we exploit recent data collected from a large multi-institutional survey. We focus on first-year students, as these students recently transitioned to college and have the most need for interacting with an advisor as part of their transition to college. This study is the beginning of a larger effort to investigate how advising shapes college experiences and outcomes for current undergraduates.

Our focus on the frequency of interactions with an advisor was informed by Pascarella's (1985) general causal model of college impact. In this model, interactions with socializing agents, such as faculty and advisors, are conditioned by characteristics of students and of the

environment of the institutions attended. Thus, we view academic advisors as one potential pathway to improve students' learning and development. However, the efficacy of undergraduates' interactions with advisors depends upon how much the institution emphasizes services and activities designed to improve student outcomes. For example, the ability of an advisor to guide a student to services, like tutoring or job placement, or special opportunities, such as study abroad or an internship, that facilitate learning and development depends upon the institution's commitment to providing the services.

Methods

Data

We utilized data from the 2013 National Survey of Student Engagement (NSSE) administration. Due to our focus on academic advising during the first year of college, we limited our data set to first-year respondents at institutions that chose to administer NSSE and the optional Academic Advising module. We also excluded students attending special-focus institutions, such as seminaries and art schools, and part-time students,¹ as we focused on the frequency of interactions with advisors and lacked data on part-time students' credit loads. After accounting for these exclusions, our final dataset contained 52,546 full-time, first-year students who attended 209 U.S. bachelor's degree-granting institutions².

About two-thirds of the respondents were female and 68% lived on campus. Two out of three students were White; African American and Hispanic/Latino students each comprised 9% of the sample; Asian and foreign students each represented 4% of respondents, while the remaining students were American Indian or Alaska Native, multiracial, or of another (unspecified) racial/ethnic background. About two-thirds of the sample attended public

¹ Part-time students on average had .33 fewer advisor meetings than full-time students. Additionally, part-time students were about twice as likely as full-time students to never meet with an advisor.

² NSSE is limited to bachelor's-granting institutions.

institutions. Students attending doctorate-granting and master's universities represented 41% and 45% of the sample, respectively, while the remaining students attended baccalaureate colleges.

Our outcome measure was the number of times students reported having met with an academic advisor during the school year “to discuss [their] academic interests, course selections, or academic performance.” Response options included exact enumerations from zero to five, plus a final option of “6 or more” (coded as six). Student-level covariates included a variety of student and academic characteristics. We also used data on the following institutional characteristics: Carnegie classification, selectivity, control, undergraduate enrollment, and per-FTE expenditures on student services.

We used multiple imputation by chained equations (MICE) to impute missing data. Multiple imputation is a preferred way to handle missing data (Allison, 2001) and MICE outperforms other imputation methods (van Buuren, 2007; Yu, Burton, & Rivero-Arias, 2007). Imputing data was particularly important in this study, as our outcome measure appeared near the end of a comprehensive survey and about 20% of the respondents did not answer our dependent variable due to survey attrition. We used a total of 20 imputations to minimize the loss of statistical power (Graham, Olchowski, & Gilreath, 2007), but keep the computation time reasonable. Continuous variables were imputed using predictive mean matching, while binary, ordinal, multinomial, and count variables were imputed using the appropriate form of logistic or Poisson regression.

Analyses

We began by examining the mean and distribution of advisor meeting frequency during the first year. Because our dependent variable is a count, we checked the assumptions of the Poisson regression model to assess whether the Poisson or another count model would be more

appropriate. We then investigated bivariate relationships between the number of advisor meetings and a variety of student and institutional characteristics by regressing the number of meetings on each characteristic separately. Finally, we built three regression models that controlled for varying combinations of student and institutional characteristics. The first model only contained student characteristics. The second model added all institutional characteristics except for institutional control, and the final model added institutional control. We converted regression coefficients into incident rate ratios (IRR), which are analogous to odds ratios in logistic regression and represent the expected multiplicative change in the predicted number of advising meetings associated with a unit increase in the independent variable. That is, an IRR of .90 corresponds to a 10% reduction in the number of meetings, while an IRR of 1.10 corresponds to a 10% increase.

We weighted all analyses by gender and institution size to correct for nonresponse bias. We used robust standard errors to account for the clustered nature of our data and further adjusted them to account for the uncertainty of the imputation (Rubin, 1987). Additionally, we compared the coefficients from the final model to an unimputed model with the same covariates using *z*-tests. Only one estimate (Barron's selectivity of highly competitive) was significantly different using a critical value of $p < .05$. Since only one of the 52 coefficient estimates was significantly different and this variable was not imputed, we concluded that any difference between the imputed and unimputed model is most likely due to chance.

Limitations

While our data are relatively unique in enabling the investigation of advising practices at a large number of institutions, the institutions included in our sample choose to administer NSSE and the academic advising module. Thus, these institutions took affirmative steps to assess

advising practices and may not be representative of all bachelor's-granting institutions. Second, our data on the frequency of advising interactions is self-reported by students and is subject to recall bias. NSSE is administered during the spring and sends reminder emails to non- and partial respondents encouraging them to complete the survey. Therefore, respondents completed the survey at different time points and we may not be capturing advising meetings that occur towards the end of the first academic year, such as course planning for the fall term. Additionally, the question wording may not capture advising interactions that occur via phone, email, or web-based systems. Also, as discussed above, we had a considerable amount of missing data in our dependent variable. We used the best possible methodological practices to handle these missing cases and compared the results to an unimputed model, but the missing data might impact our results if the number of advising meetings is correlated with survey nonresponse.

Results

The average full-time first-year student met with an advisor twice during the school year. Meeting with an advisor one to three times appears to be normative for first-year students, as this range encompassed about three out of four students in our sample (Figure 1). About one student in ten never met with an advisor.

Next, we investigated which count model was most appropriate for our data. In checking our data against the assumptions of the Poisson general linear model, we observed that our outcome did not have excessive zeros and that, with a mean and variance of 2.29 and 2.27, respectively, the counts were not overdispersed. We decided to use a general linear model with a Poisson distribution in our analyses. A goodness of fit test for our final model also indicated an appropriate fit to the data.

Table 1 presents our bivariate and multivariate findings. The first column displays bivariate associations for the student and institutional characteristics examined. Student-athletes met with an advisor about 15% more often than non-athletes. Similarly, on-campus students met with an advisor about nine percent more frequently than students living off campus. Black and foreign students met advisors more often than Whites.³ Compared to students in the social sciences, arts & humanities and biological sciences majors met with advisors more often, while business majors less often did so.⁴ Students with a parent holding a doctoral or professional degree met with advisors more frequently than their peers with a highest parental education level of bachelor's. Students expecting to earn only a bachelor's degree met with advisors less often than students who expected to complete either less than or more than a bachelor's degree. Students who received mostly Bs met with advisors slightly less often than those who received mostly As. The amount of time spent studying was positively correlated with frequency of advisor meetings. Students over age 23 met less often with advisors compared with those under 20. Interestingly, there was no significant bivariate relationship between prior preparation (as measured by SAT score) and frequency of advisor meetings.

Several institutional characteristics were also associated with the number of advising meetings. Students attending baccalaureate colleges met with an advisor more often than students at doctoral institutions. Advising meetings were also more common at more selective institutions (Barron's rating higher than "competitive"). Indeed, the largest bivariate relationship in the table is for students attending baccalaureate arts and sciences colleges, associated with a 25% increase in the number of meetings compared to doctoral institutions. Students attending institutions with fewer than 5,000 undergraduates met with advisors more often than their peers

³ "Foreign" is included in race/ethnicity because this is an institution-reported variable that aligns with reporting standards for the Integrated Postsecondary Education data System (IPEDS).

⁴ Major-field groups include expected majors.

at larger institutions. Per full-time equivalent student services spending was positively related to frequency of advising meetings, with a 6% increase in advising meetings for every \$1,000 in per-student expenditure. Finally, students at private institutions met with advisors about 19% more often than their peers at public institutions.

The remaining columns in Table 1 display results for the three regression models. Model 1 adds parameters for student characteristics only, Model 2 adds institutional characteristics other than control, and Model 3 adds institutional control. The final model shows that holding other factors constant, many of the bivariate relationships with student characteristics described earlier continue to hold (though the magnitude of the estimates changed). Student-athletes and on-campus residents met 8% and 5% more often with an advisor, respectively, controlling for other characteristics. Asian, Black, and foreign students met with advisors more frequently than White students after holding other factors constant. Students majoring in the arts and humanities, biological sciences, and education, as well as undecided students, met more often with advisors than did social science majors net of the other student and institutional characteristics. Students with a parent who holds a doctoral or professional degree (e.g., M.D., J.D.) met with an advisor 3% more frequently than students with a parental education level of bachelor's. Students who expected to earn just a bachelor's degree were the least likely to meet with an advisor, as students who did not expect to earn a bachelor's and those seeking more advanced degrees met more frequently with an advisor holding other characteristics constant. The frequency of interactions with an advisor also varied with students' grades. Relative to students earning mostly As, those who received mostly Bs had fewer meetings while those earning mostly Cs or lower had more meetings. The amount of time spent studying was positively correlated with the frequency of advisor meetings. Students aged 23 or older met less often with an advisor than

students under age 20 after controlling for other characteristics. Additionally, SAT score had a modest negative relationship with the number of advisor interactions, as a 100 point increase was associated with an estimated 2% reduction in the number of meetings after holding other characteristics constant.

In contrast with the findings for student characteristics, nearly all significant bivariate relationships with institutional characteristics fell away in the multivariate models. In Model 2, with controls for institutional characteristics other than control, the only significant finding among institutional characteristics was a positive relationship with per full-time equivalent student services spending. Each thousand dollar increase in spending was associated with a 3% increase in the number of advising meetings. However, this relationship became non-significant after adding institutional control into our third model. In the final model, students attending private institutions met advisors about 13% more often than their peers at public institutions, holding other characteristics constant.

Discussion

The diversity and complexity of America's higher education system virtually necessitates that students receive a wide variety of advice from informed persons before and after matriculating into college. Students must navigate an environment that contains substantially different requirements both between and within institutions and that can change over time. In a complex and unfamiliar environment, advice from peers or family members may be insufficient or incorrect. Academic advisors help connect students to campus resources that can enrich their educational experiences or assist them to overcome problems. Additionally, advisors can help students understand the connections between current educational activities and their long-term goals.

Due to these important functions, it is not surprising that academic advising has been linked to student satisfaction, persistence, and other desirable outcomes (e.g., Barbuto et al., 2011; Winston, et al., 1984). While it is generally accepted that interactions with advisors are beneficial to undergraduates, little is known about how often these interactions occur and how this may be related to student and institution characteristics. Using data from over 50,000 first-year students attending 209 institutions, we examined how often students met with an advisor and the correlates of these interactions. We found that the typical full-time first-year student met with an advisor one to three times per school year. However, about 10% never met with an advisor.

A number of student background and academic characteristics were related to the frequency of advisor meetings, but after controlling for student characteristics, we found few differences in the frequency of advising interactions by institutional characteristics. The exception was type of institutional control: Students who attended private institutions on average had 13% more interactions with an advisor than their peers at public colleges and universities, holding constant student and other institutional characteristics. Bivariate relationships between Carnegie type, size, and selectivity dropped from significance in the multivariate analysis, and a positive relationship between student services expenditures and number of advising meetings observed in Model 2 became nonsignificant after adding private/public status in Model 3. Private control was the only significant institutional characteristic in that model, and it also showed the largest estimated effect in that model. This result suggests that while private institutions spend more on student services than publics, there is something unique about private institutions and advising interactions—beyond institution type, size, and selectivity—that accounts for this increased spending. For example, students may demand more personalized services, like

advising, from private institutions than publics due their higher costs, shortening time to degree. Private institutions may differ in the types of student services they finance, and these differences increase students' willingness to consult with advisors. Alternatively, private colleges and universities may feel compelled to provide additional advising services to differentiate themselves from their less costly public competitors. Finally, private institutions may simply be more insistent that students meet with advisors during the first year, for example by requiring such meetings as a condition of registration. Although our data do not reveal whether advisors were faculty or professional advisors, previous research (Habley, 1988; Lynch & Stucky, 2000; Self, 2013) suggests that students at many private institutions are advised by faculty rather than professional advisors. If this is true, our findings may challenge assumptions about the benefits the professional academic advisor model and faculty willingness to commit time to advising (Selingo, 2014)⁵.

In contrast to the institutional characteristics, we found that advising interactions varied by a variety of student characteristics. Student athletes on average had eight percent more interactions with an advisor than their peers, holding constant other factors. A possible reason for this relationship is due to specialized or intrusive advising practices implemented by many teams whereby student-athletes interact more frequently with advisors regardless of academic need, to ensure the student-athlete fulfills NCAA academic requirements. A similar rationale may explain why foreign students met with an advisor nine percent more often than White students, after controlling for other factors. Advisors who work with foreign students, particularly those in their first year, may proactively encourage students to meet with them to monitor their transition into the United States. International students must also meet the requirements of the federal Student

⁵ We hasten to note, however, that the number of advising meetings is different from the quality of academic advice provided.

and Exchange Visitor Information System and may need to interact with an advisor to obtain permission to change their courses or work. In combination, these findings comport with previous research that intrusive advising practices can promote greater student interaction with an advisor (Schwebel et al., 2008; 2012).

Two findings suggest a bimodal relationship between frequency of advisor meetings and academic performance. Students expecting to obtain no more than a bachelor's degree had less frequent interactions on average than their peers not expecting to complete college as well as those planning to earn a graduate degree. Similarly, students who obtained mostly B grades had fewer advising interactions during their first college year than those who earned mostly As, while those who had mostly Cs or below had more interactions than those with mostly As, net of SAT scores and other characteristics. These findings suggest that students who are struggling or very successful academically meet with advisors more often than the typical academic student, and can speculate that the reasons for meeting with advisors differ for the groups at the extremes of educational expectations and academic performance. That said, we did find a positive relationship between the amount of time spent studying and the number of advising interactions and a negative relationship between SAT scores and the frequency of advisor meetings, net of other characteristics.

Implications for Research

This exploratory study suggests several important avenues for future research. The data used for the current study do not permit us to analyze either the reasons for advising meetings or the organization of advising at the institutional level, and both would help advance our understanding. Knowing more about the purpose of advising meetings would illuminate observed differences related to student characteristics, especially the apparently bimodal

relationship related to students' academic performance. It could also help us understand the role of "intrusive advising" for students experiencing academic difficulty.

How an institution organizes advising is another important area for further research. In what ways is the advising relationship different when an advisor is a faculty member as opposed to a professional academic advisor? What is an appropriate case load for a faculty or professional advisor? To what extent can technology offset the demands of face-to-face meetings? What is the impact of special advising programs for student-athletes? And of particular importance given our findings, how is the organization and delivery of advising distinctive at private institutions?

This analysis also does not take into account students' subjective judgment of the quality and value of the advice received from an advisor. Incorporating such measurements could go far to explain students' choices with regard to advising. Some students may elect not to meet with an advisor after an unsatisfactory experience, and this may be an entirely rational response.

Future research might focus attention on extreme cases. For example, it is worrisome that about one in ten full-time, first-year students (9%) *never* met with an advisor, and about one-quarter (24%) did so only once.⁶ To what extent does this pattern represent scheduling constraints limiting opportunities to consult with an advisor, versus choice behavior based on students' judgments about the relevance and value of advising for their circumstances? Did these students realize different academic outcomes than otherwise similar students who met more often with advisors?

At the other extreme, about one in five first-year students met at least four times with an advisor, including about one in ten (9%) who had at least five advising meetings. Who are the

⁶ Previous analyses of NSSE data indicate that older, commuting, and part-time students are over-represented among students who never or only once met with an advisor (NSSE, 2014).

“hyper-advised” and what are their reasons for frequent advising meetings? Is this group composed primarily of low- and high-achievers?

Some research implications involve research design. Although the present study involves a large and diverse institutional sample of 209 colleges and universities, those institutions self-selected into NSSE and the advising module. It would be valuable to test whether the relationships observed here stand up in a research design using a nationally representative sample of institutions. The present study examined only bachelor’s degree-granting institutions, and it would also be important to extend the research to inform the advising function at community colleges. As a cross-sectional study, the present research cannot demonstrate a causal relationship between frequency of advising meetings and student behavior and outcomes. For example, we found a positive relationship between the amount of time students devote to class preparation and the number of advising meetings. But because of the cross-sectional nature of the study, we don’t know whether this relationship simply reflects the behavior of motivated, diligent students, or the result of interactions with advisors. A longitudinal or experimental design could fruitfully inform a variety of questions related to the efficacy and impact of advising.

Implications for Practice

Our findings also offer implications for practice. These results can be used to identify student populations who may be less inclined or less able to take full advantage of academic advising, and to tailor programs to meet their needs. For example, the bimodal pattern described earlier, whereby students who are neither struggling nor excelling interact less often with advisors, raises questions of whether the needs of “the vast middle” are being properly served.

It is clear from the present study that the assertion by Ender, Winston, and Miller (1982) that first-year students “are obligated to visit [an advisor] three or four times each academic year” (p. 6) no longer holds. If periodic advising meetings are important to student success, then our results suggest the need for more systematic tracking of advising relationships. This is particularly important due to the changing nature of advising with a blend of in-person and online interactions. Additionally, the tendency of older and commuter students to meet less often with advisors (documented elsewhere; see NSSE, 2014) suggests the need to examine how well advising arrangements meet the needs of these populations.

Conclusion

Academic advising plays an important role in student success by facilitating students’ transition to college and ensuring that they are well acquainted with course offerings, degree requirements, support services, and special opportunities. As colleges and universities face mounting pressure to increase completion rates and shorten time to degree, improving the reach and effectiveness of advising systems may be an important leverage point. Yet despite its importance, empirical investigation into advising has been surprisingly sparse in recent years. The present study offers a first step in broadening the knowledge base on academic advising, and it exposes a number of avenues for further investigation.

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Table 1.

Poisson regression estimates of the number of meetings with an advisor (N=52,546)

	Bivariate		Model 1		Model 2		Model 3	
	IRR	Sig.	IRR	Sig.	IRR	Sig.	IRR	Sig.
Male	.99		1.00		1.00		1.00	
Student athlete	1.15 ***		1.14 ***		1.09 ***		1.08 ***	
On campus	1.09 ***		1.08 ***		1.06 ***		1.05 ***	
All courses online	.91		1.01		.95		.92	
Race/ethnicity (Reference=White)								
Native American	1.00		1.01		1.00		1.01	
Asian/Pacific Islander	1.05		1.06 *		1.06 *		1.05 *	
Black	1.10 ***		1.09 ***		1.08 ***		1.08 ***	
Hispanic/Latino	1.02		1.02		1.03		1.03	
Foreign	1.11 ***		1.12 ***		1.10 ***		1.09 ***	
Multiracial	1.00		.99		.99		.99	
Other	1.05		1.06		1.05		1.04	
Major field (Reference=Social Sciences)								
Arts & Humanities	1.05 *		1.07 ***		1.08 ***		1.07 ***	
Biological Sciences	1.05 **		1.03		1.03		1.03 *	
Physical Sciences	1.00		1.01		1.02		1.02	
Business	.96 *		.98		.99		.99	
Communications	.97		1.01		1.02		1.01	
Education	1.02		1.04 *		1.06 **		1.06 **	
Engineering	.97		.99		1.00		1.01	
Health Professions	.98		.98		1.00		1.00	
Social Service Professions	.96		.99		1.00		1.01	
Other major	.97		1.02		1.02		1.02	
Undecided	1.01		1.05 *		1.05 *		1.06 *	
Parental Education (Reference=Bachelor's)								
Less than high school	1.03		1.04		1.04		1.04	
High school	1.00		1.01		1.01		1.01	
Associate's/Some college	.98		.99		.99		.99	
Master's	1.02		1.00		1.00		1.00	
Doctoral/professional	1.07 ***		1.05 **		1.03 *		1.03 *	
Educational Expectations (Reference=Bachelor's)								
Some college	1.06 *		1.06 *		1.05 *		1.05 *	
Master's	1.07 ***		1.06 ***		1.06 ***		1.06 ***	
Doctoral/professional	1.13 ***		1.10 ***		1.10 ***		1.09 ***	

Table 1 (continued)

	Bivariate		Model 1		Model 2		Model 3	
	IRR	Sig.	IRR	Sig.	IRR	Sig.	IRR	Sig.
Grades (Reference=Mostly As)								
Mostly Bs	.98*		.99		.98*		.98*	
Mostly Cs or lower	1.02		1.04*		1.03		1.03*	
Study time (Reference=10-20 hours/week)								
Less than 10 hours/week	.92***		.92***		.93***		.93***	
More than 20 hours/week	1.06***		1.06***		1.05***		1.05***	
Age (Reference=Under 20)								
20-23	.97		.98		.98		.98	
Over 23	.90*		.93*		.93*		.92*	
SAT score (100s)	1.00		.99*		.98***		.98***	
2010 Basic Carnegie Classification (Reference=Doctorate-granting)								
Master's	1.01				1.00		1.01	
Baccalaureate – Arts & Sciences	1.25***				1.06		1.08	
Baccalaureate – Diverse Fields	1.10*				1.06		1.05	
Barron's Selectivity (Reference=Competitive)								
Other	.93				.89		.89	
Noncompetitive	.92				.98		.97	
Less competitive	.98				.98		.99	
Very competitive	1.06				1.07		1.05	
Highly/most competitive	1.12***				1.08		1.07	
Undergraduate Enr. (Reference=1-4,999)								
5,000-9,999	.87***				.95		.99	
10,000-14,999	.88***				.96		1.00	
15,000-24,999	.86***				.96		1.02	
25,000-46,000	.88***				.95		1.01	
Student Service Exp./FTE (\$1000s)	1.06***				1.03**		1.01	
Private	1.19***						1.13**	
Constant			2.27***		2.45***		2.42***	

*p < .05, **p < .01, ***p < .001

Notes: IRR = incidence rate ratio. Standard errors adjusted to account for the clustered nature of the dataset.

Bivariate associations for categorical variables included all other contrasts in the same category.

Race/ethnicity categories determined by federal reporting requirements. All results weighted by gender and institution size.

Figure 1
Percentage distribution of full-time first-year students by number of meetings with an academic advisor

